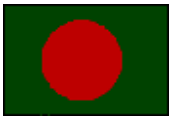
Research Report

A COMPARATIVE STUDY ON DISASTER MANAGEMENT OF BANGLADESH AND JAPAN ESPECIALLY IN THE AREAS OF FLOOD, CYCLONE AND EARTHQUAKE AND TECHNIQUES OF COMMUNITY MOBILIZATION TO CREATE AWARNESS THROUGH DISASTER EDUCATION IN JAPAN: RECOMMENDATIONS FOR IMPROVEMENT OF COMMUNITY MOBILIZATION INBANGLADESH

9 May 2011

Kobe, Japan



Final Report for the Visiting Researcher Program in 2010(B)

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Bangladesh

Visiting Researcher (ADRC)

January – May 2011 Term

Content

Foreword
- Messages to Visiting Researchers -

Dear Visiting Researchers,

As noted everywhere, there is new and arresting evidence on how and why disaster risk is increasing globally. Increasing urbanization, vulnerable rural livelihoods, and the decline of ecosystems are among the key "risk drivers" according to the 2009 Global Assessment Report on Disaster Risk Reduction by the United Nations.

About 40% of all natural disasters occur in Asia, but these account for more than 80% of the number of casualties attributed to natural disasters. Indeed, disaster risk is extremely high in Asia as compared to other regions. A series of catastrophes recently occurred in China, Indonesia, Vietnam or elsewhere again reminded us of the great importance of disaster risk reduction.

The Asian Disaster Reduction Center (ADRC), since its inception in 1998, has committed itself to promoting multilateral cooperation on disaster risk reduction in close cooperation with its twenty-nine member countries. In so doing, the ADRC is engaged in a wide range of activities, such as promoting dissemination and sharing of disaster-related knowledge. The ADRC also cooperates with its member countries in strengthening their capacity to cope with natural disasters at various levels of government. As one of such endeavours, we are very pleased to have welcomed Visiting Researchers from member countries again this year.

During their stay at the ADRC, the Visiting Researchers have visited many institutions, government and non-government alike. They have learned new knowledge and ideas through lectures and seminars and, most importantly, met many first-class professionals in Japan. I would like to take this opportunity to express my great appreciation to those who have spent their precious time and resources for our Visiting Researchers.

I congratulate the successful completion of the ADRC Visiting Researcher Program and hope that they will go back to their home countries safe and will maintain good collaboration with the ADRC in the future.

Atsushi KORESAWA
Executive Director
Asian Disaster Reduction Center

Acknowledgement

I have been serving as Deputy Secretary, Disaster Management and relief Division of Bangladesh. First of all I would like to express my gratitude to ADRC for selecting me in this program to represent Bangladesh as Visiting Researcher. I would like to pay my sincere gratitude to Honorable Minister for Food and Disaster of Bangladesh, Dr. Mohammed Abdur Razzak, Secretary in charge, Disaster Management and Relief Division, Dr. M. Aslam Alam and Secretary, Ministry of Establishment Iqbal Mahmud to give me this opportunity to serve my country. I would like to thank all the staff members of the ADRC for providing me kind cooperation to conduct the successful research program. I would like to thank Mr. A. Koresawa (Executive Director – ADRC) who guided me with his valuable wisdom, knowledge and experience on disaster management. It would be my great pleasure and happiness to extend my sincere gratitude and respect to Ms. Miki Kodama, Senior Researcher, ADRC who always guided me on research issues and given solutions to my problems instantly.

I am ever grateful to Mr. Fujieda, Senior Researcher- ADRC who mentored and supervised me in overall to achieve my target and also Ms. Tae Watanabe (Administrative Manager) guided with the administrative matters and gave me a proper way to overcome all the administrative matters. Also, I must extend my heartiest thanks to administrative staff members of ADRC and Japanese Teacher Mr. Shoji Kawahara, for their valuable information and prudent suggestions and evergreen energies spent for me in many ways during my stay in Japan**.** I would never hesitate to thank my other VR members in Asia especially Ms. Maiya Kadel (Nepal), who supported me to create better group activities throughout my stay in Japan.

Finally, I would like to express my gratitude to the Government of Japan, ADRC both its management and fellow researchers for their whole hearted support and cooperation that has been extended to me to make my stay comfortable and also to the Government of Bangladesh for allowing me to be benefited from practical experience in Japan. I would also like to extend my thanks to JICA, Hyogo, for offering some valuable session on comprehensive Disaster Management.

Abstract

Disaster risk is on the rise throughout the world. The economic losses and the number of people who have been affected by natural disasters have increased dramatically over the past decades than both economic and population growth. This will slower the economic growth of the affected country. The physical, social and economic losses caused by these disasters are particularly more expensive for developing countries. To minimize the damages caused by disasters, various efforts have been taken by government, international community including donor agencies.

Despite highest disaster preparedness by Japanese Government, this year, on March 11, northeastern part of Japan has been severely devastated by magnitude 9 earthquake followed by tsunami (called Tohoku Earthquake) which killed 25,000 people, 50,000 people missing and made 250000 people homeless and preliminary loss of lives and properties worth of $310 billion dollars. The severity of the disaster was beyond imagination which caused such big damage of valuable lives and properties. For this reason, community should be more conscious about disaster prevention culture and mitigation. They should be involved in post disaster recovery and reconstruction process for facing the future disasters and mitigate it.

Japan Government's initiative and commitment to mobilize local and international community to minimize the damage and loss from Disaster is highly commendable. Japanese experience of disaster management and mitigation and community involvement in the Great Hanshin-Awaji Earthquake had been proven most successful. Bangladesh is a disaster prone country. Japanese lessons can be replicated to Bangladesh to involve community more extensively to mitigate disaster. In this paper I examined the major disaster phenomenon in Japan and Bangladesh, a comparative study of disaster management system of Japan and Bangladesh, techniques of community mobilization in Japan for successful implementation of disaster preparedness planning and recovery from post disaster situations. I would like to replicate some experience, I gained from Japan to my country and recommend some suggestions on effective community mobilization in Bangladesh.

1. INTRODUCTION:

Disaster reduction and sustainable development are necessary preconditions for a country's economic development and overall prosperity. Natural disasters have been severely affecting the progress and goals of sustainable development. From the perspectives of Climate change, environmental degradation, human intervention, and security aspects, disaster management is a sensitive issue for all of us and comprehensive disaster management package should be undertaken. The comprehensive disaster management approach seeks stakeholders or communities at risk get engaged in all of its phases: prevention, mitigation, preparedness, response and recovery. In every disasters, community has to come forward first to rescue victims from collapsing houses or from under the debris. Every year there is a great loss of people's lives and property in Japan due to natural disasters. Up until the1950s, numerous large-scale typhoons and earthquakes caused extensive damage and thousands of casualties. However, with the progress of society's capabilities to address disasters and the mitigation of vulnerabilities to disasters by developing disaster management systems, modern technologies and involvement of community in disaster preparedness, post disaster recovery and decision making process has been proved most effective to minimize the loss of lives and properties in Japan.

Bangladesh is also vulnerable to disasters. Floods are recurring phenomenon in Bangladesh. Generally each year 18.02% area is flooded. Catastrophic Cyclone SIDR in 2007 and AILA in 2008 had severely damaged human life, property and infrastructures in six coastal districts of Bangladesh. Earthquake, tsunami and landslides are also sensitive disaster issues in Bangladesh. In order to build disaster-resilient communities, they first need to be empowered so that community members can cope with the adverse effects of natural hazards. This is the most effective approach to attain sustainable disaster management policy in dealing with natural disaster risks. ADRC has been executing various community-based programs to establish disaster prevention as an integral and essential component of sustainable development. Its activities include improvement of the safety levels of core community facilities such as schools; the dissemination of best practices in disaster risk management at the community level; and the formulation of integrated programs for sustainable development through disaster risk management initiatives. The paper presents Comparative analysis and some findings of community mobilization to Japan and Bangladesh which engage communities to deal with disaster effectively. My research plan in ADRC is to conduct a Comparative study on the community mobilization to reduce the risk of pre disaster, during and post disaster situations in Bangladesh and community mobilization in Japan to tackle disaster. More specifically I conducted a comparative study on planning community mobilization for disaster prevention and preparedness, disaster emergency measures, disaster recovery and rehabilitation in Japan and Bangladesh. In case of any disaster local people or community has to response first.

2. SPECIFIC AIMS OF RESEARCH:

This research plan promotes the design of risk reduction strategies Disaster Education, Learning and Simulation and Community Based Adaptation Programs as an outcome of the risk reduction and assessment process. This ensures Prevention, Preparedness, Response and Recovery programs are multi hazard focused and that the move from being hazard generic in nature to risk specific. This will enable communities to better understand their changing risk environment and thus become more resilient through proactive risk reduction efforts

- Gather knowledge and skills from the disaster management system in Japan especially the techniques of community mobilization in Japan.
- Mainstreaming disaster risk reduction;
- Strengthening of community institutional mechanisms;
- Empowering community at risk particularly women, the poor and the disadvantaged;
- Expanding risk reduction programming across a broader range of hazards (all hazards approach);
- Strengthening emergency response systems; and
- Developing and strengthening networks of relevant national, regional

3. PROPOSED RESEARCH ACTIVITIES:

- Classification of disasters such as flood cyclone, earthquake, landslide etc.
- Study the community participation during disaster in Japan and Bangladesh.
- Choose appropriate technique to involve the community to reduce the risk of disaster and response and recovery from disaster in Bangladesh.
- Learn basic ideas for preparing community through learning and training and drill in Japan.
- Conduct preliminary study to educational institutions and disaster related Government offices to know how they impart training to the schools and colleges and office staffs in Japan.
- Conduct Case studies on the behavior of the community in response to disaster in Japan.
- Conduct study to adaptation in disaster situations and post disaster rehabilitation.

4. ASIAN DISASTER REDUCTION CENTER

Type: International Organization

Objectives: To facilitate multinational cooperation for disaster reduction in the Asian region

Establishment: July 1998

Location: Kobe, Hyogo, Japan

Member: 29 member countries, 5 advisor countries, one observer

Operation: ADRC is operated based on stipulation adopted

The Asian Disaster Reduction Center was established in Kobe, Hyogo prefecture, in 1998, with mission to enhance disaster resilience of the member countries, to build safe communities, and to create a society where sustainable development is possible. The Center works to build disaster resilient communities and to establish networks among countries through many programs including personnel exchanges in this field.

Mission

To Enhance Disaster Resilience of the Member Countries.

To Build Safe Communities.

To Create a Society Where Sustainable Development is Possible.

5. VISITING RESEARCH PROGRAM

Objectives：

(1) To learn the Disaster Management in Japan and other countries

(2) To enhance human network among Asian Countries

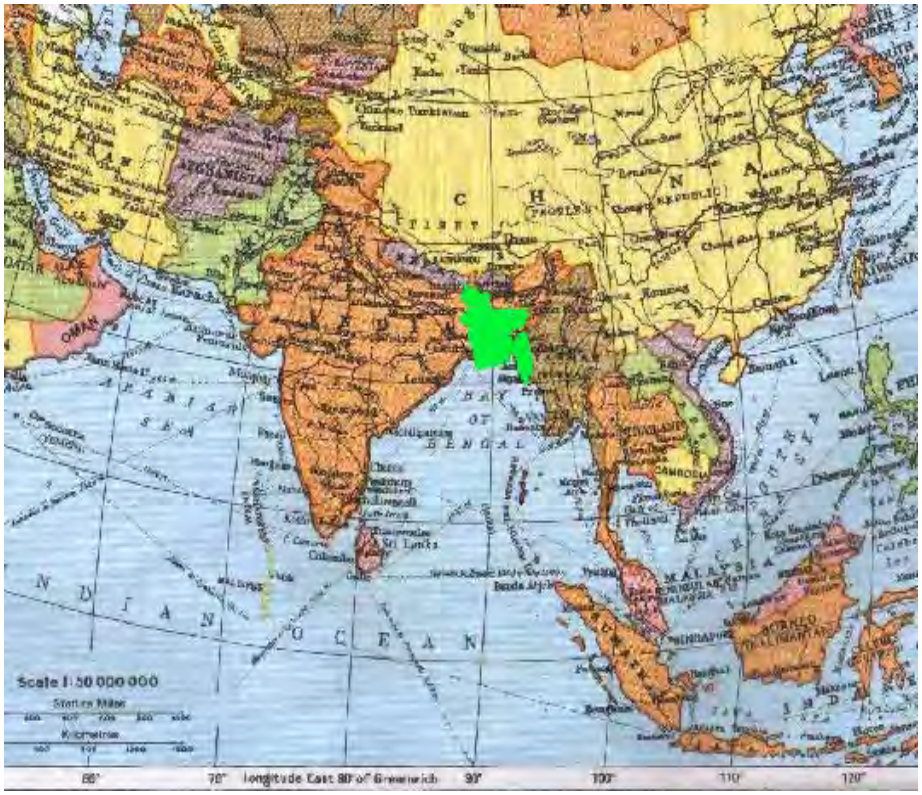
Two terms are conducted in the program, Outline The first term (January-June) and the second term (July-December) 4 Officers in charge of Disaster Management from member countries.

6. GEOGRAPHICAL INFORMATION OF BANGLADESH

Bangladesh is a low-lying, riparian country located in South Asia with a largely marshy jungle coastline of 710 kilometers (440 mi.) on the northern littoral of the Bay of Bengal. Formed by a deltaic plain at the confluence of the Ganges (Padma), Brahmaputra (Jamuna), and Meghna Rivers and their tributaries, Bangladesh's alluvial soil is highly fertile but vulnerable to flood and drought. Hills rise above the plain only in the Chittagong Hill Tracts in the far southeast and the Sylhet division in the northeast. Straddling the Tropic of Cancer, Bangladesh has a subtropical monsoonal climate characterized by heavy seasonal rainfall, moderately warm temperatures, and high humidity. Natural calamities, such as floods, tropical cyclones, tornadoes, and tidal bores affect the country almost every year. Bangladesh also is affected by major cyclones on average 16 times a decade.

The areas around Dhaka and Comilla are the most densely settled. The Sundarbans, an area of coastal tropical jungle in the southwest and last wild home of the Bengal tiger, and the Chittagong Hill Tracts on the southeastern border with Burma and India, are the least densely populated.

LOCATION OF BANGLADESH



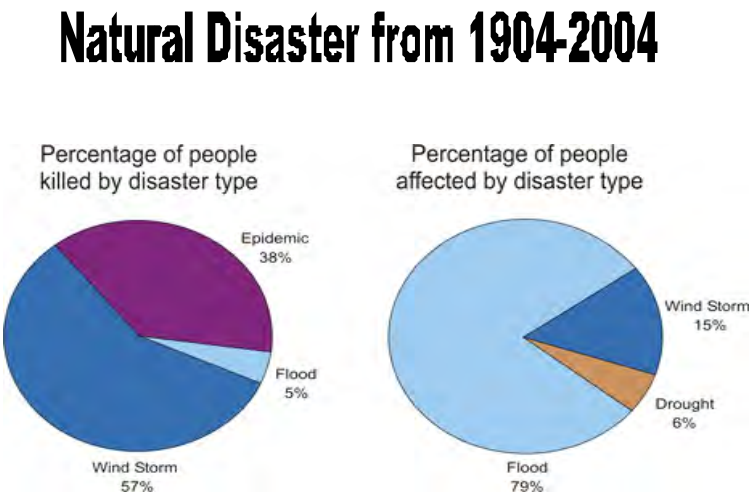
7. NATURAL HAZARDS IN BANGLADESH

a) Natural Hazards Likely to Affect the Country:

Historical statistics would suggest that Bangladesh is one of the most disaster prone countries in the world with great negative consequences being associated with various natural and human induced hazards. The geophysical location, land characteristics, multiplicity of rivers and the monsoon climate render Bangladesh highly vulnerable to natural hazards. The coastal morphology of Bangladesh influences the impact of natural hazards on the area. Especially in the south eastern area, natural hazards increase the vulnerability of the coastal dwellers.

b) Disasters and Bangladesh

- Flood
- Tropical Cyclone
- Storm Surge
- Tornado
- River Bank Erosion
- Drought
- Earthquake
- Arsenic
- Fire



Source : ISDR website

Natural and human induced hazards such as floods, cyclones, droughts, storm surges, tornadoes, earthquakes, riverbank erosion, fire, infrastructure collapse, the high arsenic contents of ground water, water logging, water and soil salinity, epidemic, and various forms of pollution are frequent occurrences. Over the years, Bangladesh has developed an elaborate system of disaster management. However, in the past, the focus of disaster management had been relief and rehabilitation.

c) Key factors of vulnerability

- Geographical location
- Dominance of flood plains
- Low elevation from the sea
- Global warming & climate change
- High population density
- High level of poverty

Bangladesh is vulnerable to a number of disasters including floods, cyclones, riverbank erosion tornados and droughts. Floods and cyclones are regular visitors to the country. Since the current floods have caused huge loss of lives and severe damage to crops and properties, (79% people Affected by flood) they deserve special attention and discussion.

8. FLOODS

Bangladesh is the largest delta in the world, created by three mighty rivers-the Ganges (Padma), the Brahmaputra (Jamuna) and the Meghna. It is criss-crossed by over 230 rivers and rivulets. These river systems drain the run-offs from a catchment area of about 1.7 million km2, 92.5 per cent of which is located outside the country. The estimated volume of water flowing through these rivers is about 1500 billion cubic meter which can form a silt(pooli)of a depth of about 10.25 meters stagnant water, if accumulated over an area equal to that of Bangladesh.

Floods are a blessing to the farmers in Bangladesh as they bring in billions of tons of silt from the Himalayas, making the land one of the most fertile in the world. It becomes a curse, causing loss of lives and property, only when it exceeds the normal acceptable limit.

The main cause of severe floods in Bangladesh is the synchronized peak flow of the major rivers, high tide in the Bay of Bengal retarding drainage efficiency, and excessive rainfall, Given the fast rate of population growth and rapid urbanisation forcing people to live in vulnerable areas and development of

rural road networks without proper consideration of the drainage system, it is only natural that high floods in Bangladesh will cause severe damage to lives, crops and properties.

a) Types of Flood and Causes

Bangladesh generally experiences four types of flood and these are as follows:

1. Flash flood
2. Rain-fed flood
3. River flood
4. Flood due to cyclonic storm surges

b) Flash Flood

This type of flood is characterized by rapid rise and fall in water levels. The duration of flash floods can vary between a few minutes and a few hours. This type of flood occurs mostly in some of the northernmost, north-central, northeastern and southeastern parts of the country. In the northernmost, north-central and northeastern parts, the land areas of the country are at the foothills whole the hilly catchments lie in India. If it rains heavily in the Indian parts of the catchments, the run-off quickly accumulates and flows to Bangladesh. It is very difficult to provide forecasts on flash floods but early warning with a short lead-time may be provided. Flash floods start in the northeast and north central parts of the country from mid-April i.e. before the onset of the southwesterly monsoon. In the northern and southeastern areas, it starts with the onset of the southwesterly monsoon.

c) Rain Fed-Flood

This kind of flood occurs in many parts of the country but is generally seen in the moribund Gangetic deltas in the southwestern part of the country, where most of the natural drainage systems have deteriorated due to a fall in the upland inflow in the main river, the Ganges. This kind of flood also occurs in the flood plains where natural drainage systems have been disturbed either due to human interference e.g. construction of unplanned rural roads and illegal occupation of river courses etc. or due to gradual decay of the natural drainage system. When intense rainfall takes place in these areas, the natural drainage system cannot carry the runoff generated by the storm and causes temporary inundation in many localities.

d) River Flood

The word flood is generally synonymous with river flood, which has been a very common phenomenon in the country from time immemorial. Normally, 20-25% of the area along a river is inundated during the monsoon season. In case of severe floods 35-70% of the country is inundated extending the areas far

beyond the riverbanks. The four worst floods experienced by the country in the last 16 years were in 1987, 1988, 1998 and 2004. The floods of 1998 were the severest in terms of magnitude and duration.

It was observed that severe floods occurred due to excessive rainfall in the catchments. When water levels in the three major rivers rise simultaneously and cross the danger marks, severe floods usually occur all over the country. This was observed during the floods occurring in 1987, 1988, 1998 and 2004. Water levels start crossing the danger marks from mid-July and stay that way till mid-September. The duration of severe floods usually extends from 15 days to 45 days, and the longest one occurred in 1998.

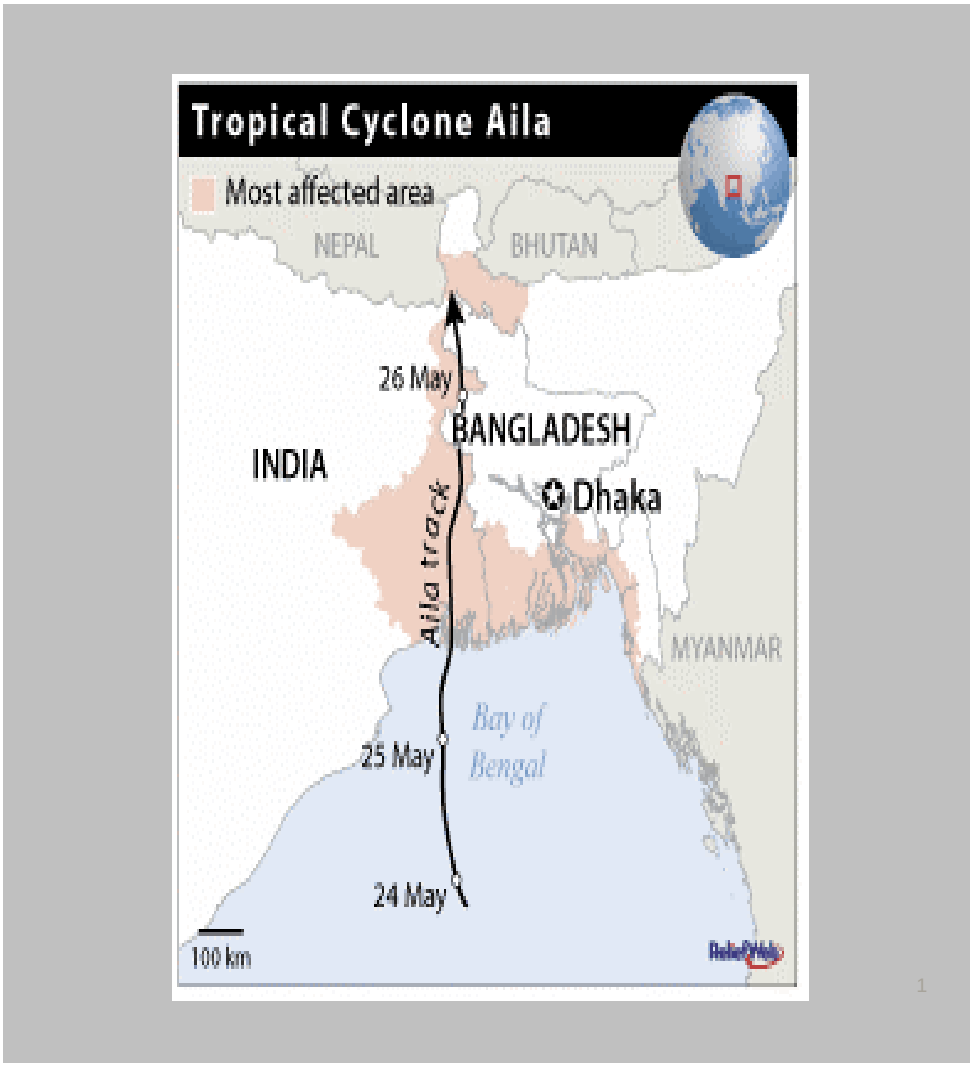
e) Flood Due to Storm Surges

This kind of flood mostly occurs in the coastal areas of Bangladesh over the coastline of about 800 km along the southern part. The continental shelves in this part of the Bay of Bengal are shallow and extend to about 20-50 km. Moreover, the coastline in the eastern portion is conical and funnel-like in shape. Owing to these two factors, storm surges generated due to any cyclonic storm are high compared to the same kind of storm surge in other parts of the world. In case of super cyclones hitting the Bangladesh coast, the maximum height of the surges was found to be 10-15 m, and these cause flooding in the entire coastal belt. The worst kind of such flooding, i.e. on 10 November 1970 and 30 April 1991 caused the loss of 300,000 and 130,000 human lives respectively. Apart from the effect of cyclones, coastal areas are also subjected to tidal flooding during the months from June to September when the sea is in spate due to the south-westerly monsoon. The incidence of such flooding is now on the increase.

f) Urban Flooding

Besides these four types of flood, another kind of flood, i.e. urban flooding, is becoming more prevalent nowadays. Due to rapid urbanization through filling up of low-lying areas, natural drainage systems in urban areas are being destroyed, and this causes urban flooding. This is most acute in major metropolises, such as Dhaka, Chittagong, Khulna, Rajshahi and Sylhet. But the phenomenon has also become gradually noticeable in other towns, e.g. Mymensingh, Jessore, Comilla, Noakhali and Rangpur.

Urban flooding is posing a serious threat to the state of roads and pavements, health and hygiene and the environmental conditions of the towns and cities. It is pertinent to note that urban planning must take into consideration the issues of storm water drainage and filling-up of the low-lying areas in and around the cities and towns.



9. REGULATIVE FRAMEWORK IN BANGLADESH

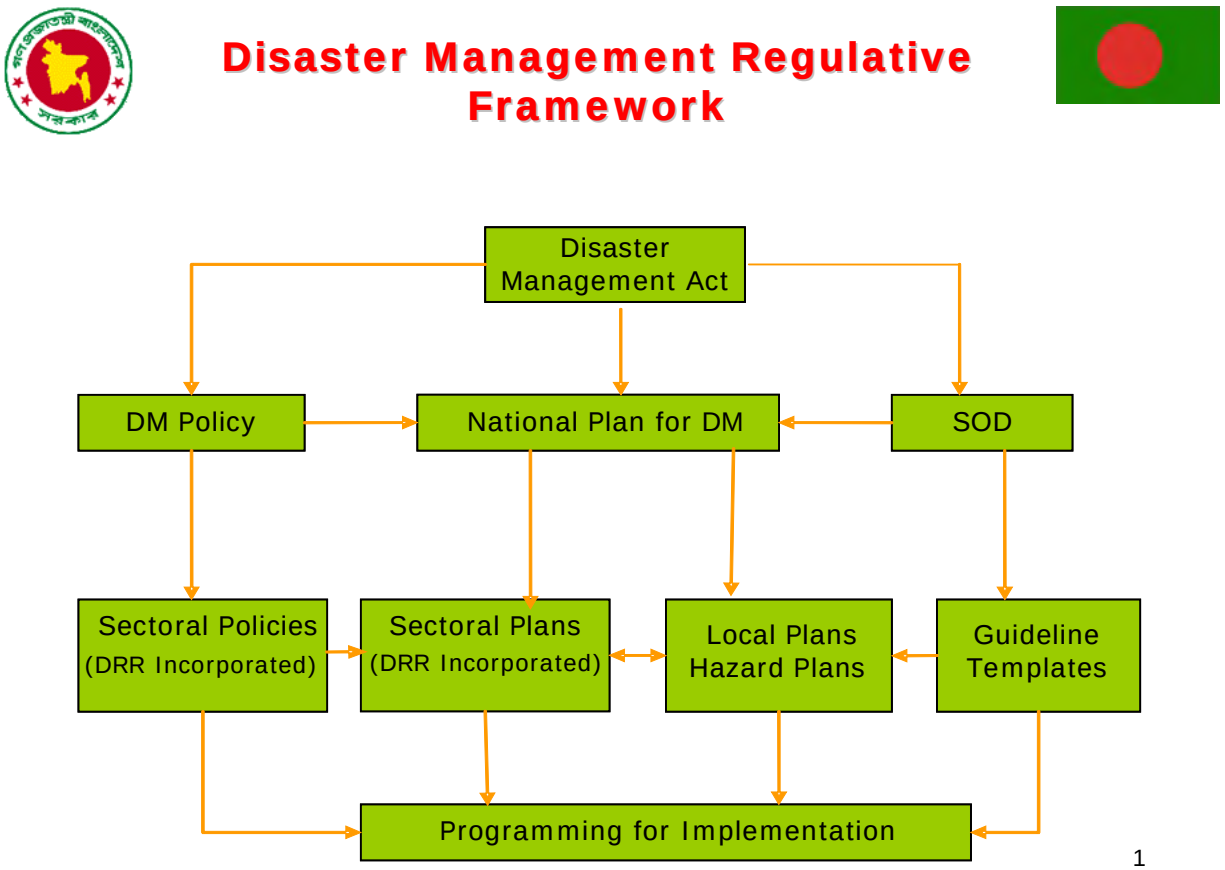
In order to manage the paradigm shift in disaster management, a disaster management regulative framework is established under which the Bangladesh Disaster Management Framework is implemented, and in which work of Ministries, Departments, NGOs and civil society are undertaken. The regulative framework provides the relevant legislative, policy and best practice framework under which the activity of Disaster Risk Reduction and Emergency Response Management in Bangladesh is managed and implemented. The framework is comprised of:

a) Disaster Management Act (to be enacted)

The Disaster Management Act creates the legislative framework under which disaster risk reduction and emergency response management is undertaken in Bangladesh, and the legal basis in which activities and actions are managed. It also creates mandatory obligations and responsibilities on Ministries, committees and appointments.

b) National Disaster Management Policy (to be adopted)

The National Disaster Management Policy defines the national policy on disaster risk reduction and emergency response management, and describes the strategic policy framework, and national principles of disaster management in Bangladesh. It is strategic in nature and describes the broad national objectives, and strategies in disaster management.

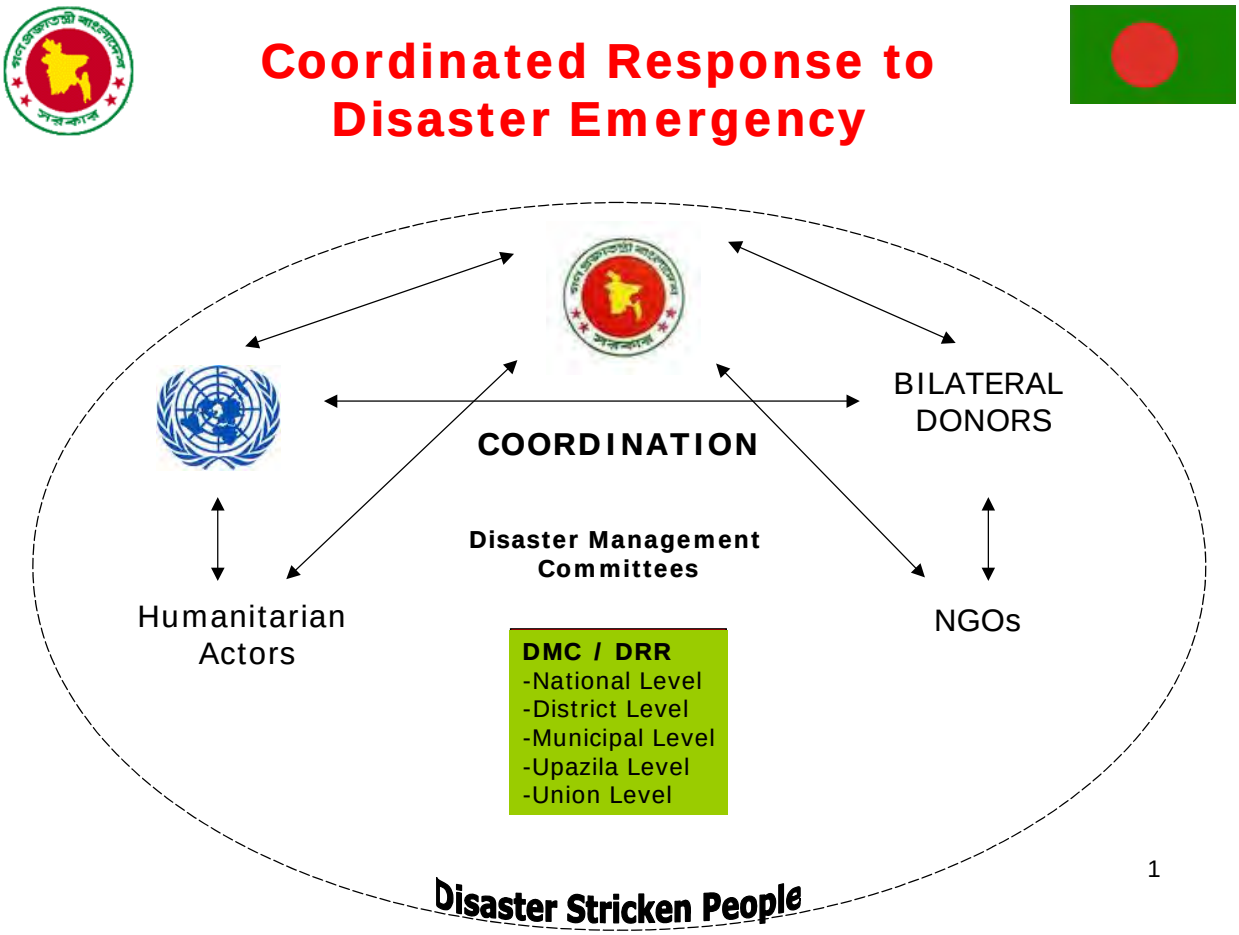


c) National Plan for Disaster Management

The National Plan for Disaster Management defines in broad outline the systemic and institutional mechanisms under which disaster risk reduction and emergency response management is undertaken in Bangladesh. It outlines disaster management vision, strategic goals and conceptual framework. It establishes disaster management regulative and planning frameworks, and identifies priority areas for disaster risk reduction and emergency response management

d) Standing Orders on Disaster (SOD)

The Standing Orders on Disaster outlines the disaster management arrangements in Bangladesh and describes the detailed roles and responsibilities of committees, Ministries, Departments and other organizations involved in disaster risk reduction and emergency response management, and establishes the necessary actions required in implementing Bangladesh's Disaster Management Model, e.g., defining the risk environment, managing the risk environment, and responding to the threat environment.



e) National Disaster Context

- Frequently hit by various natural disasters like Cyclones, Storm surges, Floods, Tornadoes, Droughts and other calamities.
- Monsoon flooding is an annual occurrence shaping lives and livelihoods.
- Almost 200 disaster events have occurred causing more than 500,000 deaths and leaving prolonged damage to livelihoods, infrastructure and the economy.
- Climate change is likely to cause significant impact in the form of severe floods, cyclones, droughts, sea level rise and salinity affecting agriculture, livelihoods, natural orders, water supply, health etc.
- The disaster vulnerable people demonstrate strong coping capacity to face the disaster challenges.

f) Government of Bangladesh's Vision DM

To reduce the vulnerability of people, especially the poor, to the effects of natural, environmental and human induced hazards to a manageable and acceptable humanitarian level

g) Mission:

- to bring a paradigm shift in disaster management from conventional response and relief to a more comprehensive risk reduction culture

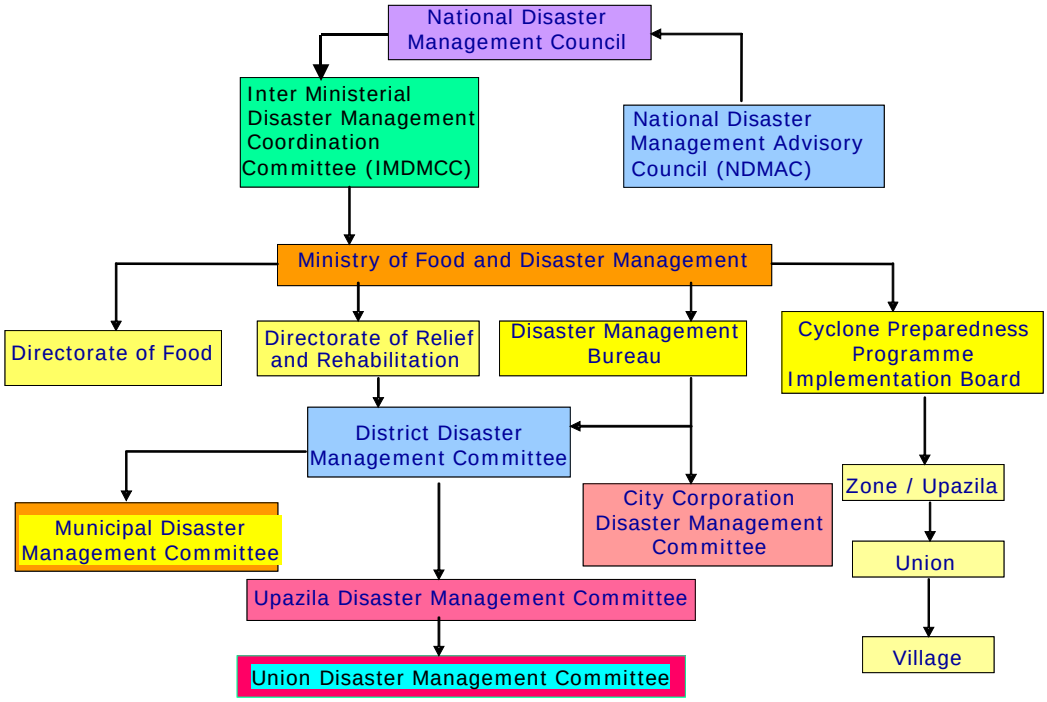
Overall Objective:

- to strengthen the capacity of the Bangladesh Disaster Management System

h) National and international Drivers

- Millennium Development Goals (MDG)
- Hyogo Framework for Action (HFA)
- United Nations Framework Convention on Climate Change (UNFCCC)
- SAARC Framework for Action (SFA)

Disaster Management Institutions in Bangladesh



i) National committees under SOD

- National Disaster Management Council (NDMC)
- Inter-Ministerial Disaster Management Co-ordination Committee (IMDMCC)
- National Disaster Management Advisory Committee (NDMAC)
- Cyclone Preparedness Program Implementation Board (CPPIB)
- Disaster Management Training and Public Awareness Building Task Force (DMTATF)
- Focal Point Operation Coordination Group of Disaster Management (FPOCG)
- NGO Coordination Committee on Disaster Management (NGOCC)
- Committee for Speedy Dissemination of Disaster Related Warning/ Signals (CSDDWS)

j) Field Level Committees under SOD

- District Disaster Management Committee (DDMC) headed by the Deputy Commissioner (DC) to co-ordinate and review the disaster management activities at the district level

- Upazila Disaster Management Committee (UZDMC) headed by the Upazila Nirbahi Officer (UNO) to co-ordinate and review the disaster management activities at the Upazila level
- Union Disaster Management Committee (UDMC) headed by the Chairman of the Union Parishad to co-ordinate, review and implement the disaster management activities of the concerned union
- Pourashava Disaster Management Committee (PDMC) headed by Chairman of Pourashava (municipality) to co-ordinate, review and implement the disaster management activities within its area of jurisdiction
- City Corporation Disaster Management Committee (CCDMC) headed by the Mayor of City Corporations to co-ordinate, review and implement the disaster management activities within its area of jurisdiction

k) Infrastructure for Disaster Risk Reduction

- Over 2,500 Cyclone Shelters along the coastal belt of Bangladesh.
- Killas (Elevated Land) for Shelter of Livestock.
- Flood Protection Embankment along coast line.
- 1400 Flood Shelters in Flood-Prone Areas.

l) Comprehensive Disaster Management Program (CDMP)

CDMP is a strategic institutional and programming approach that is designed to optimize the reduction of long-term risk and to strengthen the operational capacities for responding to emergencies and disaster situations including actions to improve recovery from these events.

Strategic Focus Areas:

- Professionalizing the Disaster Management System: Establishment of Policy Program Partnership Development Unit, Professionalizing development of Disaster Management System, etc.
- Partnership Development: Advocacy and Capacity Building of DMCs.
- Community Empowerment: Program Gap Analysis, Risk Reduction Planning, Livelihood Security and hazard Awareness, etc.
- Expanding Preparedness Program across a broader range of hazards: Earthquake and Tsunami Preparedness, Climate Change and Research.
- Strengthening Emergency Response Capabilities: DMIC and Response Management.

m) Implementation of Hyogo Framework in Bangladesh

Adopting action-plan 2005-2015, Building the Resilience of nations and communications to Disasters at the World Conference on Disaster Reduction in Kobe, Japan in January 2005, the 168 Governments

present and recognized their critical role in working with other actors to reduce disaster at national and local levels.

The first of the Hyogo Framework's five priorities of Action is to ensure that disaster risk reduction becomes a national basis for implementation in Bangladesh

Major Disasters in Bangladesh

Year	Disaster	Death
1970	Cyclone	470,000
1988	Flood	2373
1988	Cyclone	5704
1989	Drought	800
1991	Cyclone	138,882
1996	Tornado	545
1997	Cyclone	550
1998	Flood	918
2004	Flood	747
2007	Flood	800
2007	Cyclone	3,406
2009	Cyclone	190

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m) Recent Major Disaster in Bangladesh: Cyclone “Aila”.

Almost 200 disaster events have occurred causing more than 500,000 deaths and leaving prolonged damage to livelihoods, infrastructure and the economy of Bangladesh shocked by cyclone 'Aila' This tidal surge severely damaged both life and property in southern western coastal districts of Bangladesh. In the early hours of 25th May 2009 at noon, the cyclone "Aila' hit the Bangladesh coastal districts, at a wind of 60-70KPH accompanied by 8-10 feet tidal surges above normal tide.

10. DISASTER MANAGEMENT IN JAPAN

a) Overview of Disaster Situation in Japan

Japan is located along the northwestern Pacific Rim and the so called “Ring of Fire” where many volcanoes and active earthquakes are frequently encountered. The reason for such a large concentration of volcano activity and earthquake is active colliding at the plate boundaries. Movement of the plates and movements of the earth’s crust caused by such movements are known as plate Tectonics. Near the islands of Japan there is a slow but steady northwestward movement of the pacific plate against the Eurasian plate and westward movement against North American Plate. That’s why, Japan’s geographical location is in the circum-Pacific mobile zone, where seismic and volcanic activities occur constantly. Although the country covers only 0.25% of the land area on the planet, the number of earthquakes and distribution of active volcanoes is quite high. Also, because of geographical, topographical and
Meteorological conditions, the country is subject to frequent natural disasters such as typhoons, torrential rains and heavy snow.

Every year there is a great loss of people’s lives and property in Japan due to natural disasters. Up until the1950s, numerous large-scale typhoons and earthquakes caused extensive damage and thousands of casualties. However, with the progress of society’s capabilities to address disasters and the mitigation of vulnerabilities to disasters by developing disaster management systems, promoting national land conservation, improving weather forecasting technologies, and upgrading disaster information communications systems, disaster damage has shown a declining tendency.
In spite of such efforts, in 1995, more than 6,400 people became casualties of the Great Hanshin-Awaji Earthquake, and in 2004, 10 typhoons - the largest number in a single year on record - crossed over Japan, causing damage throughout the nation. There is also a high probability of the occurrence of large-scale earthquakes in the coming decades. As such, natural
Disasters remain a menacing threat to the safety and security of the country.

Japan is one of the countries affected unpredicted events of natural disasters such as earthquake, tsunami, floods, landslides and typhoons. Since 1950, many large scales Earthquake, Tsunami, and Typhoons struck the country, which caused massive damage and great loss of economy. That kind of enormous disasters killed huge amount of people. In fact the development of disaster counter measures has been contributing to the development of sustainable disaster management system especially, advanced weather forecasting system and disaster communication system.

The commonest disaster in Japan is Earthquake. Japan can have up to 5000 earthquakes each year, which is about 10% out of the total occurred of the world. As a result of Earthquakes, Tsunami can also develop to cause catastrophic damages to the coastal belt of the country, which are large waves that crash up against the shore and can wash away people, buildings, and bridges. For example recent EQ and Tsunami (2011, Tohoku Pacific Ocean Earthquake)

Volcanic eruptions are the next dangerous disaster facing in Japan. There are 67 active volcanoes in Japan which means 10% of the world's total active volcanoes over in Japan. A volcanic eruption can discharge ash and lava all over the surrounding areas including populated area too.

During the rainy season Typhoons are occurring in Japan. Severe storm may cause many damages along with landslides and floods. Japan hits about 29 Typhoons in the year. Some recorded due to the worst meteorological changes, which cause significant damage and loss of the human life.

b) Disaster Management Framework in Japan

Disaster Management of Japan is categorized into 3 levels including national, regional and municipal level. The significance of each level is detailed as follows:

i) National Level:

The Prime Minister is the National Commander through the National Disaster Management Council, and the designed government organizations (23 ministries and agencies), and designated public cooperation (63 organizations including independent administrative agencies, Bank of Japan, Japanese Red Cross Society, NHK, electricity and gas companies). In this connection, the national council is responsible for formulation and promoting the implementation of the Basic Disaster Management Plan. Meanwhile, the other two designed agencies of government and public cooperation are responsible for formulation and implementation of the Disaster Management Operation Plan.

ii) Prefectural Level:

The Governor is the commander ordering via the Prefectural Disaster Management Council, and the designed government organization and public corporations in local. The prefectural council will conjunctionally work with the mentioned designed agencies to formulate and promote the implementation of Local Disaster Management Plan.

iii) Municipal Level:

In this level, the Mayor of City, Town and Village is the commander, as the same of Governor in prefectural level, will take function through Municipal Disaster Management Council to formulate and promote the implementation of Local Disaster Management Plan.

11. DISASTER MANAGEMENT PLAN

To correlate with the three disaster management systems, Japan has made up the basic plans, operation plan, to effectively response to various types of disaster and to properly use in areas. The first is Basic Disaster Management Plan- the key plan for disaster reduction activities prepared by the Central Disaster Management Council based on the Disaster Countermeasures Basic Act, the second is Disaster Management Operation Plan made up by each designed government organization and designed public corporation, and the last one is Local Disaster Management Plan set up by each prefectural and municipal council. The last two plans are based on the Basic Disaster Management Plan.

Basic Disaster Management Plan is the plan to state on comprehensive and long- term disaster reduction issues such as disaster management related system, disaster reduction projects, early and appropriate disaster recovery and rehabilitation, as well is scientific and technical research. For the Plan‘s structure, it consists of various plans for each type of disasters which is categorized into 2 main points of natural disaster and accident disasters. The tangible countermeasures will be taken by each stakeholder such as the national and local governments, public corporations and other entities in term of the disaster phrases of prevention and preparedness, emergency response, as well as recovery and rehabilitation. Additionally, the conceptual formulation of the Basic Disaster Management Plan has emphasized on the important points of hazard and risk mapping, clarification of Jurisdiction, responsibilities and procedures on establishment of emergency response headquarter, evacuation guidance and order to citizens, designation of evacuation area in advance, procedure for disaster information gathering and dissemination, and public participation.

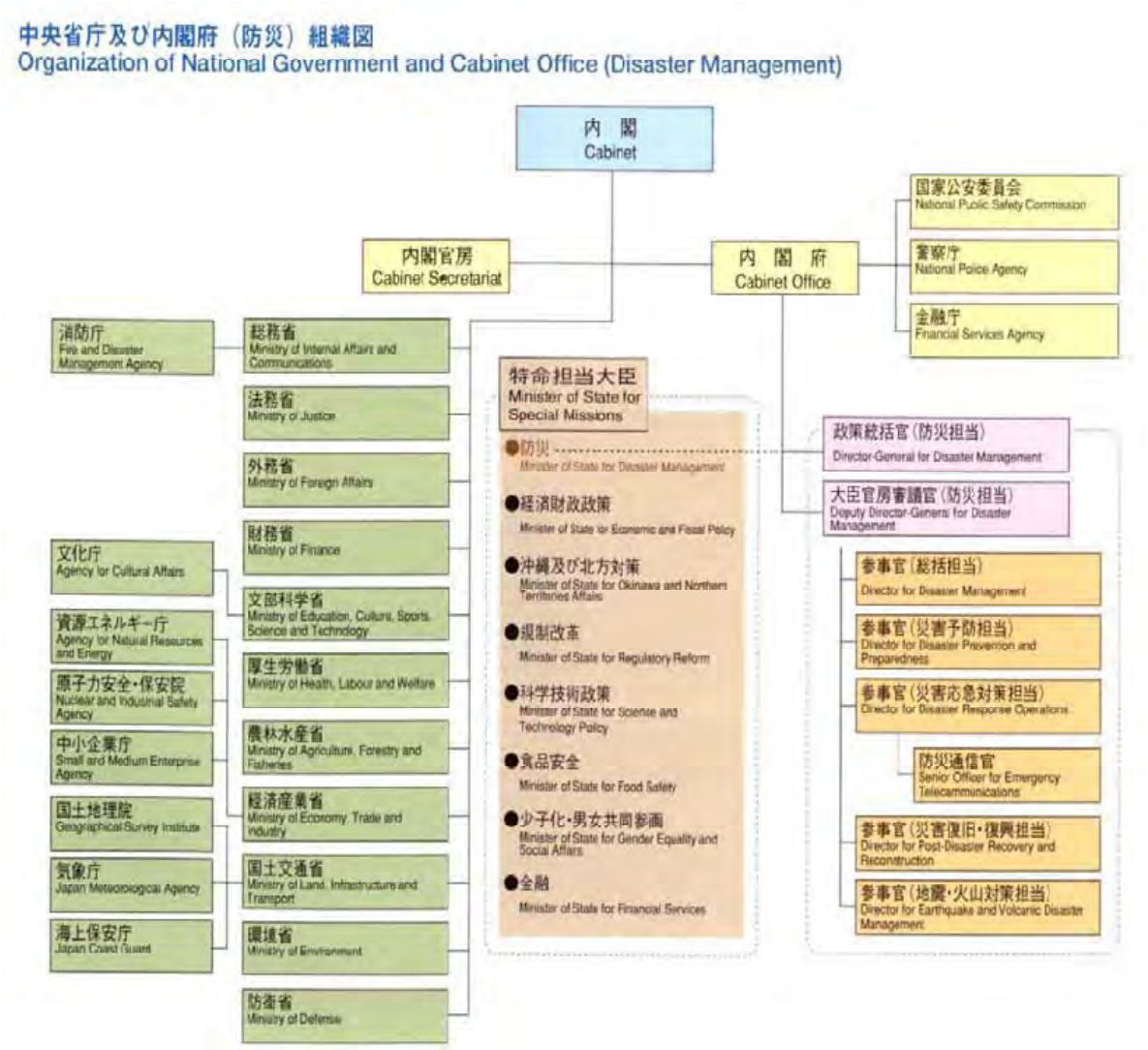


Figure shows Disaster Management structure of Japan

12. BASIC LEGAL FRAMEWORKS OF DISASTER MANAGEMENT IN JAPAN

In applying to all of the disaster phases of prevention, mitigation and preparedness, emergency response as well as recovery and rehabilitation, relevant laws and regulations were enacted including **Disaster Countermeasures Basic Act (1961)** which is the cornerstone of legislation of disaster management which set out the basic for measures for disaster risk reduction, emergency response, post-disaster recovery and reconstruction. It was formulated in 1961, after the happening of Typhoon Ise-wan in 1959 that caused more than 5,000 fatalities. Following acts are the other relevant acts associated with disaster countermeasures Basic Act (1961);

Erosion Control Act (1897), Disaster Relief Act (1947), Building Standard Law (1950)

Landslide Prevention Act (1958), River Act (1964), and Act on Special Measures for Large-scale Earthquakes (1978).

(i) Erosion Control Act 1897:

To clearly define the responsibilities of the national and local governments and other public organizations to take necessary measures for preventing sediment-related disaster from the generation and discharge of unstable sediment due to natural events, such as heavy-rain induced landslides and river-bed erosion, to ensure a sound environment and maintain the function of river in flood control and water use, and thus to contribute to the conservation of the national land and the stability of the people‘s livelihood.

(ii) Disaster Relief Act 1947:

The purpose of this law is to allow the national government to take necessary emergency relief measures in case of disaster in cooperation with local municipal governments, the Japan Red Cross, and other relevant organizations. Distribution of foods and drinking water, Supply of clothing, bedding, and other basic necessities, Medical and natal care, Rescue of disaster victim , Emergency repairs of housing subject to disaster, Distribution and/ or loan of funding, equipment, and materials required to maintain livelihoods, Distribution of school supplies , Interment and other matters as specified by government ordinance.

(iii) Building Standard Law 1950:

In Article 39 of the law, the municipal government is allowed to designate the area with considerable risk due to tsunami, storm surge, and flood and so on as disaster prone area‖ by its local ordinance. And it shall be determined in the above ordinance that necessary items for disaster Prevention in the disaster prone area such as prohibition against building a residence or restriction concerning to build a building.

(iv) Land slide Control Act 1958:

To provide the measures for preventing landslides or slag heap collapses to avoid or mitigate damage from those hazards, and thus to contribute to the conservation of the national land and the stability of the people‘s livelihood.

(v) River Act 1896:

The law is to clearly define the responsibilities of the national and local governments and other public organizations to take necessary measures for comprehensive river management, through which disaster due to floods and storm surges will be prevented, rivers will be in proper use, the regular functions of river water will be maintained, and river environment will be improved and conserved, which will contribute to the conservation and development of the national land, and thus ultimately to enhance public welfare. This law specifies the administration’s responsibilities about river management.

13. DISASTER MANAGEMENT RELATED BUDGET IN JAPAN:

The National budget for disaster management is approximately 4.5 trillion yen (average annual budget from 1955 to 2004), accounting for approximately 5% of the total amount of budget for general accounts. The percentage for each field is a) Scientific Technology Research 1.3% b) Disaster prevention and preparedness, 23.6% c) National Land Conservation 48.7% d) Disaster Recovery and Rehabilitation, 26.4%. This year after Great Tohoku Earthquake, Government of Japan allocated 63 trillion yen for rescue, relief and rehabilitation. (Source internet)

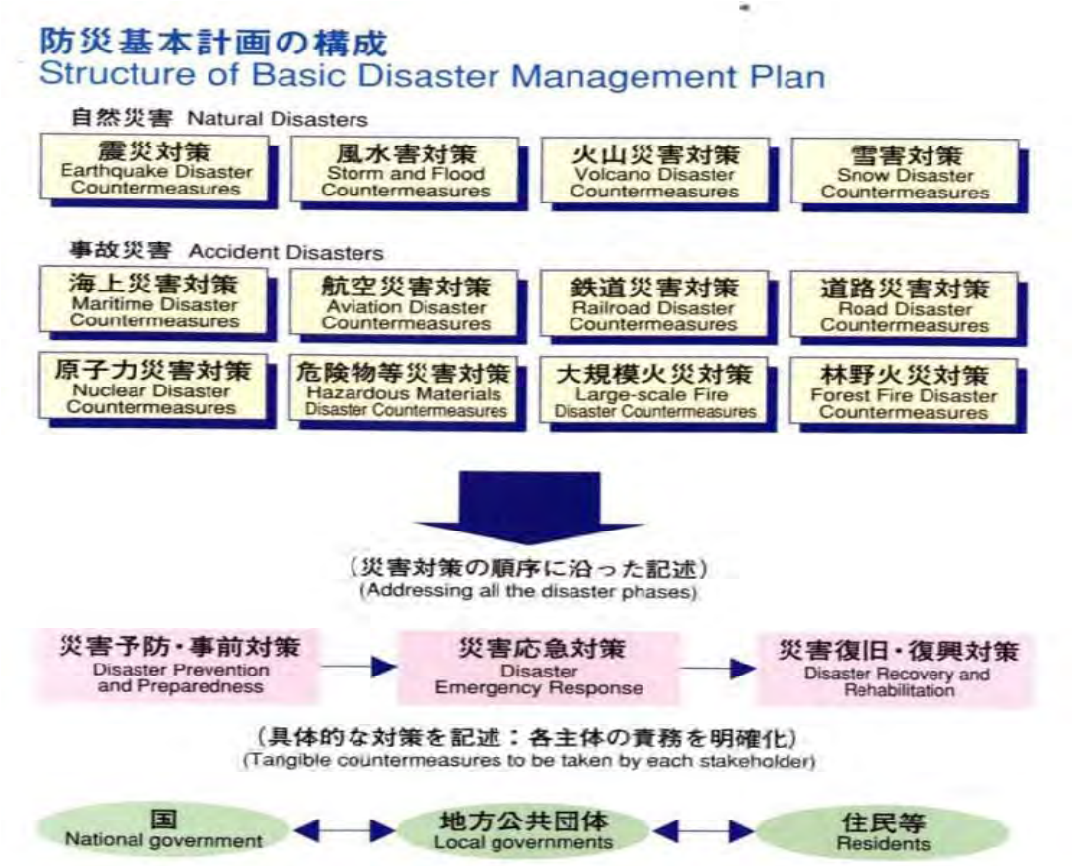
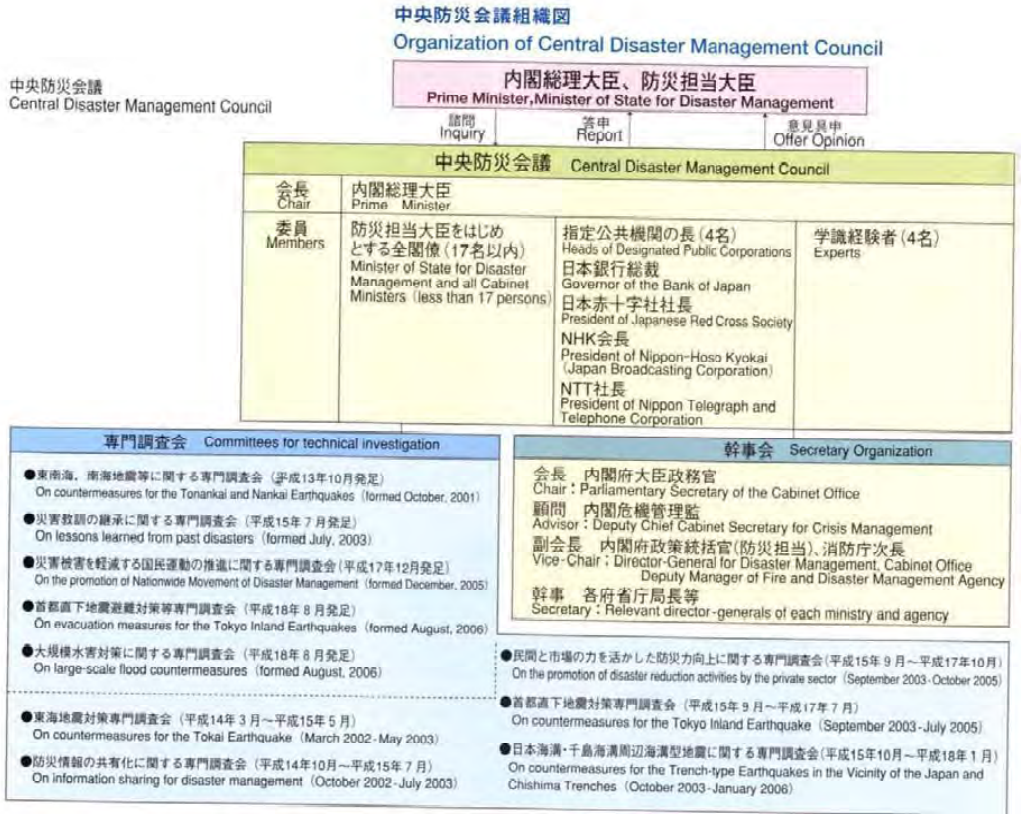


Figure shows Structure of basic disaster Management Plan

a) Organization Responsibility and Response Mechanism

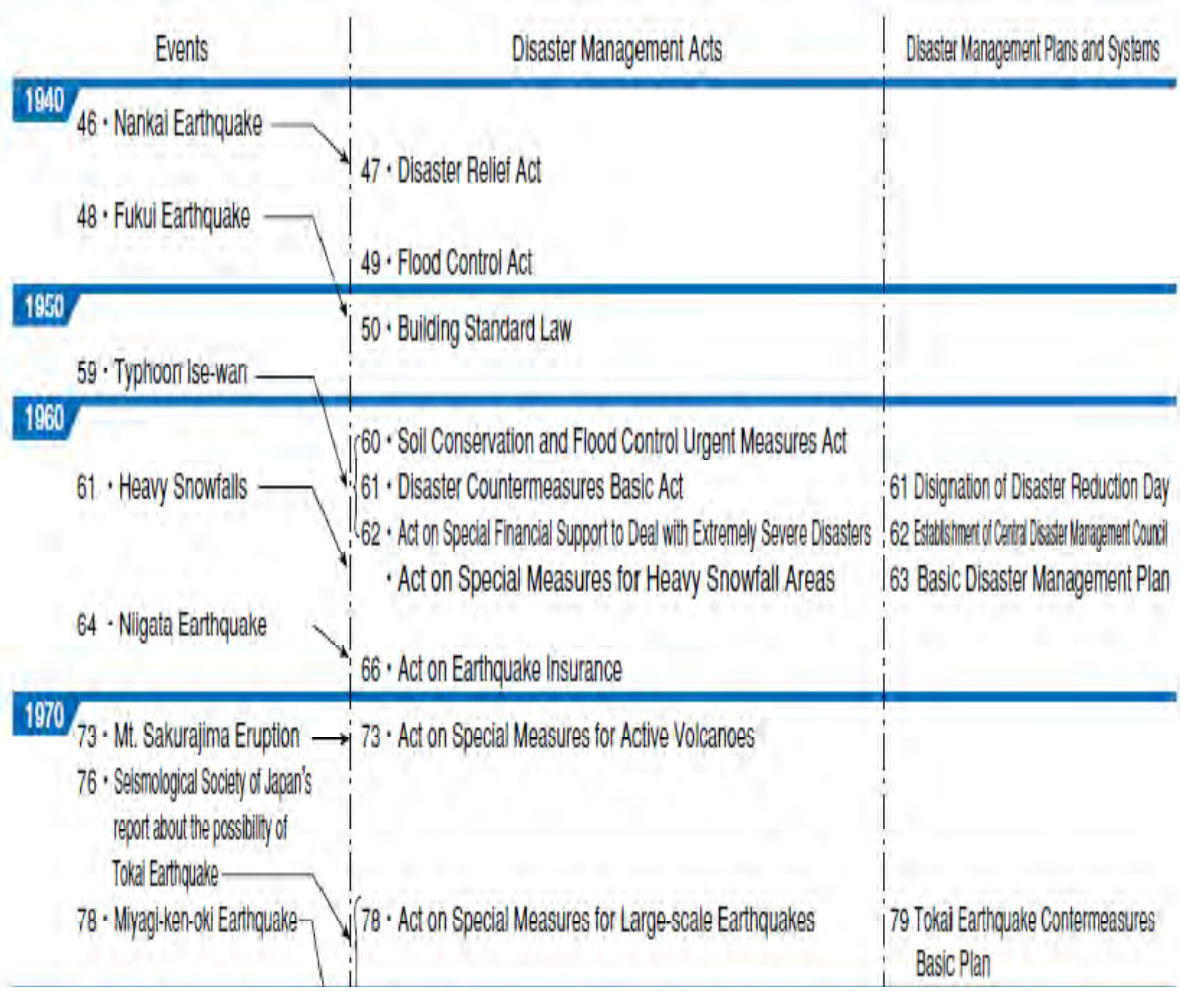
In addition to the Central Disaster Management Council, there are 23 designated ministries and 63 designated public corporations, prefectural Disaster Management Council, and Municipal Disaster Management Council . It also includes other main agencies namely Cabinet Secretariat, Cabinet Office, and Residents too.

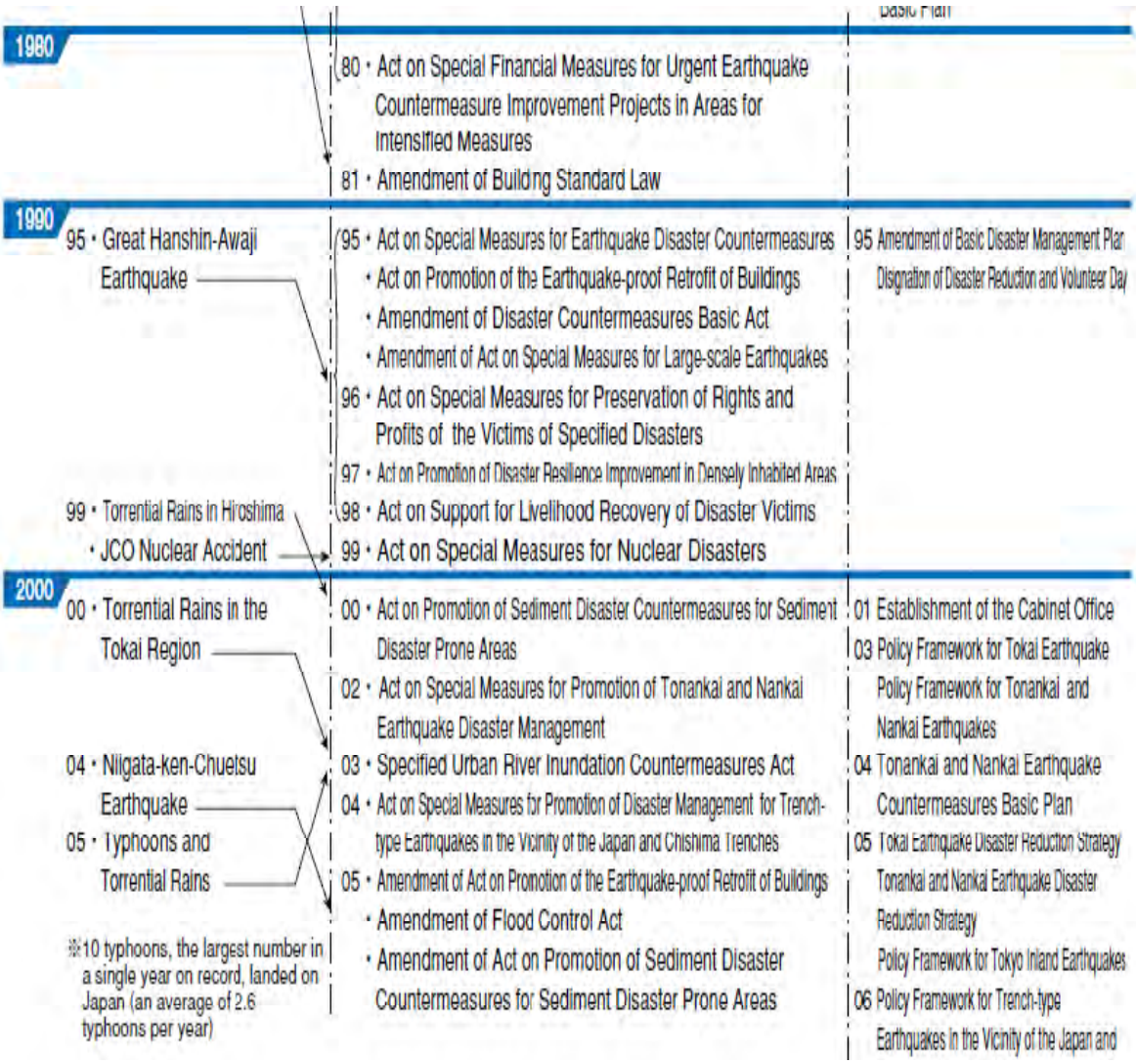
The Cabinet Secretariat has strengthening been established since 1995 to take into account for the large-scale disaster and serious accident including the Great Hanshin- Awaji Earthquake that happened in that time. Government organization in wide-ranging issues, planning of basic disaster management policies and supporting the Cabinet Secretariat to response to large-scale disaster. The Central Disaster Management Council has been, dealing with the Basic Disaster Management Act, formed under the Cabinet Office. The Prime Minister is the Chair person, Minister of State for Disaster Management, all 23 ministries, and heads of major public institutions and experts. The council has mainly taken task of formulation and promotion on implementation of the Basic Disaster Management Plan and Earthquake Countermeasure Plans. When there are large-scale disaster occurred in Japan, all agencies concerned will deal cooperatively with to disaster in areas. The two main organizations, the Cabinet Office, and Prime Minister‘s Office, will be directly responsible for this matters in line with national commanding. Firstly, the Cabinet will collect the information and dispatch the initial emergency survey team to the happening areas, coordinate and hold the inter-ministerial meeting, and then dispatch again to investigate the situations. Meanwhile, the Prime minister‘s Office will keep a close watch to the situation, analysis of damage and discuss the disaster situation.



b) Progress in Disaster Management Laws and Systems

In Japan, the disaster management system has been developed and strengthened, which is shown in the following figure.




Basic Plan
1980
80 • Act on Special Financial Measures for Urgent Earthquake Countermeasure Improvement Projects in Areas for Intensified Measures
81 • Amendment of Building Standard Law
1990
95 • Great Hanshin-Awaji Earthquake
95 • Act on Special Measures for Earthquake Disaster Countermeasures
• Act on Promotion of the Earthquake-proof Retrofit of Buildings
• Amendment of Disaster Countermeasures Basic Act
• Amendment of Act on Special Measures for Large-scale Earthquakes
95 Amendment of Basic Disaster Management Plan
Disignation of Disaster Reduction and Volunteer Day
96 • Act on Special Measures for Preservation of Rights and Profits of the Victims of Specified Disasters
97 • Act on Promotion of Disaster Resilience Improvement in Densely Inhabited Areas
98 • Act on Support for Livelihood Recovery of Disaster Victims
99 • Torrential Rains in Hiroshima
• JCO Nuclear Accident
99 • Act on Special Measures for Nuclear Disasters
2000
00 • Torrential Rains in the Tokai Region
00 • Act on Promotion of Sediment Disaster Countermeasures for Sediment Disaster Prone Areas
01 Establishment of the Cabinet Office
03 Policy Framework for Tokai Earthquake
Policy Framework for Tonankai and Nankai Earthquakes
02 • Act on Special Measures for Promotion of Tonankai and Nankai Earthquake Disaster Management
04 • Niigata-ken-Chuetsu Earthquake
03 • Specified Urban River Inundation Countermeasures Act
04 Tonankai and Nankai Earthquake Countermeasures Basic Plan
04 • Act on Special Measures for Promotion of Disaster Management for Trench-type Earthquakes in the Vicinity of the Japan and Chishima Trenches
05 • Typhoons and Torrential Rains
05 Tokai Earthquake Disaster Reduction Strategy
Tonankai and Nankai Earthquake Disaster Reduction Strategy
Policy Framework for Tokyo Inland Earthquakes
05 • Amendment of Act on Promotion of the Earthquake-proof Retrofit of Buildings
• Amendment of Flood Control Act
• Amendment of Act on Promotion of Sediment Disaster Countermeasures for Sediment Disaster Prone Areas
※10 typhoons, the largest number in a single year on record, landed on Japan (an average of 2.6 typhoons per year)
06 Policy Framework for Trench-type Earthquakes in the Vicinity of the Japan and

Source: Disaster Management in Japan (Cabinet office, Government of Japan)

c) Overview of Flood Disaster in Japan

Japan is very vulnerable to the water-related disasters. Severe water-related disasters have been causing human losses every year. Floods and sediment related disasters have occurred in more than 90% of municipalities throughout Japan during the past ten years. (1994 to 2003) The risk of disaster is becoming greater due to global warming. Heavily concentrated rainfalls exceeding 50 mm or even 100 mm per hour are on the increasing trend.

Year	Dead or missing persons	No. of inundated houses	Reason
1953	1760		
1996(July)	48		
1996(September)			Flooding due to Typhoon)
2004	240	199,371	Concentrated rainfalls and landings by 10 typhoons
2005	41	32,581	Precipitation of over 100 mm per hour
2006	42	25,804	Heavy rainfall

Causes of flood:

01. Many rivers are very steep with a short distance from the source to the sea, resulting in rapid flow. Furthermore, most of urban areas are located in low-lying areas that are lower than the water level during floods.
02. Population and city functions are concentrated in areas below zero-meters level in coastal areas of three major bays. Catastrophic disasters are anticipated once the embankments are failed.
03. Approximately half of the population and three-quarters of total assets are concentrated in low-lying areas. Major damage is anticipated when flooding occurs.
04. Level of structural improvement is lower compared with other countries. (Compared with other industrialized nations, the level of safety secured by flood control measures is lower in Japan.
05. Aggravation of flood damage by urbanization.

    Rapid urbanization has been in progress in many parts of the country, particularly in the Tokyo metropolitan area.

    Asphalt and concrete prevent natural permeation of storm water into the ground. As a result, storm water fills rivers and depressions more quickly in urban areas than in rural ones, increasing the risk of urban flood damage.
06. Occurrence of urban –type floods

    Normally, the flow rate of rivers in urban areas is extremely low, but urban-type floods frequently occur when typhoons hit because the rain water falling in the catchment concentrates and outflows within a short period, paralyzing urban functions and flooding underground shopping malls.

d) Framework of river management in Japan

Rivers subject to the river law are classified into Class A and Class B rivers, depending on the importance of their roles. The roles for managing rivers are tasked to the Minister of Land , Infrastructure and Transport (Regional Directors of Maintenance Agencies), as well as the governors of prefectures.

Management of small-scale rivers that do not fall into the categories of Class A or Class B is delegated to municipal government mayors in accordance with the rules and regulations for class B rivers. (Law applicable rivers)

(i). Class A river (directly managed segment) system is managed by the National Government (Ministry of Land Infrastructure and Transport) and some designated segments of class A rivers are managed by the governor of the prefecture or mayor of a government ordinance designated city(specified segments)

(ii). Class B rivers are managed by the governor of the prefecture or mayor of a government ordinance designated city.

Rivers of Japan are characterized by their relatively short lengths and considerably steep gradients due to the narrow and mountainous topography of the country. In this regard, the Mogami, the Fuji and the Kuma are regarded as the three most rapid rivers of Japan. Typical rivers of Japan rise from mountainous forests and cut out deep V-shaped valleys in their upper reaches, and form alluvial plains in their lower reaches which enable the Japanese to cultivate rice fields and to set up cities. Most rivers are dammed to supply both water and electricity.

The longest river of Japan is the Shinano, which flows from Nagano to Niigata. The Tone has the largest watershed and serves water to more than 30 million inhabitants of Tokyo metropolitan area.

e) Flood Management and Sediment, Erosion Control in Japan:

Various facilities and systems have been established to provide protection from flood damage.

1. River information systems ensure successful river management.
   Radar rain gauges and telemeter systems are used to measure water level, rainfall, etc. Information thus obtained is processed and provided to concerned governmental agencies and local residents so that timely and appropriate river management and flood defense measures can be taken.
2. Widening of channels and embankments
   Rise in water level is reduced by increasing the width. Levees are also used to prevent overtopping.
3. Detention basins

Water is diverted from a swollen river, and the water is returned to the river after the threat of flooding has disappeared.

4. Floodways

   Canals are used to divert water from the middle or lower reaches of the river and directly channel the water to other rivers or the sea. This technique helps to reduce river flow.

5. Dam

   Dams store water in the event of flooding caused by heavy rain and Control River flows downstream to alleviate flood damage (Figure 8.1). Dam's function both as a means to ensure stable water supply to downstream residents and as a means to generate power.

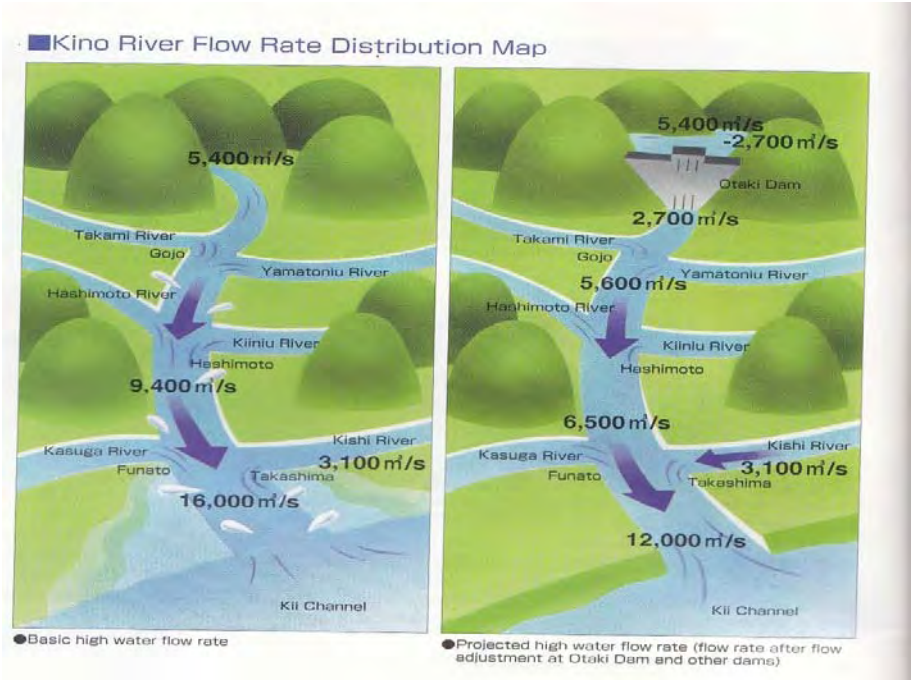


Figure shows Flood control system of Kino River, Japan using a flood control Dam

f) Comprehensive flood control measures in Japan:

Japan is in need of comprehensive flood control measures to cope with rapid urbanization. Following are those comprehensive approaches.

(1) River basin measures such as the construction of facilities designed to preserve and enhance the retention and detention capabilities of river basins and the development of land uses and buildings that are highly resistant to floods

2. For early response, evacuation and land use planning processes following maps are readily available for long term use.

(a). Flood hazard map

(b). Expected Inundation Area map

(c). Past flooding area map

(d). Key area and river facility map for Flood Control

g) Flood forecasting system

Figure shows Satellite communication facilities

Japanese Meteorological Agency is playing the major role in forecasting natural disasters through its advanced monitoring network including satellites. The whole role of activities implements with the following goals in compliance with the Act of Ministry and meteorological services act,

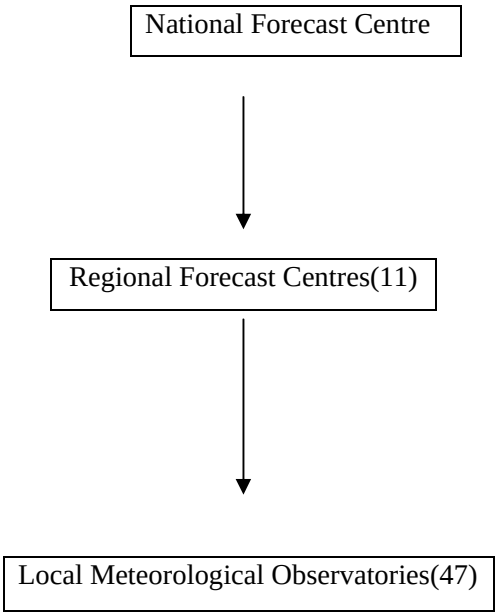
• Prevention and mitigation of natural disasters.

• Safety of transport.

• Development and prosperity of industry.

• Improvement of public welfare.

h) Framework of Forecast Operation (JMA)



i) JMA's Meteorological Services

1. Space-based Observation
2. Upper-air Observation
3. Radar Observation
4. Surface Observation
5. Ocean Observation
6. International Data Exchange

LMO is responsible for issuance of information on weather disaster prevention such as warnings/ advisories for each prefecture.

j) Main Objective of Local Meteorological Observatories:

Disaster Forecasting to save lives

- Collecting weather and EQ data
- Analysis and Prediction of Weather
- Issuing Warnings and Meteorological Information

14. THE GREAT TOHOKU PACIFIC OCEAN EARTHQUAKE

The great Pacific Ocean Earthquake occurred on March 11, 2011 at 2:46 pm at a magnitude of 9.0 at a depth approximately 25 kilometer and tsunami hit along Sanriku offing, near the east coast of Honshu, Japan. The magnitude of the main shock was is the largest in Japan History. Either way it was the strongest quake ever recorded in Japan. It has been followed by more than 150 powerful aftershocks. Scientists believe that Japan is located along the northwestern Pacific Rim and so it called the “ring of Fire” which many volcanoes are active and earthquake occurs frequently in Japan. Tectonic movement northwestern movements of the pacific plate and North American plate and collision between this two plates created Tohoku Pacific Ocean Earthquake followed by jet storm tsunami of 10 meters devastated the entire eastern Japan namely Fukushima prefecture, Iwate, Sendai, Soma city, Miyagi prefecture. Japan faced a potential catastrophe.

After a quake-crippled nuclear power plant exploded and sent low levels of radiation floating toward Tokyo, prompting some people to flee the capital and others to stock up on essential supplies. This earthquake and tsunami has not only claimed heavy loss of human lives and properties but also damaged the Fukushima nuclear power plant which has been generating radiation risks. Japan also estimated the immense economic impact of the March 11 earthquake and tsunami, saying it could hit $309 billion--double that of the 1995 Kobe quake and nearly four times more than Hurricane Katrina.

The confirmed death toll from the earthquake and tsunami that battered Japan's northeast coast rose to 14,084 and Japan holds out little hope for 13,511 officially listed as missing. The number of injured people stood at 5302, number of house completely collapsed 68,005 and partially collapsed house rose to 23,382(source: (National Police Agency, Japan).Large areas of the countryside remained surrounded by water and unreachable. Fuel stations were closed and people were running out of gasoline for their vehicles. Primary damage of property worth about 25 trillion Japanese Yen which is equivalent to 304 billion US dollars. (Source: University Professors and financial Expert of Japan). The government said 275,000 people have been evacuated to emergency shelters, many of them without power, water and gas connections.

In Tohoku, as Japan's northeast is called, aid has trickled in agonizingly slowly, despite the mobilization of 100,000 Japanese soldiers for the relief effort. It took more than a week after the earthquake, for example, for the region's highways, which are reserved for emergency vehicles. Civil society has emphasized the need for more community involvement through organizing community volunteers. Meanwhile, community members of those affected areas have started working which will gear up the relief and rehabilitation activities of the earthquake and tsunami affected areas. The Great Hanshin Awaji

experience and other disaster related experiences would help Japan to recover from this great disaster and human catastrophe.

15. DISASTER SCENARIO IN ADRC MEMBER COUNTRIES AND RECOVERY INITIATIVES:

a) Over view of Natural Disasters in Sri Lanka

Every year, different types of natural disasters affect Sri Lanka, like other developing countries. Natural Disasters in Sri Lanka are mainly hydro-meteorological and geological phenomenal events such as floods, landslides, cyclones, tidal waves droughts and Tsunamis. Following are the outline of the disasters occurred. Natural Disasters have caused extensive damage to the people and property every year, disrupting social and economic development endeavors.

I. Floods
II. Landslides, slope failures and rock fall
III. Cyclones
IV. Drought
V. Coastal erosion
VI. Subsidence and erosion
VII. Ground settlements
VIII. Reservoir induced earth quacks
IX. Tsunami
X. Minor Earth quacks

Out of all these natural disasters, Landslides and floods are the dominants. Even when compared to all the other south Asian countries, flood and landslides are the most dominant natural disaster in Sri Lanka

Table shows South Asia, Population, Urban Share and Natural Disasters caused

Country	Population (Millions)			Urban %	Natural Disasters faced
	1997	2010	2025		
1. Bangladesh	122.2	152.1	180.3	16	Cyclones, Flooding
2. Bhutan	0.8	1.1	1.5	15	Earthquake
3. India	969.7	1182.7	1384.6	26	Cyclones, Flooding, Earthquakes, Landslides
4. Maldives	0.3	0.4	0.6	26	Sea Erosion, Cyclones
5. Nepal	22.6	30.8	41.4	10	Landslides, Earthquakes
6. Pakistan	137.8	176.4	232.9	28	Earthquakes, Landslides, Droughts
7. Sri Lanka	18.7	22	23.4	23	Landslides, Flooding, Cyclones, Droughts, Tsunami

Source: Based on "Human Settlement in South Asia" and "Role of R & D institutions in Disaster Risk Mitigation", 1998

Historical evidences of Sri Lanka clearly show that, there was a strong disaster management system especially to overcome severe water shortage during droughts. This was done by adopting massive irrigation systems, which includes reservoirs to provide much needed water for farming in the dry zone, which covers about 2/3 of the country's land area. Sri Lanka has an agriculture-based economy consisting of a plantation agriculture sector and subsistence agriculture sector. Even if the economic reforms from close economy to open economy since 1977, agriculture sector continued to play an important role in the economy. The agriculture sector still contributes about 21% to the Gross Domestic Product (GDP) of the country and provides livelihood for about 40% of the labor force. Wet zone of the country, where a large number of major rivers are flowing through, is prone to severe flooding frequently. Mostly human settlements located on the riverbanks and low-lying areas are mainly subjected to flooding. Sometimes, settlements below the man made irrigation tanks are subjected to flooding mostly when tank bunts fail.
Coastal erosion and Indian Ocean tsunami are the other major disasters that Sri Lanka faces. However, most of the communities that are affected by coastal erosion and tsunami are unauthorized. Moreover, some parts of eastern province of the country are prone to cyclones. However, occurrences of cyclones are very less frequent when compared to the other disasters.

In the last 10 years period before 2003, Sri Lanka has experienced 30 major disaster events in which about 398 peoples were killed and 27.5 million people were affected. The total economic losses were estimated to be almost US$ 5.96 billion approximately. Flooding & Landslides in 2003 affected 137,221 families (720,500 persons), claimed 252 lives and also 37,227 houses were damaged. Tsunami in 2004 affected 260,967 families (1.3 million), claimed 31,225 persons, the missing people were around 41,000 and 108,467 houses were damaged. Total estimated economic loss for tsunami was around us$ 3.6 billion. Although 1,600km from the epicenter, the waves struck with huge force and swept inland as far as 5 kilometers. Waves as high as six meters had crashed into coastal villages, sweeping away people, cars and even a fully packed train with 1700 passengers. It was the worst human disaster in Sri Lankan history.

b) Disaster Management in Sri Lanka:

Disaster Management Centre (DMC), which was established as per the Disaster Management Act of Sri Lanka consists of several subdivision in order to function the DM activities properly (Figure 7.8). DMC will be directing, issuing guidelines, facilitating, coordinating, monitoring , where necessary directly implementing or enforcing activities related to:

(1). Disaster Management Technology, Long-term Mitigation & DRR

Under the Technology and mitigation activities, many activities are carried out such as Hazard Mapping and Risk Assessment, Information and Data Collection, Research and Analysis, Building Technology,

Development and maintenance of DMC Website, Long term Disaster Risk Reduction, Implementation of specific risk reduction projects to reduce specific identified risks that can cause future disasters, DRR integration in Development, long-term action planning.

(2). Early Warning

When a disaster has been predicted or forecast by a respective scientific organization, DMC do have systems in place for receiving forecasting and early warning. Also DMC is forecasting impending disasters followed by early warning and dissemination procedures.

(3). Emergency Operations in case of a disaster

DMC has established a National Emergency Operation Centre, which is 24x7 in service. It is now under the process of establishment of emergency operation rooms at provincial, district and divisional levels in some districts, provincial and district level emergency operation centers have already been established. In addition, DMC is carrying out Emergency Operations, coordinating with armed forces, police and other related agencies at national and all sub levels**.**

(4). Preparedness Planning (National and other levels)

Preparation of National Disaster Management Plan and Emergency Operation Plans along with district level and divisional level preparedness plans are in progress. Under such preparedness plans, DMC is facilitating, issuing guidelines, coordinating, directing and monitoring of preparation of disaster preparedness and response plans at provincial, district, local authority, divisional and village levels. The major objective of the preparation of preparedness plans is to improve response on time and effective response, equitable relief distribution, speedy recovery, timely rehabilitation and reconstruction at national level and all sub levels such as District and Divisional levels.

(5). Training, Education & Public Awareness

In order to train aware all groups of the general public, school community, employees of government, private and all other organizations, training programs are conducted. Public Awareness Programs for officials at all levels, school children and community level are also conducted. Objective of these activities is to reduce Disaster risks. Disaster management is being included in school curricula and in university curricula as appropriate.

c) Afghan Training and livelihood Initiative after Earthquake

Afghanistan's disaster management system has been mainly focused on relief and rehabilitation rather than concentrating on disaster preparedness, rescue, recovery and disaster planning. Due to its socio-economic and geo-political situation, comprehensive disaster management system has not yet been undertaken in Afghanistan. As Afghanistan is an earthquake prone country, and is located in one of the most active seismic belts of the world, seismic risk needs to be incorporated in its rehabilitation process.

UNCRD Hyogo Office carried out “Afghan Training and Livelihood Initiative (ALTI)” in Afghanistan from October 2002 to June 2003. Under the need of the holistic rehabilitation after more than two decades of conflict and strife, the urgent need was to build houses of people. The ALTI focused on developments of guidelines for earthquake safe construction practices, training of masons and engineers, and construction of model houses. All these activities aimed to empower the communities with their active participation in this process. In this community based initiative, livelihood recovery was incorporated through revitalization of vineyards using a cooperative system. These efforts altogether develop human resources, provide sustainable livelihood is linked to the long term recovery of the country.

d) Patanka New Life (PNY) Plan in India after Gujarat Earthquake

After the Gujarat earthquake of January 2001, Patanka New Life was initiated as joint initiative of diverse organizations including government, non-government, academics and international organizations for community based effective rehabilitation. The aim of the initiative was to train and empower local masons and communities with proper earthquake-safer technologies focusing on local tradition and culture. Emphasis was to ensure confidence building and long-term use of traditional technologies. There were two major components of the initiative: one construction and rehabilitation of model village, and training and confidence building of communities through shaking table demonstration testing. The characteristic feature of the initiative was to focus on the holistic approach of the rehabilitation including livelihood. The initiative was successful, especially in terms of community involvement and ownership. The initiative was considered a successful model for sustainable community recovery. The PNY was conceived as a model program right from its inception stage. It sought to empower the affected community to the extent that they are sufficiently resilient against future disasters.

f) Disaster Management System in Nepal

The Government of Nepal has enacted Natural Calamity (Relief) Act, 1982 for disaster management in Nepal. Prior to the enactment of the Act, 1982, natural disasters were treated in ad hoc basis. There were no pre-disaster preparedness plans and post disaster mitigating measures. All the forces and resources were, however, used on an ad-hoc basis when they occurred to alleviate the misery brought on to the community.

The main objectives of the act are to arrangement for relief operations and to provide protection of lives and properties of people. The Act includes disaster: Earthquake, Fire outbreak, Storm, Flood, Landslide, Drought, Famine, Epidemic, Industrial Accident and Explosion. Earthquake, Fire outbreak, Storm, Flood, Landslide, Drought, Famine and Epidemic are found major disasters in Nepal.

The Act also defines Natural Calamities Relief works. According to the Act natural calamities relief works means: i) any relief work to be carried out in the area affected or likely to be affected, ii) ease people's grief and inconvenience, iii) rehabilitation of disaster victims, protection of life and iv) property of people, Preparation and adoption of preventive measures.

The Act has made a provision of Centre Natural Calamity Relief Committee (CNDRC) arranged at the centre level which is comprised of 34 members from the different agencies. In addition to this, the Act also made the provision of Regional Disaster Relief Committee and District Disaster Relief Committee at regional and district level respectively.

g) Disaster Management System in Pakistan

Disaster caused by natural hazards have been affecting socio economic situation in Pakistan. Pakistan has a geographic and physiographic location that presents risks for natural disasters of the highest possible order. The great loss of lives and property in the Kashmir earthquake (2005) are sufficient to depict the harsh realities of natural disasters threatening Pakistan. Earthquakes are not only the threat; over two thousand people have died in floods in last 50 years. In Pakistan every year , hundreds of die because of flash floods, debris flows and landslides, with considerable loss of properties, agriculture, roads and livelihoods. However, the disaster management initiative in Pakistan is not enough to handle disaster situation.

Pakistan's concept of preparedness for natural disasters has remained restricted to relief. Institutions such as Emergency Relief Cell at federal level and Relief Departments at provincial level have coordinated plans for storage and supply of relief goods to district level and these are distributed in the communities affected. However, there is no institution in the country for mitigation, preparedness, response (other than relief –including search, rescue, evacuation, and emergency medical and food services). Over the years Pakistan Army carries rescue and evacuation activities and short term medical services and food. Until the 2005 earthquake, the concept of long term rehabilitation for communities affected was lacking almost completely.

h) Disaster Management System in India:

The disaster management structure was built up following India's independence in 1947, which is the basic structure upon which changes and revisions are taking place currently. A comprehensive description is given of the federal structure and the avenues through which power is devolved to the states, with the central government in a supportive, enabling role providing financial and physical resources, warning, transport, inter- state movement and emergency food supplies. Nationally the Home Ministry carries out

this work through a central Relief Commissioner who receives information through Meteorological Departments , early warning and forecasting systems and the Central Water Commission. There is also crisis management group to coordinate the activities of central Ministries and review the contingency plans of state Governments. Overarching this are the three committees at cabinet level: The National Crisis Management Committee (NCMC), headed by the Cabinet Secretary and two other Cabinet Committees, one on Natural Calamities and the other on security. At state level, the Relief Commissioners are look after relief and rehabilitation for disasters and are under the Chief Secretary and at the district level natural disasters are the responsibility of the District collectors or Magistrates. Funds namely Calamity Relief Funds is allocated and these come in varying proportions from the national and state levels. This structure had been institutionalized in India since 1947.

Since 2002, the shift in paradigm is being institutionalized through a National Disaster Management Framework and later in 2005, legal frame work was formulated. The National Disaster Management Act was formulated. Following the Act it became mandatory to establish a National disaster Management Authority (NDMA) under the chairmanship of the Prime Minister with a National Executive Committee to assist it. A National Institute of Disaster Management (NIDM) was then established to train and also to carry out research and support policy formulation as well as give support to other institutions in the field throughout country.

Regionally SAARC Disaster Management Centre (SDMC) was established in New Delhi in 2006 and there is also a Bay of Bengal Initiative for Multi-sectoral Technical and Economic Cooperation (BIMSTEC) that is considering making disaster management one of its key areas of cooperation.

16. COMMUNITY DEVELOPMENT

The ‘community in community Development ‘includes both the hardware and software aspects of “community” A community includes both software structures such as community Based organizations and hardware aspects includes roads and infrastructures. Following points are necessary for community Development:

1. Holistic-ness: Software considerations are important and consideration must be made as how the system can be built up(e.g. Cleaning roads together every morning).If residential areas and small factories are converted into nice building , it might be good in terms of community’s hardware aspects but if the people inside suffering from loans , then there is a problem with software aspect so it must be investigated. Through its content.
2. Voluntary: “ Development “ in community development refers to handmade development , just

like handmade sake breweries. We must think about how we can development the system to create an environment that takes to advantage the characteristics of the community.

3. Cooperation: This refers to implementing development to everybody. With regard to who 'everybody' is the importance not participation rate but the connections of different types of people of different backgrounds.
4. Sustainability: Recovery community development during has to continue and sustained as development during daily life. In Kobe ,the nearly half of the 100 community Development Committees have ceased operation after land readjustment projects.

   It is important for community development to incorporate the view point of disaster reduction, but disaster reduction is calculating the sum of negative damages with positive initiatives. The issue of large public or issue of small public comes into considerations.

   - Large public e.g. Construction of major roads (the responsibility of the central government or local government)
   - Small Public: Decision making at the town or ward level (over crowded urban areas, anti-seismic strengthening of aging buildings, concrete walls, narrow alleyways, environment) issues that can be solved through community development, voluntary/endogenous action by community members are necessary.

a) **Community Action**

Risk reduction measures are most successful when they involve the direct participation of the people most likely to be exposed to hazards , in the planning ,decision making and community mobilization and to increase the capacity and responsibility of the community. In theory it's easy to define the role of community but in practice it is difficult to involve the community in the time of disaster. From experience it is suggested that the involvement of local residents in protecting their own resources is possible and can work if sufficient attention, and investment is given. It's very much necessary to enhance and strengthen capacity of the local community.

Viable of community based disaster depend on a favorable political environment that understands, promotes and supports the community participation process.

b) Disaster Management Framework and Community Development:

There is a strong relationship between National Disaster Management Framework and Community mobilization. The roles and responsibilities of different stakeholders including the GO-NGOs and community based organizations have been categorically defined in the NDMF. However the major problem is to coordinate different Go-NGOs and Community affected by disaster.

Development planners and researchers have increasingly argued that preparing for sudden events , such as natural disasters ,offer opportunities for devising institutional arrangements that can embrace new and changing conditions. In addition a community with a high degree of horizontal integration has a tight knit social network among social organizations. A community with a low degree of social network among organizations has a weakly knit social network. on the other hand a lack of vertical social network between communities and outside organizations can create problems , particularly when combine this weak system of horizontal integration. This condition can result in loss of local/community control over DR programs. Under this situation knowledge of intentions, procedures, requirements, and benefits of outside programs likely to be weak. Interactions between local and outside organizations is low and as a result , the chance of external DR programs fitting local needs and capacities are reduced.

The top down mitigation program in Latin America had a serious flaw such as failure to involve people since community participation was often limited to provision of labor in self help projects . This failed to address the vulnerability as because of complex relationship between community and social, political and physical and economic environment.

According to Maskery(1989) potential relationship between the vertical and horizontal integration and communities are following four types:

A Type 1 community is ideally suited for effective recovery effort. It possesses strong vertical and horizontal integration . It has developed well developed ties to external resources and programs, while it has a viable horizontal network that will allow it to exert power and influence in the recovery process.

A Type 2 community represents as autonomous , relatively isolated community with few vertical ties. While it has a viable local structure , it suffers from lack of knowledge about and interaction with external resources.

A Type 3 community is a classic state of powerlessness and dependency . It is less likely to be able to influence the recovery will not be consistent with the local needs , concerns and values.

A Type 4 community faces significant obstacles to undertaking successful recovery efforts as it lacks access to external resources. If these vertical channels are activated , however it still lacks viable , local horizontal for effectively receiving aid or influencing the recovery process.

c) Community Participation and Recovery:

After disasters there should be momentum towards recovery and implementation. In recovery there must be strong present to make better plan. For recover momentum professor Yoshiteru Murosaki (Kwansei

Gakuin University) theorized three types:

Momentum, from Lessons: The Rafaelo recovery model(disaster utopias and its recovery requires a rehabilitation process), momentum occurs after destruction. According to how momentum is applied , things will better or worse than before. The momentum from lessons becomes important.

Momentum to rebound from crisis: people's fundamental feelings to overcome difficulties , "like darn it but I will get over this".

Project Momentum: The energy from support by concentration of global assistance and projects. It is necessary to apply momentum correctly according to the needs of community.

d) Objectives and Challenges of Recovery :

T he principle objective of recovery is to "create values" by learning from lessons. In order t o arrive at the "creation of new values" by learning from lessons. In order to arrive at the "creation of new values" there are three points to be made:

1. To immediately work towards disaster recovery.
2. Whether it has become safer than before.
3. To solve the contradictions and issues faced by the subject community.

f) Three Pillars of Community Development:

According to Director General Urban Development Department, Kobe City Government Mr. Hisanori Nakayama three pillars of community development with resident's participation are as follows:

Local Consultation Centers: Kobe city prepared local consultation centers after 1995 earthquake because it was impossible to talked at length at evacuation centers , then Kobe city made ready local consultation centers.

Community Development Council: Because it is better to organize as a group rather to act individually, the council is established. If the council collects the needs of the community, government will listen. In the case it is shown that there were neighborhood committees from before the earthquake, it was determined that there could up to 10 areas within the communities.

Dispatching Community Consultants: After the Great Hanshin-Awaji Earthquake, Hyogo prefecture government did not enforce community consultant one sided on community. Rather, it was two-way communication between local government and community members, residents could choose consultants and these could also be academics. Consultant fees were paid for by the government. Most communities hired consultants, who they were accustomed to from before. Up to here are the large pillars and from this

point forward becomes the resident participatory strategy

g)The Concept of Recovery Process:

The process of recovery consists of the stages of management of people, resources and structure on the way to reaching the objectives of recovery. For this management , there are “three requisites for recovery” that are as following:

1. Heart/spirit of recovery: tenacity for improvement and norm in recovery. How the hope and faith of community can be foster that should be considered.
2. Skills for recovery: Planning skills in recovery process is most significant part of newly undertaken projects for community of the affected areas. Both hardware((physical) and software(Human resources) element should be under considers ion the recovery process.
3. System for recovery: community participation and collaboration among the members of the community is most important for creative recovery process. Partnership should be developed between community, stakeholders and the local government for smooth recovery process

h) Principles of Recovery

As a principle of recovery we have to involve the local community or stakeholders for successful recover from post disaster situations. Here locality or community refers to

1. To sustain local society or community
2. To carry on local culture of the community
3. To utilize local resources.

i) Complementarities of Community:

1. To promote cooperative coordination
2. To encourage self help of the affected people of the communi8ty.
3. To prioritized local autonomy of the community.

The significance to connect between humans or members of the community, employment generation, protect the interests of the locality or local community and preserve the history and culture of the local community helps to recover from disaster quickly.

17. COMMUNITY MOBILIZATION IN BANGLADESH:

It is well established that the damaging effects of disasters on human lives and properties could be reduced greatly by two methods, namely structural and non-structural measures. The first one requires the investment of billions of dollars in the form of infrastructural development e.g. construction of

embankments, dykes, raising of roads, construction of shelters, private houses, etc. Bangladesh has invested quite a substantial amount of money in these constructions, which are still too little compared to the huge need. Non structural measure includes creating public awareness through community participation and training/drills of public and school children.

For a resource-constrained and highly disaster- prone country like Bangladesh, it is strongly advocated that we should combine hardware and software components of disaster management, and opt for the less expensive non-structural measures. This involves a massive Public Awareness Programme (PAP) leading to the enhancement of the capacity of the vulnerable people to cope with disasters. It is recommended to integrate PAP with structural measures in order to ensure active participation of people with the infrastructures e.g. maintenance and use of cyclone shelters, embankments, etc.

It is an established fact that during natural disasters, particularly in the post-disaster emergency phases, the people themselves, their extended families and the nearest communities, meet most of the survival needs of the distressed people — surely NOT the public, private and foreign organizations, as projected in the media

a) The Cyclone preparedness Program (CPP):

After the 1970 cyclone, which killed 5000,000 people, the government and the Bangladesh Red Crescent Society began working together to improve coastal warning and evacuation. The Cyclone Preparedness Program (CCP) covers almost 11 districts and 3500 villages. Its activities include issuing warnings, building and operating shelters (there are 1,350 along coast, some built by other agencies) assisting with evacuation, search and rescue, first aid, relief and rehabilitation, and building up community preparedness capacity.

The backbone of the project is cadre of 32000 village volunteers , men and women, organized into local teams of 12. They are equipped with radios to monitor weather bulletins , megaphones and hand operated sirens , first kits ,rescue equipments and protective clothing. They are not paid but receive travel costs and daily allowances for attending sessions . In periods between cyclone volunteers are trained by permanent Red Crescent staffs. They receive three day basic training in cyclone preparedness refreshers courses every five years. Special training in subjects such as radio use, first aid, and leadership is provided separately.

The volunteers organize regular rehearsals and demonstrations in villages, the project aims to hold at least 260 mass community awareness demonstrations each year. Plays have been written for the programs to disseminate information about storing emergency rations, safe shelters and hygiene .More than 2000,000 people have been seen these. Folk songs, wall paintings, video shows and posters are among the other methods used to raise awareness. The village volunteer groups are linked each other and to Red Crescent offices at field and higher levels through a network of radio stations. This network is maintained throughout the year and runs 24 hours a day during warning or emergency period. The system is costly and requires ongoing funding from the government and the International Red Cross/Red Crescent movement. Extending its coverage and improving its operational effectiveness are continuing challenges. However it is widely acknowledge being highly effective. Hundreds of thousands of people can now routinely be evacuated from the path of cyclones. In May, 1994, three quarters of millions of people were safely evacuated; only 127 died.(Source: Cyclone preparedness Program(London: British Red Cross Society, NGO initiatives in Risks Case Study 4,2000)

This community based early warning through devoted volunteers have been proven most effective tool to create awareness among the community members. This program has been jointly run by Government of Bangladesh and Bangladesh Red Crescent Society. At present, operation and network of the cyclone preparedness program has been further extended to 11 coastal districts, 32 Sub-districts though strengthening the capacity in disaster management in coastal people of Bangladesh. The number of trained volunteers has been raised to 492150. Due to the active role of volunteers in coastal belts, the severe tornado and storm surge ‘SIDR’ killed only 200 people in 3406 and another Tornado and devastating cyclone ‘ AILA’ killed only 190 people. This community based preparedness program is well known to local community and any message/early warning issued from CPP volunteers regarding cyclone, tidal surge or tsunami is considered with highest priority by local community and they evacuate quickly after receiving warning from them. So this is the best practice and effective tool to organize, prepare and evacuate community at the time of disasters.

b) Traditional community coping mechanism and Community participation

Disasters such as floods and droughts are linked with the collective and environmentally sound use of lands and tenure at community level. Ultimately good practices of disaster management depend on the community participation. Conventional practice of disaster management is respected in many African countries more than modern law. However, traditional ways of disaster management is replaced by modern economic and social values, which demonstrates increasing vulnerability and exposure to hazards and weakening the conventional community good practices. For example, in the Brazilian rain forests ,

where the indigenous groups' interests are being replaced by economic ones, that turns forest into pastoral lands. As a result. Land degradation as well as floods and drought increasing and forcing social exclusion. In this way community participation process in disaster management is being weakened. These considerations yet to be taken seriously in national strategy for disaster reduction in every country.

Traditional Coping Mechanism and Community Participation in Bangladesh: Detail Description of the Situation:

Experiences and sufferings are more or less similar in floods, cyclone situation in Bangladesh. For flood and cyclone affected people there were specific social, economic and physical implications. Some of the difficulties faced by flood and cyclone victims include lack of early warning, delay in rescue, recovery and rehabilitation by the government agencies, loss of possessions, fear of extortion and looting, and separation from their social network.

Besides these, other important problems faced by flood and cyclone victims are: no work, no income, and disruption of regular routine life, lack of fuel for cooking, difficulties in using latrines, managing grass for cattle and goats/ships, water-related illness, dog/snake bites, risk of drowning of young kids, adverse effect on income generating activities, etc. However, for survival, the affected village community needs emergency help. This initial help is needed for saving life and properties of the disaster victims. If quickly immediate shelters, food and clothing and first aid could not be provided, it would cause more sufferings to the affected people. That's why, village community under the guidance of elected union council/ward members face the challenges of disasters according to the policy "Do Yourself or Self help and self adaptation". This is the most effective policy to face disasters like flood and cyclone. Helping each other at the time of crisis and helping family, neighbors and village community are the guiding principle of self adaptation of community mobilization.

Women and children are often the most vulnerable groups during the floods, suffering from personal hygiene-related problems and domestic violence. Adolescent girls face additional problems in disaster situations. In most of the cases, they are unable to conform to socio-cultural norms during disasters, they are confronted with a loss of self- respect and a sense of shame.

Poorer groups are exposed to increased vulnerabilities during the floods. Even though each disaster is unique in nature, scope and timing, the problems faced are basically similar. Disasters do not give rise to new or uncommon diseases. People suffer and die in the wake of most disasters from exactly the same

diseases that they have always suffered and died from. The only difference is that the burden of diseases is up and the defenses are down. What was already bad simply become worse.

In all cases of disaster the most effective form of Floods and cyclones usually result in an acute scarcity of safe drinking water due to contamination of water sources such as tube wells and reserve tanks. This adversely affects the existing poor health conditions of the slum dwellers. During any disaster situation, work and wages become scarce for the poor. Lack of work and increasing uncertainties due to the floods led to increased tension among family members, resulting in some incidents of domestic violence. In fact, the losses of a landless person in such a disaster could be as much as half of his entire year's income.

During floods and cyclones, people faced different kinds of problems in the shelters. The shelters are not adequate for the large number of people housed there. However, people in village community adopted various survival strategies with their limited resources and make relentless effort as long as they could, before moving to the shelters or any other places.

Good practice

The village community has adopted different indigenous and adaptive strategies which they learn from experience, from ancestors, from school ,from local government bodies, NGOs and some they learn from informal village community under the leadership of Union council/ward members. For example, natural early warning system by watching the sky when it take the shape of elephant's muscular trunk, judging the wind motion and speed before cyclone and tidal surge through natural observation from experience, issues of sanitation, safe drinking water, health and hygiene, women's health, problems of adolescent girl and children's diseases, waterborne diseases, first aid, community drills all the village community members learn informally.

During and after floods, such as change of food habit and timing, diminished consumption of food, specially by women in order to avoid using latrines in the day time, use of special clay stoves (chula), raising the floor of cowsheds, preparation of seedbeds for rice and mustard on floating platforms (macha), tying their children to a pillar or macha. For safety of durable and valuable items the villagers wrap valuable items by plastic bags and put it by digging hole in the ground of the home stead. In some cases, community people responded to the floods with collective action.

Informal village community volunteers and member's "self adaptation and self help" initiative at the time disasters are using the lessons learnt from various informal sources from the nature, from ancestors, from

informal education programs and from different local government bodies, GO and NGOs. They did not drink floodwater; they did not even let their cattle drink this floodwater. They washed their dishes and utensils with clean water after washing with floodwater. They eat less and drink less so that they need not to use latrines frequently. The village community, knew the risk of using the floodwater. They adopted new cultivation technique and prepared seedbeds for rice and mustard on floating platforms (macha).This yield same production of rice and mustards like normal seasons. The non formal community meeting has been constantly warming people about its danger.

Major Achievements:

"Self help and self adaptation" or "Do Yourself" policy has been proved as the best policy to overcome the preliminary risk of disasters.

Community participation in the dissemination of early warnings to community through local and traditional early warning methods.

Leadership of union/ward members as village community head has been proved successful and effective. As a result, at the time of disaster, local government, first involve the elected members and chairman to mitigate the sufferings of community people.

Informal learning from experience, ancestors, nature and from GO-NGOs has taken a unique shape among the village community members and each of the members now understands what to do, when to do and how to adapt with the adverse situation of make shift shelters at the time of disasters.

Ensured safety, security of lives and properties of disaster affected people through informal community volunteers and village defense party.

Informal community leadership and informal self help, self contribution and self adaptation during disasters created awareness and forged unity among village community members.

Some Limitations:

Some problems were identified and suggested for correction:

Leadership of union council /ward council members at the time of disasters like flood and cyclone should be given a formal shape.

Formal and comprehensive training is needed for the village community volunteers and village Defense party members.

First aid and essential kits such as first aid box, water purifying tablets, oral saline, torch light, battery, radio, mobile latrines etc. should be provided to the village community club.

There should be small amount of Budget for the village community.

18. THE KOBE EARTHQUAKE (THE GREAT HANSIN AWAJI EARTHQUAKE) AND COMMUNITY PARTICIPATION

At 5:46 am on January 17,1995 , the Kobe Earthquake struck Japan. The damage caused by the Kobe Earthquake was the death and missing toll stands at 6,437 persons and total monetary loss for Hyogo and surrounding areas stands around 10 trillion yen. More than 80,000 houses were lost and many parts of the urban infrastructure such as express way, bridges, port, and railway facilities were heavily damaged.

Collaborative community development for recovery to implement recovery projects under the comprehensive Disaster Management strategy for recovery plan and of the importance of social capital concept that is the foundation necessary to sustain the community was observed after the Kobe earthquake. Necessity of social capital and collaborative community development for recovery proved to be the most effective tool for early socio economic development after the great Hansin Awaji commons" and indicated that richly embedded urban commons can facilitate active citizenship for community rebuilding (Maki, Hayashi, Tatsuki & Takashima, (2000). For the 2001 study,11 concrete urban commons were therefore used in order to estimate the amount of motivation toward community rebuilding. Thus community participation was during Kobe Earthquake and after the earthquake for massive rebuilding and for initial settlement in houses. It required community help. Community played a significant role in recovery from the Great Hanshin Awaji Earthquake.1

a) **Kobe City Community Development Ordinance**

The Kobe city Community development ordinance was established in 1981, fourteen years before the occurrence of the earthquake. This ordinance stipulates procedures for community development and the responsibility of the Mayor, based on experience in community development with the participation of residents of Kobe from 1960s to 1970s.This ordinance covered issues like environment, improvement of joint facilities including roads and parks gather and establish a community development Conference this was the first ordinance in Japan as an advanced ordinance for community development by resident's initiative. Based on the ordinance 29 community development conferences were established in the city before the occurrence of the earthquake in 1995.

b) Procedure for community Development with participation of Residents in the Post Disaster Restoration Project

Restoration after the Kobe Earthquake began emergency evacuation to elementary schools and Junior high schools and other public facilities because most of the houses were destroyed or burn down in the disaster area. In the first stage of the restoration project dialogue between the administration started but

the local residents were opposing almost all decision of the administration. Community development ordinance was implemented through the partnership of the prefecture government and the community members. Following the past experience, the community development conferences were organized to open as an accelerator for the understanding the residents' initiatives and the opinions of the community about the proposed project implementation by the administration. Therefore community participation was proved to be the best tool for quick recovery from the earthquake in 1995 and also massive rebuilding and reconstruction was possible due to community initiatives.

C) **A Survey on Great Hanshin Awaji Earthquake**:

A survey conducted after the Kobe Earthquake illustrates that the 199 grassroots assessment concluded that 'community feeling'(MacIver,1924) was closely associated with and could be promoted by a sense of communal ownership of things like favorite neighborhood landscape, street trees and flowers(Tamura,1999. This 1999 grassroots assessment named those communally owned goods as "urban commons" and indicated that richly embedded urban commons can facilitate active citizenship for community rebuilding (Maki, Hayashi, Tatsuki & Takashima, (2000). For the 2001 study, 11 concrete urban commons were therefore used in order to estimate the amount of motivation toward community rebuilding. Thus community participation was during Kobe Earthquake and after the earthquake for massive rebuilding and for initial settlement in houses, it required community help. Community played a significant role in recovery from the Great Hanshin Awaji Earthquake.

19. LESSONS LEARNED FROM THE GREAT HANSHIN-AWAJI EARTHQUAKE:

The Great Hanshin- Awaji Earthquake experiences have demonstrated the significance of community involvement by coordinating individual efforts engaged by each member of the community, mutual help efforts and support one another including residents , business, volunteers, specialists, municipalities and government efforts a) Individuals ,mutual help efforts and government efforts b) Life , living and community c) Emergency response , relief to recovery and reconstruction and mitigation/preparedness. Following are the manifold lessons learned from This Great Earthquake:

a) Basic elements for developing a culture of prevention:

- Disaster Management requires coordinated by individuals, communities, and governments
- Importance of residents using their imagination in the event of disaster and not thinking themselves disaster free
- Importance of transmitting the future generations the lessons learned from the past disaster, applying those lessons in disaster reduction activities

- Disaster information lessens damage

b) Life :

- Accurate assessment of situation and rapid action saves life
- Significant results from rescue and firefighting activities by communities and neighbors
- Importance of Wide-area disaster relief systems and medical strength
- Engaging with other people and cultural activities is a source strength
- Voluntary activities among local residents are indispensable to caring for victims and rebuilding their strength for living
- Importance of providing emotional support and conscientious care for those requiring support
- Importance of being prepared for disaster in daily life
- Importance of building collaborative relationships among various people and groups , including residents, volunteers, specialists and public bodies
- Importance of human resource development through the education and training on disaster reduction and provision of information

c) Living :

- Importance of emergencies of sober action that consider other victims
- Importance of providing assistance suitable to the needs of disaster stricken areas and local communities
- Evacuation sites serve as community Centers in disaster stricken areas
- Emergencies of new ways of living and community businesses
- Coordinating residents, volunteers and government is indispensable to supporting the process of living in evacuation centers and emergency housing
- Importance of rapid commercial rebuilding initiatives focused on new development
- Corporate disaster reduction activities in conjunction with local communities create a society better able to cope with disaster
- Importance of further reviewing of ways lessens economic loss related to housing
- People friendly environmentally conscious city planning leads to cities that cope well with disasters

d) Community:

- Checking electricity and gas and other actions of individuals to ensure that fire does not occur help protect the community
- Quickly reopening the stores and local businesses supports disaster stricken communities

- Importance of coordinated restoration of roads and life lines
- Importance of recycling waste products that results from disasters
- A community building perspective is essential to secure and reconstructing housing
- Housing initiatives are the corner stone of recovery policy
- Ensuring the safety of one's home protects one's family and neighbor
- Importance of advancing resident-led urban housing
- Importance of promoting the development of disaster resistant urban infrastructure

e) Importance of Disaster Reduction into National and Local Government Policy

- Importance of establishing laws and legislation to respond to large-scale natural disasters
- Importance of strengthening initial response to address disaster rapidly and appropriately
- Importance of financial coordination by the central government in order to secure the vast amount of financial resources needed for reconstruction and recovery
- Importance of land regional planning incorporating disaster prevention and mitigation and considering natural disaster risk
- Reconstruction and mitigation/preparedness are premised on risk assessment.

20. ROLE OF TOKYO FIRE SERVICE IN COMMUNITY MOBILIZATION:

12 million people lives in Japan's capital Tokyo. In this great city, with its life pattern and structure changed rapidly, there are a growing number of people and information continuously coming and going. Amid sophisticated circumstances , disasters in this cosmopolitan city are more overwhelming than before. This situation has posed new problems to disaster operations and disaster preparedness administration including fire prevention.

The Tokyo Fire Department promotes its fire administration for public safety in close cooperation with Tokyo's local Municipalities, focusing on the following issues:

1. The promotion of Disaster preparedness strategy (including anti earthquake measures) and public protection against terrorism.
2. The promotion of elaborately-prepared on-scene emergency operations measures.
3. The reinforcement of an emergency medical services (EMS) system in response to the greater public demands for EMS.
4. The sophistication of EMS and improvement of the life-saving effectiveness in cooperation with citizens.
5. The promotion of overall building fire protection measures.

6. The promotion of home fire safety for home fire death reduction and public life safety.
7. The promotion of quick and flexible public hearings.

After inauguration in 7th March 1948, the TFD has been working for most of the vast areas of Tokyo (except Higashikurume City and Inagi City) to protect people's lives and property. The TFD service areas divided into ten fire districts, which come under the protection of about 18,000 TFD personnel .The operational personnel stand by for emergencies 24 hours a day. The TFD has been globally contributing to rescue operations since achievement at toxic gas calamity in Cameron in 1986.
The TFD budget for the fiscal year 2005 is 237.3 billion . This accounts for 4.1% of the Tokyo Metropolitan Government's general Budget. The TFD responds to the general incidents caused by radioactive materials, biological agents, hazardous materials and toxic substances. There are also the hazardous material units for chemical substances and chemical emergencies.

The TFD dispatches its units by request to disaster scenes outside its service areas. Following the " Great Hanshin- Awaji Earthquake in January 17, 1995, a national rescue system" the emergency Fire Response Teams" was established in June 1995 to provide effective rescue services in times of major earthquakes and other serious disasters. There is paramedics assigned to all TFD's ambulance units .TFD also provide first Aid Education to the public, special classes have been given in junior and senior high schools for students learn to value of life and the importance of cooperation spirit.

The TFD is promoting fire drills with lessons learned from effective initial fire fighting at the time of the Great Hanshin-Awaji Earthquake. The Department also utilizes the Earthquake damage Prediction System in line with a seismographic network. For the reinforcement of resources, the Department is focusing on improving both the fire rescue 'Task Forces' provided with heavy apparatus and the long-Distance Water Supply pumper provided with a hose laying wagon. Further efforts are being made at TFD Volunteer training and the earthquake preparedness at home and work with furniture immobilized.
Volunteer fire corps is made up of community members. Together with fire station personnel , they conduct fire fighting, rescue and first aid activities for both fires and earthquakes. Furthermore, they instruct residents on fire prevention, basic fire fighting, and rescue and first aid techniques. In this way Tokyo Fire station has been playing growing role in community mobilization for disaster preparedness, rescue and recovery at the time of disaster.

21. INAMURA NO HI AND COMMUNITY INVOLVEMENT OF VILLAGERS:

"Inamura no Hi" is based on a historical fact of a massive tsunami disaster caused by the Ansei Nankai Earthquake in 1854, which attacked the Hiromura, a little village on the Kii Peninsula in western Japan (present name Hirokawa town, under Wakayama Prefecture). Against surging water up to the village, Hamaguchi Goryo led the villagers, desperately trying to flee from the waves in the darkness, to the high ground of the precincts of Hirohachiman Shrine, by setting fire to his precious rice stacks, the year's harvest.

Hirokawa township of Wakayama prefecture was severely damaged by earthquake and tsunami in 1854.In order to save the villagers from tsunami Mr. Hamaguchi Goryo had set fire at the rice stack because at that time whole village was covered by darkness. His noble effort saved lives of many villagers. Mr. Goryo had also organized villagers as community and engaged them to construct 5 meter height and 600 meter wide permanent embankment which had been completed after four years. In this way Goryo had created awareness among the village community about earthquake and tsunami, conducted massive relief and rehabilitation works and created huge employment for villagers. As a result, Hamaguchi Goryo has been memorized as 'Living God' for his noble works. This is an example of community leadership to reduce disaster risks. Community participation and community leadership is the integral part of disaster preplanning, preparedness and recovery.

22. COMPARATIVE ANALYSIS OF DISASTER MANAGEMENT SYSTEM IN JAPAN AND BANGLADESH:

Japan and Bangladesh are disaster prone countries. Geographic location of Japan is in the circum-Pacific mobile zone, where seismic and volcanic activities occur constantly. The reason for such a large concentration of volcano activity and earthquake is active colliding at the plate boundaries. Movement of the plates and movements of the earth's crust caused by such movements are known as plate Tectonics. Near the islands of Japan there is a slow but steady northwestward movement of the pacific plate against the Eurasian plate and westward movement against North American Plate.

Meteorological conditions, the country is subject to frequent natural disasters such as typhoons, torrential rains and heavy snow. Every year there is a great loss of people's lives and property in Japan due to natural disasters. Up until the1950s, numerous large-scale typhoons and earthquakes caused extensive damage and thousands of casualties. The commonest disaster in Japan is Earthquake. Recent Tohoku or Northeastern Earthquake had claimed lives of 25000 people, missing 40,000people and totally damaged property worth of US dollar 309 billion.

On the other hand, Bangladesh has a subtropical monsoonal climate characterized by heavy seasonal rainfall, moderately warm temperatures, and high humidity. Natural calamities, such as floods, tropical cyclones, tornadoes, and tidal bores affect the country almost every year. Bangladesh also is affected by major cyclones on average 16 times a decade. Generally each year 18.02% area is flooded. Catastrophic Cyclone SIDR in 2007 and AILA in 2008 had severely damaged human life, property and infrastructures in six coastal districts of Bangladesh. Tidal surge in 1970 claimed 4,70000 and 1n 1991 claimed 138000 lives in Bangladesh. Earthquake, tsunami and landslides are also sensitive disaster issues in Bangladesh. The commonest disaster in Japan is Earthquake. Japan can have up to 5000 earthquakes each year, which is about 10% out of the total occurred of the world.

Although Japan and Bangladesh are disaster prone countries but the types of disasters are different. Bangladesh basically faces flood and tornados , which affects 80% percent people. Recently, disaster risks of sea water level rise in coastal areas, tsunami and earthquake are also coming into consideration. Severity and intensity of disasters in Japan is more compared to Bangladesh. However, continuous research and development in disaster reduction and use of modern technologies have helped Japan to overcome natural disasters. The basic scientific and technology policies set a major goal of ensuring the security and people's livelihoods in Japan.

On the contrary, Bangladesh has small allocation on research and development on disaster mitigation. Technologically, Bangladesh is not advanced compared to Japan. Last year, Bangladesh procured some search and rescue equipments from Japan and other countries. At present Bangladesh has emphasized on disaster management and mitigation. Actually, Japan is world's one of the most developed country and on the other hand Bangladesh is a developing county. Therefore, comparison of Japan and Bangladesh is difficult. However, there are some similarities in disaster scenario of both the country.

Japan is pioneer in disaster management and disaster risk reduction. It has formulated basic Legal Frameworks of Disaster Management. In applying to all of the disaster phases of prevention, mitigation and preparedness, emergency response as well as recovery and rehabilitation, relevant laws and regulations were enacted including Disaster Countermeasures Basic Act (1961) which is the cornerstone of legislation of disaster management which set out the basic for measures for disaster risk reduction, emergency response, post-disaster recovery and reconstruction. It was formulated in 1961, after the happening of Typhoon Ise-wan in 1959 that caused more than 5,000 fatalities. The other relevant acts associated with disaster countermeasures Basic Act (1961); Erosion Control Act (1897), Disaster Relief

Act (1947), Building Standard Law (1950. These laws are to clearly define the responsibilities of the national and local governments and other public organizations to take emergency measures on river management, flood and erosion control, landslide prevention, earthquake and tsunami risk reduction measures.

In Bangladesh to manage the paradigm shift in disaster management, a disaster management regulative framework is established under which the Bangladesh Disaster Management Framework is implemented, and in which work of Ministries, Departments, NGOs and civil society are undertaken. Earlier, Government of Bangladesh emphasized on relief rather than disaster preparedness planning and disaster risk reduction. After the adoption of Hyogo Framework of Action in 2001, Bangladesh has adopted comprehensive disaster management program. However, the Disaster Management Act which creates the legislative framework under which disaster risk reduction and emergency response management is undertaken in Bangladesh, yet to promulgate in the Parliament and National Disaster Management Policy is yet to be adopted.

Japan had enacted “Building Standard Law 1950” and houses, shopping malls and high rise buildings are constructed by strictly following building code. In Japan, old buildings are retrofitted and new buildings are constructed with proper soil test, earthquake preventive structural designs. As a result, after 9.0 magnitude earthquake, incidents of building collapse and death related to building collapse is almost nil. Unfortunately, in Bangladesh, Building Code has been formulated in 2006 but it has not been implemented. Old buildings, Key point installations, schools and hospitals are not retrofitted. Therefore, any occurrence of severe earthquake will cause huge loss of lives and property.

The National budget for disaster management in Japan is approximately 4.5 trillion yen (average annual budget from 1955 to 2004), accounting for approximately 5% of the total amount of budget for general accounts. The percentage for each field is a) Scientific Technology Research 1.3% b) Disaster prevention and preparedness, 23.6% c) National Land Conservation 48.7% d) Disaster Recovery and Rehabilitation, 26.4%. This year after Great Tohoku Earthquake, Government of Japan allocated 63 trillion yen for rescue, relief and rehabilitation. (Source: internet). On the contrary, Bangladesh has been allocating 500 million US dollars in disaster management and food Ministry in yearly budget, of which a small amount of budget is used for strengthening disaster management system. At present, a comprehensive disaster management project has been undertaken to strengthen the National Disaster Management System.

In Japan there are many public and private organizations, local government - prefecture, municipality have been working actively for disaster management training, preparedness, planning , recovery and rescue. On contrast, in Bangladesh, Disaster Management Division, Directorate of Relief, Disaster Management Bureau, Bangladesh Armed Forces, Fire Service, District, sub-district and municipal bodies are working at the time of disasters. Measures on disaster drills and training are not adequate to face future challenges of disasters. However, Government has attached highest priority on Disaster management. Japan's vast experience on disaster management and disaster risk reduction can be replicated in Disaster Management system in Bangladesh

Like Japanese Red Cross and Fire Service, Bangladesh Red Crescent Society and Bangladesh Fire Service have been working round the clock for disaster reduction and carried out search, rescue and recovery at the time of disasters. Again, budget and necessary modern equipments are not sufficient for disaster prevention in Bangladesh. Bangladesh has limited resources. So, even after having government's willingness, sufficient budgetary allocation and modern search and rescue equipments could not be provided to these organizations. In this sector, Japanese Assistance is required.

Bangladesh has mountains and hills in the eastern part of the country. However, incidents of landslide and number of death people are not minimal. There is no act or regulation on landslides control and research on landslides is not adequate. In contrast, Japan has several institutes for landslide research and management. Japan has been using modern technologies for preventive landslides. Volcano is another major disaster in Japan, there is 108 active volcanoes. Japan has introduced new technology for managing debris fall and volcanic eruption ash fall and mud fall. At present Japan has been assisting Nepal, Australia, Philippines and Indonesia on Volcano management and SABO system.

On community mobilization Japan has set best example in the world from the point view of disaster management. Japan currently, conducting Fire fighting train/drills exercises for community volunteers, drills for community members and school children, School Earthquake Safety Initiatives to make schools safe against earthquakes and build disaster- resilient communities through self-help, cooperation and education. The project includes retrofitting of school building in a participatory way with the involvement of local communities, local governments and resource institutions, trainings on safer construction practices to technicians, disaster education in school and communities.

After the Great Hanshin –Awaji Earthquake in 1995, Local government has involved local communities for reconstruction and recovery process. Opinion of stakeholders and local community had been taken

into consideration. Consultants had consulted local community for local development. Local Government had attached highest priority on the community involvement. Local coping technologies are considered in the management of disaster reduction which actually originated from the good practices of community. Community volunteers have played significant role in the early recovery process from the Great Hanshin-Awaji Earthquake. Recently, occurred 3/11 Tohoku Earthquake followed by devastating tsunami, has completely destroyed Sanriku, Miyagi prefecture, Sendai, Fukushima areas. In these affected areas local community members and community volunteers have been working side by side the Self Defense Army of Japan and Local Government. Role of the community considered to be the most important factor to overcome disaster situation in Japan.

In Bangladesh, local community members play significant role for disaster risk reduction and disaster management. There are approximately 47000 community volunteers under the Cyclone preparedness program. Red-Crescent Society of Bangladesh has been trained up these volunteers for disaster preparedness. They plays active role for issuing early warning among the community and rescue them from disasters. Local or indigenous coping mechanism to mitigate disaster risk has also been proven effective. Indigenous coping mechanism learned from the community members. Therefore, this non-structural disaster mitigation process-awareness creation among community members, drills and exercises about disaster prevention is less costly. In community mobilization and participation Bangladesh has also achieved success. However, in Bangladesh disaster reduction institutions are not adequate like Japan. In this regard Japanese technique of community participation can be replicated.

Finally, In Japan, there are many public and private organizations for disaster risk reduction. Especially, there are many museums on the disasters- Disaster Reduction and Human Renovation Institutions Kobe, Rokko Mountains Landslides Museum, Sakurajima Volcano and SABO center, Nojima Faults Museum etc. Visitors from community and school children are regularly visiting these museums to know about the devastation of disasters and the ways to protect from disasters like tsunami, earthquake, flood, typhoons. Unfortunately, being a disaster prone country, Bangladesh has no such disaster related museums, where from community members and school children can gain practical experience about disasters like flood, cyclone, tidal surge, and learn the lessons to protect them from disasters. Although, comparison between Japan and Bangladesh regarding disaster management and disaster reduction and present status on disaster is unrealistic, even there are many lessons can be learned from Japan. People’s adaptability with disasters in Japan and Bangladesh is highly commendable.

23. COMMUNITY AND LOCAL INVOLVEMENT:

It is necessary to engage local government and community in disaster risk mitigation. If local stakeholders are not engaged in the disaster risk mitigation design, implementation and management of disaster risk reduction then the resulting policies, strategies and plans have limited chance to suit with the local conditions.

Similarly, if local community and organizations are not considered as stakeholders in the management of facilities and infrastructure then there is little chance to be implemented. For example, if local community is not involved in post disaster situation in Great Hanshin-Awaji Earthquake, Kobe, Japan in 1995 smooth recovery and reconstruction of the total area would not have been possible.

Cost of disaster risk reduction can be reduced to a great extent if the local community is involved in decision making process with reconstruction and rebuilding and mobilization of local resources, capabilities, knowledge and expertise. The potentiality of the community is proven great at the time of disaster. Engagement of local community contributes to building social capital, raises awareness of disaster risk and strengthens local capacities to address a wide range of development issue

24. COMMUNITY BASED DISASTER MANAGEMENT

The concept of BDM or community Based Disaster Management emphasizes that through capacity building community can be better prepared to face future disaster situations and manage their risks. The concept of CBDM recognizes that the community applied top down initiatives fail to address specific local needs of a given community , it fail to heed local knowledge or take into account available resources and capacities that exists within the community. The aim of developing a training curriculum and guidelines foe CBDM was primarily encourage the paradigm shift to change the focus of disaster managers to look at communities as active partners rather than helpless victims:; the shift from relief to mitigation. Another aim was to make the training available at low cost , in local languages to disaster managers at grassroots level in south east Asia. It is a very effective program to train up and integrate the community activities at the disasters.

a) Sustainability in Community Based Disaster Management

In the Year 2002, UNCRD launched a three-year project on titled “Sustainability in Community Based Disaster Management”, to study the effectiveness of the grass - root projects and to suggest policy input for sustainability, which will be useful for the different communities to take future actions. This was to help to understand the gaps in the community initiatives, and to take corrective actions in future. In order

to identify the key factors for successful CBDM, six case studies were chosen in the Asian region targeting three specific hazards: Cyclones (India and the Philippines),earthquakes (Indonesia and Nepal)and floods(Bangladesh and Cambodia). At first, field surveys were carried out and best practices from the case study countries were documented. Based on the analysis of these cases studies, overall framework of action for the sustainability of community based disaster management was prepared. Generic and specific guidelines were developed and field experimentations and testing were made for specific hazards in selected case study countries. From the three-years study, followings were found as key factors for enhancing sustainability:

- The existence of “culture of coping with crisis” and “ culture of disaster reduction” exist
- Risk assessment process involves participation of people and incorporating their perception of vulnerability and capacity
- Community and supporting agencies share common motivation and ownership for the initiation and sustainability of CBDM
- Genuine people’s participation within capacity building objectives, with specific focus on sectoral groups like women, elderly, children and ethnic minorities
- Well-delivered training inputs in accordance with the objectives of the project and the needs of the community for training
- Wider stakeholder's involvement and participation
- Accumulation of physical, technological and economic assets to reduce hazards and vulnerability
- Integration of these projects into regular development planning and budgeting to ensure sustainability

b)Role of United Nations on Disaster Prevention: Community Based Disaster Prevention Projects undertaken by UNCRD:

1.1Earthquake Safety Initiative through a project “Reducing Vulnerability of School Children to Earthquakes:

The United Nations Centre for Regional Development (UNCRD) is, currently, promoting School Earthquake Safety Initiative through a project “Reducing Vulnerability of School Children to Earthquakes” jointly with UN Department of Economic and Social Affairs (UNDESA) in Asia-Pacific region. The project aims to make schools safe against earthquakes and build disaster- resilient communities through self-help, cooperation and education. The project includes retrofitting of school building in a participatory way with the involvement of local communities, local governments and resource institutions, trainings on safer construction practices to technicians, disaster education in school and communities. These activities

are carried out in Fiji Islands, India, Indonesia and Uzbekistan as demonstration cases which will be disseminated throughout the respective geographical regions.

1.2There are three major aspects of the community empowerment in earthquake disaster risk management through this initiative:

Seismic safety of school buildings: The projects include seismic vulnerability analysis of some selected schools in a project city of each country and retrofitting of some of them which cover prominent construction typology in the region. This leads to development of country specific guidelines on the earthquake safe construction which incorporates solutions to the practical problems experienced school retrofitting.

Capacity building of communities: Retrofitting of schools in communities serves as a demonstration of proper earthquake technology to them. Masons in the communities get on-job training during the retrofitting of schools. In addition, technicians in each project cities get trainings on earthquake design and construction of houses. Consideration is given to the local practice, material availability, indigenous knowledge and affordability in trainings on earthquake technology.

Disaster education and awareness: The project includes development and wide distribution of educational booklets, posters and guidebook on teachers training and students' drills for earthquake disaster preparedness and response. The guidebooks get verification and updated through trainings and mock drills. The projects also develops an interactive educational tool for awareness raising on earthquake disaster and simple seismic risk assessment of buildings aiming to motivate households for planning seismic upgrading of their houses. It was learned from earlier programs of UNCRD that the process of making safer schools can be used as an entry points to the communities at risk to facilitate implementation of a training and capacity -building program for earthquake disaster mitigation technology besides its prime objective of ensuring the safety of school children against future earthquakes. It is achieved by demonstrating how schools can be used as community centres for earthquake disaster prevention and mitigation. Locally applicable and affordable earthquake-safer construction technology is transferred to these communities.

1.3Lessons Learn from the case study conducted by UNCRD on Empowering Community:

In regards to the issue of engaging and empowering communities for sustainable disaster risk management, followings are the major lessons:

1. Community empowerment and communication help to achieve sustainability in CBDM
2. A holistic secure-livelihood approach enhances sustainability
3. Community based action plans and training improves community's problem solving skills.

4. Because disasters are unpredictable, it is important to maintain the projects and people's awareness of disasters.
5. Transparency of activities and dissemination of knowledge and information encourage people's participation in activities.
6. CBDM efforts need stable financial resources.
7. 'What is accepted by the community' is more important than 'what is necessary'
8. Institutionalizing the community and the private sectors can result in more sustainable disaster management programs.

25. SOME CASE STUDIES ON COMMUNITY PARTICIPATION:

a)Case Study in Australia

A recent case study in Australia found that the extent of commitment by local governments to take actions depends on emergency managers making the right choices about citizens or community involvement in planning risk reduction processes. This can act as the real driving force for officials to involve community.
Key decisions include
Objectives to be achieved by involving citizens
Areas in planning process where and when citizens participate
Which citizens to include
Techniques to use in order to obtain citizen input
Information that is to be provided to citizens
Basically disasters considered as an opportunities for change and development. Women are participating actively in rehabilitation and reconstruction around the world. Networks of Networks are increasingly needed to among organizations and community.

b)Case study: Philippines

In the Philippines , the citizens Disaster Response Network(CDRN) is a national network of 14 NGOs that promotes community Based disaster preparedness work. Since its inception in the early 1980s it has conducted campaign and advocacy work to mitigate the impacts of disaster . By working together with the communities CDRN has developed strategies to enhance people’s capacities through community organizing , forming village-level disaster response committees, developing local early warning systems , organizing local rescue teams and diversifying local resources of livelihoods. Receiving little external support from donor agencies , it has reached hundreds of villages and initiated community Based mitigation initiatives.

c)Case Study : South Asian Countries(Nepal, India ,Pakistan and Sri Lanka ,Bangladesh)

Livelihood Options for Disaster Risk Reduction that proceeds from the recognition of the success of Duryog Nivaran-the South Asian Network for Disaster Mitigation, encouraged millions of people of South Asia living with disaster risks in everyday life to copy the project. It is therefore only strengthening livelihoods and by building more effective coping capacities within individual communities that a solid foundation for disaster mitigation can be created. The project is fundamentally community-based with the intention of identifying crucial linkages of livelihoods and the related option which have the potential to reduce the disaster risks. This project was funded by the DFID.

The Hyogo Framework for action on disaster management has formulated the disaster mitigation activities among the communities according to the experience gained from the Great Hanshin Awaji Earthquake in 1995. The Kobe experience is one of the best example of community mobilization to mitigate the sufferings of the victims as well as involving the community with the decision making process and in the rebuilding and reconstruction process. Basically in Japan, local community organizations with responsibility for disaster preparedness cover half the population of the country.

26. LESSONS LEARNED FROM JAPAN:

I gained versatile knowledge about disasters like tsunami , earthquake, flood, landslides, volcanoes from different disaster related public and private organizations of Japan through intensive field visits to different disaster related organizations. Disaster preparedness planning, projection of future disasters and the way to overcome these disasters with minimum loss of lives and properties and development of modern technologies to underline the causes of disasters have been widely practiced in Japan. Despite having such best precautions, modern early warning systems, equipments, disaster drills. Recently occurred disaster on 11March2011 had been devastating. It killed 17500 people officially and missing about 40,000 people and preliminary loss of properties estimated to $310 billion dollars. However, the disaster management practice in Japan is highly commendable. Following are the major experiences and lessons I learned from the ADRC, Visiting Researcher Program:

- To minimize the extent of damage from disasters, it is important for self help, mutual help and neighbors help. Then aid from government and public organizations comes.
- There should be coordination with government, non government organizations, local government and municipal bodies.
- Stock and storage of emergency goods and services and first aid medical services should be prompt to disaster affected areas and necessary food and relief materials should be dispatch as soon as possible to the affected people.

- Community based disaster prevention culture lead by community members and civil society can play a vital role for disaster mitigation.
- Conducting regular drills/training and simulation is effective to reduce disaster related deaths.
- "Disaster Risk Reduction begins at school" It will be necessary to inform and ensure participation of communities, government and individuals to ensure that disaster risk reduction is fully integrated in school curricula in high disaster risk countries and that school building are build and retrofitted to withstand natural hazards.

The major elements of effective school seismic safety programs and the basic principles of constructing retrofitted and earthquake resistant school building , learned from Japan.

- Prioritize school buildings to be retrofitted.
- Promote earthquake resistant evaluation of school buildings.
- Develop the plan for earthquake-proof school buildings.
- Disclose the results of the earthquake resistant evolution and the plan for promoting earthquake-proof school buildings.
- Check and take measures for earthquake proof non-structural elements.
- School safety is everybody's business to save our children. Let us make our school buildings earthquake resistant and promote disaster risk education.

(1) Disaster Risk Reduction Approach:

Basically "Disaster Risk Reduction training begins at school". It is necessary to inform and mobilize governments, communities and individuals to ensure that disaster risk reduction is fully integrated into school curricula in high risk countries and that school buildings are built and retrofitted to withstand natural hazards.

From Japan I learned the major elements of effective school seismic safety programs and the basic principles of earthquake –resistant school buildings. The following are the basic principles, I observed:-

1. Prioritize school buildings to be retrofitted.
2. Promote earthquake resistance and evaluation of school buildings
3. Develop the plan for earthquake – proof school buildings
4. Disclose the result of the earthquake resistance evolution and the plan for promoting earthquake-proof school buildings
5. Check and take measures for earthquake proof non-structural elements

The conclusion that aroused was that "School Safety is everybody's business to save our children". Therefore, there every country should make school buildings earthquake resistant and promote disaster risk education.

(2) Tools for Disaster Risk Reduction:

Emergency drills are most effective tools to minimize the loss of lives and properties during disasters. The government of Japan and its local governments have focused on the importance of the emergency drills conducting everywhere of the country to make people conscious about disasters. “What was heard can be forgotten, what was watched can be learned, and what was performed can be understood.” One of the most interesting drills is Card Game.

The following are the merits of game;

1. Positive participation can be expected because of the attitude towards the word “game” although it is not merely play.
2. Participants can find their lack of knowledge or problems for themselves during the game
3. Learning about feelings
4. Participants can notice other people’s ways of thinking.
5. Participants can think about what issues in real disaster prevention are represented by the rules of the game.

It is true that, active participation, sharing the important information and responsibility from as many sectors of the community as possible can reduce the disaster risk at all level

(3) Disaster Prevention Activity in the Community of Tokyo, Japan:

Japan consists of 46 prefectures and the population of Japan is approximately 122,700,000. The population of Tokyo Metropolitan city is about 13,043,441 and it consists of 23 districts and 49 cities. The population of that Ota district is 693,393.

Community is actively participating in the disaster prevention community activities. Around 1800 families and 3600 peoples are engaged in the field of disaster prevention. People think that disaster prevention is the person’s bonds. The motto of that community is “Make a town a happy town, Happy town against disaster.” They do experiment of fire drill every month. They organized one disaster prevention music band and they released a CD last year concerning about disaster prevention.

(4) The Volcanic geology, and volcano education Center, Tokyo:

Japan’s geographic location is at the ‘Ring of Fire’. There are many active Volcanoes in Japan. Here detail research on Volcano has been conducted. In the center simulation/Experiments like:

1. Lava dome experiments using mayonnaise.
2. Kitchen volcano experiments

3. Experiment to prove smooth Pyroclastic flows etc. has been conducted for the trainees to make them aware of the volcano disaster.

In fact, I gained the knowledge that –"transmitting experience of volcanic disaster is difficult and also facing volcanic disaster without knowledge of eruption is dangerous.

(5) Building Resilient Culture to Prevent the Large scale Earthquake, National Museum of Ethnology, Wakayama Prefecture:

The activities of voluntary Associations in Kushimoto –cho of Wakayama Prefecture of Japan on the Building Resilient Culture to large scale Earthquake is a glaring example of community involvement in preventing disasters. The information on the community activities on disasters were disseminated by ISAO HAYASHI, National Museum of Ethnology has opened my window of knowledge community mobilization on disasters prevention.

The followings are the lessons I learned from the community activities of Wakayama Prefecture :

1. Disaster education can facilitate people to build awareness of contemporary threats.
2. In the areas where large scale disasters are expected in near future, disaster education to school children is essential.
3. Methodology is needed to enhance their awareness of disaster risk and to develop their ability to cope with and to respond disasters correctly.
4. Whilst the education system is an excellent way to promote disaster reduction.
5. Booklets, Maps, Sign Plates, those are valuable of the communication of information both students and others.

Disaster education at school should be integrated into community based disaster reduction and there is, therefore also a need for a proliferation of initiatives in community based disaster reduction beyond schools.

(6) The Preventive Measures for Sediment Disaster:

Japan is situated at the active Volcano Zone in Asia. I knew about the proper location or places prone to sediment of disaster occur in Japan. I gained the knowledge about 3 pillars of the sediment disaster counter measures. These are:

1. Protecting life and Property-Using hard ware Measures (Soil erosion control project, landslide prevention, Steep slope collapse prevention works)
2. Protecting life-using software Measures (preparing hazard Map, and preparing warning system)
3. Controlling land development-Controlling new residential development

I watched the erosion control facilities and knew about the History of sediment related disaster and concerned legislation. I found that, the landslide prevention and Slope failure prevention is the main roles of national and prefectural government in sedimentation disaster reduction. At the end , I overviewed a hazard map about sediment related disaster.

(7) Landside Museum at NIGAWA-YURINO-Area:

This area was suffered by the worst mass movement disaster caused by the Great Hanshin Awaji earthquake. I gained information about the Landslide Museum. The entire model about preventive landslide in the museum was very informative.

I learned that the museum is very effective for raising public awareness on the landslide disaster. If we can construct this kind of museum in my country, it would be great help to enhance our people's knowledge on disaster especially in the landslide. Bangladesh is also the landslides prone countries. So I was interested to understand Japanese model which I will prefer to use in my country also.

I was informed that when earthquake occurred, a100m-wide, 100-long hillside on the right bank of the NIGAWA River Collapsed. Approximately 100,000m of displaced soil crushed 13 houses and blocked the Nigawa River, killing 34 people. An emergency project for landslide rehabilitation was planned and initiated in the after effects of the earthquake. The project was completed in 1997.

I realized that if we want to live a natural environment, we need to understand the devastating power of nature and learn how to protect ourselves from natural disaster by visiting land slide project in Kobe, Japan.

(8) The Significance and Necessity of Disaster Education at Universities in Japan:

Universities in Japan are jointly started the Interdisciplinary Education study system. A variety of lectures are provided in an interfaculty–style study system that involves participation from all faculties in the University. I knew the detail the matter about the Disaster Management and Social Service Section. It is the program of the practical science education that regards the student as the subject. It is a participatory planning type program for both students and the citizens. It can increase expertise about the disaster management through mutual education between the University and the local region. Students learned by doing practical exercise like on disasters such as earthquake, tsunami, flood and typhoon, fire and so on. Community Paramedic Training, Teaching materials and Classes are offered at local school etc. They started the "mutual Education" between the three universities. The main objective of mutual education is that they can use that expertise and can develop a system for rapid, response and mutual help

in times of disasters. It can be possible for remote communication system and sharing the information by web GIS based system also. The conclusion was that the disaster management and social service section, the institute for interdisciplinary education of Kobe Gakuin university and the three universities collaboration project also challenging program to run successfully. In spite of this they have to recognize the activities about win-win business and the challenges of universities as well. This is one of the best ways to involve community to mitigate disaster risk.

(9) The Disaster prevention and evacuation training at MAIKO High School:

In Kobe, Japan, before the great Kobe earthquake, most of the people did not realized the necessity of disaster mitigation activities. Based on the lesson learned from Great Hanshin-Awaji earthquake, the disaster and mitigation course applied in this school. Students are learning so many contents about disaster preparedness, Prevention, Mitigation and so on.

The School is divided into 4 levels;

1. Elementary School
2. Junior High School
3. Senior High School
4. University

Students work as local and international volunteer at the time of disaster. They can learn Hazard mapping, Emergency Reaction, Social background and exchange the experience with other countries in the field of disaster management.

Learned from the past fact and experience, it will be very important for learning about disaster.

After occurring disaster, we should follow below formula:

1. Protect of our own life
2. Education to be a superior
3. Help others just after we are safe in a disaster
4. To visit the affected area to support them
5. Supports the survivors' far way
6. Participate daily in the society

The Japanese model of disaster risk reduction is very helpful for future activities.

(10) Involvement of Children to Learn Disaster:

The children have a great opportunity to disseminate disaster drills techniques to their parents by telling about the drill to their parents. They can watch and realize the subject matter on disaster training. They

get chance to take special course of fire training from Kobe Fire Academy monthly drills. They can gain the strong motivation to learn about disaster mitigation. Children visits NAGATA ward to gather experience, to learn what really happened at the time disaster.

(11) The Great Hanshin –Awaji Earthquake Memorial DRI Museum:

This museum built in memory of the deceased and victims of the Great Hanshin-Awaji Earthquake. Actually the Library is very informative and touchable also. The DRI library collects and preserves many materials related to the Great Hanshin –Awaji Earthquake and disaster reduction. Firstly, the tremendous destructive power of earthquakes is portrayed using sound and dramatic images on a big screen. It made me very gloomy. In fact, it demonstrates the problems faced by Japanese people during the recovery and reconstruction process after the earthquake up to present day. Personally, I must appreciate the courage and morale of Japanese people, putting their hard labor, had overcome the disaster. I knew the approaches to disaster prevention and reduction by citizens and international disaster reduction organizations. At the last movement of my visit, I saw the animation film. That film was a love of “life” and the courage to live depicted through the story “the fall of Freddy the leaf” It is the truth of life. I was impressed to see the management of the museum at Kobe, Japan.

(12) Disaster Management and Business continuity plan:

The objective of the Business continuity plan by Tokyo Marine Risk Consulting Company Limited is to explain the role of insurance company in order to recover from any disaster related incidents by the affected industrial and business enterprises. After the Great Hanshin Awaji, litigation started with the industrial enterprise owners and insurance company. Because, insurance company was suppose to cover fire related incidents. However, at that earthquake, fire occurred after one day of the earthquake. So, debate started between insurance company and insurance claimer, which portion will be covered, whether earthquake or fire. At last it was settled at the Supreme Court.

Besides this, Cabinet Office of Japan has issued an directive to Business organizations to incorporate the risk of earthquake, Tsunami etc in their Business plan so that even at the time of disasters, industrial units and business firms can continue supply chain of their products in home and abroad. These firms also needed to come under insurance coverage and pay insurance premium. Gradually, big firms are incorporating Business continuity plan in their organizations. Cabinet Office, Government of Japan is monitoring the issue. Actually this issue is proved very urgent even at the time of The Great Tohoku Earthquake of 11 March2011 to cover the loss of lives and properties of people.

(13) “Inamura-no-Hi’ and Tsunami Education Center, Wakayama:

Tsunami Education center is located at Wakayama prefecture and far away from Kobe. I visited the Tsunami affected village in 1854 where Mr. Hamaguchi Goryo constructed 5m high and 20m at the bottom and 600m long seawall along the stone. Seawall originally constructed by a local lord Hatakeyama. The new seawall was completed in December 1854. He spent his own money 94 kan and 353.79kg monme of silver which is equivalent to 1,572 ryo: gold piece.

Mr. Hamaguchio hired 56,736 (man day) villagers to prevent the village from losing its township. Also his initiative had created employment for the tsunami affected village. On the December 14,1938 the tomb of Mr. Goryo and the seawall registered national monuments. The “Inamura-no Hi” based on true story, Mr. Goryo set fire to stacks of “Inamura”(Rice Sheaves) to use as landmarks and help him guide the villagers to a safe place, just before the Tsunami hit the village on 1920.His effort saved many lives of the village Inamura. After visiting Tsunami seawall,

Tsunami Education Center, Wakayama:

I visited the Tsunami Education center where I learnt about the true story of ‘Fire of rice sheaves’ and mechanism of Tsunami following big earthquake to prevent victims of Tsunami in future. This is one of the best practical experiences I gained.

(14) Japanese Red Cross Office, Tokyo:

I learned about the operational procedure of the organization and also visited the warehouse of the Red Cross. National Headquarter of Japanese Red Cross located at Tokyo. It has 47 Chapters and 92 Red Cross Hospitals, 64 Blood Centers and approximately 59 thousand paid staff. The Japanese Red Cross operates at local, regional and international levels at the time of emergency and Disasters. It has strong network all over Japan and big ware house.

(15) NHK National Broadcasting Authority, Japan:

NHK has been serving Japan by collecting rare documents and pictures and video footage of disasters and accidents. NHK by using modern studio and most sophisticated cameras and equipments have made the organization a symbol of reliability. NHK broadcasting stations throughout the country aim to broadcast programs that are more attractive and easily understood by the viewers. NHK has been putting special importance to disaster related news, early warning on tsunami, earthquake and volcanoes. Japanese media played significant role in recent 3/11 earth quake and tsunami which caused huge loss of lives and properties of the people of northeast part of Japan.

(16) Cabinet Office of Japan Tokyo:

Japan is a disaster prone country. Every year there is a great loss of people's lives and properties in Japan due to the Natural Disasters. Along with a series of reforms of the central Government of Japan, It has created the posts of State Minister for Disaster Management, appointed a Deputy Cabinet Chief Secretary and established the Cabinet information Collection Center. The Cabinet Office has a supporting role regarding disaster management matters. The Cabinet office has developed the Central Disaster management Communication systems involving government offices and public Corporations via hot line.

(17) Japan Meteorological Society Tokyo:

The Meteorological Society of Japan at the time of disasters play key role in issuing early warning regarding earthquake, tsunami ,volcanoes, landslides and floods.. Japan Meteorological Agency has been promptly issues warnings and information on earthquakes and Tsunamis to mitigate the disasters and protect lives and properties. In the event of large scale earthquake in ocean areas JMA announces estimated Tsunami heights and their arrival times in advance which can be regarded as Tsunami warnings and Advisories. In the event of earthquakes, JMA announces hypocenter magnitude and where strong shaking has been felt which can be called as Earthquake Information.

(18) Disaster Management of Energy Supplies at Osaka Gas Company Limited:

I joined one lecture on Disaster Management of Energy Supplies at Osaka Gas Company Limited. The company Executive and Technical Experts demonstrated us how Osaka Gas Engineering Company has constructed the main Building of the company on base isolater which is earthquake resistant. Also the Company has been Supplying Gas to the whole prefectures area among 6.63 million Households. After the Great Hanshin-Awaji (Kobe) Earthquake fire had been escalated due to gas line damage and it had taken many valuable lives and properties of prefectures. On the basis of the past experience company has introduced disaster preventive city gas production and new supply connections,/networks, monitoring and control system, which is safe and earthquake proof.

(19) The Role of Community Radio Broadcasting by FM-Y in Japan:

Community Radio plays a significant role at the time of Disasters in Japan. The concept of community Radio in Japan was replicated in Indonesia and other places of the world. Community volunteers operate this radio at the time of emergency and helps people to safe their life and properties.

(20) The Emergency Disaster Management by Hyogo Prefectural Emergency Management Training Centre, Miki City.

This Emergency Disaster Management center provides training facilities to the emergency disaster management volunteers. For whole year training schedules and training programs are prepared for volunteers. Fire drill exercises are also organized on regular basis. This center is situated in the heart of Miki City. The Environment has also been protected here. A modern stadium has been constructed with Helipad so that in the time of emergency relief goods can be dispatched to the affected people within shortest possible period. At the time of emergency affected people will be given temporary shelter at the stadium located here.

(21) Tsukuba University Graduate School of World Heritage Studies:

This center provides specialized higher education and research facilities to the students of different countries to preserve the cultural heritage of the world. The graduate school focused on “Disaster Prevention and Monitoring of Cultural Heritage Properties in Asia. The main theme of the center is Disaster Awareness, Disaster Prevention and Monitoring of Cultural Heritage Properties in Asia. The School has emphasized on “City, Region, Home, Individual role =Improvement of the disaster responsive capability in the Region which would help to preserve endangered Cultural properties from disasters.” UNESCO and Government of Japan have been providing fund to protect cultural heritage.

(22) National Institute for Earth Science and Seismic Disaster Prevention:

In Japan intensive research and development programs have been carried out for developing modern equipments to prevent disasters. Here the “ Tsukuba Shaking Table for Earthquake Resistant Building.” has been developed to construct earthquake resistant houses.25. The “Geographical Survey institute, Tsukuba: Geographic survey has been conducted from this institute for Japan. It conducts survey through satellite and exchange information regarding earthquake, tsunami, volcanoes, typhoon , and landslide etc disasters with other counties. Regular monitoring of different disasters has been going on here.
“The Science Museum of Map and Survey in Japan” where knowledge about the principles, mechanism, the History and New Technology for Map and Survey has been disseminated. The relationship between human life, Map and Survey is close and interrelated.

(23) The “Kaeru Caravan”:

I learned many ideas about disaster risk management. I participated in Blanket Stretcher Time Trial .I enjoyed lot and learned jack lifting game, Water fire extinguisher target practice game, Kaekko Bazaar game, and paper dish making game. In fact, that “Kaeru Caravan” was amazing to learn about how to reduction the risk of disaster.

(24) Drainage and Flood management system, Osaka:

I visited several Drainage Pumping Stations like:- Tohin Drainage Pumping Station (capacity of water pumping 72m3 per second), Matsushima Drainage Pumping Station (capacity of water pumping 91m3/second) and Koyagawa Drainage Pumping Station,(pumping capacity 25m3/second).

I visited in the Samondo River; Shoge River and Tomimatsu River and observed the channel improvement of River. I saw the operation procedure of the Shoge River water Gate system.

Finally, I visited the River Improvement of the area near to Takahashi bridge. This visit has given me an opportunity to know about the modern flood control, river management and drainage system of Osaka prefecture.

(25) Department of Urban and Public Works, Osaka:

I learned about the disaster-prevention measures by Osaka prefectural Government especially about measures against earthquakes and tsunami undertaken by department of Urban and Public Works.

I learned there about

1. Earthquake expected to happen and anticipated damage
2. Efforts by department of Urban and public works of Osaka Prefectural Government
3. Structure of Department of Urban and public works at the time of emergency such as earthquake hits.

I knew, If major earthquake hits directly under a city, huge damage is expected to occur against public transportation, utilities, and telecommunications and also possible collapses of many houses may cause many casualties.

There was threadbare discussion about the dangerous situation during tsunami. A tsunami is likely to happen, and estimated to cause a mass damage to the coastal area. Also, long quakes are likely to cause damage to bridges and high-rise buildings. Further, tsunami may go upstream on rivers, and it may cause damage at upper areas of the rivers.

I understood the efforts of Department of Urban and Public Works. The following works are done by that Department like:

- Seismic reinforcement
- Heightening tide embankment, disaster prevention information system, remote monitoring /control of water gates.
- Training for initial reaction, emergency assembly practice, training for collaboration with related agencies.
- Support for preparing hazard maps.

The main theme of disaster prevention activity is “Disaster Prevention starts from protecting you and your families’ live.”

I saw the video movie about tsunami and typhoon. It was really very informative. We also visited to model exhibition Section over there. I saw the picture that Osaka city situated in below the sea level with potential risks. In Osaka Prefecture, there are approximately 40 K.M. square of areas below sea level, which is home to approximately 1.08 million people vulnerable to tsunami. However, disaster preparedness is excellent.

I gained the knowledge that how to protect our live from Tsunami disaster. “Correct the knowledge and appropriate actions can save our life and our family in an emergency”.

(26) Effective Utilization of local resources for the earthquake learning:

A session on “Transfer the lessons learned through the great Hanshin Awaji Earthquake, Effective Utilization of local resources for the earthquake learning”. Conducted to understand the necessity of past disaster situation and experience sharing from victims. Futaba Elementary School is now using Local Community Center. Non –Profit Organization (NPO), Futaba supported by community. Its vision is to utilize local resource, characteristics, succeed local cultures, make active community, effective utilization of abolished Futaba Elementary school, and provide projects for revitalizing the local community.

(27) Nojima Fault:

Nojima Fault Preservation Museum is located in Awaji city of Awaji Island. It is near the northwest coast of the island, and is located about 10 km southwest of the north end of the island.

The Great Hanshin Earthquake had occurred at 5:46 a.m. on January 17th, 1995. It caused considerable damage mainly in the south part of Hyogo Prefecture. The earthquake caused 6,434 deaths and injured 43,792 people. And about 640 thousand houses were destroyed. The number of deaths was the highest since in the postwar period before the recent Tohoku tsunami and earthquake disaster. It was centered at the north end of Awaji Island, at a depth of 16 kilometers. It had the magnitude of 7.3 (Japan Meteorological Agency scale). An active fault runs from the northwest coast, through Kobe city, to Itami city at the north of Osaka city. Because the fault shifted, this great earthquake was occurred When the earthquake had occurred, the real fault appeared on the surface of the ground at Nojima district in Awaji city. Two parts of the ground slipped about 1-2 meters each other, and one part raised 0.5-1.2 meters Then this fault was designated as a natural monument. And the museum has been built on a part of the fault In the museum, one can see the real fault about 140 meters long And many photos and restored models about the earthquake are displayed

Additionally, I have experienced the same quake as the Great Hanshin Earthquake in a model room. This museum is visited by many people to learn about disaster risk and disaster preparedness.

(28) Fukura Port Tsunami Disaster Reduction Center:

Fukura Port Tsunami Disaster Reduction center is under the direct control of the Hyogo prefecture. Round the clock observation of harbor wave or tsunami at the Fukura Port is going on. At the time of tsunami this Center would be used as emergency Evacuation Center. This Port is located at nearest to the Pacific Ocean. This center is also used as tsunami preparedness and awareness training center for the local community. I learnt from there that there is a chance of 4/5 meter tsunami within next 30 years in this area. The center is well equipped with modern technologies on disaster management and early warning system.

(29) Skurajima International Volcanic SABO Center:

I gained experience about the horror of debris flow, knowledge gained about the Volcanic Eruption of Sakurajima and Sabo facilities and simulation of disaster prevention information at the center.

I knew that the Sabo Project under the supervision of the Ministry of Construction started on the Nojiri, Harumatsu, Mochiki and Kurokami Rivers, which have their sources at the especially devastated Mountain Minami. After that, the project proceeded for the Second Furusato, First Furusato, Arimura, Kanatoko, Hinohira and Fukura Rivers, and as of fiscal 1999, a total of ten rivers have been involved.
Sakurajima had erupted 30 times in recorded history. The lava that gushed out due to the fierce eruption in 1914 which is called the Taisho Eruption connected Sakurajima to the Osumi Peninsula. I came to know that there are 19 rivers at Sakurajima and all rivers are from steep mountain streams and normally no water runs in them. Devastated by active volcanic activities, the upper reaches of the rivers are full of unstable sediment, which seems to the main sources area of debris flow. Heavy rainfall may cause debris flow running down and damage the populated areas and roads in the lower reaches of the rivers. I was informed that the Sakurajima International Volcanic Sabo Center is responsible for providing accurate information on the volcanic activity of Sakurajima and other

Australia, New Zealand etc. in the field of erosion control. Various methods are tried such as use of low cost local material and simple construction techniques for the locals to carry out the program. This Project was very useful for Bangladesh sharing the information and experience and learning the good lessons from Japan

I learned more, about the history of Sakurajima city, affected people, construction works, disaster preparedness, preventions and mitigations activities, seasonal plants, Sightseeing.

(30) Sakurashima International Visitor's Center:

Sakurashima International Museum disseminates and simulated experiences for phenomena of volcanoes, debris flow, earthquake and all the information about disaster risk management.

Kagoshima Disaster management training center:

I gained the knowledge that people can survive an earthquake and minimize its damage simply by becoming aware of potential hazards and taking some basic precautions, develop a family earthquake plan, prepare and be ready every time and everywhere.

I learnt the methods of protecting ourselves at the time disasters like:

1. Stay calm and seek safety.
2. How to prevent by fires
3. Stay away from narrow streets, walled streets, cliffs and river banks
4. Evacuation procedure
5. How to listen the correct information
6. Always be ready with Emergency bag
7. Join forces for first aid
8. Join forces for rescue
9. What to do when driving a car

Daily Preparation Program for Disaster Reduction:

I learned about the daily Preparation like:

1. Anti disaster Training
2. What should do during earthquake
3. Reinforcing our houses, brick and stone walls
4. Preventing furniture and elevated furnishings from tipping over or falling down. Preparing extinguishers and Preventing fires
5. Preparing personal effects and a first aid kit for emergencies
6. How to conform family members safety

Bangladesh is also vulnerable to earthquake, landslide, flood, fire and so on. It will be very useful for awareness creation about the disaster and minimize the disaster risk at all.

Under the ADRC Visiting Research program I came across the many disaster reduction institutions run by Government of Japan, Local government, prefecture Government, Municipal level, Universities, and Private sector. Japan is pioneering the cause of Disaster management and Disaster Mitigation all over the

world. Lessons learnt from ADRC, JICA, and many other disaster management institutions and organizations have helped me to understand the cause of disasters, disaster preparedness, mitigation and disaster planning and mobilization of community to overcome disaster situations at the earliest.

27. RECOMMENDATIONS FOR COMMUNITY MOBILIZATION IN BANGLADESH:

The following recommendations are proposed to improve risk reduction efforts through the strengthening of key stakeholders' abilities to mitigate, prepare for and respond to a disaster:

- Communities have inherent capacity to respond to any disaster. Community help themselves and they are not the passive recipient of aid or help. Therefore, in disaster management strategy, communities should be involved in managing risks that may threaten their life and property.
- Comprehensive Action plan should be developed for increasing seismic safety of public facilities, schools, hospitals and life lines to minimize the future losses of lives and properties that may result from major earthquake.
- Development of disaster mitigation tools for communities at risks by involving schoolteachers and students in the process, in order to assess hazard and risk of community.
- Awareness creation, sensitization and capacity building of media in disaster risk reduction are necessary for effective use of the reach of media and civil society.
- Strengthen SAARC Disaster Management System for member countries to play central role in DRR.
- Reviewing the curricula from elementary school to higher secondary level and include DRR content in a systematic way. There should be compulsory DR training /drills in elementary and secondary schools.
- Conduct regular research on indigenous knowledge on hazard assessment and risk mitigation measures and disseminate it to wider audience.
- Develop and implement a public awareness strategy involving communities and develop a perception through public information campaign that area is disaster prone.
- Research and analyze local perceptions and adaptations to disaster risks as a basis for a disaster reduction strategy in Bangladesh.
- Participatory Learning Action(PLA) introduced by community based disaster management should be strengthen so that community's capacity for managing disaster related project will increase.
- Government of Bangladesh has to integrate disaster reduction activities into normal practice of good governance and into the regular planning and budgeting process.

- Government has to provide financial and technical and morale support to disaster related training centers , NGOs who would act as change agents in the community participation process on disaster risk reduction.
- Networking among the communities should be further strengthened to share the experience and knowledge and expertise on disasters.
- Experience and knowledge on the Great Hanshin-Awaji earthquake can be replicated and shared in disaster related training institutions in Bangladesh to face future disaster challenges.
- Community awareness programs on disasters such as Kaeru Caravan, school retrofitting program, disaster training /drills and simulation program in Japan can be replicated in Bangladesh and should be rigorously applied in schools and communities in Bangladesh.
- There is no disaster related museum in Bangladesh. Like Japan, some disaster related museums can be established so that school children and members of the public can learn about disaster reduction activities through visits to disaster reduction museum.
- Strengthen the Community member's capacity building processes that promote self help, unity within the framework of local disaster reduction.
- Role of Disaster Management Bureau and Fire Service of Bangladesh should be expanded to provide regular training/drills to public and school children.
- The Standing Orders on Disasters may be reviewed to bring about necessary amendments in the light of lessons learnt from the super cyclone SIDR in 2008 and tidal surge AILA in 2009..
- District, upazila and union-level disaster management committees must continue to maintain their capacity to plan and respond to natural hazards in a timely manner. National, district and upazila committees must be convened prior to the flood and cyclone seasons to ensure that calendar-specific plans are updated and all stakeholders are prepared to conduct their assigned roles in a timely and professional manner.
- Essential relief equipment (rescue vehicles, fuel supplies, telecommunications, mobile, fax etc.), materials and supplies (food, shelter materials, medicines, water purification tablets, etc.) necessary to respond effectively to natural disasters and human resources to tackle any catastrophe must be catalogued prior to the seasons of flooding and cyclones. Special needs of the vulnerable groups including the disabled, children and the elderly should be taken care of.
- A Program Management Information System (PMIS) may be developed with updated and accurate information on the vulnerable population at the union level through regular assessments of their vulnerability to a specific hazard.

- Greater sharing of information on the government's preparedness, mitigation and response planning and actions initiated at the time of national disasters is necessary in order to achieve transparency of purpose. An effective communication with the media has to be made, so that the extent of the crisis and the efforts of the government to respond to the crisis are correctly reported.
- National development plans and national disaster risk management planning must be integrated in order to protect valuable developmental assets from being adversely affected by natural or human induced hazards. Gender issues should be considered in the planning and implementation of all aspects related to flood risk management. Steps may be taken to establish an effective system for Damage and Need Assessment (DANA).
- A mechanism for continuous training should be put in place to improve the capacity and skills of all those who are involved in disaster management. Arrangements for the necessary training of relevant staff should also be made to build up capacity for making assessments after any natural disaster. The Disaster Management Bureau (DMB) may be strengthened in terms of human resources and logistics to undertake the responsibility.
- An evaluation and impact assessment may be undertaken in respect of the ongoing relief and rehabilitation efforts by the government to determine their effectiveness (strengths and weaknesses).
- The awareness campaign and advocacy programme may be intensified in order to apprise the common people of the devastation of past natural disasters, as well as to prepare them for future catastrophic events. The members of Ansars and the Village Defense Party (VDP), Bangladesh National Cadet Corps (BNCC), Girl Guides and National Scouts may specially be involved in the awareness campaign.
- Information on climate change and climate variability conditions on Bangladesh needs to be made available.
- Regular monitoring to ensure compliance of SOD by all concerned, as well as timely completion of disaster related projects and programs. All the committees as stated in the SOD must be activated and preparation of Action Plans at all level ensured. Incorporate the issues and concerns of river erosion and earthquake in the SOD.
- The mapping and monitoring of hazard is needed.
- Hazard mitigation activities such as the strengthening or construction of dykes ,slope stabilization, the recovery of mangroves and in urban areas improvement of drainage
- Improved ecosystem management, under the local responsibility including in some cases the use of PES mechanisms

- Development of participatory land use and development plans that incorporate disaster risks considerations
- Strengthening of livelihoods, through promotion of employment and measures to increase agricultural productivity water and food security and marketing initiatives
- Application of microfinance and micro insurance to increase social protection and resilience
- Strengthening of local governance, including the disaster risk reduction capacities of local governments
- The adaption of gender sensitive approaches into disaster risk reduction practices
- Community should be trained up for maintaining health and hygiene at the time of disaster and training on first Aid should be provided to the members of the communities.

28. CONCLUSIONS:

Japan is a highly developed country of the world. The geographical and topographical position of Japan makes it vulnerable to disasters, because of its location at the “Ring of Fire and continuous clashes of four Tectonic plates”. Although, every year Japan faces disasters like earthquake, tsunami , floods and volcanoes which cause huge loss of lives and property, by using modern technology on disaster management and disaster mitigation and preparedness planning , it has miraculous recovery from severe disasters. Indomitable courage of people of Japan helped it to overcome disasters quickly.

Similarly Bangladesh is also a disaster prone country because of its geographical and topographical location and due to the affect of climate change. The people of Bangladesh have won universal admiration for their courage and endurance when subjected to hardships year after year, as the government and international partners seek to protect them against the assaults of Nature. Actually comparison of a highly developed country like Japan and developing country Bangladesh is not rationale. However, from the point of severity and intensity of disasters, both the countries have been facing disasters.

Through initiation of more effective mitigation, prevention and preparedness measures, the Ministry of Food and Disaster Management is seeking to lower the vulnerability of people living in high-risk areas, while raising awareness about the need for inter- organizational and inter-disciplinary efforts at local, national, regional and international levels, in order to address the root causes and solutions of destructive natural hazards. Disaster prevention culture depends on the involvement the community. In future, research and development practice in Japan would explore the way in which understanding of disaster management and disaster reduction would be possible and discovering future technologies on disasters may be satellite sensor that might read tell tale of volcanic activity, seismic shift and collapses days or weeks before any catastrophe occurs or telemetry that can monitor the buildup of soil moisture in a water

shed that could serve as warning of sudden flooding downstream or early warning can be issued for earthquake long before the disaster event.

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