

# Family-Based Disaster Preparedness: A Case Study of the City of Rudsar

Jafar Akbari

M. A in Management, [jafar.akbari2@gmail.com](mailto:jafar.akbari2@gmail.com)

**Abstract:** The risks of accidents and disasters such as earthquakes, floods and the vulnerability of people to structural and non-structural damages are very high in many regions of Iran, including the city of Rudsar. This article has studied the important issue of operational preparedness of the families in Rudsar in the face of possible accidents, disasters and crises. The aim of the study is to investigate the factors influencing the participation of citizens in possible accidents in Rudsar and to suggest ways for increasing their participation. The study is an applied one and has used the existing literature and description as its method of data collection. The research sample included the household families in the rural and urban areas of Rudsar during the winter of 2015. Sampling was done by clustering method and the questionnaires were randomly distributed among the household women who were accessed through the health centers in the region. The data was analyzed in SPSS 18. The results showed that there is a significant relationship between training and household preparedness which indicates the direct relationship between training and preparedness among the families of Rudsar in the face of accidents and disasters. Therefore, to increase inclusive participation of everyone for controlling the accidents and disasters it is necessary to conduct training for all age groups especially for the women of the families – who are possible to reach at through the health centers – so that the latter group could transfer the training to all the other family members. It is recommended that certain measures be taken to empower the rural and urban families in the face of accidents and disasters as well as self-care in human-made disasters and the arrangement of household objects and the automobile in a safe way.

**Keywords:** Disasters, Crisis, Family preparedness, Training

## Introduction:

The growing increase of the population, uncontrolled constructions, illegal buildings on the suburban areas, the vulnerability of rural communities, the susceptibility of the infrastructure to human-made accidents, growing of poverty and class difference, social, economic and cultural conditions, lack of insurance for accidents and disasters, lack of prediction, local risks and vulnerability, and lack of a responsible organization for training the families to decrease damages are among the many challenges in today's world. Moreover, there are problems on the national level for coping with a crisis, including, a) lack of any systematic planning at the national level, b) lack of any institutional planning for providing the emergency services and c) lack of necessary training among the people and public training for the families. Among these factors, training can be considered to play an important role as an initial step for coping with the accidents and preparing the communities. In doing so, it is required to involve all the interest groups and properly direct the resources for training. Such planning is aimed at helping the high-risk groups to cope more effectively with a crisis and increase the social resources by involving local and household communities for identifying and designing an efficient training program to prepare the local and household communities to deal with the accidents and crises. In other words, the growing number of harmful accidents caused by natural or non-natural disasters is a warning to come up with the necessary solutions and ways to mobilize the existing resources with the priority of training and educating the families. This can be considered one of the most important solutions for decreasing the damages.

Type of disasters:

### 1. Natural disasters

A natural disaster refers to a group of harmful accidents which does not have a human origin. These disasters are usually unpredictable or hard to predict early prior to their occurrence. Some of the natural disasters include: earthquakes, floods, hurricanes, tornadoes, tsunamis, hails, avalanches, lightning, extreme variations in the temperature, draught and eruptions.

### 2. Natural disasters caused by the humans

Some of the natural disasters are indirectly caused by the humans. For example, the disasters related to the air pollution, global warming, or floods caused by deforestation.

The definition of crisis:

To put it simply, a crisis refers to a time of danger or alarm. In fact, a crisis is a condition or period in which things are uncertain, difficult and painful. This is especially so when a major danger is to be avoided (Tulaei, 1994).

Types of crisis:

#### 1. Sudden crisis

Some types of crisis happen suddenly and without warning. These are called sudden crises.

#### 2. Gradual crisis

This type of crisis begins with a series of critical events, intensifies in the course of time and by reaching to the liminal state emerges as a crisis.

The critical moment:

A critical moment refers to a time when highly important events about the future occur or when a decision is made about these events.

Crisis in medical sciences:

In medical sciences, a crisis is a condition whereby the body members become imbalanced and the human healthy is jeopardized (Tenberg , 1994).

Social crisis:

A social crisis refers to a time when the society becomes imbalanced, chaotic a confusion-stricken. A crisis can be considered an abnormal condition in which sudden and unexpected problems emerge. In such a condition, the laws, norms and common rules will not be of any use (ibid).

Crisis management:

Crisis management is a process whereby a manager controls and organizes the situation based on the temporal and spatial circumstances and by using the expenditures and resources (Baqeri, 2006).

Research question:

The Islamic Republic of Iran is exposed to many natural and non-natural (human-made) disasters. In the last decades, this country has suffered from many such events. Given the geographical condition of Iran and the occurrence of natural accidents and disasters, the country is among the 10 most disaster-prone countries. The occurrence of natural disasters like floods and earthquakes imposes many casualties and damages upon the people. This necessitates the need for family preparedness in coping with the natural disasters. According to the researches, Iran is one the most disaster-prone countries in the world. Statistically, 90% of the population in Iran are exposed to the dangers caused by floods and earthquakes.

The geographical size and climatic and ecological features of Iran have made the country to suffer from 31 out of the 41 known types of natural disasters among which floods and earthquakes are the most common ones. These latter types of natural disaster frequently impose damages and destructions upon the country. Given

the geographical position of Iran which has made it prone to the occurrence of natural accidents and disasters, the country has ranked among the 10 most disaster-prone countries in the world, and the fourth in Asia. The vulnerability of Iran to earthquakes is almost one thousand times more than Japan, itself highly prone to earthquakes. On the other hand, the preparedness in Iran is 12/2% in rural areas and 15/9% in urban areas.

The province of Guilan (located at north of Iran) is among the 10 disaster-prone provinces in Iran. In terms of the level of preparedness it has an average rank. However, the city in this case study, Rudsar (in Guilan) is located at the eastern part of the province and is one of the largest, most populated and sparsely populated cities in the province of Guilan. It is 1340 square kilometers. The population density is 117 people per a square kilometer. It has 48328 families: 26396 urban and 21932 rural. The number of population is about 157787: 90978 urban and 66809 rural. Rudsar has 7 villages, 5 regions and 5 towns. There are 478 villages around Langrood, Amlesh, Rudbar and Ramsar. It is connected to the Caspian Sea from the North, the Alborz Mountains from the South, Langrood from the West and Ramsar from the East. Statistical and historical studies show that this city has encountered many natural disasters so far. According to the existing statistics and documents the most frequent natural disasters in the city are: floods, earthquakes, lightning, draught, hurricanes, landslides, frostbites and the heat exhaustion of agricultural crops. The statistical analysis of damages in recent years shows that the severest damages have been on the infrastructure, roads, bridges, agricultural lands and houses. It should be noted that despite the many advancements and facilities, the disasters remain unpredictable. However, preparedness and readiness can decrease the dangers and damages. Family preparedness for coping with the natural disasters is necessary and indispensable. In recent years some organizations have taken certain measures to increase the citizens' information about coping with natural accidents and disasters and prepare the people for crisis managements in facing the natural disasters. One such a thing is conducting an earthquake drill the results of which show the effectiveness of training and drills in decreasing the damages and casualties caused by natural disasters.

Continuous preparedness of the families, especially rural families, for coping with the natural disasters, is highly important. Preparation, evaluation and new ways for improving the methods for accident prevention requires information and cooperation of all people. The occurrence of natural disasters is one of the most important reasons for the hindrance on the process of development and stability in rural and urban communities. To prevent the human and financial damages in these accidents one needs to cope with them in a principally systematic and scientific way. 90% of Iran's population live in cities which are highly vulnerable to accidents and disasters. It is necessary to secure the service units of the buildings and familiarize the families in the rural and urban areas with the methods of preparation including for example defense drills in coping with the crises and natural accidents and disasters. Providing the citizens with practical training is expected to minimize the damages caused by natural disasters. Moreover, the majority of the people should come to the belief that proper training can help them organize in the face natural disasters and thus improve prevention and self-aid. To achieve this important goal, it is necessary to increase the people's information about the risks of natural disasters by training and involve and train them about the measures, preparation and securing in coping with the natural disasters. Continuous training of the families is especially important in this regard.

The macro aim of the health system of the country is to decrease the dangers caused by natural and human-made disasters in the society. The health system presents an operational program for dealing with the disasters and emergencies. This program is designed by department of health in the universities and health centers of the cities and is managed by certain units to decrease the dangers of the disasters. Such a program is highly useful and has been designed for the first time in a comprehensive manner by the health system to train preparation methods for the families. The program has been based on the experiences gathered from previous accidents and disasters and is very practical. One important aspect of this program is the attention paid to the training of the families especially the women because they can be reached at through health centers and also because they play a pivotal role in coping with the accidents and disasters.

#### **The risks in urban areas:**

More than half of the population of Rudsar live in the urban areas. This has made the immunization of the cities more of a challenge. The cities are the driving force behind national growth and governmental capacities. Cities and urban areas are compact and complex systems of interrelated services. The cities are exposed to an increasing number of issues which can cause disaster risks. To deal with these issues we need to make the cities as livable as possible no matter what their size or history is. Some of the causes behind the risks include: the exponential growing of urban population, uncontrolled constructions, illegal construction on the suburbs and the consequent increase in population density which imposes pressures on urban units and services and leads to residences on the coastal areas, along unstable mountain slopes and the risky areas on the suburbs. In different historical periods, the natural accidents and disasters have disturbed the city life. Extreme changes in the climate, earthquakes and other states of emergencies caused by the man-made risk have exerted a growing pressure on the people and have jeopardized the development of cities. This has made it difficult to deal with the effects of small and large scale disasters and man-made risks. Climate changes and extreme weather conditions increase the vulnerability of cities to the disasters and risks. It is rarely noticed that urban management methods lead to complex forms of ecological changes which if ignored can increase the risks in these areas.

### **The risks in rural areas:**

The models of social and ecological developments of rural areas may increase the risks and vulnerability. Some of the challenges that the managers meet with regard to dealing with the natural and human-made accidents and disasters include: uncontrolled constructions, illegal and unsystematic constructions around the forests and agricultural lands, deforestation and the destruction of farms, exploitation of rural lands, widespread speculations and turning of the lands into villas, the increasing class conflict, vulnerability of the rural communities, the problems in infrastructure. Other problems include: the concentration of resources, capacities and facilities in the centers of the cities, lack of human and financial resources in the rural areas, lack of power of the rural managers, lack of a systematic organization of duties with regard to decreasing the risks and vulnerabilities, the weakness of local governments, insufficient participation of local interest groups, mismanagement of wastes and pollutants, which creates an unhealthy condition and leads to floods and landslides, deforestation and destruction of ecologies because of human activities like road construction, pollution, excavation of unstable resources, widespread fires which limits the possibilities of emergency services in times of floods.

### **The importance of crisis management:**

We are living in a society and a historical period faced by globalization. Its components are related by a complex system. When an accident occurs in the farthest end of the world; an earthquake in a corner of the world, a war and conflict, flight crash or a terrorist attack; the people of the world have access to the breaking news, the news travel with the speed of light and in a blink of any eye everyone becomes aware of the accident. The media and the people wait impatiently to know in exact details about the accident. It is necessary to use the capacities of the media for raising awareness and training of the families for coping with the accidents and disasters. This duty is on the shoulders of those who plan and implement an efficient crisis management program. Therefore, in order to prevent the intensification of the crisis, control the flow of relationships and to secure the people and organization in the face of threats and unpleasant events it is necessary to have a crisis management.

### **The participation of society in crisis management:**

The participation of the members of the society is the basis of a community and is a significant index because the participation of the members of the society in coping with natural disasters is one of the most important factors for crisis management and decreasing of the human and financial casualties caused by those disasters. Social groups can function as a suitable context for prevention, decreasing the harmful effects of the natural

disasters, preparation before the occurrence of the accidents, participation in search operations, save and support and in the process of psychological, mental and social recovery after the accidents. However, to involve people in the process one needs to change the perspective of the managers as well as the people themselves with regard to the issue of participation in the face of natural disasters.

### **Aims of the study:**

The aim of this study is to investigate the degree of preparedness of the families of Rudsar in coping with accidents and disasters and to identify the factors influencing the participation of the citizens in coping with possible accidents, and to finally suggest efficient ways for increasing the participation of the people. The study was conducted in the winter of 2015 on the rural and urban families of Rudsar. The sample method was clustering and a questionnaire was distributed randomly among the female members of the families. The study is aimed at finding a way for coping with the unexpected accidents through training and preparation of the families in Rudsar. To achieve this it is necessary to make use of the people's centrality. The aim is to prepare the people for dealing with natural and man-made accidents and carry out effective prevention procedures to cope with the natural and non-natural accidents. The final aim is to increase the degree of preparation of the people for dealing with the accidents and disasters and decrease the material and spiritual damages imposed on the society.

### **Hypotheses:**

In this study, the level of preparation of the families in Rudsar in coping with the crises and possible accidents is highly significant. According to the ways of operation preparedness of the families in Rudsar in dealing with the accidents, the study suggests one major and five minor hypotheses:

The main hypothesis of the study is to investigate the level of preparation of the families of Rudsar in coping with the accidents and disasters and the minor hypotheses is a response to this one.

First hypothesis: There is a significant relationship between the training of the families and the level of operational preparedness of the families in critical times.

Second hypothesis: There is a significant relationship between the training of the families for coping with the accidents and disasters and the decrease in structural damages.

Third hypothesis: There is a significant relationship between structural evaluation of the houses and retrofitting against the accidents and disasters.

Fourth hypothesis: There is a significant relationship between the training of the female members of the families to cope with the local dangers, accidents and disasters of Rudsar (earthquakes, floods, draughts, hurricanes, landslides, extreme temperature conditions, fires, etc.) and decreasing risks.

Fifth hypothesis: There is a significant relationship between suitable arrangement of household and work place tools and facilities and decrease of non-structural vulnerability.

### **Theories:**

To organize the theoretical basis of the study bibliographic sources and the theories of Larry Smith, Pearson and Klier are used.

In his theory, Larry Smith, who is the head of the American Institute of Crisis Management, notes that when crisis and accident management is done efficiently, a danger as a crisis can be prevented or its harmful effects decreased to a large extent. Moreover, according to the theories of Pearson and Klier, crisis management refers to the systematic efforts of the members of an organization or extra-organizational interest groups to prevent the crises or effectively manage them when they occur.

#### Literature review:

A look at the history of human civilization shows that the occurrence of natural disasters has always accompanied the lives of the people and imposed irreparable damages on the human societies.

The existing literature on the issue of family preparedness in decreasing the damages of accidents and disasters is ample, both in Persian and other languages. The high number of studies shows the significance of this topic of preparation for accidents and disasters for researchers.

1. In a study titled "The role of training in decreasing the damages in times of crises", Hashemi and Mosaferi (2007) have investigated the factor of training and preparation in decreasing the damages of accidents and disasters. Living in the age of management and the information technology has turned the world into a global village. In this complex world, the number of threats and opportunities has increased per the unit of time so much so that we notice severe problems and crises whose solutions require awareness and pre-accident/crisis preparedness.

Empirically speaking, one of the basic principles of coping with unexpected accidents is preparation. Preparation in turn initially requires public awareness, information, sense of responsibility, public participation in training for preparation, creating the capacities for self-aid and other-aid and increasing people's information to decrease vulnerability. Training is one of the best methods for improving the index of profitability in human societies.

The results of the above study shows that to attract public and inclusive participation training should be done to all age and social groups without any exception.

One of the most important reasons for the high degree of damages is the lack of information in natural and human-made accidents as well as lack of attention to the role of people in creating security, health and aid in disasters. The participation of people in emergency aids during disasters can greatly facilitate the process of mental and psychological recovery. This can be realized when the people have sufficient knowledge and information about aiding.

2. In a study titled "An investigation of the people's participation in coping with natural disasters: the case of Khuzestan", Jahangiri et al. (2010) have argued that the participation of the society in dealing with the natural disasters is one of the most important components of crisis management. Since the province of Khuzestan is considered one the most important border provinces of Iran and is also one the most disaster-prone provinces, the study has aimed to determine the parameters of social participation of the people of Khuzestan in coping with natural disasters. The study has also addressed the issue of ways to attract and organize people's participation in coping with natural disasters. The results of the study highlighted the significance of planning, organization and organization of the interest groups by the governmental administrators. Given the traditional context of Khuzestan and the dominance of local culture in this province, the results of this study can be used as a method for improving the culture of participation in the society to prevent and decrease the damages caused by the disasters, prepare and plan for pre-accident period, participate in the operations especially search, aid, save and support and in the stage of occurrence and recovery as well as in the aftermath of the accident to be able to organize, recuperate and return to normal state. The researcher concludes that to achieve this we need to change the perspective of the managers with regard to the role and type of people's participation in dealing with natural disasters.
3. A study conducted in the American Institute of Management shows that after 9/11 the establishment of crisis management teams in American companies has increased. Before the 9/11, 38% of the companies had crisis management teams while after it, during 2002 almost 54% of the companies and during 2003 almost 62% of the companies had crisis management teams. The programs of controlling groups such as fire extinguishment, plans to increase the experience of groups' operations, efficiency and the reaction speed were analyzed in this study.
4. A study conducted by the Kokawa N Association of International Red Cross with an emphasis on the role of Red Crescent in the crisis that occurred in Cuba, presented at the risk management conference (2003).

5. Victoria L. P. A study about the society based on crisis management in a center for people's preparedness in Philippines (2003).
6. Ramirez A. A brief study of the society's preparedness in coping with accidents and crises at the University of Sans Francisco (2003).

#### Research methodology:

This is an applied study with a descriptive methodology in Rudsar (Guilan) during 2015. The research methodology is descriptive and correlation type. The study is descriptive because it describes the situation and correlations. The main aim is to determine whether there is a relationship between two or more variables and if yes how is this relationship.

#### Research statistics:

The research population of this study includes all rural and urban families of Rudsar in Guilan; the mothers of rural and urban families who have a family health profile in the health centers and units in rural areas, in total 48328 families. This included 21932 rural and 26394 urban families.

The study is made of two sections: general and specific. The general section includes education, residence and job. The specific section includes five hypotheses.

The size of the sample:

The size of the statistical size is a set made of a part, a group or a larger group in such a way that this set introduces the quality and characteristics of the part, group or a larger group. Therefore, the sampling method includes the whole of the statistical population, that is, the female householders who had access to health centers in the rural areas. According to the Morgan table 370 were randomly chosen.

Table 1. Size of population and sample

N		S	
Female members of urban families	Female members of rural families	Female members of urban families	Female members of rural families
26394	21932	210	160
Total 48328		Total 370	

#### Validity:

Validity means whether the measurement tools are able to measure the characteristics and properties of which they are designed for. In this study, to check the validity the ideas of experts in the field were used. It shows how much the size, elements and concepts of the questionnaire were covered.

#### Reliability:

Reliability is the similarity of people's scores for a set of items in two different situations or in two equivalent tools. In other words, the measurement tools are given to a single group in a period of time for several times so that the results are similar to each other; the size changing from zero to one. Zero shows the unreliability of the analyzed scale while one shows complete reliability. The more the result is close to one the more homogenous the questions are. The reliability of measurement for each variable is obtained by using Cronbach's alfa and the results of SPSS.

Cronbach's alfa has been used in this study to measure the reliability coefficient. Cronbach's alfa is a coefficient which reflects the positive correlation of the members of a set.

The formulation for Cronbach's alfa:

$$\alpha = \frac{k}{k-1} \left( 1 - \frac{\sum S_i^2}{S_{sum}^2} \right)$$

Results:

The results of this study show that there is a significant relationship between training and the preparedness of families in coping with the accidents and disasters. The degree of this relationship indicates the existence of direct relationship between training and the preparedness of families of Rudsar in coping with the accidents and disasters.

To evaluate the indexes and descriptive statistics were analyzed about the variable of the general section. Table 2. Shows that 26/49% had university education and 73/51% had non-university education. In terms of residence, 78/38% had personal housing and 21/62% had lodging housing. I terms of jobs, 87/84% were householders and 12/16% had governmental or non-governmental jobs outside the house.

Table 2. The descriptive frequency of the general section of the research

<b>Degree</b>	<b>University</b>	<b>98</b>	<b>26/49percent</b>
	<b>Non-university</b>	<b>272</b>	<b>73 /51percent</b>
<b>Residence</b>	<b>Personal</b>	<b>290</b>	<b>78 /38percent</b>
	<b>Lodging</b>	<b>80</b>	<b>21/62percent</b>
<b>Job</b>	<b>Householder</b>	<b>325</b>	<b>87/84percent</b>
	<b>Employed</b>	<b>45</b>	<b>12/16percent</b>

Table 3. Description of research variables

<b>Variables</b>	<b>Size of the sample</b>	<b>Highest</b>	<b>Lowest</b>	<b>Mean</b>	<b>Standard variation</b>	<b>Variance</b>
<b>Preparedness of Rudsar families</b>	<b>370</b>	<b>1</b>	<b>5</b>	<b>3</b>	<b>0/892</b>	<b>0/ 795</b>
<b>Family training</b>	<b>370</b>	<b>1</b>	<b>5</b>	<b>3</b>	<b>0/910</b>	<b>0/829</b>
<b>Structural vulnerability</b>	<b>370</b>	<b>1</b>	<b>5</b>	<b>3</b>	<b>0/984</b>	<b>0/969</b>
<b>Structural evaluation</b>	<b>370</b>	<b>1</b>	<b>5</b>	<b>3</b>	<b>0/990</b>	<b>0/979</b>
<b>Training of the female members of the families</b>	<b>370</b>	<b>1</b>	<b>5</b>	<b>3</b>	<b>0/998</b>	<b>0/998</b>
<b>Non-structural vulnerability</b>	<b>370</b>	<b>1</b>	<b>5</b>	<b>3</b>	<b>0/950</b>	<b>0/932</b>



In analyzing the variables of the research in the inferential section with regard to the specific section. In the questionnaire, given the normality of the inferential statistical data the Pearson correlation was used to test the hypotheses. All the research hypotheses were confirmed which shows that there is a significant relationship between training and the preparedness of families in coping with the accidents and disasters.

Table 4. Description of the correlation coefficients of the hypotheses

Hypotheses	Variable	Size of the sample	Correlation coefficient	Significance	Result
Main hypothesis	Preparedness of the families	370	+48/9percent	0/000	confirmed
First hypothesis	Family training	370	+36/3percent	0/000	confirmed
Second hypothesis	Structural vulnerability	370	+28/6percent	0/005	confirmed
Third hypothesis	Structural evaluation	370	+35percent	0/076	confirmed
Fourth hypothesis	Training of female members of the families	370	+57/2percent	0/000	confirmed
Fifth hypothesis	Non-structural vulnerability	370	+49/4percent	0/000	confirmed

#### Discussion and conclusion:

Given the comparison of the results of this study with the findings of Persian studies about the preparedness of families in decreasing the damages of accident and disasters, including Hashemin and Mosafer, and Jahangiri et al. who have emphasized the role of training as the best way for improving the index of profitability in coping with the accidents and disasters it can be noted that those findings are in line with the present study. Moreover, other studies like the American Institute of Crisis Management, Victoria and Ramirez in a research about the accidents and crisis following 9/11 (2001) in America have emphasized the role of preparation training in dealing with the accidents and disasters which is in line with the present study. The results of this study show that the preparedness of families in Rudsar is quite low for coping with the accidents and disaster. Also, there is a relationship between the preparedness of the families of Rudsar and the decrease of damages caused by the accidents and disasters. To decrease the consequences of accidents and disasters it is necessary to attract public and inclusive participation. Also, there should be non-exclusive training for all the female members of the families and involvement of the people in achieving the macro goal of the health system of the country through public training of the female members of the families to decrease the damages of natural and human-made disasters in the society.

#### Suggestions:

In light of the fact that the Health Organization is responsible for the physical, spiritual and mental health of the people and also given the results of the hypotheses-tests in this study the following is suggested.

1. Empowering the rural and urban families for increasing their participation in all processes of crisis management in which the people are guided and helped to participate in the processes of decision-making, planning and operations and with cooperation try to prevent or recover the society before and after the crises.
2. Increasing self-care and the participation of families and people in coping with the natural disasters and decreasing the man-made disasters.
3. Effective training for organization and suitable arrangement of house and work area tools and apparatus.

4. Encouragement and improving the sense of cooperation and participation of families for securing the houses, vehicles and work area.

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