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AN INVESTIGATION OF AHAR-VARZEGHAN SEISMICITY ON AUGUST 11, 2012 IN THE NORTH WEST OF TABRIZ, IRAN

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Abstract: The Islamic Republic of Iran is situated in south-west Asia and covers an area of 1,648,000 square kilometers. Located in the active Alpine-Himalayan seismic belt that is an earthquake prone zone that has experienced many destructive earthquakes in the past due to its geographical state, climatic conditions and geological status Iran is an event ism country in the world. In this field look at recent decades earthquakes statistics that reveal average once five years has occurred an earthquake with high human and financial damages that has had long-term economical-social effects. This paper survey recent earthquake in the near of Tabriz in Iran. 0n the August 11, 2012 the northwest of Iran was shaken by two of the strong earthquakes. First was hit by 6.4 Mw at 16:54 local time (12:23 GMT), and about 11 minutes later, a 6.3 Mw struck 10 km to the west. Preliminary estimates placed, and the deaths were more than 330 persons and the number of injured persons was about 26,000 and overall, more than 50000 persons have been resettled. As many as 365 villages, out of total of 537 in the affected area, are heavily damaged (between 50% and 90%) and 46 villages are completely devastated. Successively Varzeghan-Ahar earthquakes are the cluster ones or "earthquake sequence", and involved more than hundreds moderate and small temblors and are centered on Varzeghan area.

KEYWORDS: Ahar-varzegan, earthquake, seismicity, Iran, damaged village.

Introduction

The field of natural hazards research has a rich history in geography, appropriately so because it involves conflicts between physical processes and human systems. One area of conflict concerns landscape development processes that can also have a catastrophic impact on human systems. People are killed and property is damaged or destroyed by extreme geomorphologic events (Gares and *et al.,* 1994: 1). In a word, natural events occur without direct human effect and endanger his social life. Events that enforce average annual up to 150,000 human damages and more than 140 milliard dollars financial damages on counties and especially developing countries (Poormohammadi and Mosayebzade, 2010).

Among all the natural disasters, the earthquake is one of the most serious ones. It brings tremendous economic losses and deaths of people, as well as the enormous effects on the harmonious and continuous development of society (Hongnan Li, 2009: 461). In this case earthquakes pose inevitable risks to everyone who lives on this planet. Even though the hazard is well recognized, no one knows when an earthquake will strike or how severe it will be. The hazards and catastrophic losses brought by recent earthquakes in some developing countries around the world accentuate the need for formulating policies and strategies in a line to minimize the risks and expected losses of earthquakes. It is known that, approximately 20% of the world's population are living in seismically active zones. In 50 years time, half of the urban people in the world's 50 largest cities will live within 200 km of faults that are known to produce earthquakes of Richter magnitude 7 or greater (Amiri and Tabatabaei, 2008: 581).

Seismic risk is a combination of the factors that determine the potential for people to be exposed to this type of natural hazard. In other

words, to understand earthquake we must not only know about the seismic hazard itself, but also the different types of vulnerability to that hazard. Earthquake vulnerability is determined by the probability of failure of the built environment due to the natural hazard. Seismic risk should also be understood in the context of socio-economic system, which determine people's health, income, building safety and access to information at the time of the disaster, and the effectiveness of response (Ghafory-Ashtiany, 2005: 3). In general it can be said disasters have been affecting adversely the lives, economy and environment of the people, particularly in the developing countries. Although several attempts were made by the concerned national and state governments in the respective countries yet no effective outcomes could be achieved. A review of the disaster management system led to the conclusion that no government or agency can succeed in effectively reducing the disaster risks in isolation until all kinds of stakeholders are involved into the process in a partnership mode of participation Sometimes even the physical resources, knowledge and experiences are not sufficient enough with the concerned specific stakeholders if these are not pooled together during the disaster times (Parkash, 2012: 26). In continue this research will study Iran seismic state and occurred earthquakes and then analyses 11 August 2012 earthquake in north-west Iran in east Azerbaijan.

Statement of Problem

The Islamic Republic of Iran is situated in south-west Asia and covers an area of 1,648,000 square kilometers. Located in the active Alpine-Himalayan seismic belt that is an earthquake prone zone that has experienced many destructive earthquakes in the past (Mahdi, 2013: 127). During the last 500 years, surface ruptures associated with large earthquakes have appeared and documented in various places in Iran. Most of these ruptures occurred along the active faults which have moved repeatedly in the Quaternary, thus constituting evidence that these active faults have the potential of reactivating in the future (Hessami and Jamali, 2006: 2), that has experienced more than 130 strong earthquakes with magnitude of 7.5 or more in the past centuries. In this century alone, 20 large earthquake have claimed more than 100,000 lives, destroyed many towns and thousands villages, and caused extensive economic damages. Recent earthquake in Iran i.e. Manjil-Rudbar (June 90, mb =7.2); Darab (Nov. 90, mb =6.6), Lordegan (March 92, mb =5), Sefidabeh (March 94, mb =6.1); Bojnoord (February 97, mb =6.1); Ardebil (February 97, mb =5.5); Ardekul (May 97, mb=6.6); Golbaf (March 98, mb =6.0; April 98, mb =5.1) ; Birjand (April 98, mb =5.9), Kazeroon (May 99, mb=6.0), Avaj-Ghazvin (June 2002, mb=6.1), Bam (February 2003, Ms=6.5) Kojoor-Baladeh (June 2004, Mw=6.4) and Zarand (February 2005, Ms=6.5) have shown Iran's high seismicity as well as its vulnerability to earthquakes. In all the past-occurred earthquakes, especially in Manjil and Bam earthquake, human and economic losses were high (Ghafory-Ashtiany, 2006: 1, 2).

During the June 20, 1990 Rudbar-Tarom earthquake (Mw = 7.3) in northwest Iran, more than 40,000 people lost their lives, more than 500,000 became homeless, nearly 100,000 buildings were destroyed, three cities and 700 villages were razed to the ground. The moderate (Mw = 6.6) Bam (SE Iran) earthquake of December 26, 2003 killed several thousands and demolished a city of 80,000 people located in a sparely populated area at the southwestern edge of the Lut Desert. Such great disaster occurred not only because of a large magnitude earthquake but also because of poor construction and preparation in vulnerable areas. Reconstruction of these regions was estimated to cost at least 10 billion dollars (Amiri and Tabatabaei, 2008: 581). Table 1 shows some of the most destructive earthquakes that have occurred in Iran in the last five decades.

Therefore due to its geographical state, climatic conditions and geological status, Iran is an event ism country in the world. In this field look at the recent decades earthquakes statistics that reveal average once in every five years,

Table 1: The Early AT Thoughts.

Data	Location	Mag. (M)	Fatalities
1/9/1962	Buyin-Zahra, Western Iran	7.3	12225
31/8/1968	Dasht-i Biyaz, Eastern Iran	7.3	12000
10/4/1972	Ghir (Qir), Southern Iran	6.8	5054
24/11/1976	Turkey:Muradiye (Turkey-Iran border region)	7.3	5000
16/9/1978	Tabas, Eastern Iran	7.8	15000
11/6/1981	Golbaft, South eastern Iran	6.9	3000
28/7/1981	Sirch, South Eastern Iran	7.3	1500
20/6/1990	Manjil, Northern Iran	7.7	35000
28/2/1997	Ardebil, North Western Iran	6.1	965
10/5/1997	Ardebil, North Western Iran	7.3	1572
22/6/2002	Changureh (Avaj), Western Iran	6.5	261
26/12/2003	Bam, South Eastern Iran	6.6	31000
22/2/2005	Zarand, Central Iran	6.4	612
31/3/2006	Silakhor, Western Iran	6.1	70

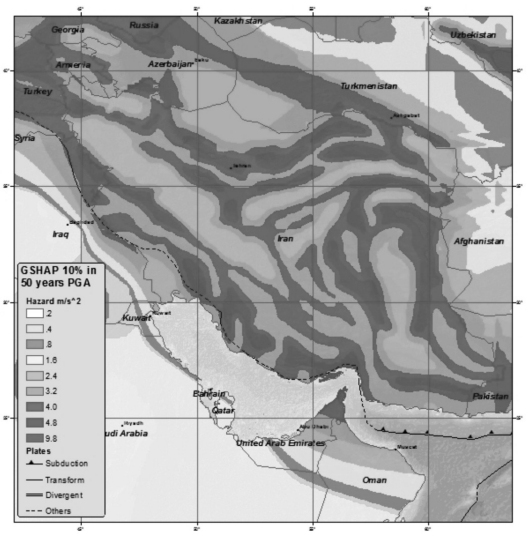

Figure 1: The Seismic Hazard Map of Iran (USGS, 2013).

has occurred an earthquake with high human and financial damages that has had long-term economical-social effects (Amini Hosseini and Pishnamazi, 2010).

Figure 1, which shows the seismic hazard map of Iran, indicates that most major cities of Iran have been located in very high hazard zone. One of the earthquakes that has occurred in Iran recently is east Azarbaijan earthquake that occurred in 11 August 2012. An estimated 250,000 were affected by the earthquake in Ahar, Varzeghan and Heris and their 313 villages north east of Tabriz. The earthquakes left about 300 died, 3000 injured and affected the residence of about 72,000 (HFIR report, 2012: 1).

The Review of Related Literature

Natural Hazards

Geographers have long been concerned with natural hazards, with early research focusing on understanding physical processes, spatial distributions and patterns, and to some extent, the impacts of events and mitigation. The publication of Gilbert White's landmark work, Human Adjustment to Floods led to significant changes in natural hazards research. It was this work in geography that set in motion the new era of hazards research focused specifically on solving societal problems. Thus began the tradition of applying geographic knowledge, techniques, and skills to the complexity of issues associated with natural hazards and disasters, exemplified by the series of studies carried out by White and

his students at the University of Chicago (Montz & Tobin, 2011: 1). Unfortunately, from a global perspective such events are a lot more frequent than one might imagine. For example, in 2007 alone there were approximately 450 of these natural disasters worldwide, affecting around 211 million people, and causing economic losses amounting to 74 billion US dollars. One of the main stylized facts that has arisen from the still relatively new academic literature on natural disasters seems to be that the economic and human losses associated with natural disasters are larger the poorer a country is. This was first shown by Burton *et al.* (Schumacher & Strobl, 2011: 97).

On the basis of international useful program of nations organization catastrophe decreasing all dangers have two main origins: natural dangers and technology dangers. In this case natural dangers is a natural phenomenon that occurs in human residential area, threats his/her life and some catastrophes. Such dangers are due to geological, biological, climate, logical and such process causes in living environmental (Zangiabadi *et al.,* 2008: 65). In clear statement, each sudden unexpected accident that causes economical, social and physical abilities loss such as body and financial damages, infrastructure establishment destruction and decreasing deployment fields in society is known as natural catastrophes. Natural catastrophes could refer as earthquake, flood, drought, natural pests, volcano and forests fire and atmospheric phenomena (Rezaei *et al.,* 2012: 37). In developed and leader countries in urban planning to remove or reduce long – term effects and know natural hazards results, created natural hazards preventions plan in human societies life and asset. Such plans aim could serve current condition improvement and future developments conservation. Dangers effects decreasing methods and acts in mentioned plans include structural acts (such as buildings and infrastructures conservation against water and wind destructive effects) and unstructural acts (such as laws pose or rise and field use policies taking).

A suitable plan development and determine to prevent dangers is on the basis of three main process:

1- Analyze dangers vulnerability rate.
2- Develop and determine catastrophes prevention methods.
3- Unify and combine interest plan in comprehensive plans and other made plans (Bemanian *et al.,* 2012: 10).

Earthquake and Villages Vulnerability

Vulnerability is a concept to explain economical, social, anatomical or geographical causes or limitations that decrease a society ability to face dangers (Ibid, 9). Earthquake as the most important earth natural dangers in short – term has caused imcompensable damages on human residential structures. Today with technological advance and increasing human knowledge and ability to control natural catastrophes still cities face earthquake danger and are vulnerable. Although earthquake prevention is impossible but could decrease its damages to at least by some counsels (Mahdavinejad and Javanrudi, 2012: 14, 15). Many factors play role in cities and village vulnerability in a comprehensive system form (Zangiabadi *et al.,* 2008: 66). Unfortunately rural areas damages don't limit to buildings destruction but total rural areas text, villages placement in earthquake prone areas, communication ways destruction and lack of quick relief cause damages increasing (bahrami, 2008: 165). Rural house problems evaluating indicates that following factors have the most effect on rural building vulnerability:

- Unstable and poor material presence.
- Unprinciplly combine local and new building material.
- Lace of enough technical knowledge and engineering view and therefore poor design and administer.

The above factors result in rural residential units construction is mold and old houses that are very vulnerable and need improvement and renovation (Ghaderi *et al.*, 2011: 8).

Crisis Management

The term disaster is defined as "a serious disruption of the functioning of society, causing widespread human, material, or environmental losses which exceed the ability of affected society to cope using only its own resources" by the United Nations (1992). The damage caused by disaster depends on climate, the geographical location and the type of the earth surface/degree of vulnerability and disasters adversely the mental, socio-economic, political and cultural state of the affected area in general. Previous losses experienced in recurring disasters have led to a paradigm shift from "a traditional relief approach (where communities are considered as "victim" and "beneficiaries" of assistance) to disaster preparedness (a more holistic and long term approach which incorporates vulnerability reduction as part of the development planning process)". This comprehensive approach recognizes that disaster mitigation has the highest effectiveness at the community level where specific needs are met thus; an efficient disaster management system becomes mandatory in order to mitigate recurring losses and manage the disaster in a successful manner (Caymaza *et al.,* 2013: 610).

Crisis management is an important subject that has mentioned in recent years in act and thought scope learners. Crisis management acts enable organization to remove some crisis, control others in effective method and has needed instrument to learn occurred crisis completely and quickly (Hosseini and Demnabi ASL, 2012: 18). Crisis management includes administrative activities and management and political decisions dependent on different stages and all crisis levels to decrease damages, life break prevention, production and service and communication maintained (Taghvaie *et al.,* 2012: 24). Crisis management views and strategies are developing. At present has defined four procedures in the world for crisis management:

- General and comprehensive procedure: needs develop and administer strategies to face natural catastrophe risk in different fields and is an efficient procedure to crisis management.
- Facing procedure to all dangers: uses to improve present sites and buildings.
- Internal and multipart procedure: that is not a comprehensive procedure, crisis management parts facilitate for crisis condition.
- Prepared society procedure: practically includes organizational position and civic structure improvement, social capacity enforcement by aiding citizens and organizations training and informing for crisis management (Rafieyan and Motahari, 2012: 6).

Description of the Varzeghan-Ahar Earthquake

East Azerbaijan Province is one of the 31 provinces of Iran. It is in the northwest of the country, bordering Armenia and the Republic of Azerbaijan, and the provinces of Ardabil, West Azerbaijan, and Zanjan. Its capital is Tabriz. (Figure 2).

Figure 2: East Azarbaijan Position in Iran.

At 16:53 of August 11th 2012 (local time) an Mw6.4 (NEIC) earthquake occurred near the cities of Ahar and Varzeghan in the East-Azerbaijan province in northwest of Iran (Figure 3). This event was followed by another event at 17:04 (11 minutes after the first shock) with Mw6.3 (NEIC) that was based on the

precise location of the local seismic network (Institute of Geophysics, University of Tehran; IGUT) is located just below the first event at a depth of around 16km. Following this twin earthquakes, more than 20 villages such as Zangabad, Gourdeh, Dino, Bajebaj, Sarand, and Shahsavar have completely destroyed and cities of Varzeghan, Ahar and Heris suffered different levels of the damage (Razaaghi and Ghafory - Ashtiany, 2012: 1).

Based on seismograms 'records in the national broadband seismic network of IIEES, the epicenter of these events, were: 38/55 degrees north latitude and 46/87 degrees east for the first one and the second earthquake coordinates 38/58 degrees north latitude and 46/78 degrees east. The depth of both earthquakes has been reported to be about 10 km. The mechanism of the first earthquake is believed to be Strike-slip, but defining that whether it has been the North-South or East-West plates, needs more in-field surveys and recording aftershocks with the local seismograms. However, based on the aftershocks' trends, it is more probable that the fault has an East, north-eastern, West, south-western mechanism (IIEES Report, 2012: 1).

The earthquakes destroyed more than 20 villages and damaged the cities of Varzeghan, Ahar, and Heris. The earthquakes killed 327 people, caused more than 3,000 injuries, and left more than 30,000 homeless. Many adobe buildings in villages collapsed and several masonry and framed buildings were damaged. Roads were damaged by surface faulting and geotechnical instabilities; some bridges were damaged, but remained serviceable. Many essential facilities such as hospitals were damaged and some industrial plants were closed and suffered significant economic losses (EERI Special Earthquake Report, 2012: 1).

Discussion

The earth's crust thickness in Azarbaijan region is in the range of 38 km to 55 km, and the earthquakes depth was around 10 km.

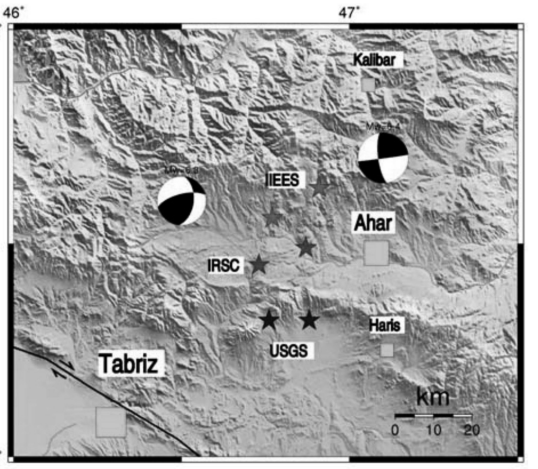

Figure 3: The Epicentral Area of the 2012 Varzeghan-Ahar Twin Earthquakes. Main shocks epicenters estimates are the stars in red (from IIEES), green (preliminary location from the Institute of Geophysics at Tehran University), and blue (from the NEIC).

Varzeghan-Ahar earth-quakes lay as inter-plate type and earthquakes of this type account for more 90% of the total seismic motions around the world. The relatively tight distribution of aftershocks within 20 km of the second event, leads me suggest that there is no migration towards the main fault (North Tabriz Fault).

Several local and international seismological centers have determined the position of these earth-quakes as shown in Tables 2, 3 (Miyajima *et al.,* 2013: 2).

Past earthquakes experience has shown that rural areas buildings that have established traditionally are very sensitive to earthquake and even weak earthquakes cause their destroying and much human and financial damages (Bahrami, 2008: 165). On the basis of recorded statistics the total number of damaged villages in this county after earthquake are up to 555 villages. The important results in this section are the damages of 52% of Ahar villages, 44% Jolfa, 40% Calibar, 61% Varzeghan and 89% Heris villages. Altogether 20% east Azarbaijan villages damaged in this earthquake (Figure 4 and Table 4).

Table 2: AHAR-Varzeghan First Earthquake Profile, Reported by Various Seismological Centers1.

DATE & TIME (UTC) 2012/08/11 12:23:16					
DATE & TIME (LOCAL) 1391/05/21 16:53:16					
	Latitude	Longitude	Depth (Km)	M	Type
BIN	38.55	46.87	15	mb	6.1
IGTU	38.49	46.87	10	M_N	6.2
EMSC	38.41	46.81	10	M_W	6.4
USGS	38.32	46.89	10	M_W	6.4
GFZ	38.37	46.88	10	M_W	6.4

Table 3: Ahar-Varzeghan Second Earthquake Profile, Reported by Various Seismological Centers1 (Miyajima *et al.*, 2013: 3).

DATE & TIME (UTC) 2012/08/11 17:34:35					
DATE & TIME (LOCAL) 2012/08/11 17:04:35					
BIN	Latitude	Longitude	Depth (Km)	M	Type
IGTU	38.58	46.78	16	mb	6.1
EMSC	38.45	46.73	10	M_N	6
USGS	38.48	46.75	10	M_W	6.3
GFZ	38.32	46.76	10	M_W	6.2
BIN	38.45	46.83	10	M_W	6.3

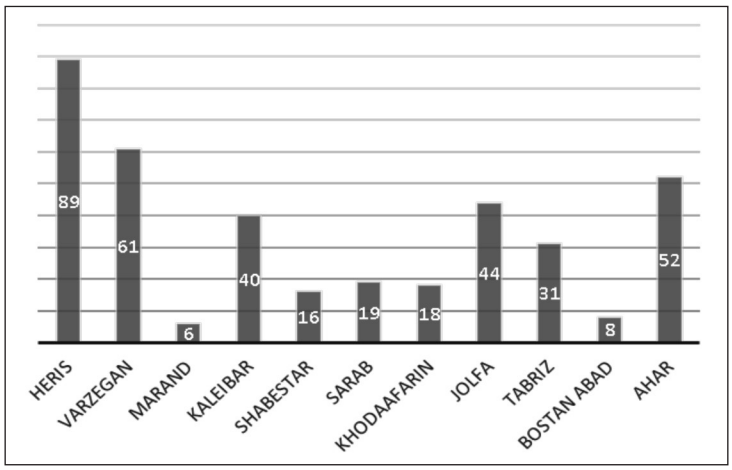

Figure 4: Percent of Damaged Villages in County.

Another case in rural damages is the damages rate on rural residential houses. As presented in Table 5, Varzeghan, Heris and Ahar have seen the most damages respectively. In Varzeghan among 7678 damaged residential units, 3883 units damaged up to 60%, 2,192 units between 30% to 60%, 4,870 units up to 60%, 1329 units between 30% to 60% and 1,116 units less than 30%. Finally in Ahar 5449 units were damaged: 2,872 units damaged up to 60%, 1,561 units up to 60% and 1116 units less than 30%. On the base of this statistic, Heris has the

Table 4: Number of Damaged Villages in County.

Row	County	No. of villages	No. of population	No. of family	No. of damaged village	Percent of damaged villages
1	Azarshahr	36	37485	11118	0	0
2	Oskou	42	42070	12479	0	0
3	Ahar	302	53058	13811	156	52
4	Bostan Abad	179	74386	19870	14	8
5	Bonab	29	49901	14206	0	0
6	Tabriz	72	149603	42641	22	31
7	Jolfa	48	17410	5339	21	44
8	Charoymagh	212	27093	6866	0	0
9	khodaafarin	175	33318	8721	31	18
10	Sarab	164	72441	19753	31	19
11	Shabestar	76	64106	19249	12	16
12	Ajab shir	42	40466	10351	0	0
13	Kaleibar	220	36632	9502	89	40
14	Maragheh	167	83822	22564	0	0
15	Marand	104	90334	26345	6	6
16	Malekan	81	74631	20565	0	0
17	Mianeh	332	79068	23072	0	0
18	Varzegan	147	38950	10536	90	61
19	Heris	93	35593	9443	83	89
20	Hashtroud	190	39653	10620	0	0
East Azarbayjan Province		2711	1140020	317051	555	20

Table 5: Number of Damaged Buildings in County.

Row	County	N. of damaged villages	below 30 % damaged	30-60 % damaged	Upper 60 % damaged	Sum
1	Ahar	97	1016	1561	2872	**5449**
2	Heris	84	1116	1329	4870	**7315**
3	Varzegan	86	1603	2192	3883	**7678**
4	Kalaibar	108	578	128	23	729
5	Jolfa	21	78	527	85	690
6	Tabriz	21	1287	622	735	2644
7	Total	417	5678	6359	12468	24505

most damaged units up to 60%. On other hand, Varzeghan has the most villages between 30% to 60% and also has the most villages in less than 30% damaged.

Therefore at all, this county has 24505 damaged residential units in villages. 12468 units (51%) damaged up to 60%, 6,359 units (29%) between 30% to 60% and 5,678 units (23%) less than 30%.

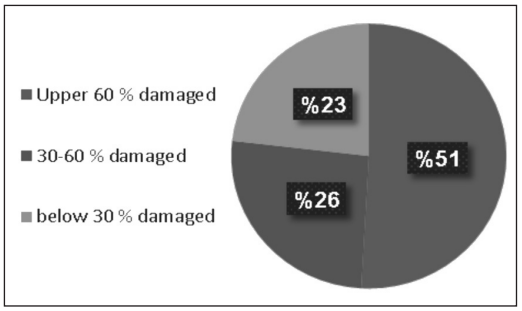

Figure 5: Percent of Damaged Building in East Azarbaijan Province.

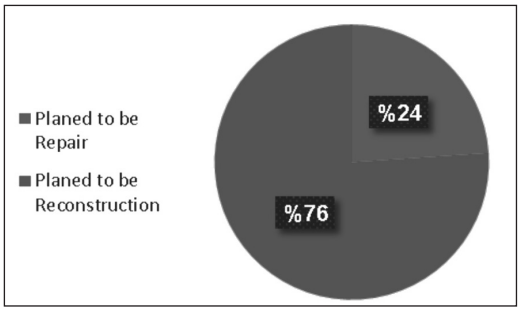

Figure 6: Planned Residential Units Rate for Repair and Reestablish.

Table 6: Reconstruction and Repair Residential Units Number in County Separation.

Row	County	Repair	Reconstruction	Total
1	Azarshahr	0	0	0
2	Oskou	0	0	0
3	Ahar	1077	4460	5537
4	Bostan abad	17	2	19
5	Bonab	0	0	0
6	Tabriz	1287	1357	2644
7	Jolfa	79	611	690
8	Charoymagh	0	0	0
9	khodaafarin	221	193	414
10	Sarab	171	1	172
11	Shabestar	0	452	452
12	Ajab shir	0	0	0
13	Kaleibar	567	150	717
14	Maragheh	0	0	0
15	Marand	2	55	57
16	Malekan	0	0	0
17	Mianeh	0	0	0
18	Varzegan	1681	6094	7775
19	Heris	1044	6168	7212
20	Hashtroud	0	0	0
East Azarbayjan Province		6146	19543	25689

Other cases to study in this section are the residential units number that have been established and repaired. In Ahar, among 5,537 damaged residential units, 4,467 units have known for reconstruction and 1,077 units for repair. Varzeghan and Heris statistic also are important in this field. As in Varzeghan among 7,775 damaged residential units, 6,094 units have planned for reconstruction and 1,681 units for repair. In Haris also among 7,212 units, 6,168 units have planned for reestablish and 1,044 units for repair (Table 6).

To conclude, in east Azarbaijan country, 25,689 residential units knew for repair and

reconstruction. In this statistic, the repair units are 6,146 and reconstruction units are 19,543 (Figure 6).

On the basis of these studies of this organization after east Azarbaijan earthquake, 9,500 rural residential units were damaged up to 60% and also 18,400 units up to 30%. In this statistic 4,750 urban residential units and 25,700 rural units were planned for reestablish (HFIR report, 2012: 1).

Conclusion

Natural hazards as recurring phenomenon have always existed in human life and will in the future, too. Nowadays Natural hazards occur throughout the world, but their impacts have been increasing and are generally much greater in developing countries than in developed ones. Earthquake is a kind of natural hazard that has the most damages for humankind. Earthquakes pose inevitable risks to everyone who lives on this planet (Pourtaheri *et al.,* 2011: 28). Earthquake induced landslides have an important role in fatalities, and financial losses resulted from earthquakes. In many earthquakes, the resulting landslides have caused as much or more damage than the other effects of Seismic shaking (Memarian and Mahdavifar, 2012: 35).

In this case, Iran due to its specific geographical state has experienced many dangers and natural events during history. In more clear word Iran is one of the 10 sensitive countries to natural events in the world because during recent 90 years 120,000 ones have killed and among this the most human loses (76%) are due to earthquake (Poormohammadi and Mosayefzade, 2010: 118).

Iran is located in a high-risk seismic zone, but its seismicity intention is not the same in all parts. Iran is a country where earthquake causes many financial and life losses. Located in Alp-Himalaya seismic belt, Iran has a devastating earthquake per year. The specification of some cataclysmic earthquakes like Bouin-Zahra (1962), Dashte Baiaz (1967), Tabas (1978), Manjil-Roudbar (1990) and Bam (2003) support the significance of the issue (Ghodrati Amiri et al, 2010, 183).

In this research east Azarbaijan earthquake on 11 August 2012 was studied and the results are as follow. On the late afternoon of Saturday August 11, 2012 the northwest of Iran was shaken by two of the strong earthquakes in Iranian history. First was hit by 6.4 *Mw* at 16:54 local time (12:23 GMT), and about 11 minutes later, a 6.3 *Mw* struck 10 km to the west. Preliminary estimates placed, and the deaths were more than 330 persons and the number of injured persons was about 26,000 and overall, more than 50,000 persons have been resettled. As many as 365 villages, out of the total 537 in the affected area, are heavily damaged (between 50% and 90%) and 46 villages are completely devastated. Successively Varzeghan-Ahar earthquakes are the cluster ones or "earthquake sequence", and involved more than hundreds moderate and small temblors and are centered on Varzeghan area (Miyajima *et al.,* 2013: 1).

Thus, different factors contributed to these damages. Natural events such as ground, geological characteristics and country geographical in management plans and also short-term houses built have caused that earthquake and natural events would have bad effects. So, the organization plans should be more uniformed against natural events and to decrease earthquake damages, the following procedures is cracial:

1- Holding training classes for all villagers on how to defend themselves when earthquake.
2- People economical enabling to enforce residential buildings against earthquake occurs.
3- More control and supervision on house construction.
4- Determine temporal residential places.
5- Suitable placing to establish relief centers in cities and villages level.
6- Determine suitable structure for crisis management.
7- Try to fit organization related to earthquake.

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