Analysis of Sustainable Development of Damaged Urban Fabric, with Emphasis on Earthquake Crisis (Case Study: Koran Abad City)

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Abstract: Now disaster management and sustainable development can be considered as an integrated subject because given limited resources, especially in Third World countries without actually developing natural disaster reduction programs is not possible. Iran located on the earthquake belt in the world is repeatedly faced with an earthquake. As a result, Khorramabad city also not an exception due to the presence of the main faults and active in the area of high seismic risk zone earthquake is located. The overall goal of this study is to analyze the sustainable development of damaged fabrics. Research methods based on objective applied and based on the nature is descriptive-analytical. Therefore, in this study, with a view of sustainable development in damaged fabrics areas in Khorramabad city, stability damaged fabrics was assessed in relation to earthquakes and to prioritize and analysis of indicators AHP method was used. The results show that in most cases, particularly in the field of physical indicators such as building materials, buildings age, access and damaged fabrics in Khorramabad is unstable and modernization of old ones and improvement of old ones can be useful with a view to sustainable development.

Key words: Damaged fabrics areas, sustainable development, crisis, earthquake, vulnerability, Khorramabad city

INTRODUCTION

Damaged fabrics refers to areas of the city due to physical exhaustion, lack of adequate roadway access, facilities, services and urban infrastructure is vulnerable and spatial values, environmental and low economic is low. The most important problems of old and damaged buildings in cites is people migration of old and worn fabric and replacing them with people who are low income and culturally diverse which in practice fabric culture has been deteriorated. In addition, due to the transition area and lack of sense of place to distressed areas and unwillingness to modernize and investment due to financial weakness and lack of place attachment has brought many problems. General characteristics of the fabrics including old buildings, non-durable building materials such as brick and wood, narrow passages deadlock, low penetration of tissue, serious shortcomings in the enjoyment of services, infrastructure and green open spaces and the population issue (Ali *et al.*, 2006).

Statement of problem research: According to what was mentioned in the introduction that the damaged fabrics of Khorramabad is the old cities of in Iran is not the exception and the tissue marginally in recent years with various economic, social and the physical problems. Statement of problems and problems such as immigration of poor and financial weakness residents to improve their buildings, road networks with low permeability and inefficient and damaged building with non-durable building materials and fine so about 47% of the buildings are over 30 year old. About >67% do not have concrete and metal structures and 35% of the residential parts have <100 area meter. According to Article 5 of Commission approved Khorramabad, area of damaged fabrics approximately 270 ha and mainly based on urban districts 2 region of central context of city such as the market, Asadabadi, the market, back of market, Motahari and Farhang and Alavi.

This range allocated to 9% of the total area of the city and 18.5% of the total population of Khorramabad. Measures taken in previous experiences (plans prepared for according areas in Khorramabad) cannot have the

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least regard to crisis management and reduce vulnerability to deal with natural disasters (earthquake) and therefore cause the development of comprehensive and sustainable development context is not provided. Because one of the indicators of sustainable development of urban is vulnerability to natural disasters and preparedness against disaster and increase urban security and protecting citizens against natural disasters.

Hence, questions such as "how urban management in reducing fabrics vulnerability against natural disasters, especially earthquakes can be effective?" or by recognizing the problems of Khorramabad how old fabrics can be moved in sustainable urban development and questions like why the authors were motivated to pay study.

MATERIALS AND METHODS

Research method in term of the aim is applied and development in term of the nature and method of research is descriptive-analytical

Quantitative analysis: In this study, according to the nature of issue using Cochran formula sample size 321 households were questioned. Descriptive statistics were used to analyze the concepts. In addition, after collecting data and the communication between them using AHP method to assess the stability of distressed areas and prioritize measures against earthquake disaster has investigated.

Qualitative analysis: In this research, qualitative research method is used, using reasoning and logic documents and documents relating to the review and analysis and discovery of truth and reality has commented on hypotheses and research questions.

Perspectives and theoretical foundation:
Sustainable development: The term of sustainable development that discuss economic and social goals of science in solving the environmental problems posed by Barbara Ward entered again in the mid-1970s was used. This concept first Land Brandt once officially in 1987 as "our common future" was raised. In this report, the objective of sustainable development "needs of the present generation without violation of state ability of future generations to meet their needs" is defined. In a more general definition of sustainable development, the process is based on improvement and eliminates the shortcomings of the social-cultural communities.

Therefore, development without stability and sustainability will not be conceptual development. In recent years major, changes in approach and international policies related to urban risks are done and the need to reduce risks for sustainable development was highlighted. Sustainable Development at the International Conference on Environment and Development in Rio de Janeiro in 1992 became a basic policy (Murat *et al.*, 2014).

Systems theory: In system approach, the crisis becomes appears when the system is impaired. Because any system with interconnected components that make up the whole unit, any disturbance in the system is a component of the system is experiencing the disintegration and disorder (Mahmood and Pirasteh, 2012).

The political economy theory and political economy of space: The focus of political economy is on this how economic forces influence decision-makers and politicians and how they affect economic forces (Majekodunmi and Adejuwon, 2012). The political economy approach it is vulnerability to hazards arising from the processes of social, economic and political (Ahadnejad, 2010). Therefore, the vulnerability is not result of risk, but socia-economic and political processes and disaster is a final status of process and the vulnerability arises because of socio-economic processes.

Theory school of structuralism: In structural view increase in disasters of developing countries and least developed, more to the attention of the global economy, the spread of capitalism and the marginalization of the poor and oppressed to the impact of geophysical disasters. As a result, proponents of this view achieve clearer and clearer to detect the subject preferred, on the natural nature of economic development, social and political disasters debate in least developed countries (Ghivechi, 2009).

Research location
Status and position of distressed fabric in Khorramabad: Article 5 Commission of Khorramabad on the basis of indices were determined and by the civilization Supreme and Iranian Architecture area of damaged fabrics in Khorramabad about 270 ha has announced. The area mainly with the central and old fabric in city also known as the commercial center of the city corresponded. The range is 8% of the total area about 3,400 ha which allocated. In terms of population, the tissue around 18.5% of the total population in 2010 is allocated to
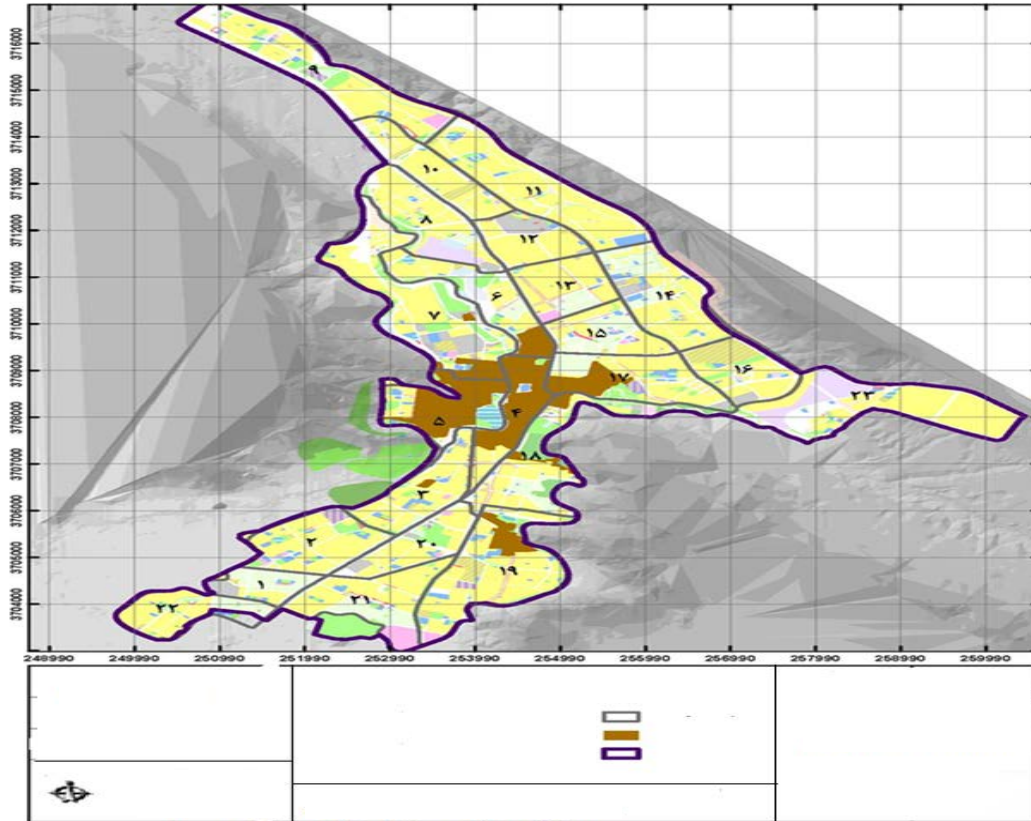
Fig. 1: Status and position of distressed fabric in Khorramabad

Table 1: Indicators of sustainable development in damaged fabrics in Khorramabad

Type Indicator	Description
Social indicators	Acting on this indicator such as sex. The number of households in housing units, age groups for family, education of household head, the birthplace of the head of household and the percentage of native and immigrant status, self, spirit of solidarity, cooperation and help others, educate and inform existence of public volunteer organizations to assistance in times of crisis, social problems have been studied
Economic indicators	Acting on this indicator such as employment status, household level, family income, occupation, head of household, housing and property ownership is examined
Physical indicators	The area of the field in the index, such as plaque, plaque visible area, number of floors, type of construction, age of building access, passage width is studied
Access to emergency	In this index, such as the distance to the park or open space, away from the clinic, the distance to the center of the fire is under services investigation
Environmental indicators	In this index, such as environmental problems, the status light is studied
Municipal utilities network security	The indexes such as seismic strengthening gas network and central control code properly designed water network and the use of multiple sources is studied
Seismicity status indicators	In this index, such as the earthquake acceleration distance to the fault is investigated.

Khorramabad (Khorramabad improve and repair of plan for damaged fabrics, 2011). As can be seen, although 8% of the city's damaged fabrics included but more than 18% of the total population and highlights the high population density of the city (Fig. 1).

Data and indicators: In line with the data and indicators with a subset of their seven main indexes has investigated. Table 1 specifies the status indicators.

Model: Application of AHP in the old fabric of sustainable development, Analytic Hierarchy Process (AHP) is one of the most efficient in planning techniques that are widely used by researchers in various scientific fields, decision-making and planning is used. This model of Multi-criteria Evaluation Methods (MCE) is the decision starts with the identification and prioritization of elements, these elements include the purpose, standards or specifications and options possible and as one of the

most recognized multi-purpose complex patterns that have multiple conflicting measures and flexible tool and can be taken into account.

Generally, AHP has four levels of review that first level target, the second level criteria; sub-criteria tertiary level study included four options. Given that this method is known in detail it will be refused. After the weighting of criteria and sub-criteria study found, weight obtained individually by each of the criteria under the relevant criteria multiplied finally, the standards weight were obtained and as can be seen in Table 2.

Weight gain between zero and one are the results of this phase indicates that is most effective factors in research.

RESULTS AND DISCUSSION

The results of the hierarchical model: The results of the above table show that the earthquake horizontal acceleration in this study had the greatest impact and should be given special attention to this issue and the first priority. Safety distance to fault gas networks, distance and open parks and green spaces, street width, self-reliance, employment status, access to fire departments, life building, type of construction materials, income, ownership, environmental status, place of birth, state of the water network, access to medical centers, number of floors, access to the police station and are next in order of priority.

Social indicators: The results of library studies and surveys have shown the old fabric of Khorramabad has

Table 2: Final weight criteria, sub-criteria studied in the research

Criterion	Weight	Subcriteria	Weight	Final weight	Variables
Social indicators	0.0692	Acting gender	0.0334	0.002311	Female
					Male
		The number of households in housing units			
	0.2104	0.01456	One family	Two families	Three households
					Four families
		Age groups, family	0.1447	0.010013	Lower 15 year
					15-25 year
					25-45 year
					40-60 year
					Above 60 years
		Level of education of household head	0.1051	0.007273	Illiterate
					Diploma
					Diploma
					Associate degree
					Bachelor's degree or higher
		The birthplace of the head of household and the percentage of native and immigrant status	0.2632	0.018213	Neighborhood
					Other Neighborhoods
					Other cities in the Khorramabad city
					Villages in the city of Khorramabad
					Other towns and villages in Lorestan province
					Other towns and villages
					Other country
		Self-reliance	0.599	0.041451	Very little
					Little
					Average
					Much
					Too much
		Spirit of solidarity, cooperation and help others	0.0391	0.002076	Very little
					Little
					Average
					Much
					Too much
					Too much
		Education and awareness	0.0604	0.00418	Very little
					Little
					Average
					Much
					Too much
		There are volunteer organizations to assist people in times of crisis	0.0415	0.002872	Very little
					Little

Table 2: Continue

Criterion	Weight	Subcriteria	Weight	Final weight	Variables
					Average
					Much
					Too much
		Social problems	0.0423	0.002927	Addiction
					Theft
					Conflicts between neighbors
					Insecurity
Economic indicators	0.0907	Employment status of head of household	0.4479	0.040625	Practitioner
					Jobless
					Retired
					Other
		Monthly income household	0.2204	0.01999	<500 tomans
					500-1 million tomans
					A million to one million five hundred tomans
					One million five hundred thousand to 2 million tomans
					>two tomans
		Occupation, head of household	0.1222	0.011084	Simple occupations such as workers, hawkers and
					Engineering
					Free
					Government job
					Other
		Housing and property ownership	0.2096	0.019011	Civilian
					Rental
					Organizational
					Free
					Common
Physical indicators	0.1672	Area of the field	0.0474	0.007925	<50 m
					50-100 m
					100-200 m
					>200 m
		Obvious area	0.039	0.006521	<50 m
					50-100 m.
					100-200 m.
					>200 meters
		Number of floors	0.0822	0.013744	One floor
					Two floors
					Three floors
					Four floor
					Five floors and more
		Type of building materials	0.137	0.022906	Metal archaic
					Reinforced Concrete
					Brick and Iron
					Brick and wood
					Wood and Clay
					Other
		Life Building	0.1592	0.026618	5 year
					5-10 year
					10-20 year
					20-30 year
					>30 year
		Convenient access	0.1854	0.030999	There are not (>20 m to residences)
					Poor (10ms to residences)
					Medium (5-10 m)
					Good (at the door)
		Width passage	0.3499	0.058503	<6 m and standoff
					6-10 m
					10-14
					Over 14 m
Access to emergency services	0.1241	Park distance or open space	0.4917	0.06102	<50 m
					50-150 m
					150-300 m
					300-1000 m
		Distance to clinic	0.1336	0.01658	<200 m
					200-500 m

Table 2: Continue

Criterion	Weight	Subcriteria	Weight	Final weight	Variables
					500-700 m
					>700 m
		Distance to station	0.093	0.011541	<400 m
					400-700 m
					700-1000 m
					>1000 m
		Distance to Fire	0.2817		<200 m.
					200 to 400 m
					>700 m
					>700 m
Environmental Indicators	0.0556	Sewage disposal	0.1728	0.034959	Absorption wells
					Public sewage network
					Dedicated Tank
					Surroundings
		Environmental problems	0.3358	0.009608	Despite the passage of waste
					Improper disposal of sewage
					air pollution
					Noise pollution
					Other
		Lighting situation	0.4914	0.027322	Very bad
					Bad
					Average
					Good
					very good
Safety networks, municipal utilities	0.0898	Strengthening the gas network and central control with seismic code	0.81	0.072738	Favorable
					Undesirable
		Proper design of water network and use multiple source	0.19	0.017062	Favorable
					Undesirable
Seismicity status Indicator	0.4033	The earthquake acceleration	0.53	0.213749	0-0.1g
					0.2-0.3g
					0.2-0.3g
					0.3-0.4g
					0.4-0.5g
					>0.5 g
		Distance to fault	0.47	0.189551	0-700 m
					700-1000 m
					1000 and 3000 m
					>3000 m

most social indicators regarding gender of household. The number of households in housing units, age groups for family, education of household head, the birthplace of the head of household and the percentage of indigenous escape self-reliance, the spirit of solidarity and partnership and social problems are unstable (Table 3).

Economic indicators: Based on library studies and questionnaires, most economic indicators examined the old fabric of Khorramabad city, including jobs the unemployment rate heads of households, income; type of job and housing ownership in unfavorable conditions and in critical situations of high vulnerability (Table 3).

Physical indicators: In the third quarter explicit plaque area and residential area, number of floors, type of building materials in the building, access and wide streets were examined, the results of the study library and questionnaire indicate that the damaged fabric of Khorramabad in terms of these indicators is vulnerable (Table 3).

Indicators of access to emergency services: Emergency service indicators include the distance to the park or open space, distance to health centers, distance to the police and fire departments were studied distance. The results of the studies show that the old fabric less favorable in terms of these conditions is not met and in terms of access to emergency services is confronted with fundamental flaws and a high degree of instability (Table 3).

Safety indicators for damaged fabric areas installations network: In the field of network safety indicators established and investigated. Seismic strengthening the gas network code and the central control and proper design of water network and the use of multiple sources of cases that have been investigated in the third quarter. The results of the studies also show that the old fabric of Khorramabad in connection with the above-mentioned index is unstable (Table 3).

Seismicity status indicator: One of the most important indicators about the status of Khorramabad seismicity is

Table 3: Status indicators of sustainability

Criterion	Measures	Description	Percent	Status	Measures	Description	Percent
Social Index	The number of households in housing units	Stable	70	Economic indicators	Employment status of head of household	Stable	55.8
						Middle sustainable	8.70
						Unstable	35.5
		Middle Sustainable	27.5		Monthly income household	Stable	0.00
						Middle sustainable	11.7
						Unstable	88.3
		Unstable	2.7		Occupation, head of household	Stable	18.1
						Middle sustainable	1.60
						Unstable	70.4
	Age groups, family	Stable	50.32		Housing and property ownership	Stable	79.1
						Middle sustainable	1.60
						Unstable	19.3
		Middle Sustainable	19.5		Employment status of head of household	Stable	55.8
						Middle sustainable	8.70
						Unstable	35.5
		Unstable	30.18		Monthly income household	Stable	0.00
						Middle sustainable	11.7
						Unstable	88.3
	Level of education of household head	Stable	13.2		Occupation, head of household	Stable	18.1
						Middle sustainable	1.60
						Unstable	70.4
		Middle Sustainable	31.5		Housing and property ownership	Stable	79.1
						Middle sustainable	1.60
						Unstable	19.3
		Unstable	54	Physical indicators	No area of the field	Stable	22.4
						Middle sustainable	49.8
						Unstable	26.8
	The birthplace of the head of household and the percentage of native and immigrant status	Stable	48.8		No obvious area	Stable	11.6
						Middle sustainable	39.2
						Unstable	49.2
		Middle Sustainable	10.6		Number of floors	Stable	58.3
						Middle sustainable	36.1
						Unstable	5.60
		Unstable	40.6		Type of building materials	Stable	3.10
						Middle sustainable	0.00
						Unstable	96.9
	Self-reliance	Stable	1		Life Building	Stable	4.50
						Middle sustainable	34.4
						Unstable	61.0
		Middle Sustainable	27.1		Width passage	Stable	10.4
						Middle sustainable	46.6
						Unstable	43.0
		Unstable	71.9	Access to emergency services	park distance or open space	Stable	22.1
						Middle sustainable	22.4
						Unstable	55.5
	Spirit of solidarity, cooperation and help others	Stable	19.9		Distance to health centers	Stable	13.7
						Middle sustainable	38.7
						Unstable	47.4
		Middle Sustainable	18.7		Distance to station	Stable	22.8
						Middle sustainable	17.4
						Unstable	60.8
		Unstable	41.7		Distance to Fire	Stable	15.2
						Middle sustainable	25.9
						Unstable	58.3
	Education and awareness	Stable	0	Municipal utilities network	Strengthening the gas network and central control with seismic code	Stable	0.00
						Middle sustainable	0.00
						Unstable	100
		Middle Sustainable	0		Proper design of water network and use multiple source	Stable	0.00
						Middle sustainable	0.00
						Unstable	100
		Unstable	100	Seismicity status indicators	The earthquake acceleration	Stable	0.00
	There are volunteer organizations to assist people in times of crisis	Stable	0			Middle sustainable	0.00
						Unstable	100
		Middle Sustainable	0	Distance to Fault		Stable	0.00
						Middle sustainable	0.00
			100			Unstable	100

damaged fabric. Damaged fabric of Khorramabad in terms of earthquake acceleration in high-risk conditions, are extremely vulnerable and have high potential earthquake risk is high risk (Table 3).

CONCLUSION

Evaluation of study indicator in damaged fabric area in Khorramabad shows the fabric is grappling with the dilemma and difficulties. Low permeability fabrics, non-compliance with the hierarchy of streets, passages are narrow, lack of green and open spaces and improper distribution, burnout fabric and strength of its weak and old buildings above them inappropriate materials, poor infrastructure and services, there are multiple nodes and heavy traffic in the area and surrounding tissue. There are bridges that when the earthquake disaster relief is difficult and weaknesses in the design of critical network equipment like gas network is proportional to the earthquake of the most important problems of damaged fabric in Khorramabad which was in unstable condition should be taken into consideration and implementation mechanisms for them is a solution for this problem.

SUGGESTIONS

Rehabilitation and reconstruction of damaged fabric in Khorramabad with a view to sustainable urban development. Flexible design of urban form, neighborliness and fit and suitable distribution density urban land use (population and construction) which can be a major role in reducing vulnerability and increasing sustainability in damaged fabric. The policy of decreasing the population density and the location of some land as green space in central city areas is particularly in the areas of the market.

Select suitable locations for temporary deployment and emergency disaster population within and around the old texture. In this context, open spaces western edge of the neighborhood on the hillside behind the market, City's Central Park, Shariati Park, Behesht Park and East neighborhood and open spaces suitable stack of options for temporary deployment of disaster and emergency has been proposed.

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