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Mainstreaming Disaster Risk Reduction into Local Development Plans (Bhutan)

A final research report presented

by

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to

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LIST OF ABBREVIATIONS

ADRC	Asian Disaster Reduction Center
BHU	Basic Health Unit
DDM	Department of Disaster Management
GLOF	Glacial Lake Outburst Flood
RGoB	Royal Government of Bhutan
RNR	Renewable Natural Resource
RBP	Royal Bhutan Police
VR	Visiting Researcher

GLOSSARY

Dzong	Fortress
Dzongkhag	District
Dungkhag	Sub-district
Thromde	Municipal
Gewog	Administrative Block consisting of a number of villages under a District

1. INTRODUCTION

1.1 Background and Significance of Research

Disasters affect the countries irrespective of size and geographical location but it is the small and poor countries impacted severely. This hinders the development and creates extra burden economically and socially to achieve the desired prosperity of many developing and vulnerable communities. In fact, this is absolutely true particularly for the small landlocked country like Bhutan.

Disasters are frequent in Bhutan. Each year many lives and huge properties are lost due to unpredictable disasters. Bhutan is prone to disasters such as earthquake, flash floods, windstorms, fires and landslides etc. The earthquake of 2009 and 2011 took many lives, caused damages to infrastructures, agricultural land and industrial productions, also severely affected the socio-economic development progress of the country. Flash floods, house fires and windstorms are also one of the prominent threats in Bhutan every year. Every year millions of dollars are lost due to poor disaster management. This is lack of national, local and community disaster management. This shows inadequacy preparedness and response mechanisms to overcome disasters future.

Bhutan being signatory to Hyogo Framework of Actions (HFA)and Sendai Framework for DRR has brought series of institutional settings in field of disaster management. However, government failed to implement DRR/DRM activities in the overall local plans but implemented as a separate project under different sectors. Lack of DRR at local level planning has hampered to address the local disaster management planning and community disaster management system is not encouraged to counter the disasters. This phenomenon is aggravated by shortage of disaster management knowledge and skills of the actors further weakened the coordination of emergency management system at local level.

The huge Disaster Management policy and implementation gap made ineffective institutional progress exclusive of disaster risk reduction on ground level. There is no point of direction to monitor the development and disaster management progress. Every year many houses and

properties were lost due to poor response system. Government not able mobilize adequate funds in DRR. Therefore, large development funds are diverted for recovery and restoration.

With unclear DRR strategy which seemed essential as a part of preparedness and to mitigate risks associated. Lack of clear DRR policy at local planning has adversely affected the implementing agencies to put afford in better disaster management programs at the local level.

Lack of effective DRR policy and plan at local level planning has hampered the coordination of actors and disaster management remain reactive in nature. To create better, manage disaster management at all levels it is better to have a clear well defined strategical DM plan to implement DRR activities. Therefore, DM plan to be drawn to set the direction of actors in main implementing institutions around the administrative jurisdiction. A national and local level disaster management plan is must to well manage the future disaster events through continues efforts and technological advancements. By having a concurrent disaster management plan It is creating a platform in monitoring the level of preparedness of government, community and institutions in long run. Because scale of disasters is not predictable and cannot be pointed out the magnitude of disasters such as earthquake by scientific reasoning.

1.2 Objectives of the Research

This paper intent to study the Japanese and Bhutan Disaster Management especially focusing on disaster management planning systems, institutions, legal setting, administrative structure. The role of national and local government in conjunction with communities in carrying out DRR activities. To create learning opportunity for DM actors to understand the importance of DRR and DM plan.

Moreover, this research will compare with Japanese experiences especially in disaster management planning focusing on pre-recovery and recovery planning citing past great events in Japan and Bhutan. This paper will also discuss how well the resources are mobilized to carry out DRR activities.

Furthermore, this paper will not only present the potential research options to prepare disaster management plans of Disaster Management in Bhutan but also discuss challenges face while implementing some DRR programs. This paper is also intended to discuss some of challenges while implementing DRR as a whole.

1.3 Expected Results

This paper is expected to have a defined DRR strategy and a recommended approach in dealing future events of disasters. Moreover, following research questions will be fulfilled in course of research narratives:

1. Linkages between Disasters and Development?
2. Community Based Disaster Management Approach?
3. Importance of Community Disaster Management approach?

This research is expected to highlight some of challenges face by Bhutan is its endeavor to design disaster management planning in Dzongkhag, Municipalities and Geogs. It might trigger up for preparedness and formulation for disaster management plans. Challenges of institutionalizing DRR into organizations is also expected in line with mainstreaming DRR in plans

The result of the research is expected to contribute in fulfilling the following functions of the national government and local government in dealing with disasters especially: Moreover, the research will discuss Community Based Disaster Risk Management as approach in preparing for efficient disaster management system in future. Finally, this paper is expected to create better networking of actors and understand the concepts of disaster risk management.

1.4 Scope and Delimitations of the Study

The limitation of this research is this paper will not serve as policy option for Royal Bhutan Government rather it intends to point a direction of disaster management planning system. Since disasters are complex and characteristics place are very important while dealing disasters therefore, it is not possible to predict similar disasters events that happened in Japan will strike in Bhutan in years to come. However, learning experiences can be applied to make aware and draw our own conclusions. Japan's disaster management system is world class and many theological inputs can be viewed as reference point for decisive disaster management. The great scope of this research is Japan topographical setup is similar with that of Kingdom of Bhutan therefore, some of critical methods can be highlighted to educate our authorities and communities.

3. METHODOLOGY

3.11 Type of Research

This research is descriptive in nature and mostly qualitative. The data and information gathered by primary and secondary means were used to understand the DRR for preparedness of the nation and the local communities as a whole in Japan in order to learn lessons to recommend a possible Pre-disaster and recovery planning as well as disaster management plans in Bhutan.

3.12 Data Collection Methods

The primary data collection was done in some of the Prefectures, Cities and Municipalities of Japan which have experienced mega disasters in the past history. Few of the disasters include Great East Japan Earthquake in 2011, Great Hanshin Awaji Earthquake in 1995.

Information sessions were provided by the Cabinet Office, JMA, disaster management units of MLIT, Prefectural Governments, Self Defense Force, Cities and Municipalities, Fire Departments

and Towns. Quite a lot of the data is from the Hyogo Prefecture and Kobe City. This research has used both primary and secondary data to understand the DRR and disaster management planning and the disaster preparedness at different levels in Japan.

3.12.1 Secondary Data Collection

Most of the secondary data were collected from the relevant authorities, departments and Bosai Units. Published and unpublished researches and other related data about DRR and Community Based Disaster Preparedness and Planning have been gathered for the study. The secondary data sources include books, journal articles, papers, research reports, NGO reports, documents and reports. In addition, several internet websites were found to be very useful in providing secondary data. Numerous English translated documents and readings were available from web portals and websites. Some of important documents were translated by researchers of ADRC which essentially proved highly benefited for course of this research.

3.12.2 Primary Data Collection

Primary data were gathered mainly from the institutional presentations, tours and field visits and observations. In addition to this, interactive presentation and discussion sessions with officials and experts during the site visits provided firsthand information and insight into the specific disaster planning and countermeasures. The observations made by participating community awareness programs, university and house lectures on disaster management and participating in disaster drills and interacting with local people were very useful and enabled to know more about the Japanese disaster historical events, their culture of safety and protection, community participation and delivery methods to create prepared communities for disasters.

2.2.3 Observation sand Field Visits

During the research period, several field visits were conducted and site observations were made to get in depth knowledge about the effects of past disasters, recovery and reconstruction efforts of recent disasters like Great East Japan Earthquake and Tsunami, various counter measures and disaster prevention and mitigation for sediment disasters, volcanic hazards, landslides, debris flows, storm surge, tsunami and flooding.

2.3 Community Disaster Awareness Programs

Japan provides perhaps one of the best environments to witness and participate in the community disaster awareness programs and events. Researchers were allowed to look, observe, feel and experience lot of events and programs organized by Prefectures, Municipals, Cities, NGOs and other CBOs, NPOs and communities.

2 LITERATURE REVIEW

2.3 Disaster Management Plan

Disaster management is a continuous and integrated multisector, multi-disciplinary process of planning and implementation of measures aimed at; a) prevention or reduction of the risk of disaster; b) relieve of the severity of results of disasters; c) emergency preparedness; d) swift and effective reaction on disasters; and e) after-disaster repair and rehabilitation (KMG n.d).

A Disaster Management Plan is a document describing the organizational structure, its roles and responsibilities and concept of operation covering all aspects of the Disaster Risk Management Continuum and placing emphasis on measures that reduce vulnerability, viz. hazard identification, risk and vulnerability assessment, risk reduction and mitigation, planning and preparedness, emergency response, relief and recovery efforts. Disaster Management Plan can be many forms

notably the overall state plan, regional, local, community and household emergency plans depending upon requirement (KMG n.d).

The purpose of the disaster risk management plan is to enhance the capacity of the actors and institutions to prevent and to deal with disaster and to avoid developments which are subject to high risk of disaster. The Disaster Management Plan is to be seen as an information guide to the relevant role players. It shall advise the role players how to lead in case of a disaster to prevent or at least mitigate negative effects on the community. The plan is the basis to establish procedures which will assure maximum and efficiently utilization of all resources, minimize the loss of life and/or injury. With a comprehensive DMP (Disaster Management Plan), the community will be better prepared to support and in dealing with disasters and to speed up the recovery process. It is crucial to have effective and efficient Disaster Risk Management in order to save lives, prevent escalation of emergencies and incidents and relieve suffering.

The range of deliberate, critical tasks and activities necessary to build, sustain, and improve the operational capability to prevent, protect against, respond to, and recover from incidents. Disaster management attributes for preparedness which contributes to disaster risk reduction through measures taken in advance to ensure effective response to the impact of hazards, including timely and effective early warnings and the temporary evacuation of people and property from threatened locations. Preparedness enables organs of state and other institutions involved in disaster risk management, the private sector, communities and individuals to mobilize, organize, and provide relief measures to deal with an impending or current disaster, or the effects of a disaster. Preparedness differs from prevention and mitigation, as it focuses on activities and measures taken in advance of a specific threat or disaster (KMG n.d).

2.4 Disaster Risk Reduction Strategy and Mainstreaming DRR

Disaster risk is the potential loss expressed in lives, health status, livelihoods, assets and services, which could occur to a particular community or a society due to the impact of a natural hazard. Disaster Risk Reduction (DRR) is a systematic approach to identifying, assessing and reducing

that risk. Specifically, the purpose of DRR is to minimize vulnerabilities and disaster risks throughout a society to avoid (prevent) or limit (mitigate and prepare for) the adverse impacts of natural hazards, as well as to facilitate sustainable development. DRR is also recognized as a key climate change adaptation strategy (UNICEF 2011).

Disaster risk reduction strategies and risk management are approaches that also seek to build resilience and reduce vulnerability, and therefore they offer capacities to support adaptation, in respect to coping with extreme events such as drought, floods and storms as well as addressing longer term issues such as ecosystem degradation that increase vulnerability to these events (UNISDR 2008).

Disaster Risk Reduction Strategy is a cross-cutting, comprehensive, achievable, effective and efficient strategy aiming to reduce the risks. To understand this, the disaster risk management, for governmental officials at all levels, civil society, communities and volunteers as well as the private sector, must be increased through exchange of experiences, lessons learnt, best practices and training and education on disaster risk reduction, including the use of existing mutual mechanisms of training, education and learning (MIAROK 2015**)**.

Mainstreaming of disaster risk reduction (DRR) under Sendai Framework for DRR requires all governments to introduce the DRR perspective in all development policy and planning and implement activities by regional and sub-regional governments to municipal governments (CAO 2015). International, regional, cross-regional and cross-border cooperation remains important in supporting the efforts of countries, their national and local authorities, as well as the business communities on disaster risk reduction. Taking this into consideration and in order to reduce disaster risk, there is a need to address the existing challenges and preparations for future challenges, focusing on monitoring, assessment and understanding of risk disaster and exchange of such information and on how is created the disaster risk management strengthening and coordination of all institutions and relevant sectors and full and meaningful participation of stakeholders in relevant levels.

Prevention of new risks and reduction of current disaster risks, through implementation of integrated and overwhelming economic, structural, legal, social, health, cultural, educational, environmental, technological, political and institutional measures that prevent and reduce the

exposure and vulnerability from disaster risks, increase the preparedness, response and recovery, hence strengthening sustainability (MIAROK 2015**)**.

2.5 Disaster and Development

International Monetary Fund studies over the past few decades illustrate a complex relationship between disasters and development. In general, the recent years have seen a growing trend in regard to direct disaster impacts. Economic damages due to natural disasters have risen from an annual average of $20 billion in the 1990s to approximately $100 billion during 2000–2010 (IMF 2012). A recent World Bank report notes that the impact of extreme natural disasters is equivalent to a global $520 billion loss in annual consumption, and forces some 26 million people into poverty each year (World Bank 2017).

There was a Gross Domestic Products after Great Hanshin Awaji earthquake of 1995 and Great East Japan earthquake depicts steep fall in stock and flow. Caused long term and short economic stagnation due to devastated natural disasters (Toyoda 2016).

An increase in exposure of both population and assets is perceived as the major driver of increasing economic disaster risk. Theoretical and qualitative understanding that development dynamics drive disaster risks, and disaster risk may constraint development opportunities is now widely accepted (IPCC 2012). Sendai Framework DRR regards disasters are an obstacle to poverty eradication and sustainable development, and thus a threat to human security (CAO 2015). Small islands and low income countries, in particular, are highly vulnerable to natural disasters due to their limited ability to absorb large external shocks affecting the economy (Mochizuki et al. 2014).

Natural disasters have direct negative relationship with development of nation or community. Disaster impacts are measured in many different ways such as number of events and some it becomes complex to measure the direct link between development and impact of disasters. However, studies show that poor and developing countries are most affected due to inadequate response and preparedness. Poor disaster management at local and national is seen not functioning well. Either manpower or technical incapacity are blamed for worse results of disasters in

development. With natural disasters risks expected to continue increasing in the foreseeable future, obtaining a clearer understanding of common challenges is crucial (Mochizuki et al. 2014).

Therefore, for smooth development progress communities and governments should manage the disasters events efficiently to minimize risks through mainstreaming disaster risk reduction in development plans. Governments and communities have opportunity to manage ill effects of disasters to development by having adequate institutional and legal support to prioritize DRR activities to gain a formal in development plans. Sustainable economic growth and sustainable development cannot be achieved in many countries without adequate measures to reduce disaster losses by development of disaster resilient societies and disaster prevention and preparedness (CAO 2015).

2.6 Disaster Risk Management (DRM)

Disasters put development achievements at risk in many societies. Often, disasters hurt the most vulnerable and poor communities who live multi-hazard prone areas. However, disasters may not spare the developed world from recurring. The Great East Japan Earthquake and the subsequent Tsunami caused widespread damage and extreme devastation five years ago on March 11, 2011 is a powerful remainder to the world that even the best prepared country will face exceptional disasters (World Bank, 2014).

Most of the developmental gains achieved in the past can be destroyed in a matter of seconds with disasters if not prepared and responded to disasters effectively and efficiently. Adaptation and risk reduction are the most common and the best options to prepare for future climate risks and disasters. Mainstreaming and integrating Disaster Risk Reduction (DRR) and DRM in development planning could help lower the impact of disasters, protect and save lives and property. Furthermore, disaster preparedness and effective countermeasures enhance the coping capacity of the people leading to more resilient communities and nations around the globe (UNISDR 2009).

UNISDR disaster terminology defines DRM as the systematic process of using administrative directives, organizations, and operational skills and capacities to implement strategies, policies and improved coping capacities in order to lessen the adverse impacts of hazards and the possibility of

disaster. This term is an extension of the more general term “risk management” to address the specific issue of disaster risks. Disaster risk management aims to avoid, lessen or transfer the adverse effects of hazards through activities and measures for prevention, mitigation and preparedness.

The ultimate goal of DRM is to build disaster resilient societies and keep achieving sustainable development. Hence, DRM put stronger focus on risk prevention, risk reduction and resilience building in post disaster recovery and reconstruction by supporting principles and practice of ‘Building Back Better’ and safer as well as learning from past disasters. DRM also ensures effective preparedness for communities to respond rapidly, recover better and remain resilient, including to new and deteriorating emergencies.

2.7 International Mechanism and Platforms for DRR

Disaster risk is a global challenge. In many countries, economic and social exposure to natural hazards is increasing. Thus, reducing the risk of disasters requires an all-states and all-stakeholders effort. International mechanism helps to create an enabling environment for the nations to achieve disaster resilience with global partnership, much-needed risk-sensitive investment and sustainable development.

Unlike the traditional response and relief centric approach, more proactive and community based approach of Disaster Risk Reduction (DRR) is popular and preferable by many nations and communities. Lots of initiatives have been taken up to now by the international, regional, national platforms and the local communities to reduce the risk and impact from disastrous events. DRR is a top priority in the development agendas, global forums and platforms. The purpose of these initiatives is to build resilience of nations and communities to future disasters and reduce the disaster loss.

The United Nations International Strategy for Disaster Reduction (UNISDR n.d) system provides a vehicle for cooperation among the international community, Governments, organizations and civil society actors to assist in the formation, adaptation and implementation of the International DRR Frameworks. Furthermore, regional platforms play a vital role in promoting DRR and capacity building in their respective regional countries. Being a member of the Asian Disaster

Reduction Center (ADRC) and SAARC Disaster Management Center (SDMC), Bhutan receives many opportunities and benefits in the field of DRR and related efforts to build resiliency.

A comprehensive approach to reduce disaster risks is set out in the most recent two United Nations-endorsed Frameworks for Action, adopted in 2005 and in 2015 respectively. National Platforms in the countries support better national DRR governance efforts and help to build stronger and more effective national coordination mechanism with the relevant stakeholders.

2.8 Hyogo Framework for Action (HFA)

The Hyogo Framework for Action 2005-2015, which aimed at building the resilience of nations and communities to disasters, was adopted by the governments and organizations at the World Conference on Disaster Risk Reduction in Kobe City, in the Hyogo Prefecture of Japan in January 2005.The conference outcome is known as the Hyogo Framework. Its goal was stated as "the substantial reduction of disaster losses, in lives and in the social, economic and environmental assets of communities and countries" and it set out five Priorities for Action to achieve this, namely (UNISDR n.d):

1) Ensure that disaster risk reduction (DRR) is a national and local priority with a strong institutional basis for implementation.
2) Identify, assess and monitor disaster risks and enhance early warning.
3) Use knowledge, innovation & education to build a culture of safety & resilience at all levels.
4) Reduce the underlying risk factors.
5) Strengthen disaster preparedness for effective response at all levels.

2.9 Sendai Framework for DRR (SFDRR)

The Framework was adopted at the Third UN World Conference on Disaster Risk Reduction in Sendai, Japan, on March 18, 2015. The predecessor to the HFA, also refer as the post-2015 framework for disaster risk reduction offers an important opportunity to renew a broad-based

commitment to building resilience and to support coherence across the post-2015 development agenda and the Sustainable Development Goals (UNISDR, 2015). Currently, Sendai Framework for Disaster Risk Reduction 2015-2030 is the international guideline for DRR.

The SFDRR aims to achieve the substantial reduction of disaster risk and losses in lives, livelihoods and health and in the economic, physical, social, cultural and environmental assets of persons, businesses, communities and countries over the next 15 years. It has four priorities for action to prevent new and reduce existing disaster risks as follows:

(i) Understanding disaster risk;
(ii) Strengthening disaster risk governance to manage disaster risk;
(iii) Investing in disaster reduction for resilience and;
(iv) Enhancing disaster preparedness for effective response and to "Build Back Better" in recovery, rehabilitation and reconstruction.

2.10 Community Based Disaster Risk Reduction (CBDRR)

In the context of disaster risk management, a community can be defined as people living in one geographical area, who are exposed to common hazards due to their location. They may have common experience in responding to hazards and disasters. However, they may have different perceptions of and exposure to risk. Groups within the locality will have a stake in risk reduction measures.

Community-Based Disaster Risk Reduction (CBDRR) is an approach and process of disaster risk management in which communities at risk are actively engaged in the identification, analysis, treatment, monitoring and evaluation of disaster risks in order to reduce their vulnerabilities and enhance their capacities to prevent and withstand damaging effects of hazards (ADPC, 2004). CBDRR contributes to progressive realization of safety, disaster resilience and development of all. Simply put, the aim of CBDRR is to reduce vulnerabilities and strengthen people’s capacity to

cope with hazards. This means that the people are at the heart of decision making and implementation of disaster risk management activities.

2.11 Disaster Risk Management Cycle

When a disaster strikes, emergency response and relief are taken, then recovery and reconstruction work follows. Society learns lessons from the disaster and takes countermeasures for future disasters to prevent and mitigate possible loss and damages. Then, preparedness is carried out for future disasters. The figure below shows disaster management cycle.

Figure 0.2 Disaster Management Cycle

Source: https://sites.google.com/site/dimersarred/disaster-management-cycle

Mitigation: Measures that prevent or reduce the impact of disasters.

Preparedness: Planning, training, & educational activities for things that cant be mitigated.

Response: The immediate aftermath of a disaster, when business is not as usual.

Recovery: The long-term aftermath of a disaster, when restoration efforts are in addition to regular services. Management (or disaster management) is the discipline dealing of with and avoiding risks. It is a discipline that involves preparing, supporting, and rebuilding society when natural or human-made disasters occur.

2.12 Disaster Preparedness for Response

Preparedness has been defined as "the capacities and knowledge developed by governments, professional response organizations, communities and individuals to anticipate and respond effectively to the impact of likely, imminent or current hazards or conditions" (UNISDR, 2009b).

In order to lower the impacts of natural disaster, it is desirable to make damage itself as small as possible by preventive measures. However, it is impossible to protect all areas from all disasters, and also there is a budget limitation to do so. For these reasons, in order to protect lives from a natural disaster, it is important to response with better preparedness immediately before and after the occurrence of the disaster event. Response with better preparedness means to forecast the occurrence of natural disasters in early stage, quickly disseminate the forecast and warning information, appropriately alerts or evacuate people in accordance with the information and once a disaster occurs, immediately provide relief to victims and suffered areas (lifesaving, medical care and relief supplies (JICA, 2014).

Preparedness activities are a critical part of corrective disaster risk management in that certain risks, particularly those associated with mortality and morbidity can be reduced through anticipation and response. Put simply, if a prepared population is able to evacuate an area before a major flood, lives will be saved and mortality and morbidity risk will therefore be lower. At the same time, preparedness is part of compensatory risk management and helps strengthen resilience. Well-organized emergency assistance based on contingency plans can help households and communities to buffer disaster losses, recover more quickly and avoid the translation of loss into broader impacts.

Strengthening early warning systems, disaster preparedness and response capacities is vital to minimize the human losses and damages to the property, livelihood assets and critical infrastructure of the communities. The basic requirements for a prepared community are:

a. Alert, informed and active community members;
b. Effective community organizations with identified and constructive roles in local emergency management arrangements;
c. Local governments which acknowledge their roles in community safety issues and which have well established, widely understood and practiced arrangements for discharging their community safety responsibilities; and
d. Organizations and communities being able to work together to respond to the emergency, save lives and property, and assist the community to recover.

Increased awareness on vulnerability and disaster risk to the island settlements is very important to make proactive disaster preparedness culture in the mindsets of the local island community people. Conducting and promoting regular disaster preparedness exercises, including evacuation drills, with a view to ensuring rapid and effective disaster response is a crucial part of disaster preparedness.

Preparing to respond to, and mitigate the impact of, disasters as well as delivering assistance during and after the incident comprise the 'preparedness and response' aspect of dealing with disasters. Activities included under this umbrella are the activities of government at all levels, as well as of the private sector, communities, individuals, volunteers, and non-governmental organizations.

Most of the developmental gains achieved in the past can be destroyed in a matter of seconds with disasters if not prepared and responded to disasters effectively and efficiently. Emergency Response is a set of activities implemented soon after a hazard event, designed to save lives, reduce suffering and promote speedy recovery, utilizing any remaining capacities of the community. Effective response depends on integration of the whole community and all partners executing their roles and responsibilities.

Local communities play a key role in preparing for disastrous events and are normally the first responders to take action. During GEJE on March 11, 2011, community based organizations were

very active in the disaster response and saved countless human lives. The foundation for effective disaster preparedness and response is laid at the local level. Well prepared local communities can often significantly reduce their disaster losses, even if national level emergency management structures collapse or fail to respond. In contrast, even the best organized disaster management at the national level may be ineffective if local preparedness capacities are weak or non-existent (CAO 2016b).

3 DISATER RISK PROFILE AND TURNING POINTS IN DISASTER MANAGEMENT

5.7 Disaster Risk Profile of Japan

With its geo-physical characteristics Japan is prone to virtually every type of natural disaster. A multiple natural disaster events occurred in the past. Historically, destructive natural disasters have stood the greatest challenge for Japanese and its people. Harsh geographical, rugged topographical and uneven climatic conditions of the country have made it one of the most disaster prone countries in the world. Although its territory accounts merely for the 0.25 percent of the planet's land area, Japan is subject to about 20.5 percent earthquakes with the magnitude 6 or more and 7 percent the world's active volcanoes are located on its territory.

The most frequent natural hazards in Japan are earthquakes, tsunamis, typhoons, volcano eruptions, floods and landslides. Occasional torrential rains and heavy snows are another challenge for the country. The high number of earthquakes, tsunamis and active volcanoes are the conditioned by the fact that territory of Japan forms the part Circum-Pacific Seismic Belt which is sometimes called as Pacific Ring of Fire (CAO- n.d).

Japan is located at the junction of 4 tectonic plates – Eurasian Plate, North American Plate, Pacific Plate and Philippine Sea –which is the cause of high seismicity of its territory. Tsunamis are triggered by strong earthquakes at ocean bottom or huge landslides in the vicinity of the coast.

Typhoons and rain front are the main causes of storm and flood disasters in Japan. About 10 typhoons hit Japan causing storm, tidal wave and high tides mainly during the period between May and October with August and September. 1959 year is considered to be turning point in fighting

with typhoons – in that after Isewan typhoon which caused to the death of more than 5000. Since then as a result of set of measures taken and application new technological advancements by Japan Meteorological Agency (JMA) number of dead or missing peoples in the result of typhoons sharply decreased (CAO n.d).

Fire vulnerability and risk in Japan is high. This is mainly due to large forest areas which cover about 70 percent of its total area, highly developed chemical and high-technology industries and close proximity of buildings in densely populated areas. Wildfires in Japan occur usually in dry seasons, mainly in summer. Moreover, tsunamis and earthquakes are also likely to entail large-scale fires in its immediate aftermath. About 7000 fire cases occurred in immediate aftermath of the Great Hanshin-Awaji earthquake in 1995.

Rivers in Japan are short and steep and flow rapidly and violently. Moreover, ratio between normal volume of flow and that during a storm is extremely great. A great amount of rain falls on the Japanese archipelago during the rainy season (heavy rains of June and July) and typhoon seasons; and during periods of intensive rainfall, even a small stream that usually runs low may become a raging torrent. Moreover, combination of such factors as steep mountains, fast-flowing rivers, unstable and soft ground, rainy climate and frequent earthquakes often lead to such sediment disasters as debris flows, landslides and slope failures (CAO 2016b).

5.8 Major Recent Disasters and Paradigm Shift in Disaster Management

5.8.1 Disaster Risk Reduction Strategy

Disaster risk reduction strategies and risk management are approaches that also seek to build resilience and reduce vulnerability, and therefore they offer capacities to support adaptation, in respect to coping with extreme events such as drought, floods and storms as well as addressing longer term issues such as ecosystem degradation that increase vulnerability to these events. Disaster risk and the adverse impacts of natural hazards can be reduced by monitoring, systematically analysing and managing the causes of disasters, including by avoiding hazards, reducing social and economic vulnerability, and improving preparedness for response to adverse hazard events. Natural hazards by themselves do not cause disasters; it is the combination of an

exposed, vulnerable and ill-prepared population or community with a hazard event that results in a disaster. Human activity, such as land use changes, environmental exploitation and unplanned settlement, often exacerbates the level of disaster risk (UNISDR 2008).As per Hyogo Framework of Action there are three Strategic Goals: a) The integration of disaster risk reduction into sustainable development policies and planning b) The development and strengthening of institutions, mechanisms and capacities at all levels, in particular at the community level, that can contribute to building resilience to hazards c) The systematic incorporation of risk reduction approaches into the implementation of emergency preparedness, response and recovery programs (CAO 2015).

Based on these concepts, the Hyogo Framework sets out strategies for reducing disaster risks through the five priorities for action:

1. Ensure that disaster risk reduction (DRR) is a national and a local priority with a strong institutional basis for implementation Creation of National institutional and legislative frameworks, etc.
2. Identify, assess and monitor disaster risks and enhance early warning National and local risk assessments (Development of risk maps, Development of systems of indicators of disaster risk), etc. and vulnerability
3. Use knowledge, innovation and education to build a culture of safety and resilience at all levels Information exchange, research, public awareness (engagement of media, sustained public education campaign), etc.
4. Reduce the underlying risk factors Improvement of earthquake resistance of the important public facilities and infrastructure, etc.
5. Strengthen disaster preparedness for effective response at all levels Preparation of contingency plans and policies at all levels, promotion of disaster preparedness exercises, etc. Strengthen disaster preparedness for effective response (CAO 2015 and UNISDR 2008).

As per UNISDR these priority areas, three immediate and cost-effective areas where action can be taken to advance adaptation to climate change through disaster risk reduction are as follows:

Risk assessments

These involve the collection and summary of national risk information, including socio-economic data on existing vulnerability and capacity. They should cover the entire territory and all populations, and should be routinely updated to assess emerging risks including those related to climate change. The information is most often represented in risk maps. It should be made widely available to all relevant users, in order to support policymaking, raise community awareness, and enable populations to reduce their own risks.

Early warning systems

Effective early warning systems involve four elements: risk knowledge, monitoring and warning service, dissemination and communication, and response capability. Early warning systems are highly effective in saving lives and livelihoods. Although all four elements of the system need to be strengthened in many countries, it is the communication of warnings and people's readiness to act that usually fails in disasters.

Sector-specific risk reduction plans

To be effective, national plans and strategies to reduce disaster risk need to be integrated in the plans and programmes of every sector and area of development. Land-use planning, the locating of critical infrastructure, the management of natural resources, the protection of key assets-all should ensure that risk is identified and reduced at all stages from planning through to implementation (UNISDR 2008).

- Climate system is fundamental to both issues: 75% of all disasters are originated by weather & climate extremes.
- DRR and CCA strategies both are aimed at enhancing sustainability, resilient societies and human security.

- Similar sectoral focus, complexities & challenges, rely on same type of measures and policies.
- DRR offers opportunities for bottom-up strategies for adaptation to current climate variability and climate extremes.
- DRR can promote early adaptation to CC.
- DRR offers a way to address some of the main obstacles (economic, political, social, technological, and institutional) to develop total potential for adaptation.

Disaster risk reduction as part of enhanced action on climate change adaptation. Calls for:
"Disaster reduction strategies and means to address loss and damage associated with climate change impacts in developing countries that are particularly vulnerable to the adverse effects of climate change"

The inclusion of disaster risk reduction reflects (UNISDR 2008):

- Recognition that climate change adaptation should benefit from experience in reducing disaster risk
- Opportunity to build synergies: e.g., disseminate existing tools, scale-up successful risk reduction efforts
- A shift in the climate negotiations to integrate the agendas on mitigation, adaptation, technology transfer and funding

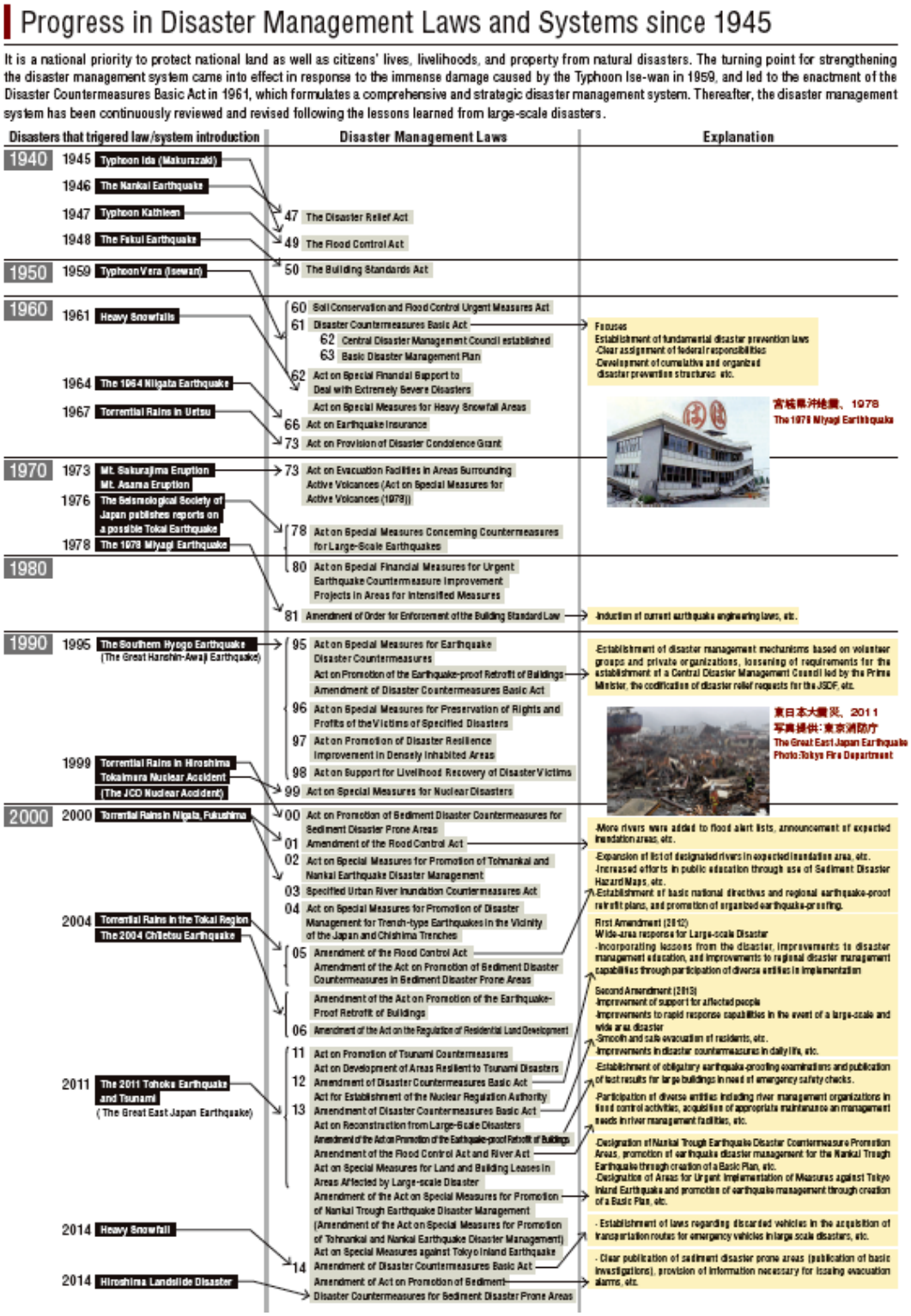

Fig: 4.1 Events Leading to Enactment of New laws and Modifications

Source: CAO-Disaster management in Japan report, Government of Japan.

5.8.2 Nankai Earthquake 1945 and Disaster Relief Act 1947

The Nankai Trough is a convergent boundary where the Philippine Sea Plate is being subducted beneath the Eurasian Plate. Large earthquakes have been recorded along this zone since the 7th century, with a recurrence time of 100 to 200 years. The 1946 Nankai earthquake was unusual in its seismological perspective, with a rupture zone estimated from long-period geodetic data that was more than twice as large as that derived from shorter period seismic data. In the center of this earthquake rupture zone, scientists used densely deployed ocean bottom seismographs to detect a subducted seamount 13 kilometres (8 mi) thick by 50 kilometres (31 mi) wide at a depth of 10 kilometres (6 mi). Scientists propose that this seamount might work as a barrier inhibiting brittle seismogenic rupture. The Disaster Relief Act was enacted by the parliament in 1947 after Nankai earthquake (CAO).

5.8.3 Typhoon Ise-wan 1959 and Disaster Countermeasures Basic Act 1961

Hit Nagoya city and surrounding region, killing more than 5 K people; Abnormally high storm surge (3.55 m at maximum); Weak structure and insufficient height of coastal dykes; People settled in low-lying areas, many of which were reclaimed from the sea for the use of agriculture, industries, etc.; Moreover, they were subsiding because of groundwater withdrawal; Lack of preparedness, lack of effective early warning system and communication system to reach out to individual communities (CAO n.d).

5.8.4 Nigata Earthquake 1964 and Act on Earthquake Insurance 1966

The earthquake had a magnitude of 7.6 on the moment magnitude scale, but the relatively deep focal depth of 34 km meant that the perceived intensities on the coast of Honshu were generally VIII (*Severe*) or less on the Mercalli intensity scale, on consolidated ground.The calculated focal mechanism indicates reverse faulting on a west-dipping fault trending N20°E.

The first wave of the tsunami hit Niigata City approximately 15 minutes after the earthquake. It caused flooding damage on Sado Island, Awa Island, and as far away as the Oki Islands in Shimane Prefecture. The wave reached heights of 3 m at Ryōtsu Harbor, 4 m at Shiotani and near Iwafune Harbor, and between 1 and 2 m at Naoetsu. It was also reported that due to the run-up that occurs on sandy beaches the wave reached 6 m in some places. The first wave was the highest in many places, but the third was reportedly higher in others. The ensuing waves came at intervals of 20 and 50 minutes. Flooding caused by the tsunami persisted in some areas for up to a month (CAO n.d).

Due to urbanization and modernization in Niigata City and the surrounding area, in order to extract water-soluble natural gas in the ground water, water pumping quickly increased in 1950. As a result, land subsidence became a serious problem. Since 1959, thanks to restrictions on the extractions of natural gas and ground water in the Niigata city area, large scale land subsidence has lessened. However, in that period the ground was observed to settle an average of 20 cm a year. This land subsidence, the liquefaction in the inner city, and the tsunami all contributed to the massive inundation damage during the earthquake.
New laws concerning earthquake insurance were enacted in June 1966 in response to this earthquake (CAO n.d).

5.8.5 Great Hanshin-Awaji Earthquake 17 January 1995 (Various Special Acts and Amendments-Act on Support for Livelihood Recovery of Victims 1998.

On 17 January 1995, an earthquake with a 7.3 on the Richter scale occurred at Awaji island of Hyogo Prefecture in Western Japan. It killed 6,434 people, injured 43,792 people, destroyed 104,906 houses, half destroyed 144,274 houses, and partially destroyed 390,506 houses. By the fires broke out along with the earthquake, the area of 835,858 square meters was burnt down (CAO n.d).

Directly hit Kobe and surrounding areas, resulting in the deaths of more than 6 K people; Also damaged administrative and industrial functions and communication and transport networks; Little

knowledge about an island earthquake and no preparation; More than 80 % of victims were killed by collapse of buildings: enforcement of building regulations and retrofitting; Most of the victims buried under debris were rescued by families and neighbors. This great event triggered the government to come up with various Special Acts and amendments were enacted on Support for Livelihood Recovery of Victims in 1998 (CAO n.d).

On the other hand, it is worth discussing the Kobe City Recovery Plan and this big event has change the perception of mind of all communities especially the locals, academicians, local government, experts, teachers and parliamentarians. Many changes where brought in after this event in every sectors and given the world to learning from it (Kobe 2010).

The Kobe Recovery Plan was drawn consisting of various aspects:

1. Infrastructure reconstruction such as roads, lifeline and railways.
2. Housing construction
3. Reviving economic vitalization.
4. Urban planning.
5. Livelihood recovery

The plan was implemented in two stages; the first is to indicate a direction of recovery in a form of guidelines. During this period discussion were held with experts and high level proposals were issued quickly to recovery from the disasters. Second stage is an implementations of plans based on guidelines and details of plans were drowned and discussed by member committee consisting of 100 diverse set of experts. Selected a symbol project which provide a framework of recovery and reconstruction.

The features of recovery plan guideline are as follows:

1. Give priority to Kobe's restoration and regeneration as an advanced city outlook based on experience and lessons.
2. Recovery goal is set 2005.
3. Imminent goals are safety, vitality, attraction and cooperation.
4. Safe city standard was set to make a disaster proof community.
5. District plan for each districts was sort out.

Community recovery plan gained high attention as damage brought up by the earthquake touched almost all aspects of livelihood of people. Therefore, recovery process has built on working together concept where people can live, work and study safely around the city in harmony with business and the government. One of specific goals of recovery plan is 'securing citizen's life'; high quality housing, developing a living environment compatible with the local character, upgrading health and welfare services and preparing a good nurturing atmosphere for young people.

Appeal of Kobe was key campaigns of recovery and promoted 'Community Creation by Working Together'. The community has been being rebuilt by its people through unique cooperation and collaboration among different classes. Promoted higher caliber of volunteer activities since after the earthquake disaster most of victims are helped by relatives of its neighbors. So this was a great lesson for Japanese to put community at high stack in disaster management. Therefore, creative volunteer activities are promoted all over Japan and engages community in every aspects of activities in promoting disaster resilient society (Kobe 2010).

After Kobe earthquake it is also realized that creating a safe city is important especially safe structures. Secondly having an integrated daily life and emergency preparedness in such a way that it can take advantage of those things that afford the people with comfort and convenience in daily life even during times of disasters. Thirdly, role play by central and local government as well as private sectors, businesses, NGOs and community is very important especially planning and integrated action is desired to achieve make safer future.

Features of Kobe recovery plan is based on 'Local Government based Recovery Planning' however special legal support to secure a budget for recovery was not materialized by central government and no clear numeric targets in the plan resulted in wakening target over time.

Lessons (Kobe 2010)

1. Concept of disaster risk reduction emerged.
2. Building codes and safety features gained momentum
3. Change of people perception on disasters.
4. Self-help concept gain place in community disaster management
5. Actions not usually done in daily lives will surely not be undertaken in disaster situations.
6. With times recovery changes.

7. Recovery should be tackled flexibly through an interrelated recovery field.
8. Community development is accomplished or enhanced by individual self-governing activities.
9. Individual participation and collaboration is essential for community development.
10. Recovery means the challenge to propose and create new system.
11. Foster social capital by promoting horizontal and open networks.

5.8.6 Mid Niigata Prefecture Earthquake (October 2004) and Amendments on Support for Livelihood Recovery of Victims 1998 Act- 2007.

On 23 October 2004, the Mid Niigata Prefecture was affected by an earthquake with a 6.8 on the Richter scale. Landslides and destruction of buildings and houses caused 68 dead, and 4,805 injured. 3,175 houses were totally destroyed, 13,810 houses were half destroyed, and 105,573 houses were partially destroyed. In response to this disaster amendment on Supports for Livelihood Recovery of Victims 1998 Act was made in 2007 (CAO n.d).

5.8.7 The Great East Japan Earthquake 11 March 2011

A magnitude 9.0 earthquake hit the northeastern Japan on 11 March 2011, recording the largest earthquake hit in Japan. Its epicenter was located in the coast of Sanriku and its epicentral area stretched from the coasts of Iwate Prefecture to Ibaraki Prefecture. Massive shakes were observed particularly in eastern Japan including Japanese intensity scale of 7 registered in the north of Miyagi Prefecture. Furthermore, this earthquake, a trench-type earthquake occurred near the boundary of the Pacific Plate and the plate beneath Tohoku area, triggered seafloor movements and generated massive tsunami. According to the National Police Agency, this earthquake and tsunami have left unprecedented human suffering: 15,870 people death, 2,814 people missing and 6,114 people injured, as well as property damage: 129,472 totally collapsed buildings, 255,977 half collapsed buildings and 702,928 partially collapsed buildings. Furthermore, the value of the destruction of the social infrastructure, housing, and corporate facilities was estimated at 16.9 trillion yen and it had a great impact on Japanese economy. Several special Acts and Amendments are made in response (Shaw and Takeuchi 2012, CAO n.d).

There were about 470,000 evacuees located primarily in the prefectures of Iwate, Miyagi, and Fukushima (as of March 14, 2011), but that number has fallen to just over 341,000 (as of May 10, 2012). Of those, 254 are still living in evacuation shelters while the remainder are living in emergency temporary housing or public housing (in about 1,200 municipalities across all 47 Japanese prefectures). In terms of the infrastructure and public services, considerable progress has been made on emergency restoration activities, except in areas where homes and other structures were washed away and in the nuclear accident hazard zone. To provide reconstruction support for businesses, the government has adopted support measures to provide a total of ¥22.6 trillion in basic operating costs through Great East Japan Earthquake Recovery Special Loans and the Great East Japan Earthquake Recovery Emergency Guarantee Program (as of April 20, 2012). The Organization for Small and Medium Enterprises and Regional Innovation is providing support for temporary shops and factories, and operations have launched at 433 locations. Support is being provided to farmers to facilitate the procurement of capital needed for restarting their operations, and 4,090 businesses accounting for about 40% of the agricultural businesses that sustained tsunami damage, have restarted their operations (as of March 11, 2012). About half (417) of the seafood processing facilities that were damaged across the three affected prefectures have restarted their operations (as of April 2, 2012).

Establishment of the Reconstruction Agency (February 2012) System of Special Zones for Reconstruction Approval has been given to 14 Reconstruction Promotion Plans (in five prefectures) formulated independently or jointly by prefectural and municipal governments in a bid for access to special treatment with regard to individual regulations and procedures, and special tax breaks (as of April 2012). In areas promoting community development, Reconstruction Project Plans formulated by municipal governments independently or jointly with the prefecture in a bid for access to special permits and procedures with regard to land use restructuring, have been announced by four municipalities in Iwate Prefecture and five municipalities in Miyagi Prefecture (as of the end of April 2012). Reconstruction Grant System A reconstruction grant system has been established to enable downtown reconstruction to be pursued all at once. In the first round, grants were awarded to 59 municipalities in seven prefectures on March 2, 2012. The amounts distributed were ¥305.3 billion in operating costs and ¥250.9 billion in government costs. The Great East Japan Earthquake Enterprise Turnaround Support Agency was established (February 2012) to address the double-loan problem being faced by businesses.

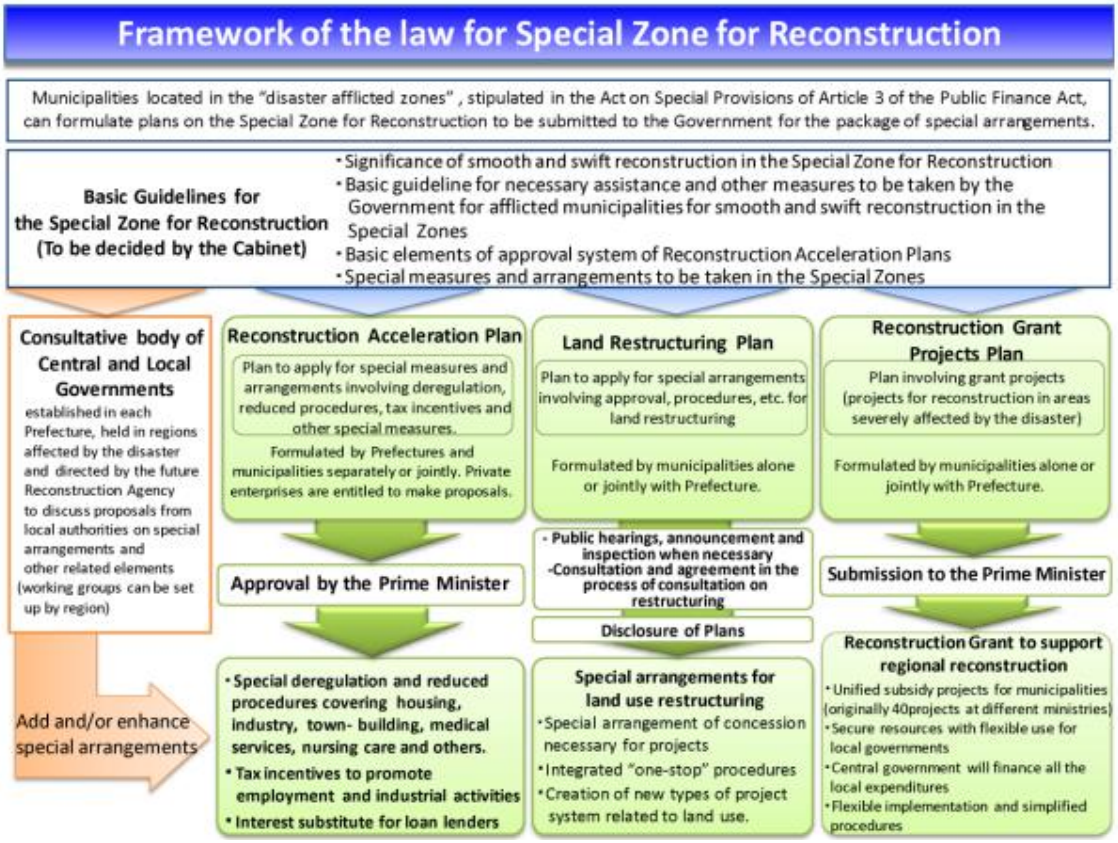

Fig: 4.2 Framework of the Law for Special Zone for ReconstructionSource : Disaster Management of Japan, Cabinet Office.

4.2.8 The Kumamoto Earthquake 2016

In 2016, April 14 a magnitude 6.5 earthquake struck the Kumamoto region of Kumamoto Prefecture, with a seismic intensity of 7 observed in Mashiki Town, Kumamoto Prefecture. This was followed by a magnitude 7.3 earthquake at 01:25 on April 16, with a seismic intensity of 7 observed in Mashiki Town and Nishihara Village. These two violent tremors occurred within a short time of each other and triggered intense seismic activity from the Kumamoto district to the Aso district, along with central Oita Prefecture. As a result, there was immense damage in both Kumamoto and Oita prefectures, primarily in Mashiki Town and Nishihara Village.

Cabinet Office of Japan reports (2017) that the government endeavored to ensure that recovery following the Kumamoto Earthquake were carried out promptly, including emergency recovery transport infrastructure to facilitate the distribution of supplies to the affected areas and recovery of rivers to prevent secondary damage. In addition to what has been learned from the stock of examples amassed since the Great East Japan Earthquake, a great deal of inspiration was obtained from new initiatives such as push-mode support and collaboration between NPOs and local government bodies. The national government, and prefectural and municipal governments must use these lessons to strengthen the systems needed in times of disaster, as well as enhancing their partnership and coordination functions. In addition, it is necessary to establish and revise the requisite systems, guidelines, and manuals (CAO 2017).

4.3 Disaster Risk Profile of Bhutan

4.3.1 Earthquake of 2009 and 2011-Recovery Plan

The earthquake of 6.3 magnitude on the Richter Scale, that struck Eastern Bhutan, with its epicentre in Narang, Mongar, on September 21, 2009 at 2:53 p.m. has been the most damaging disaster that Bhutan has experienced in recent times. The earthquake lasted for 95 seconds and had a shallow depth of 10 Km in and around the epicentre. The earthquake has been confirmed as from the Main Central Thrust, which is the nearest reverse fault to the epicentre. More than 100 aftershocks and two major earthquakes of 5.3 and 5.5 magnitude on the Richter Scale (i.e. 29October, 2009 and 31December, 2009 respectively) have been recorded after the September 21, 2009 earthquake, which have caused further damages to rural homes and other properties.

	Sector	Approximate Loss (Nu. Million)	Approximate loss (USD Million)
1	Shelter	1119	23.3
2	Education	594	12.3
3	Cultural Heritage	650	13.5
4	Health	124	2.6
5	Govt. and Public Offices	14	0.3
	Approx. Total Loss	**2501**	**52**

Damages and Loses, Source: *National Recovery and Re-Construction Plan Document*

Bhutan Recovery and Re-construction Project was approved and implemented by sectors under local government administrations and project amount is USD 450,000 in total. The Project has three Components:

1. Support restoration of social and community services,

2. Support regeneration of rural livelihoods and to

3. Build recovery and response capacities.

Formulation of the Recovery and Re-Construction Plan

As there is need for a unified and multi-sectoral strategy, to effectively and urgently undertake the re-construction process, three National Stakeholder Meetings have been conducted to facilitate formulation of the Comprehensive National Recovery and Re-Construction Plan. The Plan, Implementation Strategies and the Proposed Coordination Mechanism were presented in the 60Session of the Cabinet Meeting on 29December, 2009. The main Resolutions of the three Stakeholder Meetings and directives of the Lhengye Zhungtshog, (to carry out the Recovery and Re-construction activities in the field) were as
follows:

- Concerned Sectors would take the lead role in implementing all recovery and re-construction activities in their concerned areas. The Sectors are to finalize their Dzongkhag-wise prioritized activities and work in close coordination with concerned Dzongkhag Administrations, the GNH Commission and the Ministry of Finance to re-appropriate the required fund, as much as possible, from within the 10FYP budget outlay.

- A Recovery and Re-Construction Coordination Mechanism has been adopted to oversee implementation of recovery and re-construction activities as
planned.

5 DISASTER MANAGEMENT SYSTEM IN JAPAN AND BHUTAN

5.1 Disaster Management System in Japan

It is a national priority to protect national land as well as citizens' lives, livelihoods, and property from natural disasters. The turning point for strengthening the disaster management system came into effect in response to the immense damage caused by the Typhoon Ise-wan in 1959, and led to the enactment of the Disaster Countermeasures Basic Act in 1961, which formulates a comprehensive and strategic disaster management system. Thereafter, the disaster management system has been continuously reviewed and revised following the lessons learned from large-scale disasters such as the Great Hanshin-Awaji Earthquake in 1995 and the Great East Japan Earthquake and Tsunami in 2011and the nuclear disaster (CAO, 2015). Response mechanisms to emergencies are specified in the Basic law on Natural Disasters as well as in a series of contingency-related laws.

5.2 **Administrative and Legal System**

At the national level Central Disaster Management Council, the apex body for DM in Japan is housed within the Cabinet Office headed by the Prime Minister. Along with a series of reforms of the central government system in 2001, the post of Minister of State for DM was newly established to integrate and coordinate disaster reduction policies and measures of ministries and agencies. In

the Cabinet Office, which is responsible for securing cooperation and collaboration among related government organizations in the wide-razing issues, the Director-General of Disaster Management is mandated to undertake the planning of basic disaster management policies and response to large-scale disasters, as well as conduct overall coordination.

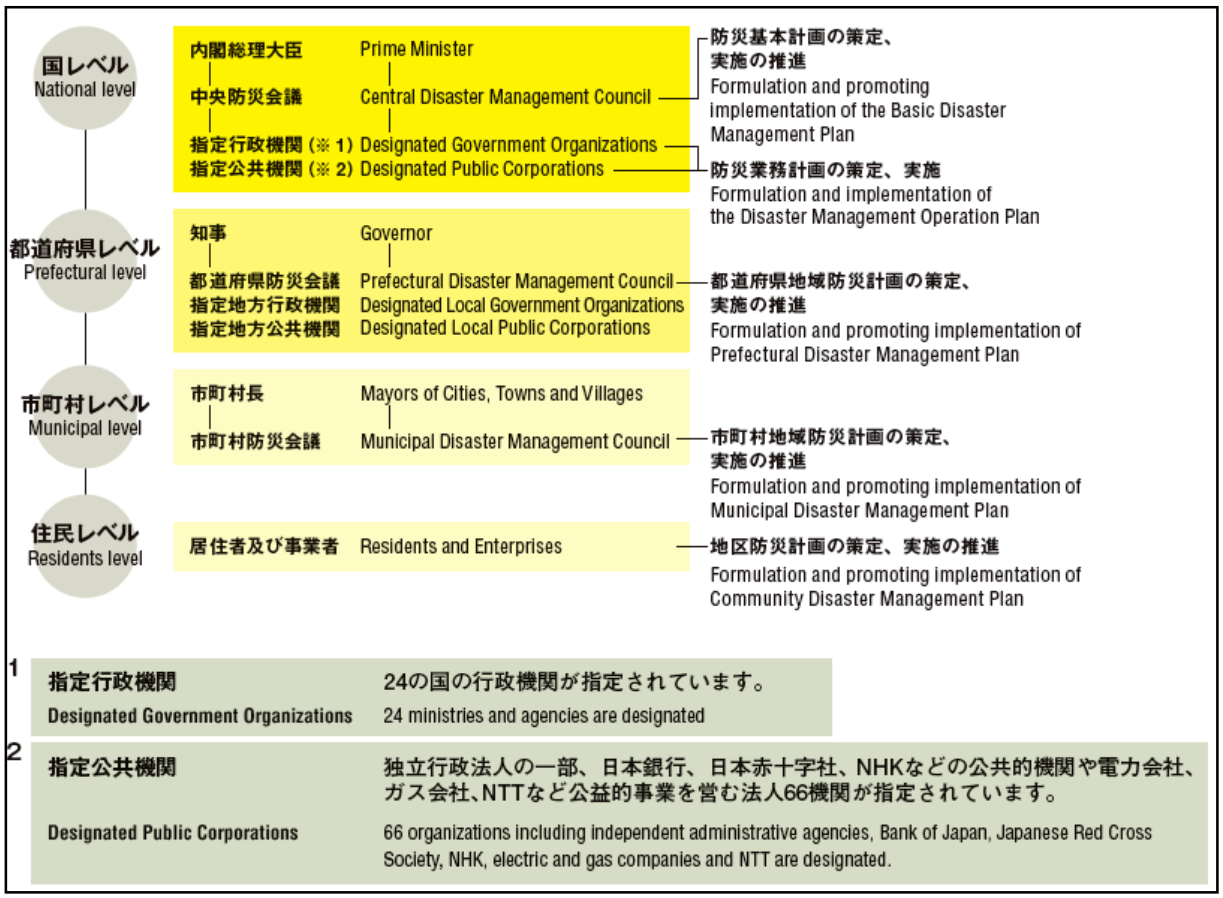

Figure 0.1 Outline of the Disaster Management System in Japan

5.2.1 Legal

It was major disasters in the Japanese history that triggered the introduction of disaster management Acts and Laws which enabled to form a comprehensive disaster management system in Japan. Japan's legislation for disaster management system, including the Disaster Countermeasures Basic Act, addresses all of the disaster phases of prevention, mitigation and preparedness, emergency response as well as recovery and reconstruction with roles and

responsibilities among the national and local governments clearly defined, it is stipulated that the relevant entities of the public and private sectors are to cooperate in implementing various disaster countermeasures.

In Japan, the DM system has been developed and strengthened following the bitter experience of large-scale natural disasters and accidents over the years. The country has 7 basic acts, 18 disaster prevention and preparedness legislations, 3 legislations governing disaster emergency response and 23 disaster recovery and reconstruction and financial measures acts. The first act for the disaster response i.e. Disaster Relief Act dates back to 1947, passed after the 1946 Nankai earthquake. Thereafter every disaster led to learning and experience and it led to passing of new legislation. There is almost a separate legislation for each disaster and separate legislation for every aspect of disasters such as prevention, preparedness, response, rehabilitation and recovery, building standard, financial measures, earthquake insurance, etc.

The most notable piece of legislation is the Act passed in 2002 namely 'Act on Special Measures for Promotion of Tonankai and Nankai Earthquake Disaster Management'. The country is expecting mega earthquakes which may arise out of Tonankai and Nankai troughs and this legislation aims at reducing possible impact from these earthquakes and preparing the country to face them.

The Disaster Countermeasures Basic Act has constantly been reviewed and amended since its first enactment, and with lessons learned from the Great East Japan Earthquake, provisions were added including enhancement of the measures concerning support activities mutually done by local governments in 2012 and the measures for ensuring smooth and safe evacuation of residents and improving protection of affected people in 2013. In 2014, provisions were added for strengthening measures against unattended cars in order to promptly clear them from the roads for emergency vehicles.

5.2.3 Institutional

The highest and the supreme body for the disaster management in Japan is the Cabinet Office (CAO). Along with a series of reforms of the central government system in2001, the post of Minister of State for Disaster Management was newly established to integrate and coordinate disaster risk management policies and measures of ministries and agencies. In the Cabinet Office,

which is responsible for securing cooperation and collaboration among related government organizations in wide-ranging issues, the Director-General for Disaster Management is mandated to undertake the planning of basic disaster management policies and response to large-scale disasters, aswell as conduct overall coordination.

In the event of a large-scale disaster, the Cabinet Office is engaged in collection and dissemination of accurate information, reporting to the Prime Minister, establishment of the emergency activities system including the Government's Disaster Management Headquarters, overall wide area coordination concerning disaster response measures.

Central Disaster Management Council (CDMC)

To prepare for disasters, the Central Disaster Management Council decides the national government's disaster management policies. Such decisions are carried out by respective ministries and agencies, accordingly. The Central Disaster Management Council is one of the councils that deal with crucial policies of the Cabinet, and is established in the Cabinet Office based on the Disaster Countermeasures Basic Act.

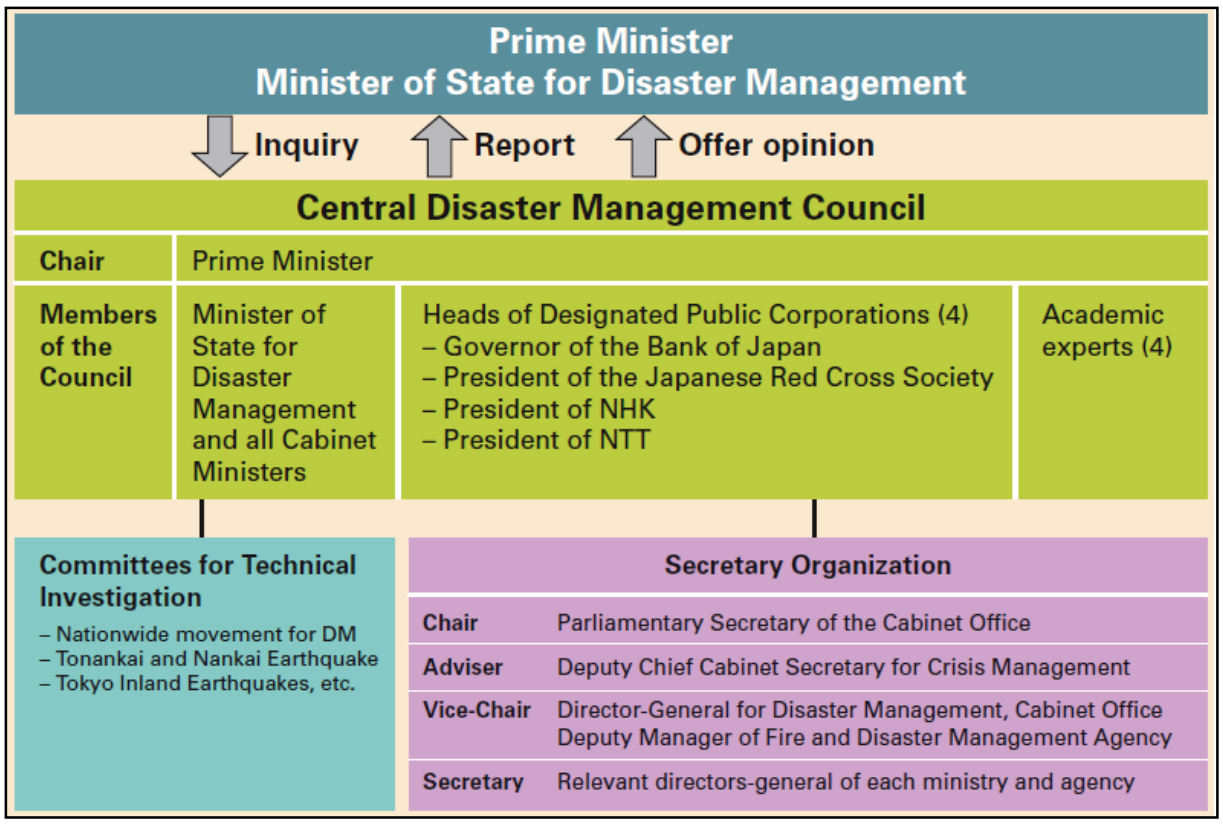

Figure 0.2 Structure of the Central Disaster Management Council Source: Cabinet Office Japan

The Council consists of the Prime Minister as the chairperson, all members of the Cabinet, heads of major public corporations and experts. The Council develops the Basic Disaster Management Plan and establishes basic disaster management policies, and plays a role of promoting comprehensive disaster countermeasures including deliberating important issues on disaster management upon requests from the Prime Minister or Minister of State for Disaster Management. The duties of the Central Disaster Management Council are to:

- Formulate and promote implementation of the Basic Disaster Management Plan and Earthquake Countermeasures Plans;
- Formulate and promote implementation of the urgent measures plan for major disasters;
- Deliberate on important disaster reduction issues, in response to requests from the Prime Minister or Minister of State for Disaster Management (basic disaster management policies,

overall coordination of disaster countermeasures and declaration of state of disaster emergency);

- Offer opinions regarding important disaster reduction issues to the Prime Minister and Minister of State for Disaster Management.

5.2.4 Disaster Management Plans

In Japan Disaster Management Planning is done at three levels namely:-

Disaster Management Planning System

Basic Disaster Management Plan: This plan is the highest-level plan and constitutes the basis for disaster management activities prepared by the Central Disaster Management Council based on the Disaster Countermeasures Basic Act.

Disaster Management Operation Plan: This is a plan made by each designated government organization and designated public corporation based on the Basic Disaster Management Plan.

Local Disaster Management Plan: This is a plan made by each Prefectural and Municipal Disaster Management Council, subject to local circumstances and based on the Basic Disaster Management Plan.

Community Disaster Management Plan: This is a disaster management activities plan at the community level which is established by residents and businesses jointly on a voluntary basis. In order to encourage and promote proactive disaster management activities among residents (including both individual and corporate residents) in a given area based on the spirit of self-help and mutual help, and to enhance the disaster management capabilities of the area in a bottoms-up manner, it is stipulated that a community disaster management plan, featuring the community level disaster management activities, may be prescribed in the municipal area disaster management plan(CAO n.d).

In developing a community disaster management plan, more active and proactive participation of the area residents is necessary at an early stage of such development. As such, it is stipulated that the area residents may jointly make a proposal (proposed plan) to the municipal disaster

management council that a community disaster management plan be stipulated in the municipal disaster management plan (CAO n.d).

Basic Disaster Management Plan

The Basic Disaster Management Plan is a basic plan for disaster management in Japan, which is prepared by the Central Disaster Management Council in accordance with Article 34 of the Disaster Countermeasures Basic Act. Local governments are required to prepare Local Disaster Management Plans, while Designated Administrative Organizations and Designated Public Corporations are required to prepare Disaster Management Operations Plans, which must be based on the Basic Disaster Management Plan (CAO 2016). The Basic Disaster Management Plan is also a comprehensive and long term disaster management plan forming a foundation for the Disaster Management Operations Plan and Local Disaster Management Plan. It is the most over-arching plan and stipulates provisions for the establishment of the disaster management system, promotion of disaster management measures, acceleration of post disaster recovery and reconstruction measures, and promotion of scientific and technological research on disaster management.

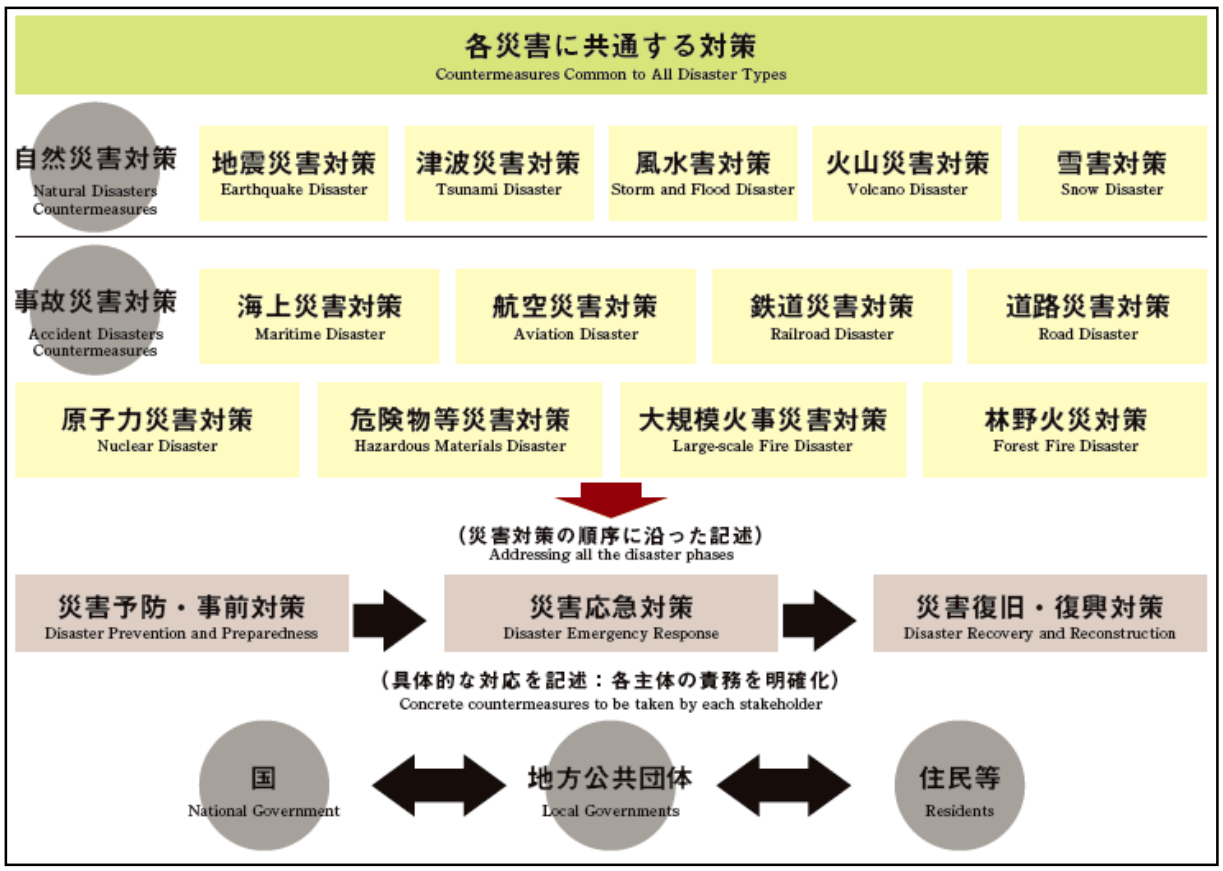

Figure 0.1 Structure of Basic Disaster Management Plan Source: CAO. Disaster Management System in Japan

The plan was revised entirely in 1995 based on the experiences of the Great Hanshin-Awaji Earthquake. It defines responsibilities of each entity such as the national and local governments, public corporations and other entities. It consists of various plans for each type of disaster, where specific countermeasures to be taken by each entity are described according to the disaster management phases of prevention and preparedness, emergency response, as well as recovery and reconstruction.

Further, based on the lessons learned from the Great East Japan Earthquake, a new chapter was created in December 2011, for Tsunami Disaster Countermeasures and changes were made in September 2012 and January 2014, reflecting amendment of the Disaster Countermeasures Basic Act and reflecting the study results by the Nuclear Regulation Authority (NRA)respectively. In November 2014, another change was made to reinforce the measures for removing unattended cars

in case of emergency. A further change was made in March 2015, to enhance the nuclear disaster management system (CAO n.d).

The Basic Disaster Management Plan was revised twice in FY2015: in July 2015 and February 2016.

Department/Organizational Level:

Disaster Management Operation Plan: This is a plan made by each designated government organization and designated public corporation based on the Basic Disaster Management Plan. They are responsible for the formulation and promoting implementation of the Disaster Management Operation Plan.

Prefectural / Municipal Level:

Local Disaster Management Plan: This is a plan made by each prefectural and municipal disaster management council, subject to local circumstances and based on the Basic Disaster Management Plan.

Prefectural and municipal Disaster Management Councils are established in prefectures and local municipalities, with membership comprised of representatives of local government organizations, including police and fire management departments, and designated local public corporations. Implementation of disaster risk management measures is based on the Local Disaster Management Plans drafted by the Councils. These Disaster Management Councils and Disaster Management Plans, at each level from central government to local municipalities, are prescribed in the Disaster Countermeasures Basic Act. This Act requires the Disaster Management Council at each level to review its Disaster Management Plan every year and amend it in order to ensure that the capacities of all early warning system stakeholders are utilized in the most effective and efficient manner. Each Disaster Management Council should communicate developments and/or amendments of their Disaster Management Plan to the Prime Minister, governors of prefectures and local municipalities.

The plans at all levels have been prepared and regularly revised and updated incorporating the lessons learnt and changes made in the Basic DMP prepared at the national level. DMP is the main document which is referred to for disaster management and emergency response in Japan.

5.6 Disaster Management System in Bhutan

5.6.1 Administrative System

In order to secure interactions of action and confluence of strategies and resources for implementation of disaster risk management agenda in the country, it is essential that a well-defined structure/mechanism is put in place at all administrative levels. As per the Disaster Management Act of Bhutan 2013, the disaster management institutions are set up as follows:

5.6.2 Legal System and Framework

With increasing occurrence of disasters across the country, a strong need arose to ensure systematic Disaster Risk Management approach and provide responses as required. This need led to the enactment of the Disaster Management Act of Bhutan 2013 on the 18th of March, 2013. The Article 8(6) of the Constitution of Bhutan. The Kingdom of Bhutan (2008) provides that it is the responsibility of every Bhutanese to provide help to victims of accidents and in times of natural calamities.

The Article 33 (2) of the Constitution, dealing with emergency, gives the authority to His Majesty the King of Bhutan to ―proclaim that a public emergency or calamity, which threatens or affects the nation as a whole or part thereof, exists in which case the Government may take measures derogating from the provisions of this Constitution to the extent strictly required by the exigencies of the situation‖. The Environmental Acts and Policies, the Mines and Minerals Management Act, the Bhutan Water Act and Policy, the Land Act, the Local Government Act and the Bhutan Building Rules indirectly support disaster management system in the Country.

The Royal Bhutan Police Act has provisions for the RBP to provide help in the times of disasters. Similarly, the other branches of the Armed Forces must take part as and when they are called upon to do so. The Local Government Act of Bhutan 2009 also state that the Geog Tshogde (GT) has the administrative powers and functions to organize relief measures during natural disasters/emergencies and the Dzongkhag Tshogde (DT) to mobilize voluntary actions in times of

natural catastrophes and emergencies. An article on environment, reaffirming the country ‘s commitment to sustainable development is also included in the Constitution of Bhutan. Elements supportive of and addressing disaster risk management concerns, even though in an elementary form, can be found in some of the Acts/ Rules and Regulations of different sectors.

5.6.3 National Platform for Disaster Risk Reduction

The Disaster Management Act of Bhutan 2013 governs the establishment of National Disaster Management Authority (NDMA) as the highest decision making body on disaster management in Bhutan. The NDMA shall be chaired by the Prime Minister & the Minister of Home and Cultural Affairs shall be the ex-officio Vice Chairperson. Other members include the Finance Minister.

5.6.4 Local Organizations for Disaster Risk Reduction

At Dzongkhag level, Dzongkhag Disaster Management Committee (DDMC) is instituted with Dzongdag as the ex-officio chairperson and Dzongkhag Disaster Management Officer as the Member-secretary. The other members of the committee include an official from the Regional Office of His Majesty‘s Representative for People‘s Welfare, chairperson of DzongkhagTshogdue, all Gups, all Thrompons, Officer-in-charge of Royal Bhutan Police, the Drungchen of the Zhung Dratshang or Dzongkhag Rabdeys and such other members as may be co-opted in accordance with the Disaster Management Act of Bhutan 2013. The DDMC may constitute a subcommittee at local (Dungkhag, Gewog or Thromde) level, if it deems necessary, to assist in the performance of its functions.

5.6.5 Disaster Management Strategy, Policy and Plan

Disaster Management Act of Bhutan 2013.

Until early 2013, the Department followed the National Disaster Risk Management Framework (NDRMF) as one of the main guiding principles in policy making and planning disaster programs and activities. However, this could not suffice to the needs of disaster management with increasing occurrence of disaster in the country. The Disaster Management Act of Bhutan 2013 was enacted on the 18th of March, 2013. Secretaries of all Ministries, Dasho Zimpon from the office of Gyalpoi Zimpon, the head of National Environment Commission, the secretary of Gross National Happiness Commission, the Head of the Department of Disaster Management, who shall be the Member secretary and such other member as may be co-opted in accordance with the Disaster Management Act of Bhutan 2013. The National Disaster Management Authority shall be responsible for the following functions:

1. Approve the Disaster Management Strategic Policy Framework;

2. Approve the National Disaster Management and Contingency Plan;

3. Approve hazard zonation and vulnerability map;

4. Approve structural and non-structural measures and direct its implementation;

5. Approve national standard, guideline and standard operating procedure for effective disaster management including but not limited to objective assessment tool.

6. Recommend allocation of fund for the purpose of recovery and reconstruction;

7. Direct agencies to mainstream disaster risk reduction into their development plans, policies, programmes and projects;

8. Allocate resources from the National Disaster Management Budget; and

9. Ensure the establishment of an Inter-Ministerial Task Force.

The national Disaster Management Authority has constituted an inter-ministerial Task Force comprising of technical experts from relevant Agencies and other members as it may prescribe based on requirement. It shall review hazard zonation maps, vulnerability maps, structural and non-structural measures, national standard guidelines, standard operating procedures for disaster risk reduction and management. It will also provide technical assistance in the preparation of Disaster Management and Contingency Plan and advice relevant agency in setting up Critical Disaster Management Facilities.

5.6.6 National Organizations for Disaster Risk Reduction

The department of Disaster Management under the Ministry of Home and Cultural Affairs serve as the secretariat and executive arm to the National Disaster Management Authority. It functions as the main Coordinating Agency for disaster management in the country. The secretariat or department prepares national plan in coordination with relevant agencies, formulate national standard, and develop guidelines and standard operating procedures for disaster management in the Country. It also ensures that public education, awareness and capacity building on disaster management are carried out effectively.

Disaster Management Planning Guideline/Contingency Planning Guideline

As per the DM Act of Bhutan 2013, Disaster Management Planning Guideline has been issued to assist and guide the Dzongkhags and other relevant agencies/sectors.

School Disaster Management Planning Guideline

In collaboration with the Department of School Education, a Planning guideline for the formulation of the School DM Plan has been developed and distributed. *National Disaster Risk Management Strategy* National Disaster Risk Management Framework 2006 is being reviewed and revised, in line with the DM Act of Bhutan 2013 and it is still in its draft stage. This Strategy includes all the elements of a risk management framework including: establishing the context; risk

identification; risk analysis; risk evaluation; risk communication; risk reduction (through both anticipatory and compensatory means) and continuous monitoring and evaluation. The Strategy outlines all the key outcomes that need to be achieved under each of the components and indicative activities that need to be carried out to achieve those outcomes over the short, medium and long term. However, as the implementation of this Strategy commences, detailed programmes and projects need to be developed covering all the components. In this respect, this Strategy presents the breadth‘ of actions that need to be undertaken over the next ten years but does not cover the depth‘ of analysis and programming that needs to be undertaken to carry out these activities. This will be done by the respective lead institutions for each of the components when the implementation begins.

Five year plans of Bhutan

In addition, mainstreaming disaster risk reduction is taken up as one of the important policy element for disaster management in Bhutan. The RGoB has given high priority in mainstreaming disaster risk reduction initiatives in all the developmental activities to develop a comprehensive disaster risk reduction strategy for the country. Mainstreaming disaster resilience and management is highlighted as one of 16 National Key Results Areas (NKRA) of the Royal Government of Bhutan (RGoB) for the period of 11th Five-Year Plan (FYP) (2013-2018).

5.6.7 Financial Arrangements as per the Disaster Management Act of Bhutan 2013

As per the Disaster Management Act of Bhutan 2013, following types of funding mechanisms have been envisaged.

Response and Relief Expenditure

The Dzongkhag Disaster Management Committee shall, as an emergency measure, meet the expenses for response and relief operation from the annual budget of the Dzongkhag in accordance

with the guideline formulated jointly by the National Disaster Management Authority and the Ministry of Finance.

Budget for National Disaster Management Activities

There shall be a separate budget head to be called the budget for National Disaster Management Activities and it shall receive adequate budgetary allocation for immediate restoration of essential public infrastructures and service centers, which will be managed by the National Disaster Management Authority. *Department of Disaster Management Budget* There shall be a separate budget head to be called the Department of Disaster Management Budget mainly for capacity building, establishing and maintaining Critical Disaster Management Facility including purchase of equipment and any other activity as may be required to strengthen the preparedness of the nation against disaster.

Budget for Local Governments

There are 20 districts, 15 sub-districts and 4 municipal local governments in Bhutan. Local governments can propose disaster management budgets in their annual plans as per five year plans. Till 11th five-year plan there was no significant activities spotted DRR activities however, local governments have implemented several projects tied assistance securing some funds in terms of capacity building and institutional improvements. Some local governments targeted to improve their response mechanisms and preparedness. Equipment were purchased and human resources where trained to cope up with natural disaster events. Some ad hoc activities were executed if the funds are secured. Some local governments did well in securing funds but some not able to as government fund mobilization is purely based on proposal submitted by local governments.

Recovery and Re-construction

The Government will allocate the fund for purpose of recovery and reconstruction once damage assessment of public assets and infrastructure completes.

9. COMMUNITY BASED DISASTER RISK MANAGEMENT (CBDRM)

Most of disaster response can be characterized as command and control structure one that is top down and with logistic centre approach. Because of this, if is often observed that lack of community participation that results into failures in meeting the appropriate and vital humanitarian needs, unnecessary increase in requirement for external resources, and general dissatisfaction over performance despite the use of exceptional management measures (UNCRD n.d).

Therefore, recognizing these limitations, the Community Based Disaster Risk Management (CBDRM) approach promotes a bottom-up approach working in harmony with the top - down approach, to address the challenges and difficulties. To be effective, local communities must be supported into analysing their hazardous conditions, their vulnerabilities and capacities as they see themselves.

Moreover, the people at the community level have more to lose because they are the ones directly hit by disasters, whether major or minor. They are the first ones to become vulnerable to the effects of such hazardous events. On the other hand, they have the most to gain if they can reduce the impact of disasters on their community. This concept gave rise to the idea of community-based disaster management where communities are put at the forefront.

Through the CBDRM, the people's capacity to respond to emergencies is increased by providing them with more access and control over resources and basic social services. Using a community-based approach to managing disasters certainly has its advantages. The scope of this approach is communities will be strengthened to enable them undertake any development programs including disaster preparedness and mitigation.

Therefore, The CBDRM approach provides opportunities for the local community to evaluate their own situation based on their own experiences initially. Under this approach, the local community not only becomes part of creating plans and decisions, but also becomes a major player in its

implementation. Although the community is given greater roles in the decision-making and implementation processes,

Furthermore, CBDRM does not ignore the importance of scientific and objective risk assessment and planning. The CBDRM approach acknowledges that as many stakeholders as needed should be involved in the process, with the end goal of achieving capacities and transferring of resources to the community, which level who would assume the biggest responsibility in over disaster reduction (UNCRD n.d).

6.1 Importance of Community Based Approach?

Over the last two decades, the community-focus on disaster risk reduction has increasingly been recognized as an essential component of a comprehensive national disaster risk management system, for the following reasons:

- The community is the first responder in any disaster.
- In many cases, top-down approaches may fail to address the specific local needs of vulnerable communities, ignore the potential of local resources and capacities and in some cases may even increase people's vulnerability.
- Nobody can understand local opportunities and constraints better than the local communities themselves.
- CBDRR brings together the local communities and other stakeholders for disaster risk management to expand its resource base.

At the time of need, locals become the best readily available resource for the rescue of the community. Therefore, it is believed that the most successful and sustainable approach of DRM is to empower the local community through the Community Based Disaster Risk Management (CBDRM), and it is often the local residents who suffer or get affected by disasters.

Figure: Roles of the Communities in CBDRM,

Source: https://sites.google.com/site/dimersarred/disaster-management-cycle

Recognizing the role of communities and providing them with central and local government support is critical in order to maintaining and strengthening important community based functions. Community based disaster risk management (CBDRM) programs have also provided a critical vehicle for strengthening preparedness. Most CBDRM activities usually have a strong component of raising local awareness of risks. However, while many programs are short-lived, there are numerous examples of CBDRM programs successfully leading to enhanced preparedness and response capability in the communities.

From the past disaster experience, Maldives has learned the importance of risk reduction before disasters and the enhancement of local level preparedness at the island communities. Given the geophysical nature and the dispersion of the islands, the most effective approach to address the disasters in the Maldives is to prepare each and every island community for the multiple hazards they are exposed to. Hence, the main focus is given to empower the islanders through the community based disaster risk reduction. This certainly would help to reduce the vulnerabilities, strengthen people's capacities to cope with multi-hazards and finally, improving the disaster resiliency of the island communities.

9.1 CBDRM and Community Disaster Management Plan

Since development is human centred and reducing disaster impacts involves regulating human actions that create the conditions in which disasters happen, disasters risk reduction should be seen as a development issue. Incorporating Disaster Risk Reduction concerns into development makes sense for many reasons, including the following:

The underlying causes of poverty, unsustainable development and disasters are related and all originate from factors that cause or increase the vulnerability of people;

Development with disaster risk reduction concerns can reduce disaster risks, thereby reducing people's vulnerability and contributing to poverty alleviation and sustainable development;

Disasters can put development at risk and make it unsustainable, thereby reducing the development potential of the country. It is a well-documented fact that for every dollar invested in risk reduction, countries actually save seven dollars in terms of recovery and reconstruction;

6.2 Mainstreaming DRR into Development Programming

Mainstreaming-The word is derived from the metaphor of a small isolated flow of water being drawn into the mainstream of a river from where it is expected to expand and flow smoothly without loss or diversion. Therefore 'mainstreaming risk reduction' describes a process to fully.

Mainstreaming Disaster Risk Reduction into Development.

Incorporate disaster risk reduction into development policy and practice. It means radically expanding and enhancing disaster risk reduction so that it becomes normal practice, fully institutionalized within an agency's development agenda.

Mainstreaming has three main purposes:

•To make certain that all the development programmes and projects are designed with evident consideration for potential disaster risks and to resist hazard impact.
•To make certain that all the development programmes and projects do not inadvertently increase vulnerability to disaster in all sectors: social, physical, and economic and environment.
•To make certain that all the disaster relief and rehabilitation programmes and projects are designed to contribute to developmental aims and to reduce future disaster risk.
Mainstreaming disaster risk reduction ultimately means ensuring **Sustainable Development,** which basically means meeting the needs of the present without compromising the ability of future generations to meet their own needs.

While mainstreaming disaster risk reduction we would also need to consider the needs of **Vulnerable groups** in disasters such as women, children, older people and people with disabilities (PWDs) as these groups often suffer specific disadvantages in coping with a disaster and may face physical, cultural and social barriers in accessing the services and support to which they are entitled.

6.3 Aim of Resilience

The aim of CBDRM is to create resilient people living within safer and resilient communities within safer and resilient environments within safer and resilient countries. This may be achieved by:
1. Putting in place risk reduction and prevention measures to prevent or reduce impact of hazards;
2. Putting in place preparedness and capacity building measures to ensure fewer lives lost, fewer injuries and reduced direct and indirect damage;
3. Reducing the time needed for recovery; and
4. Patterns of vulnerability that can develop during the process of reconstruction.

6.4 The Nature of Resilient Communities

A resilient community is one that has certain capacities in three phases:

Phase 1.

The ability to absorb the shocks of hazard impact, so that they do not become disasters (thus to reduce the probability of failure);

Phase 2.

The capacity to bounce back during and after disaster (thus to reduce the consequences of failure);

Phase 3.

The opportunity for change and adaptation following a disaster (thus to reduce thetime needed for recovery as well as patterns of vulnerability).

Characteristics of resilience before a disaster

Societies anticipate and reduce disaster impact by adopting many approaches:

•Using traditional experience and knowledge (coping mechanisms);

•Preparing for any possible hazard by having emergency kits or supplies, (buffer stocks) ready for the event;

•Having family or community disaster plans as well as adaptive behaviour, (strengthening houses, providing emergency protection of doors and windows from high winds, etc.);

•Organizing training courses in first aid, etc.;

•Temporary evacuation before an impending flood or windstorm.

•Permanent relocation of the community away from unsafe sites.

Characteristics of resilience during a disaster

Themes need to be addressed such as integrating recovery plans to link social, physical and economic recovery; following a disaster recovery plan; recognizing the importance of securing a prepared community who know what to do to recover; and taking actions to reduce future vulnerability. Societies cope during and after a disaster by:

1. Drawing on the support of their community;
2. Taking stock to determine what they have and what or who is missing
3. Restoring communications to facilitate aid distribution;
4. Mitigating future risks (both psychological as well as material threats);
5. Recognizing that physical recovery work can combine with bereavement therapy with a possible income source; and
6. Regarding the entire experience as a learning process.

Characteristics of resilience after a disaster

The following concerns need to be addressed during the recovery process, together they will build far more resilient communities:

•Devise a community recovery plan that links social, physical, economic and environmental recovery;

•Regard physical recovery work as bereavement therapy and a possible income source and the entire reconstruction experience as a learning process;

•Draw on support of their community by being adaptable, flexible and patient;

•Where possible ensure that there are local purchase or reconstruction goods using local labor to re-vitalize the damaged local economy;

•Recognize the value of a prepared community who know what to do to recover;

•Take actions to reduce future vulnerability as the recovery proceeds.

Elements of Community Level DRR System

Resilience is a moving target, and realistically it may not be possible for communities to achieve absolute resilience against hazards or other risk factors. However, communities can still achieve certain level of development, and they can establish institutional arrangements that would enhance their resilience. In order to assess whether a community has achieved a certain level of resilience, we will need to establish some indicators, which if existed would mean that the community had achieved a minimum level of resiliency. Though by no means comprehensive, a set of elements is given below:

•A community organization;
•A DRR and DP plan;
•A Community Early Warning System;
•Trained manpower: risk assessment, search and rescue, medical first aid, relief distribution, masons for safer house construction, fire fighting
•Physical Connectivity: roads, electricity, telephone, clinics
•Relational connectivity with local authorities, NGOs, etc
•Knowledge of risks and risk reduction actions
•A Community Disaster Reduction Fund to implement risk reduction activities
•Safer House to withstand local hazards
•Safe source/s of livelihoods

Achieving absolute resilience however is probably impossible. Like vulnerability, resilience is complex and multifaceted. Different features or layers of resilience are needed to deal with different kinds and severity of stress. The aim of disaster risk reduction therefore is to make the community as resilient as possible. In order for this to happen many different areas need to be addressed. It is unlikely that one organization could address all of them by itself. Therefore, just as it is important to encourage participation within the community it is important to promote partnerships with other communities and organizations so that all areas can be addressed appropriately. In this way, all the necessary resources can be made available and used appropriately.

6.5 Community Disaster Risk Management Planning

A. Why plan?

If participatory risk assessment unites the district in understanding their risks (hazards, vulnerabilities, and capacities), elements at risk and why these are at risk, local coping strategies and resources, the disaster risk management plan unites the district in commitment and actions to reduce these risks. The DRMP can be called by various names such as disaster preparedness and mitigation plan, counter disaster plan, disaster reduction plan or even district development plan. What is essential is that the DRMP is a blueprint or guide in charting the Dzongkhag/community's progression to safety, disaster resilience and community development.

B. What to plan?

Using the results of the risk assessment, the plan contains measures, activities to reduce vulnerabilities and increase capacities to reduce disaster risks.

The plan contains a mix of do-able structural and non-structural measures or interventions necessary for the community's safety, protecting and strengthening well being and development at the individual, household and community levels.

Immediate short term, medium term and long term activities and measures are identified together with the supporting mechanisms to make the plan a reality.

The plan contains measures on how the community can:

•Avoid loss, rather than replace loss

•Avoid social dislocation

•Protect assets of households, community, government

Protect community safety nets (family, health, food supply, business, education, culture) and equity of access to support

•Ensure the needs of vulnerable people are adequately addressed

Fail to Plan or Plan to fail

The term fails to plan or plan to fail reminds CBDRM planners to plan properly otherwise the plan would fail at the implementation stage.

C. How to plan?

CBDRR Planning is a process where all parties propose concrete risk reduction measures based on the following:

1. vision of their ideally prepared and resilient community
2. determining the acceptable level of risk
3. decision as to whether identified risk can be prevented, reduced, transferred or lived with
4. Their own capacities and other resources that can be generated outside of their community.

Taking off from the results of the HVCA in which the community ranks the disaster risks according to priority for action, the team will now proceed to participatory disaster risk management planning. The following steps may be followed:

6.6 Steps in Formulating the Community Disaster Risk Reduction Plan (CDRRP)

1. Risk Assessment (Hazard, Vulnerability Capacity Assessment)-Also referred to as the community problems to address.
2. Identify the objectives and targets of the CDRRP-Also referred to as aims or goals of the plan
3. Identify the Disaster Risk Reduction Measures-Strategies and activities in the pre-, emergency phase, post disaster periods; also referred to as the solutions to identified community problems
4. Determine the Resources Needed-Manpower/labor, materials, money, etc. for particular risk reduction measures.
5. Assign responsibilities for activities-Who will implement the pre-, emergency phase, post-disaster phase activities at the various stages of plan implementation?
6. Determine Schedules and Deadlines-When will the particular activities be initiated and complete?

7. Lay down operational procedures and Policies-Basic principles and agreements on operational procedures and policies to guide disaster management committees and community members
8. Determine critical elements and barriers for plan Implementation-Project what can go wrong, what can delay or derail plan implementation, or who will likely oppose the implementation of the plan and identify ways to address these issues.
9. Discuss with Community Members and Other Stakeholders-Draw more supporters for the CDRRP and its implementation
10. Implementation, periodic review and plan Improvement-Regular assessment, review and adjustment of the plan
11. Continued progress in ensuring public safety, building community resilience and attaining sustainable development.

6.7 Parts of community Disaster Risk Reduction Plan

a. Brief description of the community

• Location, population, livelihood, community in relation to other villages (significance of the community)

b. Community Disaster Situation

• Summary of Disaster History and Risk Assessment Results
• People and other elements at risk in the community
• Why they are at risk

c. Objectives and Targets of the CDRRP

• Target number of population or families to cover; target percentage decrease in deaths and damages to property.

d. Strategies and activities for risk Reduction

• Pre-emergency phase, post-disaster risk reduction activities
• Community EWS; evacuation sites, routes and procedures for families and animals; evacuation centre management, drills and simulation exercises

• Structural and non-structural measures such as strengthening of houses and river embankments, community health and sanitation, reforestation activities, diversification of livelihood and income sources, sustainable agriculture training, and projects etc.

e. Roles and responsibilities

• Persons, committees and organisations to be in-charge of particular functions and activities; relationships of persons, committees

• Relationships of persons, committees and organisations. An organizational structure to implement the plan may be drawn as needed.

6.8 Local Government Disaster Management Plan

6.8.1 Rational about Disaster Management Plan

Section 77 of the Disaster Management Act of Bhutan 2013 mandates the Dzongkhag Disaster Management Committees to develop Disaster Management and Contingency Plans, in consultation with the Dzongkhag sectors and other relevant agencies. Further, Section 78 mandates the Dzongkhag Disaster Management Committee to submit the Dzongkhag's disaster management plan to the National Disaster Management Authority through the Department of Disaster Management. Similarly, Section79 of the Act mandates Disaster Management and Contingency Plans to be updated at-least once a year and reviewed every five years.

With the changing risk patterns and frequency of disasters, formulation of Dzongkhag specific disaster management plan is an important strategy to strengthen local level disaster management systems and systematically reduce disaster risks.

The Disaster Management and Contingency Plan is to be referred by Gewogs and sectors to ensure mainstreaming and integration of disaster risk management into their annual and five year development plans. It is required that every stakeholder within Dzongkhag Administration and

relevant National Disaster Management institutions and agencies take ownership and fulfill their own roles and responsibilities to make a disaster resilient and safe Dzongkhag.

6.8.2 Scope & Objectives

The objectives of the Dzongkhag Disaster Management and Contingency Plan are:

- To ensure mainstreaming and facilitation for implementation of disaster risk reduction and preparedness activities in Dzongkhag;
- To ensure required capacities are developed for risk reduction, mitigation, preparedness and response;
- To increase awareness on disaster risks, risk reduction and preparedness measures in the Dzongkhag;
- To establish a coordination mechanism for emergency response and relief operations.
- To ensure safety of community, reduce loss to property; protect critical infrastructure, and environment and continuity of essential services.

7. Lessons and Challenges

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

- Community empowerment and communication help to achieve sustainability in CBDRM.
- Transparency of activities and dissemination of knowledge and information encourage people's participation in activities.
- CBDRM efforts need stable financial resources.
- 'What is accepted by the community' is more important than 'what is necessary'?
- Institutionalizing the community and the private sectors can result in more sustainable disaster management programmes.
- Communities are not fully aware of local risks and DRR education is not fully covered.

- Community Disaster Management plan is not institutionalized and local leaders lack skills and management knowledge on disaster.
- Poor resource allocation in DRR activities in local governments due to lack of financial policy.
- Lack of support from central government in building long term community viability.
- Lack of investment in DRR in Bhutan.
- Private sector not interested in DRR activities in Bhutan therefore, lesson can be learned from Japanese case improving engagement of community, local government and private in disaster management. Making a responsible business organization.
- Strictly enforce building codes lesson learned from 2009 and 2011 earthquake recommendations.
- Low level of knowledge and skills-Inadequate capacity at Community/ District/Sectoral/Ministerial level.
- Low institutional and technical capacity at all levels.
- Lack of Disaster Management and Contingency Plans.
- Increasing Risks.
- Lack of Resources.
- There is no blue print for CBDRM

8. Conclusion

Disaster management in Japan is world class and every country in world can learn from Japanese case. DRR into sectoral local level planning is not only important but also essential because it helps

- to highlight DRR as a **long-term concern**
- to guides a **country's development**
- to allocate and channel **resources**
- for **monitoring and evaluating** performance of country's development

For example, in order to improve the disaster resilience of the community and to reduce disaster damages, there must be close cooperation among individuals, families, local community, businesses and relevant entities, to build momentum for a nationwide movement. Moreover, mainstreaming of DRR is important to countermeasure and to prepare future disaster events. In Japan government has designated September first as 'Tsunami Preparedness Day' and various events were carried out on that day to raise awareness and readiness about the disaster. Community members, school faculties and students, local governments and institutions join the drills and public lectures as well demonstration were given by experts and academics. Repeating awareness and training will build more preparedness for future deadly events such as earthquake and floods etc.

It is vital to have reality pre-recovery plan and post disaster recovery plans covering community life restorations, business and institution recovery from dead end. Having DM plan will have good opportunity to restore the vital facilities quietly and response/relief can be executed effectively. Moreover, restoration plan will have point of reference for necessary support for affected citizens. One of key lesson is community engagement is vital in DM planning pre-disaster as well as post disaster.

In order to continue the DRR process the central government should support local governments and communities to strife for disaster preparedness and response to any events keeping view of following consideration.

- **Social assets** are important elements of sustainable development
- **Education, literacy, health care and social services** make society more resilient to potential impact of hazards.
- **Community members with skills** to prepare, respond, and recover from disasters will contribute to reduce casualties and losses.

Stable financial incentives is must for resource allocation.

Development planning have opportunity to Short-term, medium term and long term plans therefore, disaster management can be easily incorporated into comprehensive development plans, spatial and land use plans and sectoral development plans.

- **Social assets** are important elements of sustainable development
- **Education, literacy, health care and social services** make society more resilient to potential impact of hazards.
- **Community members with skills** to prepare, respond, and recover from disasters will contribute to reduce casualties and losses.
- **Well-nourished and vaccinated communities** are more likely to endure the diseases that disasters can produce.
- **Stable political system and strong community networks** are factors that increase social capacity.

Finally Bhutan desires for proactive disaster management system to improve long term resiliency at all levels and sectors.

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