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Assessment of Earthquake Vulnerability & Levels of Mitigation Measures in Srinagar city, J&K State-India

Manzoor A. Wani, Sheraz A. Lone,

Bashir A. lone , Ishtiaq A. Mayer

Department of Geography & Regional Development, University of Kashmir Srinagar

ABSTRACT

Vulnerability measures the extent of resilience, coping capacity of a community in the face of disasters and is an inclusive concept of a particular community to a particular type incorporated number of factors i.e. Geographical factors, Social factors and Economic factors. Present study aims to assess the extent of vulnerability and levels of preparedness in earthquake prone region of Srinagar. Although government of India has adopted mitigation and prevention as essential components of their development strategy. The level of perception and preparedness is highly traditional and below the mark witnessing from the past experience. From the study it has been observed that Srinagar is most vulnerable to earthquake and floods. Older buildings are more vulnerable because these are made of kachha or semi pucca material. Few newly constructed buildings have found to adopted scientific measures such as vertical columns and other safety measures during construction. The level of perception among the people regarding the earthquake seismicity was found to be very low.

Key words: Assessment, Earthquake, Mitigation, Srinagar, Vulnerability

I INTRODUCTION

Earthquakes are one of the most dangerous, destructive and unpredictable natural hazards, which can leave everything up to a few hundred kilometers in complete destruction in seconds. In more than 300 natural disasters in year 2011, over 30,000 people lost Tsunami in March 2011) and 206 million people were affected and $366 billion were the economic losses, which made it the costliest year in the history of the catastrophes (EM-DAT, 2011). The number of disasters and number of deaths were less compared to the year 2010, where the Haiti earthquake event in January 2010 alone claimed deaths of nearly 220,000. EM-DAT (2011) reports indicate that the earthquakes in the developed countries would result higher economic losses and more number of deaths in developing countries. In developing countries due to economic conditions people are forced to live in high vulnerable locations and people have invested so much money for construction, and post disaster moving to safer locations is not an option as they cannot abandon their present houses. Earthquakes don't kill people but buildings do. Components: structural and non-structural. Structural components are the building load bearing elements like foundations, columns, beams and walls etc. Non-structural components include architectural and design features like doors, windows, false ceiling etc and services include features like electrical and plumbing fixtures. Buildings fail in the event of earthquake when major damage occurs to structural systems. Kircher et al.

(1997). Ideally, buildings should be designed with respect to earthquake such that they survive in moderate earthquakes with non-structural damages and resist collapse with structural damages in strong and major earthquakes and ensure that no life is lost because of the collapse of buildings. The mode of construction in the rural areas has also changed from mud and thatch to brick and concrete construction thereby increasing the vulnerability. The increasing population has led to settlements in vulnerable areas close to the river bed areas which are prone to liquefaction. The Government has moved to address these issues. Mitigation and preparedness measures go hand in hand for vulnerability reduction and rapid professional response to disasters. The State Governments' search and rescue teams to be constituted from the State Police will be equipped to meet the requirement. For this purpose, the State Governments have been authorized to utilize 10% of the annual allocation made under the Contingency Relief Fund for purchase of equipments.

II STUDY AREA

Srinagar city is not only the largest urban centre in the state of Jammu & Kashmir but in the whole Himalayan region. The city has been growing at an alarming pace therefore indicating considerable changes. The city lies 74º 43´ - 74º 52´ E longitude & 34º 0´ - 34º 14´ N latitude. It is about 5200 feet above mean sea level. The location map of the study area is shown in fig.1. (see page 119 for fig.1) The city has a unique physiographic setup with steep hills in the East and North East, low lying paddy fields falling in the flood plain of Jhelum in the South and West, the karewas of Budgam in the extreme South and towards the North are located the uplands with moderate slopes. The famous Dal Lake is situated in the heart of the city. There are two conspicuous physical features in the shape of Kohimaran and Kohisuleiman hillocks. The city of Srinagar experiences a Mediterranean type of climate and receives most of its precipitation during the winter season in the form of rain and snow.

III METHODOLOGY

The study is based on both primary and secondary sources of data. Field survey was conducted through semi structured questioner taking into account different measures such as level of vulnerability, level of perception among people as they are the first to experience and also incorporate to estimate the risk factors in terms of both structural and human loss. The samples were selected from various income groups ranging low, middle and upper income groups by using Socio Economic Census Survey (SECC) data generated by Directorate of Economics, Srinagar.

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IV RESULTS

Table 4.1: Engineering Safeguards Taken by All Income Groups

S.NO	Particulars	Nil	Upto 25%	25%-50%	50%-75%	Above 75%
01	Engineer Consulted Before Construction	61	39 (F18,P21)*	-	-	-
02	Ratio of doors & windows in a wall (GROUND FLOOR)	-	4	26	70	-
	(a) Up to 33% windows & Doors In The Building (FIRST FLOOR)	-	12	-	-	-
	(b) 33-50% Windows & Doors In The Building (FIRST FLOOR)	-	-	-	67	-
	(c) Above 50% Windows & Doors In The Building (FIRST FLOOR)	-	5	-	-	-
	(d) Total Number Of Houses Which Do Not Have First Floor At all	-	16	-	-	-
03	Use Of Vertical Columns	-	8(F2, P6)*	-	-	-
04		92	-	21 Partly	-	69 Fully
	Use Of Beams & Lanters	10	17	-	-	-
	(a) Single Story Buildings	-	-	-	-	77
	(b) Double Story Buildings	-	6	-	-	-
	(c) Three Or Above Stories	-	5	-	-	-
	(d) Thickness Of Wall 9"	-	-	-	-	-
	(e) Thickness Of Wall 13"	-	7	-	-	-
	(f) Thickness Of wall 17"	-	-	-	-	-
05	Roof Type Of Building	-	-	-	-	88
06	Provision Of emergency Doors	-	9(2F, 7P)*	30 Slab	70 Tin roof	-
		85	15	-	-	-

Source: Field survey 2017

* F: FULLY, P: PARTLY

**All the Calculations After decimal has been taken to the nearest multiple of ten.

With regard to engineering safeguard It have been observed that 61%of the households do not consult engineers before construction that is why these buildings are earthquake prone. Engineer consulted before construction is important for strong foundation of a building. 70% households have ratio of doors and windows 50%-75% for ground floor and 67% of households have ratio of doors and windows 25-50% for first floor. No doubt ground floor is base for first floor, if ground floors have more than 33% of windows and doors it cannot bear the load of first floor/top floor and the building can be collapsed. 92% of households do not use vertical columns and beams in their buildings at the time of construction. 88% of households have a 13inchs thick wall which reveals that these walls can bear heavy load and also building become strong. 70% of households have tin roof which is lighter than the slab and in case of disaster if it can be collapsed the damage can be less than the slab. 85% of households have no emergency exists which later become most important factor for the mass of causality.

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Table 4.2: Medical Safeguards Taken by All Income Groups

S.NO	Particulars	Nil	Upto 25%	25%-50%	50%-75%	Above 75%
01	Availability Of First Aid Kit In The Houses	66	3 Fully	21 Partly	-	-
02	Houses Which Has Been Insured	82	12yes	-	-	-
03	Adoption Of LIC Policy	58	42(20F,22P)*	-	-	-
04	Health care Centre In The Locality within 2Kms	-	-	-	-	100
05	Distance Of Major Health Institution(DH) From The Locality Up to 5Kms	-	-	-	-	100
06	Distance Of Major Trauma Hospital From The Locality Above 20Kms	-	-	-	-	100

Source: Field survey 2017

*F: FULLY, P: PARTLY

**All the Calculations After decimal has been taken to the nearest multiple of ten.

With regarding to medical safeguard 72% of the households have no first aid kit available in their house. It is important that there shall be availability of first aid kit in a house because at the time of disaster immediate treatment can be given at home if the injuries are small. 94% of population do not insured their houses and 63% population do not use LIC policy because they are not aware about it.100% population says that Srinagar city have both primary health care centre and major district hospital within 2km which is a good thing but100% of population says that the trauma hospital is above 20kms away from the Srinagar city which sometimes cause loss of life due to very long distance and hectic traffic jams.

Table 4.3: Awareness Safeguards Taken by All Income Groups

S.NO	Particulars	Nil	Upto 25%	25%-50%	50%-75%	Above 75%
01	Any Volunteer Organization To Deal with Disasters	100	-	-	-	-
02	Public Awareness Programme About disaster Conducted	90	10 Partly	-	-	-
03	Distance Of Fire Service Station In The Locality Up to 2Kms	45	-	-	55yes	100Yes
04	Any Major Water Source (Stream, Spring) In Or Near The Locality	88	12 Partly	-	-	-
05	Use Of Fire Extinguishers In The Houses	18	28 Fully	-	54 Partly	-
06	Electric Safety devices Installed	100	-	-	-	-
07	Fire Alarm used In The Houses	-	-	-	-	100yes

08	Distance Of Police Station Within 3Kms From The Locality	-	-	-	-	
	(a) Connectivity To Main Road (Easy)	- 90	- 10yes	- 15	-	85
09	(b) Connectivity To Main Road (Manageable)	58	-	- 34	-	-
10	Use Of Mock drill In The Locality	84	8 Fully	Partly	-	-
11	Objects Firmly Fixed On The Wall	-	16(10F,6P)*	-	-	-
12	Knowledge About Seismicity	62	-	38partly	-	-
13	Earthquake safety standards adopted at social centers(Mosques/Panchayat) and Schools			-		

Source: Field survey 2017

*F: FULLY, P: PARTLY

**All the Calculations After decimal has been taken to the nearest multiple of ten.

With regarding to awareness safeguard, there is no any volunteer organization in Srinagar city which become active at the time of disaster to save the life and property of people during any disaster.90% of the households says that they have no awareness about earthquake vulnerability and steps that should be taken after the disaster. If awareness programmes will be conducted regularly people become aware about how life and property can be saved or how these losses can be reduced. 100% population says that fire service station is present in Srinagar city within a distance of 2km so at the time of disaster they can come and reduce the loss. 45% of households says that in the locality we have presence of water sources, water is collected from these resources at the time of disaster when there is shortage of water. 88% households do not have fire extinguisher in their homes because they are not aware of the use of such fire extinguishers. 18% People are not aware about modern electric safety devices that can be used to reduce loss of life and property at the time of disaster due to fire caused by short circuit. 92% households says that mock drills had not been organized at the community level. If mock drills will be organized regularly people may become aware about what steps should be taken before, during and after the disaster.58% of households are not aware about the damage caused by objects hanged on the walls. 84% of households say that they do not know anything about seismicity and also not know anything about the zone in which they live which became the major cause of earthquake vulnerability.62% of population says that earthquake safety standards cannot be adopted at social centers(schools, panchayats mosques, etc.

The surveyed 150 households of Srinagar city regarding earthquake vulnerability and levels of preparedness can be divided in three classes i.e. lower, middle and upper class on the bases of their income.

Table 4.4.Calculation on The Basis of 50 Households of Lower Income Class on Engineering

S.NO	Particulars	Nil	Upto 25%	25%-50%	50%-75%	Above 75%
01	Engineer Consulted Before Construction	95	5yes	-	-	-
02	(a) Upto 33% windows & Doors In The Building (GROUND FLOOR)	-	-	-	55	-
	(b) 33-50% Windows & Doors In The Building (GROUND FLOOR)	-	-	45	-	-
	(c) Above 50% Windows & Doors In The Building (GROUND FLOOR)	-	-	-	-	-
03	(a) Upto 33% windows & Doors In The Building (FIRST FLOOR)	-	-	30	-	-
	(b) 33-50% Windows & Doors In The Building (FIRST FLOOR)	-	-	35	-	-
	(c) Above 50% Windows & Doors In The Building (FIRST FLOOR)	-	-	-	-	-
	(d) Total Number Of Houses Which Do Not Have First Floor At All	35	-	-	-	-
04	Use Of Vertical Columns	95	5fully	-	-	-
05	Use Of Beams & Lanters	30	-	70(30F,40P)*	-	-
06	(a) Single Story Buildings	-	-	40	-	-
	(b) Double Story Buildings	-	-	-	60	-
	(c) Three Or Above Stories	-	-	-	-	-
07	(a) Thickness Of Wall 9"	-	10	-	-	-
	(b) Thickness Of Wall 13"	-	-	-	70	-
	(c) Thickness Of wall 17"	-	20	-	-	-
08	Roof Type Of Building	-	-	30 Slab	70 Tin roof	-
09	Provision Of emergency Doors	100	-	-	-	-

Safegaurds

Source: field survey 2017

* F: FULLY, P: PARTLY

**All The Calculations After decimal has been taken to the nearest multiple of ten.

In the lower class families with regard to engineering safeguard it have been observed that 95%of the households do not consult engineers before construction that is why these buildings are earthquake prone. Engineer consulted before construction is important for strong foundation of a building. 55% households have ratio of doors and windows 50%-75% for ground floor and 30% of households have ratio of doors and windows 25-50% for first floor. No doubt ground floor is base for first floor, if ground floors have more than 33% of windows and doors it cannot bear the load of first floor/top floor and the building can be collapsed. 95% of households do not use vertical columns and beams in their buildings at the time of construction. 70% of households have a 13inchs thick wall which reveals that these walls can bear heavy load and also building

become strong. 70% of households have tin roof which is lighter than the slab and in case of disaster if it can be collapsed the damage can be less than the slab. 100% of households have no emergency exists which later become most important factor for the mass of causality. In lower class families with regarding to medical safeguard 95% of the households have no first aid kit available in their house. It is important that there shall be availability of first aid kit in a house because at the time of disaster immediate treatment can be given at home if the injuries are small. 100% of population do not insured their houses and 100% population do not use LIC policy because they are not aware about it.100% population says that have Srinagar city both primary health care centre and major district hospital within 2km but 100% of population says that trauma hospital is above 20kms away from the Srinagar city which sometimes cause loss of life due to very long distance and hectic traffic jams.

Table 4.5. Calculation on The Basis of 50 Houses of Lower Income Class on Awareness Safeguards

S.NO	Particulars	Nil	Upto 25%	25%-50%	50%-75%	Above 75%
01	Any Volunteer Organization To Deal with Disasters	100	-	-	-	-
02	Public Awareness Programme About disaster	100	-	-	-	-
03	Conducted	-	-	-	-	100
04	Distance Of Fire Service Station In The Locality Upto 2Kms	25	-	-	75yes	-
05	Any Major Water Source (Stream, Spring) In Or	100	-	-	-	-
06	Near The Locality	65	-	35 Partly	-	-
07	Use Of Fire Extinguishers In The Houses	100	-	-	-	-
08	Electric Safety devices Installed	-	-	-	-	100
		-	-	-	-	85
	Fire Alarm used In The Houses	-	15	-	-	-
09	Distance Of Police Station Within 3Kms From The Locality	100	-	-	-	-

10	(a) Connectivity To Main Road (Easy)	65	35		-	-
	(b) Connectivity To Main Road (Manageable)		Partly	-		
11		100			-	-
	Use Of Mock drill In The Locality		-	-		
12		50			-	-
	Objects Firmly Fixed On The Wall		-	50		
				Partly		
	Knowledge About Seismicity					
	Earthquake safety standards adopted at social centers(Mosques/Panchayat) and Schools					

*All the Calculations after decimal has been taken to the nearest multiple of ten.

In lower class families with regarding to awareness safeguard, there is no any volunteer organization in Srinagar city which become active at the time of disaster to save the life and property of people during any disaster.100% of the households says that they have no awareness about earthquake vulnerability and steps that should be taken after the disaster. If awareness programmes will be conducted regularly people become aware about how life and property can be saved or how these losses can be reduced. 100% population says that fire service station is present in Srinagar city within a distance of 2km so at the time of disaster they can come and reduce the loss. 75% of households says that in the locality we have presence of water sources, water is collected from these resources at the time of disaster when there is shortage of water.

Table 4.6 .Calculation on The Basis of 50 Houses of Middle Income Class on Engineering Safeguards

S.NO	**Particulars**	**Nil**	**Upto 25%**	**25%-50%**	**50%-75%**	**Above 75%**
01	Engineer Consulted Before Construction	74	26(8F,18P)*	-	-	-
02	(a) Upto 33% windows & Doors In The Building (Ground Floor)	-		-	-	74
		-	-	-	-	-
	(b) 33-50% Windows & Doors In The Building (Ground Floor)	-	26	-	-	-
			-			
03	(c) Above 50% Windows & Doors In The Building (Ground Floor)	3		-	-	-
		-	-	-	-	86
		-	-	-	-	-
	(a) Upto 33% windows & Doors In The Building (First	11	-	-	-	-

	Floor)		-			
04	(b) 33-50% Windows & Doors In The Building (First Floor)	99		-	-	-
	(c) Above 50% Windows & Doors In The Building (First		1 Partly			
05	Floor)					
	(d) Total Number Of Houses Which do Not have First Floor	2		-	-	80 Fully
06	At All	-	18 Partly	-	-	-
		-	10	-	-	75
	Use Of Vertical Columns	-	-	-	-	-
			15			
07	Use Of Beams & Lanters	-		-	-	-
		-	4	-	-	90
	(a) Single Story Buildings	-	-	-	-	-
	(b) Double Story Buildings		6			
08	(c) Three Or Above Stories	-		-	-	65 Tin
			35 Slab			roof
09	(a) Thickness Of Wall 9"	85		-	-	
	(b) Thickness Of Wall 13"		15Partly			-
	(c) Thickness Of wall 17'					
	'					
	Roof Type Of Building					
	Provision Of emergency Doors					

Source: field survey 2017

*F: FULLY, P: PARTLY

In the middle class families with regard to engineering safeguard it have been observed that 74%of the households do not consult engineers before construction that is why these buildings are earthquake prone. Engineer consulted before construction is important for strong foundation of a building. 74% households have ratio of doors and windows 75% for ground floor and 86% households have ratio of doors and windows 50% for first floor. No doubt ground floor is base for first floor, if ground floors have more than 33% of windows and doors it cannot bear the load of first floor/top floor and the building can be collapsed. 99% of households do not use vertical columns and beams in their buildings at the time of construction. 90% of households have a 13inchs thick wall which reveals that these walls can bear heavy load and also building become strong. 65% of households have tin roof which is lighter than the slab and in case of disaster if it can be collapsed the damage can be less than the slab. 85% of households have no emergency exists which later become most important factor for the mass of causality.

Table 4.7. Calculation On The Basis of 50 Houses of Middle Income Class Awareness Safeguards

S.NO	Particulars	Nil	Upto 25%	25%-50%	50%-75%	Above 75%
01	Any Volunteer Organization To Deal with Disasters	100	-	-	-	-
02	Public Awareness Programme About disaster Conducted	100	-	-	-	-
03	Distance Of Fire Service Station In The Locality Upto 2Kms Any Major Water Source (Stream, Spring) In Or Near The Locality	-	-	-	-	100
04	Use Of Fire Extinguishers In The Houses	25	-	-	75	-
05	Electric Safety devices Installed Fire Alarm used In The Houses	100	-	-	-	-
06	Distance Of Police Station Within 3Kms From The Locality (a) Connectivity To Main Road (Easy) (b) Connectivity To Main Road (Manageable)	5 100	30 Fully -	-	65 Partly -	-
07	Use Of Mock drill In The Locality	-	-	-	-	100
08	Objects Firmly Fixed On The Wall	-	-	-	-	-
09	Knowledge About Seismicity Earthquake safety standards adopted at social centers(Mosques/Panchayats) and Schools	-	25	-	75 -	-

10		90 64	10 Partly -	- 36 Partly	- -	- -
11			10(4F,6P)	-	-	-
12		90 66	* 34 Partly	- -	- -	- -

***** F: FULLY, P: PARTLY

All the calculations after decimal has been taken to the nearest multiple of ten.

In middle class families with regarding to awareness safeguard, there is no any volunteer organization in Srinagar city which become active at the time of disaster to save the life and property of people during any disaster.100% of the households says that they have no awareness about earthquake vulnerability and steps that should be taken after the disaster. If awareness programmes will be conducted regularly people become aware about how life and property can be saved or how these losses can be reduced. 100% families told that fire service station is present in Srinagar city within a distance of 2km so at the time of disaster they can come and reduce the loss. 75% of households told that in the locality we have presence of water sources; water is collected from these resources at the time of disaster when there is shortage of water. 100% households do not have fire extinguisher in their homes because they are not aware of the use of such fire extinguishers.95% People use modern electric safety devices fully or partly in their houses that can be used to reduce loss of life and property at the time of disaster due to fire caused by short circuit. 90% households told that mock drills had not been organized at the community level. If mock drills will be organized regularly people may become aware about what steps should be taken before, during and after the disaster.64% of households are not aware about the damage caused by objects hanged on the walls. 90% of households say that they do not know anything about seismicity and also not know anything about the zone in which they live which became the major cause of earthquake vulnerability.66% of population says that earthquake safety standards are not used in social centers (schools, panchayats, mosques etc).

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Table 4.8 .Calculation on the Basis of 50 Houses of Upper Class Engineering safeguards

S.NO	Particulars	Nil	Upto 25%	25%-50%	50%-75%	Above 75%
01	Engineer Consulted Before Construction	15	-	85(35F,50P7	-	-
02	(a) Upto 33% windows & Doors In The Building (Ground Floor)	-	22	0	08	-
	(b) 33-50% Windows & Doors In The Building (Ground Floor)	-	06	-	-	-
	(c) Above 50% Windows & Doors In The Building (Ground Floor)	-	12	-	-	-
	(a) Upto 33% windows & Doors In The Building (First Floor)					
03	(b) 33-50% Windows & Doors In The Building (First Floor)	-	12	-	-	-
	(c) Above 50% Windows & Doors In The Building (First Floor)					
	(d) Total Number Of Houses which Do Not Have First Floor at all	-	12	68	20	-
	Use Of Vertical Columns					
	Use Of Beams & Lanters	-	20	-	-	-
	(a) Single Story Buildings					
	(b) Double Story Buildings	-	8	-	-	-
	(c) Three Or Above Stories					
04	(a) Thickness Of Wall 9"	72	28(4F,24P)*	-	-	-
05	(b) Thickness Of Wall 13"	-	05 Partly	-	-	95 Fully
06	(c) Thickness Of wall 17'	-	2	-	-	-
	'	-	-	-	-	90
	Roof Type Of Building	-	8	-	-	-
07		-	-	-	-	-
	Provision Of emergency Doors	-	-	-	-	
		-	-	-	-	100
08		-	-	65 Slab	35 Tin roof	-
09		60	40(18F,22P)*	-	-	-

* F: FULLY, P: PARTLY

The calculations after decimal have been taken to the nearest multiple of ten.

In the upper class families with regard to engineering safeguard it have been observed that 85%of the households consult engineers before construction which means that people of upper class became aware about consulting engineers before construction. 70% of households have ratio of doors and windows 25-50% for ground floor and 68% of households have ratio of doors and windows 25-50% for first floor. No doubt ground floor is base for first floor, if ground floors have more than 33% of windows and doors it cannot bear the load of first floor/top floor and the building can be collapsed. 72% of households do not use vertical columns and beams in their buildings at the time of construction. 100% of households have a 13inchs thick wall which reveals that these walls can bear heavy load and also building become strong. 35% of households have tin roof which is lighter than the slab and in case of disaster if it can be collapsed the damage can be less than the slab. 60% of households have no emergency exists which later become most important factor for the mass of causality.

Table 4.8. Calculation on the Basis Of 50 Houses of Upper Class Awareness Safeguards

S.NO	Particulars	Nil	Upto 25%	25%-50%	50%-75%	Above 75%
01	Any Volunteer Organization To Deal with Disasters	100	-	-	-	-
02	Public Awareness Programme About disaster Conducted	85	15 Partly	-	-	-
03	Distance Of Fire Service Station In The Locality Upto 2Kms	-	-	-	-	100
04	Any Major Water Source (Stream, Spring) In Or Near The Locality	58	-	42	-	-
05	Use Of Fire Extinguishers In The Houses	80	20 Partly	-	-	-
06	Electric Safety devices Installed	08	-	92(52F,40P)*	-	-
07	Fire Alarm used In The Houses	100	-	-	-	-
08	Distance Of Police Station Within 3Kms From The Locality	-	-	-	-	100

(a) Connectivity To Main Road (Easy)
(b) Connectivity To Main Road (Manageable)
Use Of Mock drill In The Locality

	Objects Firmly Fixed On The Wall					
09	Knowledge About Seismicity	-	-	-	80	-
		-	-	20	-	-
	Earthquake safety standards adopted at social centers(Mosques/Panchayats) and Schools					
10						
		88	12yes	-	-	-
11						
		14	24 Fully	-	62 Partly	-
12		45	35 Partly	20	-	-
13						
		65		55 partly	-	-
				-		

***** F: FULLY, P: PARTLY

All the calculations after decimal has been taken to the nearest multiple of ten.

In upper class families with regarding to awareness safeguard, there is no any volunteer organization in Srinagar city which become active at the time of disaster to save the life and property of people during any disaster.85% of the households says that they have no awareness about earthquake vulnerability and steps that should be taken after the disaster. If awareness programmes will be conducted regularly people become aware about how life and property can be saved or how these losses can be reduced. 100% of population says that fire service station is present in Srinagar city within a distance of 2km so at the time of disaster they can come and reduce the loss. 58% of households says that in the locality we have presence of water sources, water is collected from these resources at the time of disaster when there is shortage of water. 80% households do not have fire extinguisher in their homes because they are not aware of the use of such fire extinguishers.92% People partly or fully use modern electric safety devices in their houses to reduced loss of life and property at the time of disaster due to fire caused by short circuit. 88% households says that mock drills had not been organized at the community level. If mock drills will be organized regularly people may become aware about what steps should be taken before, during and after the disaster.86% of households are aware about the damage caused by objects

hanged on the walls so they firmly fixed objects on the wall partly or fully. 45% of households say that they do not know anything about seismicity and also not know anything about the zone in which they live which became the major cause of earthquake vulnerability.65% of households says that earthquake safety standards cannot be used in social centers(schools, panchayats, mosques, etc).

V CONCLUSION

From the above study it has been observed that Srinagar is most vulnerable to earthquake than other disasters. It falls in a high risk zone (zone 4). Its impact is on both life as well as property. Older buildings are more vulnerable because these are made of kuccha or semi pucca material. Newly buildings are less vulnerable because these are made of pucca material, vertical columns and also some safety devices are installed in their houses. People do not know anything about seismicity. Mock drills cannot be organized at school level. Earthquake safety standards cannot be installed in the social centers, schools, hospitals, etc. Trauma hospital cannot be established in the locality. Average population is comprised of children and old aged people which are more vulnerable to earthquake. At community level there is no voluntary group or committee to combat the disaster. It is also seen that vulnerability lies in all income groups with higher proportion in lower and middle income groups which constitutes a higher concentration in the study area.

It has been shown that a seismic ground motion is capable of collapsing portion of the study area. Based on the current study it can be concluded that the sections of the study areas structures will fail for seismic ground motion.

VI SUGGESTIONS

Given below are some suggestions ought to be taken for reduce the impact of disaster:

- Awareness should be raised among the children's start from the school level upto college level.
- Mock drills should be organized at the school, college and university level.
- Awareness within the community and region should be raised through printed, electronic media, more and more NGOs should be encouraged.
- NGOs should be encouraged to work in disaster risk reduction in capacity building.
- People of the locality should be induced to install safety devices in their homes, shops, offices, hospitals, schools etc.
- Proper building codes and norms should be devised by the town planning agency and the same should be enforced strictly.
- Voluntary and community level organizations should be promoted, strengthened and encouraged to engage the disaster risk reduction and capacity building activities.

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REFERENCE

1. J&K state disaster management policy (2011) by department of revenue, relief and rehabilitation.
2. Preparation of state disaster management plan (2007 July) by national disaster management authority.
3. Disaster management in India (a status report 2004 august) by GOI, minister of home affairs, NDMD.
4. District Disaster management plan (District Srinagar).