



A Study on Community Disaster Response: A Way toward Vulnerability Reduction

The twenty-first century is experiencing an unparalleled explosion in the world's population growth and an exponential growth in the size and number of towns and cities across the world. The risk of earthquake disaster is higher than at any time and it is increasing. In the past few decades we have seen catastrophic disasters to cities and regions across the world on a scale unheard of a century ago. Unless serious efforts are made to improve earthquake protection world wide, we can expect to see similar and greater disasters with increasing frequency in the years to come.

Earthquake protection involves every one. The general public have to be aware of the safety issues involved in the type of house they live in and of earthquake considerations inside the home and workplace.

It is assumed that vulnerability to any hazard origins from lack of efficient response which is related to disaster mitigation and preparedness ideas. So within this framework, response to hazard consequences is an essential parameter in preventing from damage.

Both vulnerability and response by themselves are very wide and include a wide range of studies and activities.

Vulnerability indicates any situation that reduces individual or society function and ability to confront hazard. Therefore, it can be viewed from many dimensions as far as individuals and society functions vary.

Response indicates all activities in after hazard occurrence to confront hazard impacts. So, response includes activities in immediately after hazard occurrence such as rescue and relief, fire fighting or activities that are related to longer time such as rehabilitation and reconstruction.

How an individual, group or community responds to any hazard occurrence impacts reflects its level of vulnerability to that hazard consequences and its level of preparedness to that specific hazard. In this way response is viewed as coping capacity with hazard consequences.

Risk is a combination of hazard, vulnerability and the coping capacity as:

$$\text{Risk} = \text{Hazard} \times \text{Vulnerability} \times \text{Coping Capacity}$$

What increases or decreases risk is the interaction of these elements and they are interconnected to each other (Figure 1.1)

Deficiencies in preparedness means reduced coping capacity and consequently higher level of vulnerability.

As response to hazard impacts increases to higher levels the vulnerability decreases.

In this view disaster response is beyond some activities such as stocking emergency goods for times of disaster or medical preparations. It rather includes all individuals, groups and organizations or the community by itself to be aware about hazard occurrence and the probable consequences to equip. This refers to recognize all involved groups (authorities and residents) responsibilities and interests in dealing with disastrous situation.

During Hanshin-Awaji Earthquake in 1995, which was one of the most destructives earthquakes in the end of last century, many problems occurred in responding to earthquake impacts and saving lives and properties. The nature of problems brought new ideas to address how to confront more effectively and prevent from damages. Nagata Ward in Kobe City was the area that went under lots of human/physical damages due to firebreak and its widespread, while relief efforts and fire fighting could not be done efficiently because of many unpredicted problems such as lack

of fire fighting instruments at local level, difficulties in reaching areas and residents lack of experience.

This research has mainly addressed disaster response from fire fighting and rescue/ relief point of view.

The main purposes of the research are:

- Giving a clearer concept of capacity assessment at local level.
- How response assessment and vulnerability reduction are interrelated.
- Providing a basis for risk reduction.

1.1. Research characteristics:

The research characteristics that distinct it from other related studies are:

- Studying vulnerability in a rather comprehensive context: vulnerability is considered as a result of different elements interaction including physical sources of natural hazard and social background of stricken area.
- Providing a basis for capacity assessment through recognizing vulnerabilities and capabilities at local level: effective disaster preparedness guidelines can be driven from capacity assessment.
- Emphasizing community level capacity: community level is the most important and immediate group in aftermath of any disaster to start rescue and relief.
- Having wide range of applicability: addressing vulnerability through different social/physical parameters provides wide range of using the model and studying different aspects.

2. Concept clarification:

Some main concepts as response, coping capacity, vulnerability and community are clarified.

2.1. Response:

In disaster management literature response has been mainly viewed as activities in aftermath of disaster, which are a part of emergency management such as emergency sheltering or search and rescue.

In this research response contains not only the relief activities by responsible authorities and local communities but also how residents perceive risk and prepare themselves to confront with the hazard consequences. Therefore, response is related to some other concepts such as coping capacity and resilience.

2.2. Coping capacity:

Coping capacity is rather a new concept that means the adaptability capacity with disaster process.

ISDR et al., defines coping capacity as “... Coping capacity is the manner in which people and organizations use existing resources to achieve various beneficial ends during unusual, abnormal, and adverse conditions of a disaster event or process”. (ISDR et al. 2002)

The strengthening of coping capacities usually builds resilience to withstand the effects of natural and other hazards.

2.3. Vulnerability:

Vulnerability is frequently used in the risk, hazards and disasters literature. Different fields of study have been defined vulnerability from different points of view.

Blaikie et al., have viewed vulnerability as means of coping with natural hazard. “... By vulnerability we mean the characteristics of a person or a group in terms of their capacity to anticipate, cope with, resist and recover from the impact of a natural hazard. It involves a combination of factors that determine the degree to which someone’s life and livelihood are put at risk by a discrete and identifiable event in nature or in society”. (Blaikie et al., 1994)

Comfort et al., views vulnerability as means of response. “ ... Vulnerability are those circumstances that place people at risk while reducing their means of response or denying them available protection”. (Comfort, L. et al., 1999)

2.4.Community:

In this research the word community refers to all people at local level in any disaster stricken area that in immediate response phase to disaster and later in recovery phase have the main role. Community comprises the local authorities for disaster management such as fire fighting or relief, community based organizations such as disaster prevention community because of their role as medium between authorities and people; and finally residents in any area. Each of these groups has its own role in response to disaster and their attitude toward disaster reduction and their relation is the main study in this research.

3.1.Disaster response framework:

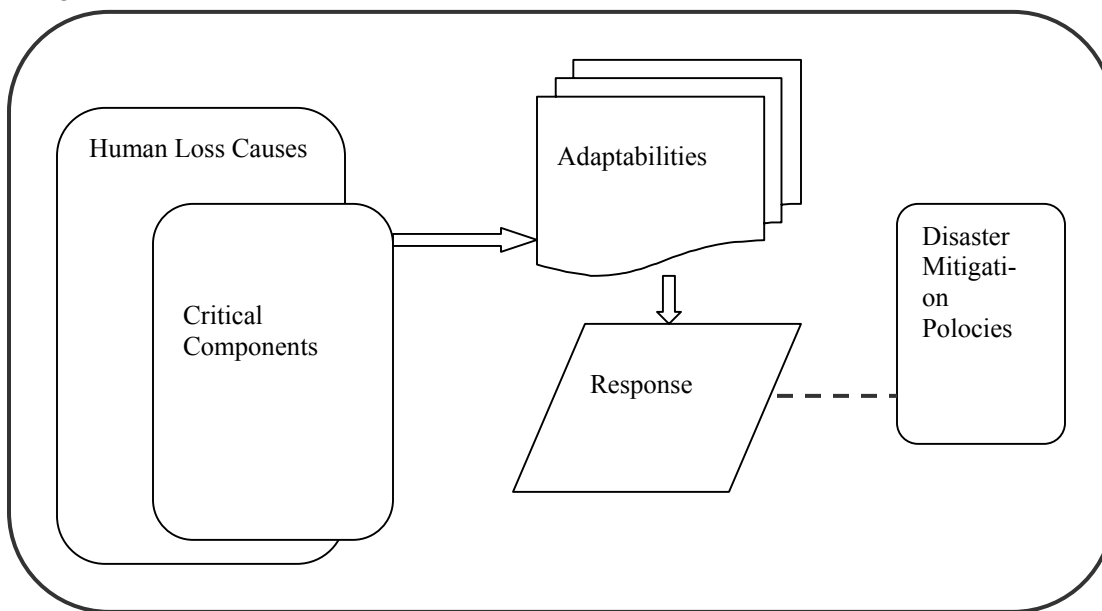
This model consists of four categories, which succeed each other. In developing this model it is assumed that:

- First, vulnerability reduction is a step-by-step process through recognizing potential problem areas.
- Second, previous earthquakes damages and experiences are guides on current vulnerabilities for future disasters mitigation.
- Third, human loss causes are driven from human risk perception and decisions on how to respond to disaster consequences. This means that the soft side of disaster related studies (social aspects and not physical aspects) are more effective in reducing damages.

By these assumptions, model starts with human loss parameters to see what are the main causes of human loss during earthquakes; then what are the critical components for each human loss causes category; how each category could have adaptability to adjust itself in times of disaster and finally which response could be expected. The last part, which response could be expected will lead us to disaster mitigation guidelines that focus on problem areas to have a easier disaster recovery. (Figure No3.1.)

Hanshin earthquake experience is one of the main sources that this idea has emerged.

Figure3.1. General view of the model



3.1.1.Human loss parameters:

Human loss parameters refer to the main elements that cause human damage during and after natural hazard occurrence.

According to previous earthquakes in different countries human damages are due to different reasons such as: structural collapse, firebreak, closed traffic, lack of rescue and relief, some individual characteristics like being aged, physical/mental disability, living in weak houses due to economic reasons, lack of experience, lack of education on disaster preparedness etc.

Here the main causes of human damages are classified in main four groups:

- Social and Economic parameters
- Structures and infrastructures
- Disaster countermeasures
- Urban development policies

Table No: 3.1. Main categories of human loss parameters

Categories	Description	Consequences in times of disaster
Social & Economic	Characteristics such as aged people; disabled people; low-income people; Uninformed people.	Difficulties in self-rescue and relief in times of disaster; lack of preparations in adjusting themselves with post earthquake situation; problems in recovering from disaster effects.
Structures & Infrastructures	Weak structures, unsuitable locations such as unsuitable soils for construction; non-resistant infrastructures.	Structural collapse and damage; breaking fire; infrastructures stop such as lack of water or electricity.
Disaster Countermeasures	Lack of disaster prevention measures such as performed building codes or earthquake/fire insurance; lack of public education and preparedness through local communities with local government support.	Lack of regional disaster preparedness; lack of coordination in rescue and relief; longer recovery time.
Urban planning policies	Lack of construction and urban development restriction law in dangerous seismic zones; lack of adequate open spaces, which increases population density; lack of proper transportation network for emergency times.	Damage increase in dangerous zones; difficulties in movement and sheltering disaster victims in post earthquake.

The critical components of each human loss parameter (HLP) are as following:

- Socio-economic parameters: includes specific groups who are more in danger due to their social and economic status; elder people, disabled people, low-income people and those who have no contact with social organizations are considered as socio-economic category.
- Structural and infrastructure parameter: includes the structures that due to their function during and after earthquake are important; hospitals, centers for disabled people, elementary schools and kindergartens, transportation network and bridges and main electricity/gas or water installations are considered as structural/infrastructures category.
- Disaster countermeasure parameters: includes organizations, policies or activities that increases preparedness at regional level, individual awareness and participation in disaster prevention such as housing earthquake insurance.
- Urban planning parameters: includes policies and planning that can increase or decrease urban spaces danger such as land-use plan, urban development law.

3.1.2. Adaptability to disaster:

Adaptability is the situation in which individuals, organizations and groups react to hazard effects. Adaptability is the combination of each element characteristics and established condition through society's organizations and institutes.

Each group of human loss parameters has its own adaptability and according to its adaptability could respond to disaster impacts. (Table No: 3.2.)

Table No: 3.2 Critical components and adaptabilities of each human loss parameters

Human Loss Parameters	Critical Components	Adaptability	Adaptability Elements	Adaptability elements Prerequisites
Socio-economic Parameters	<ul style="list-style-type: none">. Elder people. Disabled people. Low-income people. Uninformed people	<ul style="list-style-type: none">. Community services for elders and disabled people;. Educational programs and events for public;. Introducing safety points for public;. Local cooperation network for emergency times.	<ul style="list-style-type: none">. Disaster safety cases considerations for elders and disabled people by families or disaster prevention communities;. Holding seminars, drills and different events on disaster preparedness by local communities with local government support;. Anticipating disaster mitigation provisions at local level;. Local community support system.	<ul style="list-style-type: none">. Previous earthquakes experience;. Disaster awareness by social groups;. Risk perception at community level;
Structures & infrastructures Parameters	<ul style="list-style-type: none">. Hospitals;. Centers for disabled people;. Elementary schools & kindergartens;. Transportation network;. Main electricity, water and gas installations.	<ul style="list-style-type: none">. Structural upgrades for hospitals; rehabilitation centers and schools;. Alternative traffic routes;. Safety anticipations for infrastructures;. Fire fighting anticipations for critical facilities (hospitals, schools & rehabilitation centers).	<ul style="list-style-type: none">. Having rules for critical facilities structural upgrade;. Considering emergency evacuation routes in times of disaster;. Infrastructures reinforcement to continue functioning in times of disaster;. Fire fighting preparations for critical facilities.	<ul style="list-style-type: none">. Having seismic resistance plans;. Evacuation considerations in emergency plans;. Disaster prevention considerations for infrastructures;. Fire fighting integration in structures and infrastructures emergency plans.

Disaster countermeasures Parameters	<ul style="list-style-type: none"> . Policies and activities on disaster prevention by law; . Public awareness and participation in disaster prevention; . Organizational framework for disaster reduction activities. 	<ul style="list-style-type: none"> . Legal policies such as building codes or earthquake insurance; . Issuing information on disaster safety for public through media, local communities and educational institutes. 	<ul style="list-style-type: none"> . Integrating earthquake mitigation criteria in administration system; . Defining disaster preparedness organizations (public/private) at regional level that can manage disaster prevention cases for public and make arrangements between authorities and residents for implementing disaster mitigation tasks. at regions. 	<ul style="list-style-type: none"> . Disaster prevention legislative system; . Updating disaster mitigation methods with current social & economic status; . Defining local disaster mitigation idea by researchers to authorities and also to local communities to give alternatives for implementation.
Urban Planning Parameters	<ul style="list-style-type: none"> . Open spaces; . Activities proximity; . Population & spaces density. 	<ul style="list-style-type: none"> . Urban planning policies for space allocation; . Urban development law for density prevention. 	<ul style="list-style-type: none"> . Defining land-uses importance in times of disaster; . Geological situation integration in urban planning; . Inputting disaster prevention points in urban planning law. 	<ul style="list-style-type: none"> . Previous earthquakes experiences; . Improving the urban disaster management idea; . Putting urban data in a disaster mitigation frame.

3.1.3. Disaster response as a vulnerability or capacity indicator:

The kind of response to disaster can have two kinds of situation vulnerability or capacity; in other words response can increase vulnerability or can reduce it. When increases vulnerability is considered as a vulnerability indicator and when reduces it is considered as a capacity indicator.

Matrix No: 3.1. Adaptability as vulnerability or capacity indicator

Human Loss Parameters	Adaptability	Response	Vulnerability Indicator	Capacity Indicator
Socio-economic	Active community organizations, which have programs for disabled people rescue in times of disaster.	Rescue of disabled people		*

Structural & infrastructure	Hospital structures have had no upgrade to be earthquake resistant.	Stop functioning in post earthquake	*	
Disaster countermeasures	Holding fire fighting drills for residents by disaster prevention community organization	Residents' cooperation in fire fighting after earthquake occurrence.		*
Urban planning	Increasing open spaces all over the area	Less structural and human damage and having open spaces as shelter.		*

3.2. Community disaster response system:

Disaster response at community level has its own components and interactions. Response components at community level are the main elements whose activity is because of their responsibility or their interest. Responsibility refers to local governmental organizations that are responsible for rescue, relief and fire fighting. The other sides that activate due to their interest are local community organizations and residents that try to save their lives and property.

Local government response to disaster is considered to be a function of two matters:

- Defined responsibility based on disaster prevention law;
- Previous earthquakes experience.

Community-based organizations (CBO) members are combinations of residents and local government authorities. These organizations have the role of being medium between authorities and residents. The main expected roles that CBOs can play in relation with disaster response are:

- Having area's information on critical social groups such as elders, disabled, young group as elementary students; the characteristics of these groups; their ability in responding to disaster and their needs in adjusting themselves in times of disaster.
- Knowing area's physical/social facilities under current situation for different social groups.
- Having emergency plans for immediate response to disaster impacts.
- Preparing the proper condition for different social groups to participate in community disaster prevention activities.
- Having different activities to animate disaster memory for people.
- Establishing a coordinating center for disaster management affairs in area's level with public organizations such as fire fighting.

Resident's response capacity to disaster is a very determinant factor in community response system.

In considering resident's response to disaster there're two matters, which are in a cause and effect manner: (Figure No: 3.3)

- Resident's risk perception
- Resident's risk reduction behavior.

People's perception of risk is originated from their experiences on disasters, their social and economic status and their awareness about hazards and disasters.

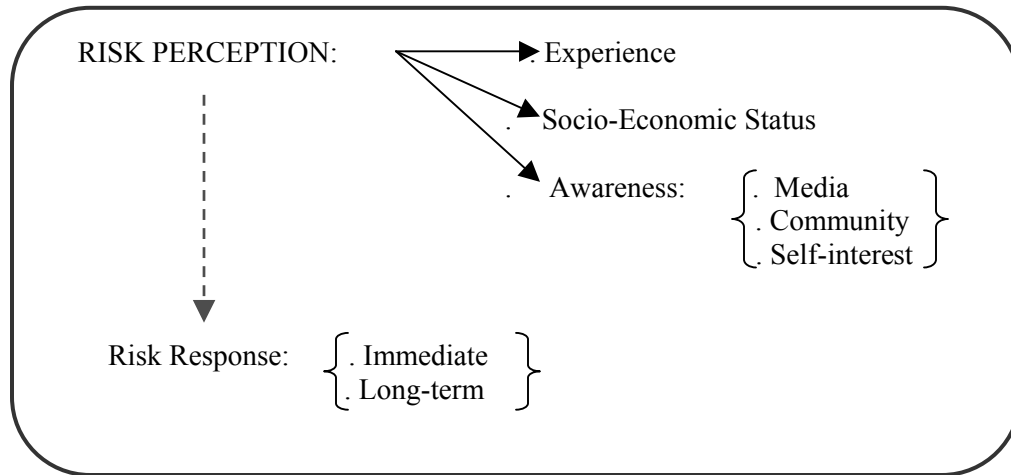
People can be informed about disasters through media, local disaster prevention communities or their own interest.

The level of perception will depend on the ability to estimate risk and perceive its causes, the level of past experience with hazards and the level of access to appropriate information.

People's risk reduction behavior or risk response can be categorized in two groups as:

- Immediate responses: includes responses in the aftermath of hazard occurrence such as: rescuing themselves and their family members, fighting fire in their own house, providing some basic living needs.
- Long-term responses: includes decisions that lead to longer time needs such as housing insurance to earthquake or fire in order to recover from housing damages. Long-term responses usually include recovery period needs.

Figure No: 3.3. People's risk perception and behavior

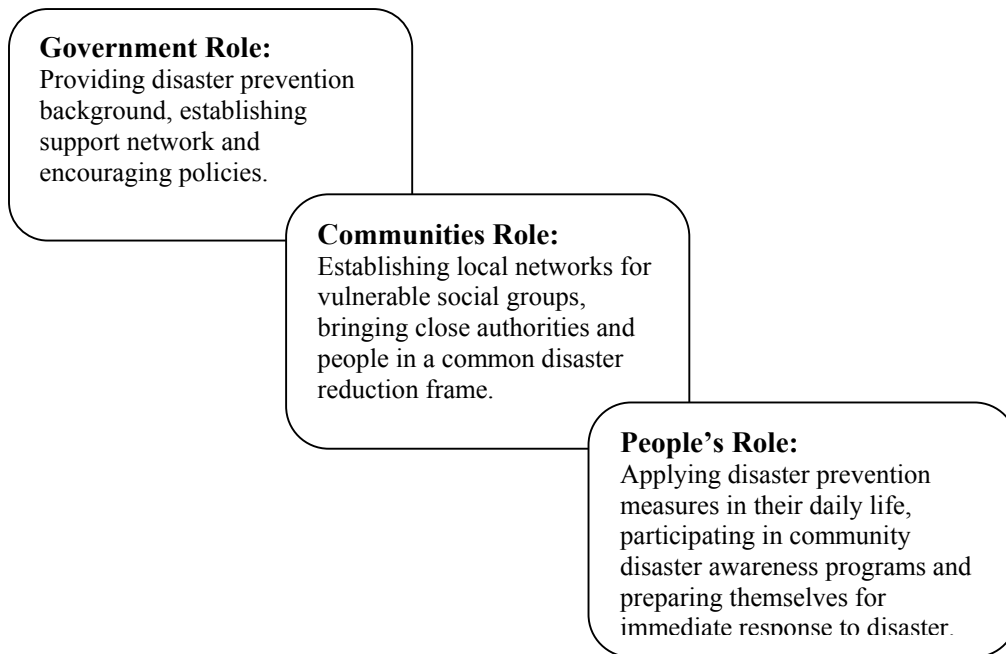


3.2.4. Community adaptability indicators:

Community adaptability to disaster can include many parameters, as there're different respondents with different roles. Adaptability could have different kinds due to wide range of disaster damages for example community adaptability for rescue/relief, adaptability for fire fighting or medical center services adaptability to disaster.

In this research for different disaster respondents (local government, local communities and residents) adaptability indicators have been considered that sometimes these indicators are related to each other.

Figure No: 3.4. The role of each society groups in disaster response



Local government adaptability indicators:

- Having hazard information;
- Having evaluations about previous disasters;
- Having precise information system about damaged areas;
- Having relations with local communities and residents;
- Revising disaster prevention plan with current social and economic trend;
- Arranging immediate needs after disaster in coordination with local disaster prevention communities.

Disaster prevention communities' adaptability indicators:

- Regional characteristics information;
- Recognizing social vulnerable groups such as elders, disabled people etc;
- Public facilities information;
- Having disaster prevention anticipations such as: hazard information, relief centers, rescue material, evacuation plans and shelters, medical centers, public educational programs and disaster mitigation functions;
- Having exchange programs with public facilities;
- Holding annual disaster prevention events;
- Participating social groups in disaster prevention activities.

Residents' adaptability Indicators:

- Having personal disaster experience;
- Having received information about disasters;
- Contacting with disaster prevention communities;
- Adequate income;
- Attending in disaster reduction events;
- Knowing about self-protection.

4. Disaster response situation in Hanshin Earthquake:

4.1. Outline of the Hanshin Earthquake:

Hanshin earthquake occurred on Jan 17, 1995 and the most affected areas by this earthquake include Kobe City on the southern part of Hyogo Prefecture, the northern portion of Awaji Island, and several sites of the eastern part of Osaka Prefecture.

This earthquake caused many lost lives, destroyed houses and damages to infrastructures.

The number of death and missing due to this earthquake was ranked 10th compared with other principal natural disasters to happen during the last 10 years and is considered one of the largest due to natural disasters including those due to all other kinds of disasters in the 20th Century.

Kobe City responded to the earthquake with the dissemination of various kinds of information including the publishing of information related to the earthquake with facsimile and personal computers, and set-up several information windows and telephones for questions.

The city opened shelters and accepted refugees in its office buildings. The city also received relief supplies from within Japan and overseas and distributed them. Temporary housing were also initially built by the city and it ordered the utilization of unoccupied public houses, buildings and rooms.

Kobe city built temporary houses for old and handicapped people and established a facility to accept old people who needed temporary care and an emergency center to care for the handicapped. Kobe City also built temporary nursery schools and childcare rooms. The city also built temporary classrooms out of prefabricated materials to reopen school classes early.

4.4. Kobe City fire department activities:

In Kobe City many fires had broken simultaneously that the fire department's activities were restricted to fire fighting. As a result, rescue activities were carried out mostly by other fire services, which had come from other cities to help with the fire fighting activities although officially, the fire department is supposed to be responsible in the rescue of people trapped in collapsed houses and buildings. In most areas help in search and rescue was received from other cities.

5. Community response analysis in Nagata Ward:

5.1. Local Government adaptability and response:

Local government includes Hyogo Prefecture and Nagata Ward Fire Fighting officials.

Hyogo Prefecture is in charge of disaster prevention plan so the current disaster prevention plan and how it can respond to future disasters will be discussed.

Nagata Ward Fire fighting department is in charge of fire fighting and rescue/relief activities in post earthquake so, the current situation and how it can respond to future disasters are discussed.

5.1.1. Nagata Ward Fire-fighting Headquarter coping capacity:

Nagata Ward Fire-fighting Headquarter is responsible for firefighting and rescue/relief activities after disaster occurrence. Their adaptability or coping capacity arises from their responsibility, which has been assigned to them, their experiences during Hanshin earthquake and current plans to prevent from fire spread and a prompt response to rescue victims. Therefore, there are three main axes in evaluating the Headquarter coping capacity:

- Organizational assignments;
- Hanshin earthquake experience;
- Current plans.

Organizational assignments are responsibilities, which have been defined by law and have been assigned to the related organization.

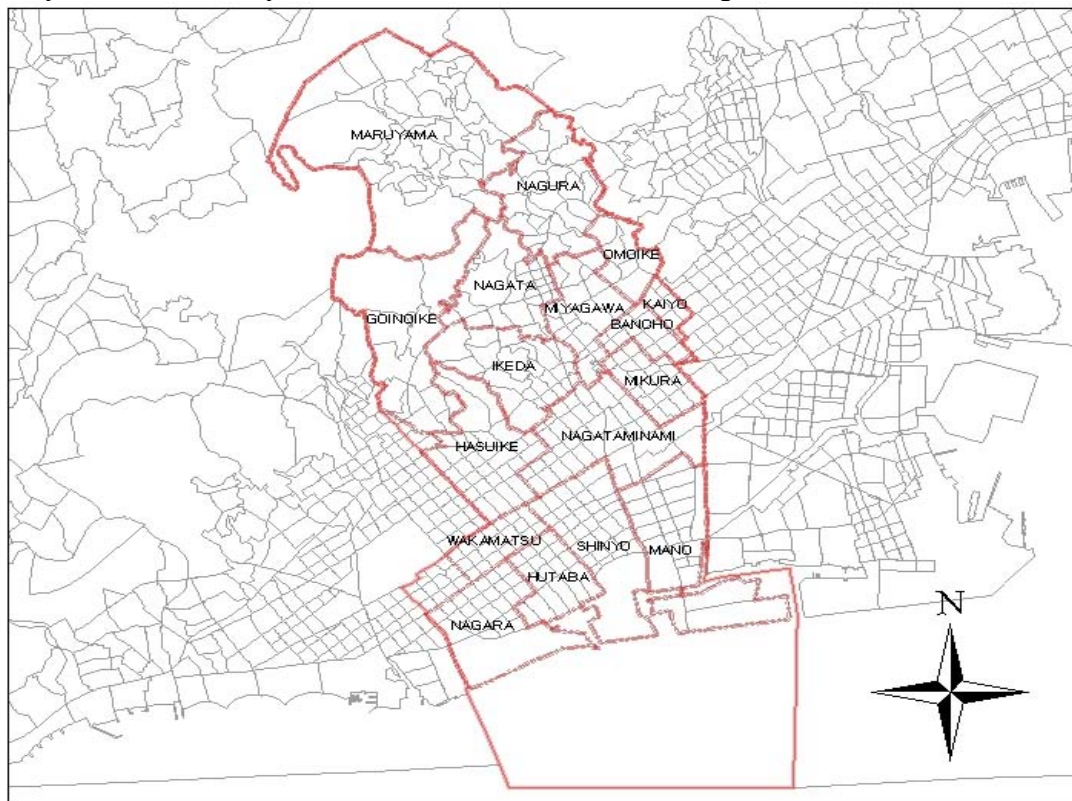
Hanshin earthquake experience refers to the problems during Hanshin earthquake in fighting fire and doing rescue and relief. Hanshin earthquake could bring some changes for current plans that are prepared for future disasters. On the other hand they can even affect the organizational assignments at local level in order to increase the level of preparedness and prevent from secondary disasters.

Current plans include the present plans for times of disaster from different aspects such as information system, equipments, shelter and medical provisions. Current plans are the result of organizational assignments and previous experiences that direct the organization orientation for preparedness.

5.2. Local disaster prevention communities' adaptability and response:

Local disaster prevention communities, which are called disaster prevention-welfare community, are local organizations at the lowest level in Kobe City. Each ward of Kobe City includes these communities that have diversity of activities for different social groups including elders, women, children etc.

Map No5.1: Disaster prevention-welfare communities in Nagata Ward



In evaluating communities adaptability to disaster the main parameters are:

- 1.Community history and structure;
- 2.Information about main social, economic characteristics of the area;
- 3.Community Disaster Prevention Activities;
- 4.Community relation with social groups in the area;
- 5.Community role in improving the situation between before and after earthquake for future disasters.

5.3.Residents' adaptability and response to future disasters:

In this part how Nagata residents perceive risk and how they will respond to future disasters are discussed. This part information is based on the questionnaires that have been distributed among Nagata Ward residents. About 1400 questionnaire distributed, which about 700 ones received.

The questionnaire included 6 parts as:

- Individual characters;
- Disaster experience;
- Disaster preparedness;
- Disaster prevention system and disaster measures;
- Disaster response;
- Administrative disaster measures.

The questionnaires were distributed in five disaster prevention communities' districts as: Hutaba (A), Wakamatsu (B), Shinyo (C), Nagata (D) and Goinoke (E).

The result of these information on how residents perceive risk and will respond is based on the main model of the study (chapter 3) and different parameters in risk perception such as experience, socio-economic status and awareness medium will be discussed. Then based on the risk perception which responses are expected will be discussed.

The main items in residents' risk perception are:

- Hanshin earthquake experience;
- Hanshin earthquake housing damage;
- Hanshin earthquake human damage;
- Monthly income;
- Housing ownership pattern;
- Knowing about disaster prevention community;
- Future earthquake expectation.

For each of these parameters there are some expected responses that the relation between these parameters and related items, which the expected response will be shown by tables and figures in all five areas.

6.Conclusions:

As conclusion the response capacity of each group is presented.

6.1.Local Government Response Capacity:

Hyogo Prefecture as Local Government has done modifications in its regional disaster management plan, creation of disaster management organization system in its system, holding effective emergency drills, creation a volunteer system for disaster relief and establishment of the Disaster Management Center. Besides, there are preparations for immediate response system and cooperation with local disaster management organizations such as emergency drills and having other supports for them like holding promotional meetings for voluntary disaster management activities.

While Hyogo Prefecture has improved its facilities for disaster information system and regional disaster management, which by itself can be useful but on the other hand how disaster response can work at district level, will depend on the residents' awareness and cooperation. According to present situation there is no vertical relation between Hyogo Prefecture and local community disaster prevention except than ward office activities for disaster prevention communities.

Nagata Ward Firefighting Headquarter has increased its firefighting facilities such as firefighting stations and holding drills for different groups like hospitals or disaster prevention communities. But on the other hand about evacuation plans and future simultaneous fires and secondary disasters still is not clear.

Mainly the changes in firefighting system are based on Hanshin earthquake problems.

6.2. Local Disaster Prevention-Welfare Communities Coping Capacity:

Here, the main points about interviewed Nagata Ward disaster prevention communities are as:

- It seems that some communities still do not have adequate information about the main socio-economic characteristics in their own district.
- The main disaster prevention activities are about preparing hazard map, preparing some instruments such as stretchers, scoop, jack etc. holding drills like fire drill for residents or introducing some disaster prevention principles through other events as monthly lunch or friendly communications.
- Communities mainly have relation with elder people in each district and in some districts young people do not show any interest to cooperate with local communities.
- Regarding community role in improving the situation in before and after Hanshin earthquake it seems that except than the current drills for residents and some connections with local government officials there is not much change in districts, which is a result of residents' social and economic situation.
- By the way some interviewed communities in Nagata Ward have been established rather newly and have planning for their future activities. How their plans can be effective as a risk perception medium for people depends on parameters such as community integration with daily life and creating incentives for people to follow disaster mitigation criteria.

6.3. Residents' General Coping Capacity:

In evaluating residents' coping capacity with future disasters the main points are:

- People have started to learn about earthquake after Hanshin earthquake;
- pattern and depends Residents' acceptance on housing earthquake resistance depends on the costs, having experiences such as housing or human damage during earthquake has not change their attitude;
- Housing fire insurance coverage is rather high;
- Residents' mainly do not participate in the training that is held by disaster prevention community;
- Those residents' whose housing during earthquake was completely destroyed have more interest to accept resistance expenses but in general depends on its cost;
- Those residents who have lost their family members during earthquake do not participate in the trainings, which are held by disaster prevention community;
- Those residents who have lost their family members do not have communications about safe place at their own home with other family members;
- The most reliable ones for rescue in times of disaster are family members and neighborhood, other such as policemen or fire-fighting volunteers are not much accepted by residents.
- Housing resistance expenses acceptance does not a function of residents' monthly income and depends of its costs.
- Housing earthquake insurance is not a function of income and its coverage is rather low;
- Housing resistance expenses is not a function housing ownership on its cost;
- Residents' awareness about disaster prevention community is not a function of having human loss in their family members;
- Participating in disaster prevention communities trainings is not a function of knowing these communities;
- Whether residents expect future earthquakes or not they are interested to learn more about earthquake;
- Residents prefer to learn about earthquake preparedness through mass media than disaster prevention communities;

The most influencing parameters in residents' adaptability are:

- Earthquake self-experience;
- Hazard occurrence frequency;
- Economic situation;
- Losing family members.

The parameters that were expecting to be influencing but are not that influencing are:

- Property damage incentives;
- Disaster prevention communities;
- Housing ownership pattern in accepting structural reinforcement.

The mentioned parameters give us guidelines to put more emphasize on which parts to improve community capability.

- Disaster preparedness measures such as structural reinforcement or housing earthquake insurance should be a part of current life and this needs more public education in order their expenses be accepted by residents;
- Disaster prevention communities need more public advertisements in order to introduce their activities to the public and select the contexts that residents show more interest to participate;
- Residents need more public education to consider safety measures in their daily life;
- Providing suitable instruments to give people more information on earthquake protection;
- Coordination between mass media and local organizations to keep residents informed about earthquake self protection;
- Coordination between disaster prevention communities and local welfare centers for different social groups to give earthquake preparedness information;

Community response to disaster by itself is the basic and the most important component in damage reduction. A capable community means having enough strength to start emergency activities and make the emergency period as short as possible.

Today in all over the world there are many earthquakes, which sometimes lead to mass destruction of physical features and too many human damages. Considering the importance of emergency relief in the aftermath of earthquakes a capable community is equipped with its own resources to response to hazard consequences.