Strengthening Disaster Risk Governance Framework in India: Learnings from global best practices

Revised Draft Report

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Executive Summary

Disaster Risk Management (DRM) refers to the systematic process of using policies, strategies and capacities of the society including communities to prevent new disaster risk, reduce existing disaster risk and manage residual risk, contributing to the strengthening of resilience and reduction of disaster losses (UNDRR). In India, the disaster risk governance framework has evolved significantly after the enactment of Disaster Management Act (2005). The National Disaster Management Authority (NDMA), headed by the Prime Minister of India, is the apex body for Disaster Management in India. The institutional mechanism of state and district level authorities for Disaster Management is governed by the Disaster Management Act, 2005. The Disaster Management Act, 2005 was also impressed upon during the COVID-19 response as it envisaged the role of all ministries and agencies in the measures to be taken for the response to the situation. "***Strengthening Disaster Risk Governance Framework in India: Learnings from global best practices***" is being undertaken as part of the National Cyclone Risk Mitigation Project (NCRMP) of the NDMA. The report is prepared to understand the DRM governance structures in the eight selected countries of ***Australia, Canada, Germany, Indonesia, Japan, Philippines, Turkey, and the United States of America***. The report includes the framework design of the DRM governance assessments, followed by explanation of the methodology undertaken. Thereafter, it consists of findings from literature review as well as web-based consultations with country experts. The findings are organized into eight case studies which capture the DRM governance structures, institutional mechanisms and policies followed by thematic good practices.

The overall research framework follows the *DRM Systems Assessment Framework* to understand the linkages of stakeholders and sectors which need to be further assessed through the study. The DRM Systems assessment study is divided in two parts of DRM Governance Assessment which is carried out for all eight countries and the thematic case study-based assessment for the eight countries, covering key themes of DRM. The ***secondary literature review*** is undertaken to study the national level reports, national disaster management plans, policies, country level reports and other related reports by international agencies. The secondary literature review is followed by in-depth ***web-based consultations*** with identified country experts and DRM practitioners. The key experts and practitioners from each of the eight countries were identified and categorised into different sectors such as National Government, local government, private sector, civil society and academia. The data from secondary resources as well as interviews is compiled and assessed to draw good practices relevant for India. The case studies identified through literature review were cross-validated by the country experts. Similarly, the case studies referred by country experts were corroborated through literature review. Further, only those cases were undertaken which satisfied the four criteria of feasibility, effectiveness, replicability and adaptability as well sustainability.

The report presents the governance framework of the eight countries across five dimensions: *organizational structure, horizontal and vertical linkages, key functions, strengths with respect to human resource and funding mechanism.* The thematic case study cover the areas of response, recovery, reconstruction, preparedness, mitigation, risk insurance, community based disaster risk reduction, volunteering and training.

As a way forward, for the final report, besides undertaking the cross-sectional analysis of the eight countries, DRM systems of India will be re-visited to strengthen the contextual understanding for effective and efficient delivery of DRM system. Thus, the lessons from the

eight countries will be mapped with contextualized recommendations for India, based on the key thematic areas indicated in ToR.

1. Background and Introduction

Disasters continue to occur more frequently and with more devastating effects. Disasters are not only increasing in number; they are becoming more complex and multi-faceted. This is compounded by the effects of climate change, environmental degradation, economic inequality, population growth, political unrest and migration thus weakening the overall community resilience. Disaster Risk Management (DRM) refers to the systematic process of using policies, strategies and capacities of the society including communities to prevent new disaster risk, reduce existing disaster risk and manage residual risk, contributing to the strengthening of resilience and reduction of disaster losses (UNDRR). Since the adoption of Hyogo Framework for Action 2005-2015, countries around the world have made significant progress in DRM, like in terms of technological advancements, institutional capacities, and arrangements.

The Sendai Framework for Disaster Risk Reduction (2015-2030) (SFDRR) infused a renewed sense of urgency and need among the member nations for strengthening the disaster risk governance and building resilience to disasters through well-integrated and risk informed policies, plans, programmes and budget at all levels of governance. The DRM systems need to set out the goals and specific objectives for reducing disaster risks together with related actions to accomplish the objectives guided by the SFDRR goals, targets and actions. Linkages to sustainable development and climate change adaptation plans need to be made at the policy level so as to mainstream their implementation. The Sustainable Development Goals also embody the spirit of building disaster resilience through capacity building and vulnerability reduction targets. By strengthening the institutions and weakening the factors of risk like poverty, food insecurity and social disparity, the SDGs bring in resilience cover for all. The SDGs lay an emphasis on early warning, risk reduction and management of national and global risks, which is particularly relevant in the context of COVID-19 situation. The Paris Agreement considers the emerging risks of climate change and calls for implementation of mitigation and climate change adaptation solutions.

As per (Pandey, 2020), the global economy suffered a loss of Rs. 16.5 lakh crores from the disasters. The report also notes that the maximum losses occurred due to weather related disasters, with typhoons, floods and hurricanes being the main events. Seasonal monsoon floods in India also contributed to the total damage and destruction with economic loss of around $10 billion. Cyclone Fani added to the losses in the eastern part of the country. The globally fast-spreading pandemic of COVID-19 is now testing the abilities of all countries to manage its widespread implications on public health and economy. It has strongly brought forth various underlying vulnerabilities and systemic risks in the existing risk governance mechanism across the globe. The initial forecast envisions a 5.2 percent contraction in global GDP in 2020, using market exchange rate weights (World Bank, 2020). The interaction of the COVID-19 pandemic with the existing vulnerabilities and the health nexus is an example of the systemic risk, which requires a whole-of-government and an all-of-society approach.

In India, the disaster risk governance framework has evolved significantly after the enactment of Disaster Management Act (2005). The National Disaster Management Authority (NDMA), headed by the Prime Minister of India, is the apex body for Disaster Management in India. The institutional mechanism of state and district level authorities for Disaster Management is

governed by the Disaster Management Act, 2005. There is a National Policy on Disaster Management, 2009 and on National Disaster Management Plan, which provide framework and direction to the government agencies at all levels. The Disaster Management Act, 2005 was also impressed upon during the COVID-19 response as it envisaged the role of all ministries and agencies in the measures to be taken for the response to the situation.

While the frameworks and guidelines are available, however, several envisioned outcomes are yet to be achieved like the integration of disaster risk reduction in development planning. Thereby, it is imperative to develop policies and practices within the relevant cultural context so as to achieve the goals. The current initiative of the NDMA presents an opportunity to explore the DRM systems around the world, with a special focus on aspects of its localization, integration with development planning, monitoring and regulatory mechanisms, financial mechanisms, multi- & cross-sectoral engagements, risk communications, local actions, etc.

"***Strengthening Disaster Risk Governance Framework in India: Learnings from global best practices***" is being undertaken as part of the National Cyclone Risk Mitigation Project (NCRMP) of the NDMA. The report is prepared to understand the DRM governance structures in the eight selected countries of Australia, Canada, Germany, Indonesia, Japan, Philippines, Turkey, and the United States of America. The figure 1 below depicts the selected eight countries which are undertaken for the study.

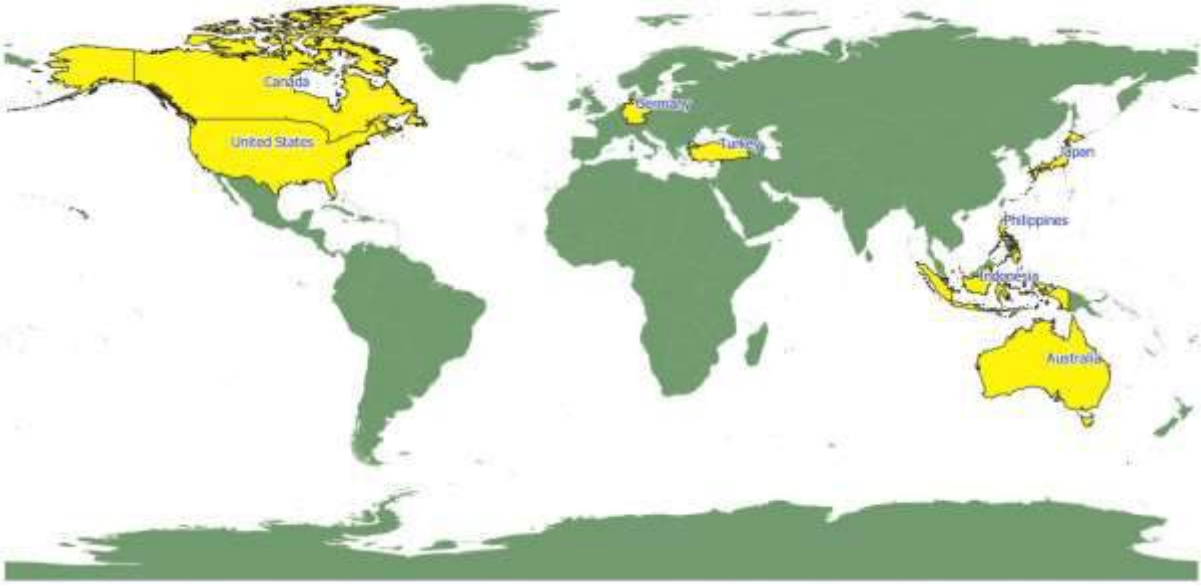

Figure 1: The eight identified countries for the learnings from the global best practices

The Prime Minister's ten-point agenda during the seventh Asian Ministerial Conference on Disaster Risk Reduction, in 2016 highlights that "*the opportunity to learn from a disaster is not wasted*". In this regard, this study is aims at learnings from the other countries in terms of their management practices of the multiple disasters.

The report includes the framework design of the DRM governance assessments, followed by explanation of the methodology undertaken. Thereafter, it consists of findings from literature review as well as web-based consultations with country experts. The findings are organized into eight case studies which capture the DRM governance structures, institutional mechanisms and policies followed by thematic good practices. The best practices allow to understand how countries adapt and face the wide-ranging challenges. The report undertakes the contextualization of the identified best practices. The contextualization is based on the

literature assessment to understand the gaps for the Indian DRM governance system. The contextualized best practices are presented in the form of recommendations.

2. Aim and Objective:

The key objectives of the current study are to undertake:

a. Analysis of the DRM systems and processes in the selected eight countries namely- Australia, Canada, Germany, Indonesia, Japan, Philippines, Turkey, and the United States of America; and,
b. Highlight good practices that could be adopted for the Indian context.

3. Scope:

With the recognition of continual process of learning and iterative exploration of different aspects of DRM systems, this study is aimed at strengthening the disaster risk governance framework in India by harvesting lessons from global best practices. The study captures the essence of the integration of disaster risk reduction practices in development planning and linkages to sustainable development and climate change adaptation at the policy level. The analysis includes case studies drawn from disasters by addressing the 17 Indicative Questions as per Annexure-1.

Primarily, the following aspects of DRM are studied for analysis:

a. Structure of the concerned Department/Agency/Institutions;
b. Functions of the concerned Department/Agency/Institutions;
c. Important features of core risk governance process and organization capacity;
d. Measures undertaken for disaster risk reduction;
e. Integration of resilience into development planning and growth;
f. Interface between Government and private sector;
g. Role of education and voluntary institutions;
h. Ways lessons are drawn from disasters.
i. Vertical as well as horizontal linkages of Disaster Management Agency with various Government Agencies / Ministries / Departments within that country

4. Overall Research Framework

The overall research framework follows the *DRM Systems Assessment Framework* to understand the linkages of stakeholders and sectors which need to be further assessed through the study.

The effective implementation of DRM systems is contingent on sound institutional capacities by key actors at different levels of government, the private sector and civil society as well as effective coordination between these actors and levels. An effective DRM system encompasses all the four priorities of SFDRR: Priority 1 on “Understanding Disaster Risk” focuses on leveraging the knowledge on practices for disaster risk assessment so as to develop cross-sectoral approaches which are tailored to specific contexts. Further, the Priority 2 of SFDRR highlights assessment of the *technical, financial and administrative* disaster risk management capacity to deal with the identified risks at the local and national levels. The Priority 3 of SFDRR highlights the importance mainstreaming investment in disaster risk reduction for

resilience in the socio-cultural contexts and integrating voluntary sector into DRM planning. The priority 4 of SFDRR focuses on public policies to strengthen the coordination and funding mechanisms for pre- and post- disaster recovery and reconstruction. However, considering the focus of assessment, the study will primarily focus on Priority 2 and its linkages with other 3 Priorities.

Steered by the SFDRR priorities and the indicative questions of the NDMA, the following framework for DRM Systems Assessment will be used for the study.

Figure 2: DRM Systems Assessment Framework

The DRM Systems Assessment Framework aims to assess the existing structures, resources and capacities in order to identify the gaps and improve the effectiveness. The systems approach establishes the linkages between disaster risk management with development planning, sustainability and resource allocation. Under this, critical aspects of existing DRM systems such as DRM institutions, their governance, key functions, capacities to undertake these functions, mechanism for monitoring their performance and impact, engagement and management of key stakeholders and vertical & horizontal linkages with various sub-aspects as shown in figure 2 above are identified for assessing the DRM systems.

Governance is the process of decision-making and the process of implementation of such decisions. The decision-making and implementation are a complex process which involve multiple stakeholders. The DRM Governance recognizes the existence of multiple actors other than the government agency which play an important role including private sector and civil society organizations. DRM requires a multi-sectoral approach, which covers urban development, infrastructure, water, education, health, and many other sectors. Linking of DRM plans with urban development and school education are of utmost importance. Hence, identification of such linkages of inter-dependencies allow to comprehend the important dimensions of DRM systems. Figure 2 depicts five broad aspects of DRM Systems assessment. An important indicator which enables understanding of all the five aspects is the study of legislations and policies in the respective countries. Legislation to minimize the disaster risk provides the framework around which strategies of mainstreaming DRR into development can be built. Second important aspect is the understanding of institutional set up which govern and monitor the said legislations. Thirdly, the framework encompasses the elements of financial provisions which ensure the actualization of the efforts of recovery, reconstruction and strengthening of prevention and mitigation.

5. Methodology:

Disaster Risk Governance (DRG), as defined by the UNDP, refers to the way in which public authorities, civil servants, media, private sector, and civil society at community, national and regional levels cooperate in order to manage and reduce disaster and climate related risks, and to ensure that sufficient levels of capacity and resources are made available to prevent, prepare for, manage and recover from disasters.

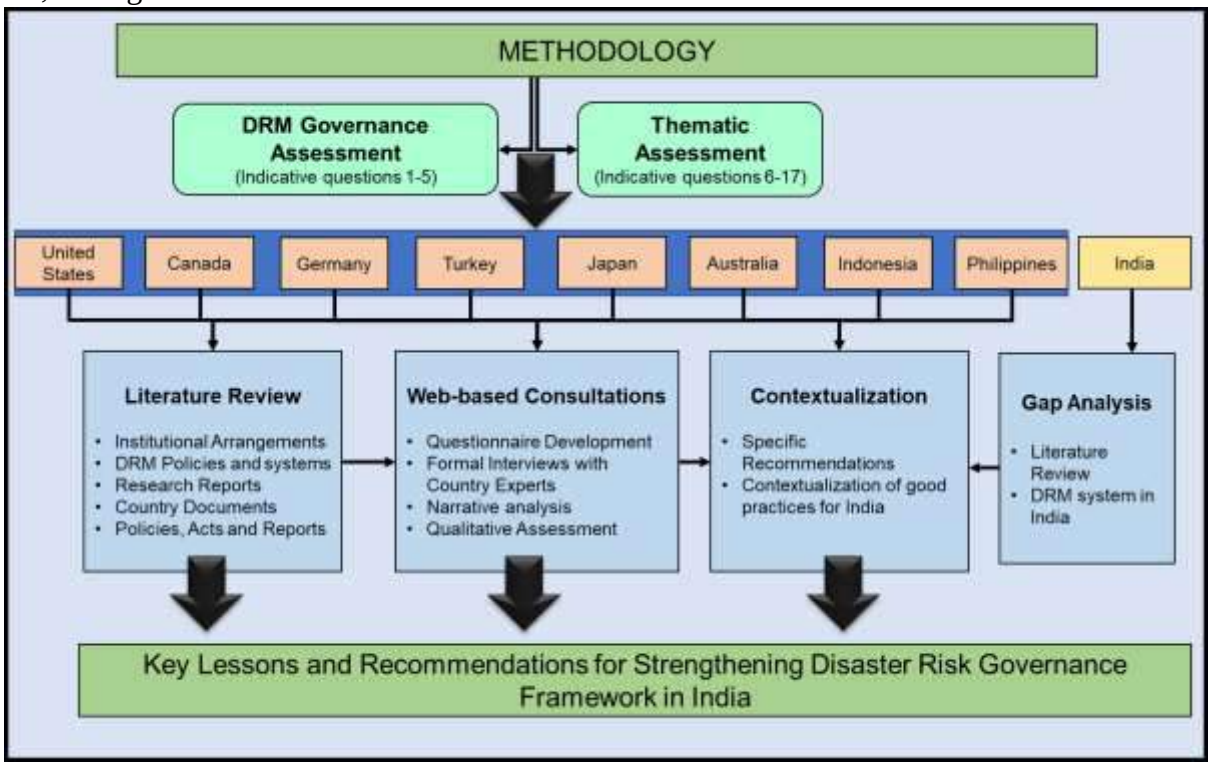

Figure 3: Methodology

The DRM Systems assessment study is divided in two parts of DRM Governance Assessment which is carried out for all eight countries and the thematic case study-based assessment for the eight countries, covering key themes of DRM. Figure 3 demonstrates the overall methodology while figure 4 specifies the contents under DRM governance assessment and thematic areas for case study assessment.

The ***secondary literature review*** is undertaken to study the national level reports, national disaster management plans, policies, country level reports and other related reports by international agencies. The national level legislative procedures and guidelines for each c

The thematic approach for case studies allows in-depth and multi-faceted capturing of the inter-related issues. It also provides for qualitative analysis of the thematic issues of risk reduction and management and enable in-depth understanding to draw good practices. Further, it allows for intensive investigation through literature review as well as interviews that foster analysing causal factors to deduce appropriate inferences. The case studies are identified through literature review and then validated through the web-based consultations.

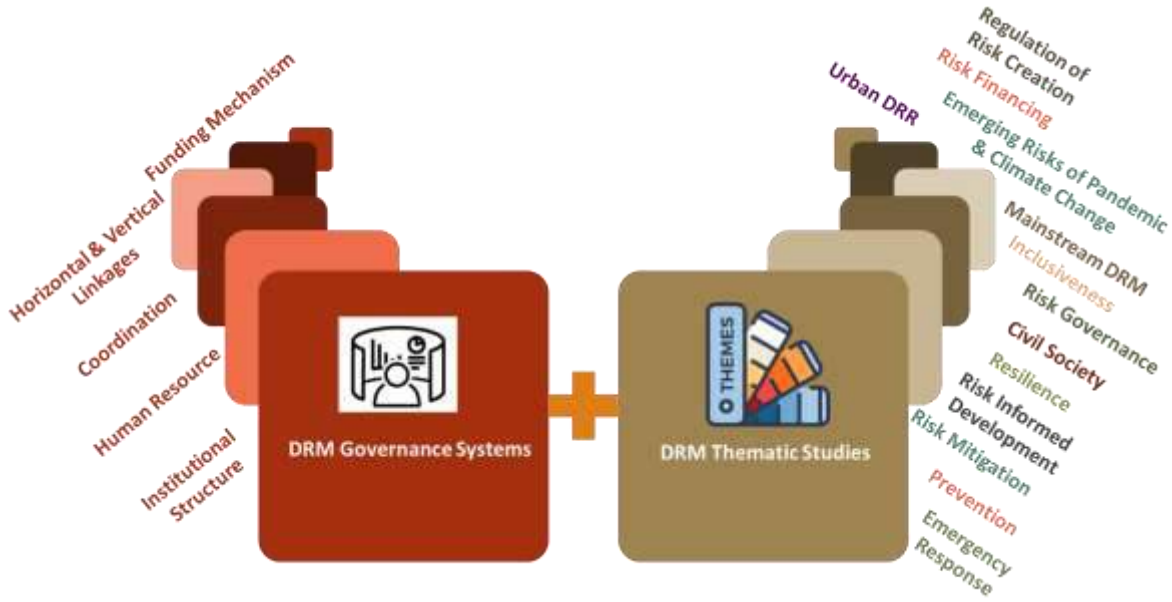

Figure 4: DRM Governance Assessment Aspects and Thematic Areas for Assessment

As mentioned, the secondary literature review is followed by in-depth ***web-based consultations*** with identified country experts and DRM practitioners. The interviews were guided through a semi-structured questionnaire as attached in Annex-2. Based on the consultations, narrative analysis was undertaken to complement the findings of the secondary literature review on the various governance aspects as well for the country specific case studies.

The key experts and practitioners from each of the eight countries were identified and categorised into different sectors as indicated in Annex-3 so as to cover varied and multi-sectoral perspectives on DRM from the selected countries. The various sectors covered pertain to National Government, local government, private sector, civil society and academia.

The study provided impressions from research that covered how these organizations operate. The data from secondary resources as well as interviews is compiled and assessed to draw good practices relevant for India. Besides reviewing the eight selected countries, DRM system of India is also assessed to identify the barriers and gaps for effective and efficient delivery of DRM system. The lessons from the eight countries will be mapped/ overlaid on the identified barriers and gaps to come up with specific recommendations for India.

The case study approach allows to examine data from both quantitative and qualitative aspects. The qualitative aspect is important to dig out unique set of processes which operate in different environmental and societal contexts. This study undertakes eight case studies for the eight countries. The first set of the case studies includes the DRM governance structures (based on indicative questions 1-5 of Annex-1). The second part of the case studies includes the good practices which reflect the thematic areas (based on indicative question 6-17 of Annex-1). The good practices were identified based on the framework as shown in figure 5. As per the framework, the initial identification of case studies was done both through literature review as well through web-based interviews. The case studies identified through literature review were cross-validated by the country experts. Similarly, the case studies referred by country experts were corroborated through literature review. Further, only those cases were undertaken which satisfied the four criteria of feasibility, effectiveness, replicability and adaptability as well sustainability. The feasibility was considered both from technical and administrative aspect. Sustainability was also looked upon through three key factors of environmental, social and economic.

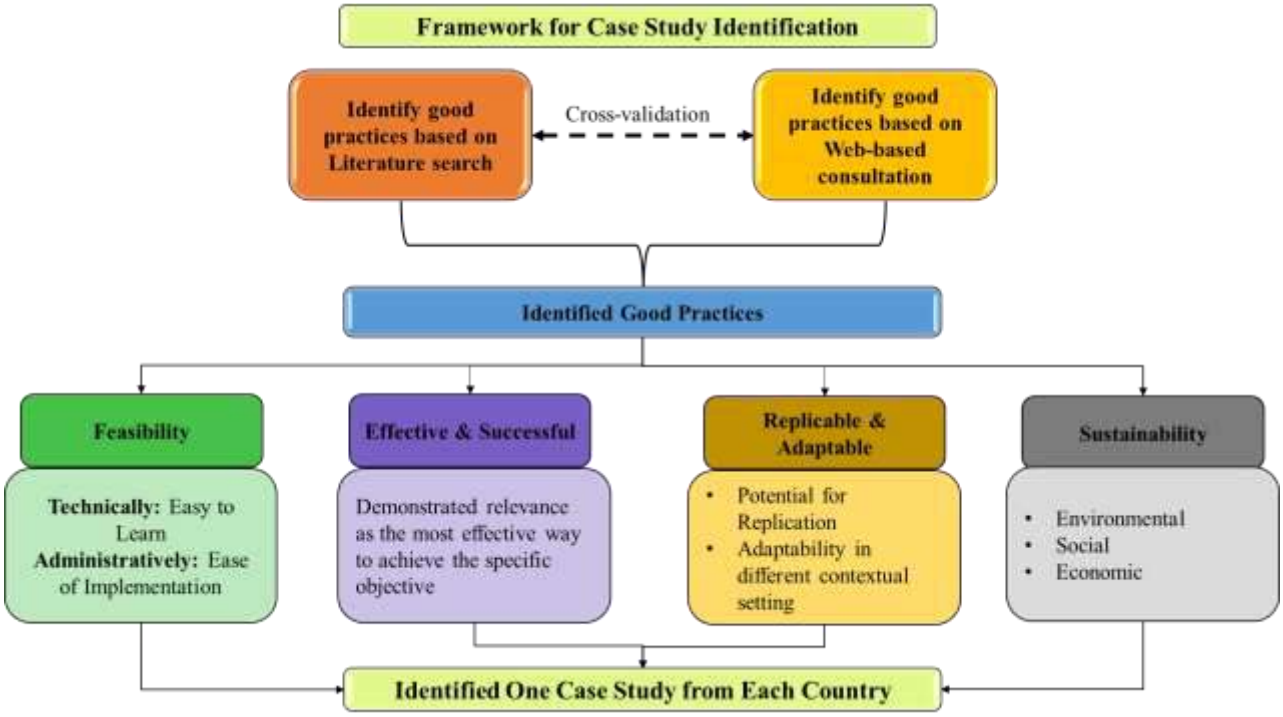

Figure 5: Case Study Selection Framework

The themes for the good practices were covered from the eight countries in such a way that all the identified themes as per indicative questions (Annex-1) are covered. Good governance and responsive administration in all identified thematic areas allow for effective interface with all stakeholders in the community.

6. DRM context of India

DRM in India: Governance Structure

India is highly vulnerable to floods, droughts, cyclones, earthquakes, landslides, avalanches, tsunamis and forest fires. In the federal polity of India, the primary responsibility of disaster management vests with the State Governments. The Central Government lays down policies and guidelines and provides technical, financial and logistic support while the district administration carries out most of the operations in collaboration with central and state level agencies.

The Disaster Management Act, 2005 provides the legal and institutional framework for "the effective management of disasters and for matters connected therewith or incidental thereto". It provides for establishment of National Disaster Management Authority (NDMA), State Disaster Management Authority (SDMA) and District Disaster Management Authorities (DDMA) at the National, State and District levels with adequate financial and administrative powers. It also enables creation of National Institute of Disaster Management (NIDM) with the mandate of undertaking training and capacity building on various aspects of Disaster management. The act also provides guidelines for creation of National Disaster Response Fund, National Mitigation Fund, Establishment of funds by State Government and Allocation of funds by Ministries and Departments for Emergency procurement. The act also provides for establishment of National Disaster Response Force (NDRF).

The Disaster Management Act, 2005 was used during the management of COVID-19 pandemic. The Act empowers the government to take necessary regulatory and control measures. The government in India passes orders and issued guidelines under this Act to deal with the pandemic.

Horizontal and Vertical Linkages:

NDMA has published hazard specific guidelines and also prepared National Disaster Management Policy and National Disaster Management Plan for the country. NDMA is governed by the Ministry of Home Affairs (MHA) in the Central Government which has the overall responsibility for disaster management in the country. At the State Level the State Disaster Management Authority (SDMA), headed by the Chief Minister, lays down policies and plans for disaster management in the State. The States/UTs have also been advised to set up their own Specialist Response Force for responding to disasters on the lines of National Disaster Response Force. In the district level the District Disaster Management Authority (DDMA) is headed by the District Magistrate, with the elected representative of the local authority as the Co-Chairperson. The local authorities both the rural local self-governing institutions (Panchayati Raj Institutions) and urban local bodies (Municipalities, Cantonment Boards and Town Planning Authorities) ensure the capacity building of their officers and employees for managing disasters.

The example of horizontal linkages were observed during COVID-19 when multiple legislative provisions were enacted to administer and manage the pandemic situation. Other than the Disaster Management Act, 2005 which empowered the central government to pass necessary orders and regulations, IPC Act (Section 188, section 21, section 269, section 271) ensured the monitoring and implementation with provisions which prescribes the punishments and fines for disobeying the orders. The Epidemic Disease Act of 1897, allows the government to take

special measures by way of a public notice to prescribe temporary guidelines and regulations. The Essential Commodities Act ensured to declare hand sanitizer, N95 mask, 2ply and 3 ply surgical masks as essential commodities. It also allowed the government to regulate the production and pricing of the essential commodities.

The National and state level disaster response funds constituted by this have also helped the government economically fight the catastrophe as a huge sum of money has been disbursed from it to states and Union Territories for procurement of material and various other things.

Funding Mechanism:

As per Fifteenth Finance Commission, to promote local-level mitigation activities, the setting up of National and State Disaster Management Funds is recommended. The recommended grants for the State Disaster Risk Management Fund is Rs 28,983 crore, while the allocation for the National Disaster Risk Management Fund is Rs 12,390 crore. The Commission has recommended retaining the existing cost-sharing patterns between the centre and states to fund the SDMF (new) and the SDRF (existing). The cost-sharing pattern between centre and states is (i) 75:25 for all states, and (ii) 90:10 for north-eastern and Himalayan states. The funding is allocated as 20% for mitigation and 80% for response (Garg and Surya, 2020).

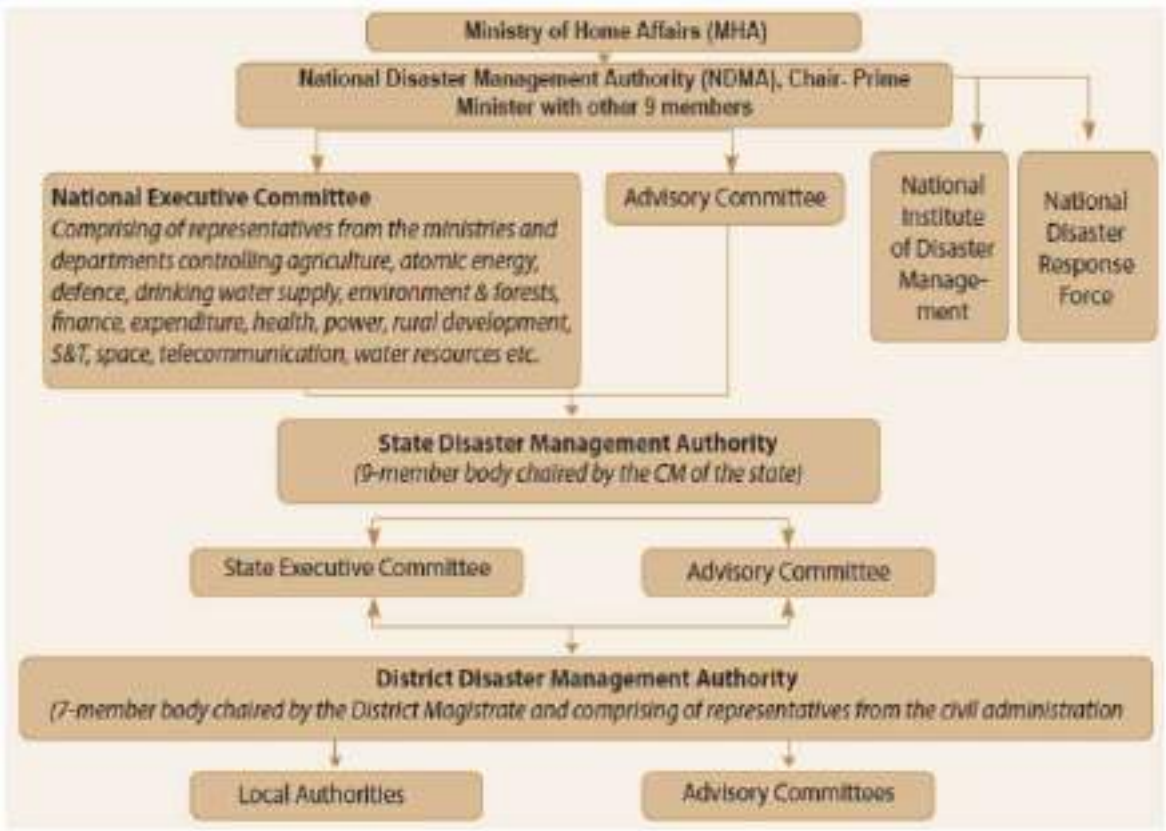

Figure 6: Governance Disaster Management Structure [Source: (ADRC, 2018)]

Gap Assessment:

With respect to gap assessment, while the disaster management plans exist on paper, the ***implementation*** remains a challenge. Despite the emphasis on a paradigm shift to a preparedness approach by the government, most parts of the country continue to follow ***a relief-centric approach*** in disaster management, rather than a proactive prevention, mitigation and

preparedness path. There is a need for ***investing in disaster preparedness and mitigation*** across the country, irrespective of whether a state has been hit by a disaster (Jafar, 2018).

There is ***a gap in bringing together the different stakeholders*** through a collaborative approach, where the roles of the government, corporations, academia, civil societies and communities are recognized, and all actors work hand-in-hand towards achieving disaster resilience.

The Report of the Task Force: A Review of the Disaster Management Act, 2005 also highlights the ***lack of clarity of roles*** at the national level between the nodal agencies. As per a report on analysis of state disaster management plans, there is a need to have clear distinction of roles for the nodal institutes for disaster risk management (Bahadur, Lovell and Pichon, 2016). Different governance and management roles can be identified in the existing institutional framework at multiple levels-national, state and district levels.

India also currently lacks in having ***new and innovative models of risk financing for disaster risk reduction***. There is little evidence of public–private partnerships and risk-transfer mechanisms being used (ibid).

Data for baseline assessments on indicators related to SFDRR and SDGs are not available for the lowest level of administration i.e. urban local bodies and Panchayati Raj Institutions.

Risk-reduction activities are less prominent, and are the weakest link in the disaster management cycle across the plans. The current DRM structures do not institutionalise the ***accountability mechanisms*** to ensure that departments follow the DRM considerations in their own planning for mainstreaming. As a result, risk-reduction activities are driven by schemes and external projects, rather than by long-term guidelines in SDMPs.

The disaster risk management planning currently follows ***a top-down approach*** with most of the policies being planned at the central level and implemented by the states and districts. The district level authorities are not very active and not all districts have a separate functional set-up for disaster management. This is due to non-availability of financial and human resources with the districts. This poses challenge in ***local empowerment*** of disaster risk management activities.

The current DRM planning at all levels of national, state and local lacks the preparedness for the ***new and emerging risks*** including NATECH and climate change related risks. The DM Act 2005 focuses on response for sudden disasters while there are no specific guidelines for progressive disasters. The examples of COVID-19 depict that the biological hazard preparation and risk reduction needs to be strengthened. Further, the fire accident in pharmaceutical plant of Vishakhapatnam in the year 2020, drives the need to plan for cascading hazards. The risks related to climate change need to be captured in a more holistic way along-with the need for mainstreaming those risks with the current development planning.

The National guidelines and plans ***can provide for minimal qualification*** criteria to for professionals engaged in DRM planning at national and state level.

With respect to ***resilient infrastructure,*** there is a gap in the building practices and rapidly growing urban settlements which need to be made disaster resilient.

7. Case Study Countries

The eight countries for which the case studies are identified are Australia, Canada, Germany, Japan, Indonesia, Philippines, Turkey and USA as depicted in figure 7.

Australia is the driest inhabited continent on earth, making it particularly vulnerable to the challenges of climate change. Australia experiences a range of hazards including bushfires, floods, severe storms, earthquakes and landslides.

Canada is a country in North America with plains and mountains. The disaster profile of the country includes hazards like avalanches, floods, landslides, storm surges, tsunamis, hurricanes, severe storms, earthquakes, hurricanes, tornadoes and wildfires.

Figure 7: The eight case study countries (Source: Google maps)

Germany is located at the centre of Western Europe. The country faces the hazards of storms, flood, earthquake, heat and frost. Climate change and pandemics are the other two severe hazards faced by the country.

Indonesia suffers from floods, landslides, droughts, tsunamis, earthquakes, volcanoes, forest fires. In particular, floods and earthquakes are the most frequent disasters. Indonesia is the world's largest archipelago, with more than 17,500 islands.

Japan is vulnerable to hazards because of its climate and topography, and it has experienced countless earthquakes, typhoons, and other types of disasters. The country is subject to extreme climatic variations, such as seasonal rain and typhoons, as well as heavy snowfall.

Philippines is also an archipelago state, consisting of around 7,100 islands and islets. It is ranked third among all of the countries with the highest risks worldwide according to the World Risk Report 2018. The multiple hazards that the country is prone to include earthquakes, volcanoes, tsunamis, storm surges, rising sea levels, typhoons, flooding, landslides and

droughts. Large mountainous terrain, narrow coastal plains and interior valleys and plains make up the country's topography.

Turkey lies in the most active earthquake and landslide regions in the world. Besides, the floods, avalanches and rock falls are some of the other hazards. The region is one of the seismically active.

United States of America is located in central North America and bordered by Canada to the north and Mexico to the south. Some of the natural hazards faced by the country are earthquake, tsunami, flood, sediment related disasters, volcanic eruption, hurricane, tornado, drought, heat wave, heavy snow, forest fire, and coastal erosion.

Table 1: Identified Good Practices from the eight Countries

No.	Name of Good Practice (Country)	Thematic Relevance												
		IQ.6	IQ.7	IQ.8	IQ.9	IQ.10	IQ.11	IQ.12	IQ.13	IQ.14	IQ.15	IQ.16	IQ.17	New
1	Climate Risk Mitigation and Heat Wave Management (Australia)							√						
2	Bushfire Response (Australia)	√												
3	Australia Bushfire Recovery Planning (Australia)	√	√											**a**
4	Degrees and Certificates for Disaster Management (Canada)	√	√											
5	Community and Trades Focused Tools: the Aboriginal Disaster Resilience Project (Canada)	√	√				√							
6	Flood-insurance as a tool to catalyse resilience building (Germany)										√		√	
7	Changes in Policies and Institutions related to Flood Risk Management triggered by recent large-scale floods in Germany	√									√		√	
8	Volunteers in Disaster Management System													**b**
9	Disaster Resilient Village Program (Indonesia)	√	√	√	√		√	√	√			√		
10	Disaster-safe schools Program (Indonesia)	√	√											
11	Disaster Database (Indonesia)	√	√	√										
12	Japan Disaster Medical System (Japan)	√			√									
13	Community based organizations in Disaster Risk Reduction (Japan)	√	√				√		√					
14	Self-help & mutual aid system (Japan)	√	√						√					
15	Disaster Recovery and Reconstruction Approach in Japan	√		√	√									**a**
16	Private Sector Engagement (Philippines)		√		√									
17	Community Based Disaster Risk Reduction (Philippines)	√					√		√			√		
18	Disaster Risk Insurance (Philippines)										√			
19	The Disaster Management and Decision Support System 'AYDES' (Turkey)	√	√											
20	Turkish Catastrophe Insurance Pool 'TCIP' (Turkey)	√	√		√	√					√			

21	Istanbul Seismic Risk Mitigation and Emergency Preparedness Project 'ISMEP' (Turkey)	√	√										√	
22	Disaster Recovery as a Collaborative Challenge: Working across borders to speed recovery (USA)	√		√										
23	Building Back Better: Improving recovery with the Disaster Recovery Reform Act of 2018 (USA)	√									√			
24	Federal Emergency Management Administration (FEMA) Training													**c**
	IQ 6-17 are as per questions 6-17 of Annex-1 **a**-Recovery and Reconstruction **b**-Volunteer System **c**-Disaster Risk Management Training Organisations													

AUSTRALIA

7.1 Australia

7.1.1 DRM Governance structures

Organization of lead disaster management agencies

Australia is a federation, comprising a Federal government as well as State/Territory governments. Each of these, coordinate within a sphere, and also act independently on various aspects of emergency and disaster management. ***Emergency Management Australia*** (EMA) is the foremost agency within the Australian Government's ***Department of Home Affairs***. While the State and Territory governments manage emergency responses in their respective jurisdictions, the EMA coordinates the Australian Government's response with the physical and financial support. EMA hosts the Crises Coordination Centre which provides whole-of-government situational awareness on all hazards and is functional 24*7 throughout the year. The National Coordination Mechanism operates through the Department of Home Affairs and together with the States and Territories co-ordinates the whole-of-government responses. The Australian Government also established the Australian Institute for Disaster Resilience (AIDR) which enhances the disaster resilience through innovative leadership, professional development and knowledge sharing. Additionally, the Australian Tsunami Warning System provides timely early warning in collaboration with EMA.

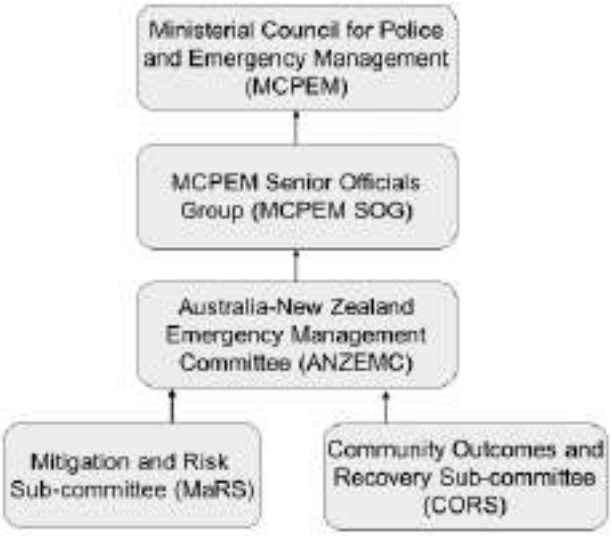

Figure 8: Organogram for the lead Disaster Management Agency, Source: National Strategy for Disaster Resilience

The Department of the Prime Minister and the Cabinet is responsible for maintaining and updating the Australian Government Crisis Management Framework (AGCMF). As elaborated in figure-8, The Ministerial Council for Police and Emergency Management (MCPEM) centers upon the broad themes of law enforcement, reform and emergency management and collaboration across these themes. MCPEM constitutes the ministers for police and emergency management from the Australian Government, States and Territories and New Zealand, and the President of the Australian Local Government Association. The Australia-New Zealand Emergency Management Committee (ANZEMC) supports works on advocacy of national policies and capabilities that reduce disaster risk and uphold public trust and confidence in

emergency management matters. ANZEMC constitutes senior representatives from the Australian, State and Territory governments, the Australian Local Government Association and the New Zealand government. ANZEMC is co-chaired by the Department of Home Affairs and a rotating State/ Territory representative. The Mitigation and Risk Subcommittee (MaRS) and the Community Outcomes and Recovery Sub-committee (CORS) are sub-committees of ANZEMC.

Disaster Management Functions of lead Agencies/Department/Institutions

States and Territory governments have the primary responsibility for protection of life, property and environment within their borders. However, where crises involve actual or potential national consequences the high-level collaboration and coordination within and across all levels of government is undertaken. The National Strategy for Disaster Resilience was adopted by the Council of Australian Governments (COAG) in February 2011. It lays the approach to managing emergencies during the four phases of emergency management: prevention, preparedness, response and recovery (PPRR). For such national coordination to take place, assistance must be requested by the State or Territory, or if the crisis has the potential to affect, or has affected, multiple jurisdictions, the broader community or an Australian Government area of responsibility, regardless of the level of emergency.

The primary functions of Australian Government can be summed up as follows:

1. Supporting Role: Providing support to the States and/or Territories where Australian Government coordinated assistance has been requested or where Commonwealth interests are affected or threatened.
2. Joint Management: Working together with the States and/or Territories to manage a crisis that has potential to affect, or has affected, more than one jurisdiction, the broader community or an Australian Government area of responsibility, and prioritise limited resources when there is competing demand.
3. Primary Responsibility: Managing any crisis that is not the responsibility of a State or Territory
4. Funding Assistance: Providing financial assistance to State and Territory governments and individuals affected by a major crisis.

The lead minister for the Australian Government on response and recovery is usually the relevant portfolio minister, which is pre-identified in the National Plan. Where there is no clear ministerial lead on a domestic crisis, the Minister responsible for Home Affairs is the default lead minister, supported by the minister responsible for emergency management. The details of the jurisdictional arrangements depend on category of the Disaster and are depicted in Annex-4.

Vertical and Horizontal Linkages

Australian emergency management arrangements are characterized with scalability and supported by partnerships at every level. As per the whole-of-government approach, there are different coordinating committees to look after response. The Crisis Coordination Centre (CCC) in Home Affairs coordinates the domestic crises including administering Australia's Online Content Incident Arrangement. Department of Foreign Affairs and Trade provides

initial response actions through the Global Watch office for international crises. The ministers and ministerial offices are notified either by senior officials from their respective agencies or by the lead ministerial office. The Secretaries/Deputy Secretaries separately brief their ministers on the situation and provide advice on a whole-of-government communication strategy, key decisions and policy options as needed. Emergency Defence Assistance to Civil Community (DACC) is provided to the civil community where immediate action is necessary. The relevant local Australian Defence Force (ADF) commander or Base Manager approves the minor requests of cooperation which does not exceed 48 hours. ADF assistance beyond that, for a more extensive or continuing crisis response requires Commonwealth Government Disaster Response Plan (COMDISPLAN) to be activated and a request for assistance through Emergency Management Australia (EMA). Figure 9 depicts the horizontal and vertical linkages and the position of the lead disaster management agency in the governance structure.

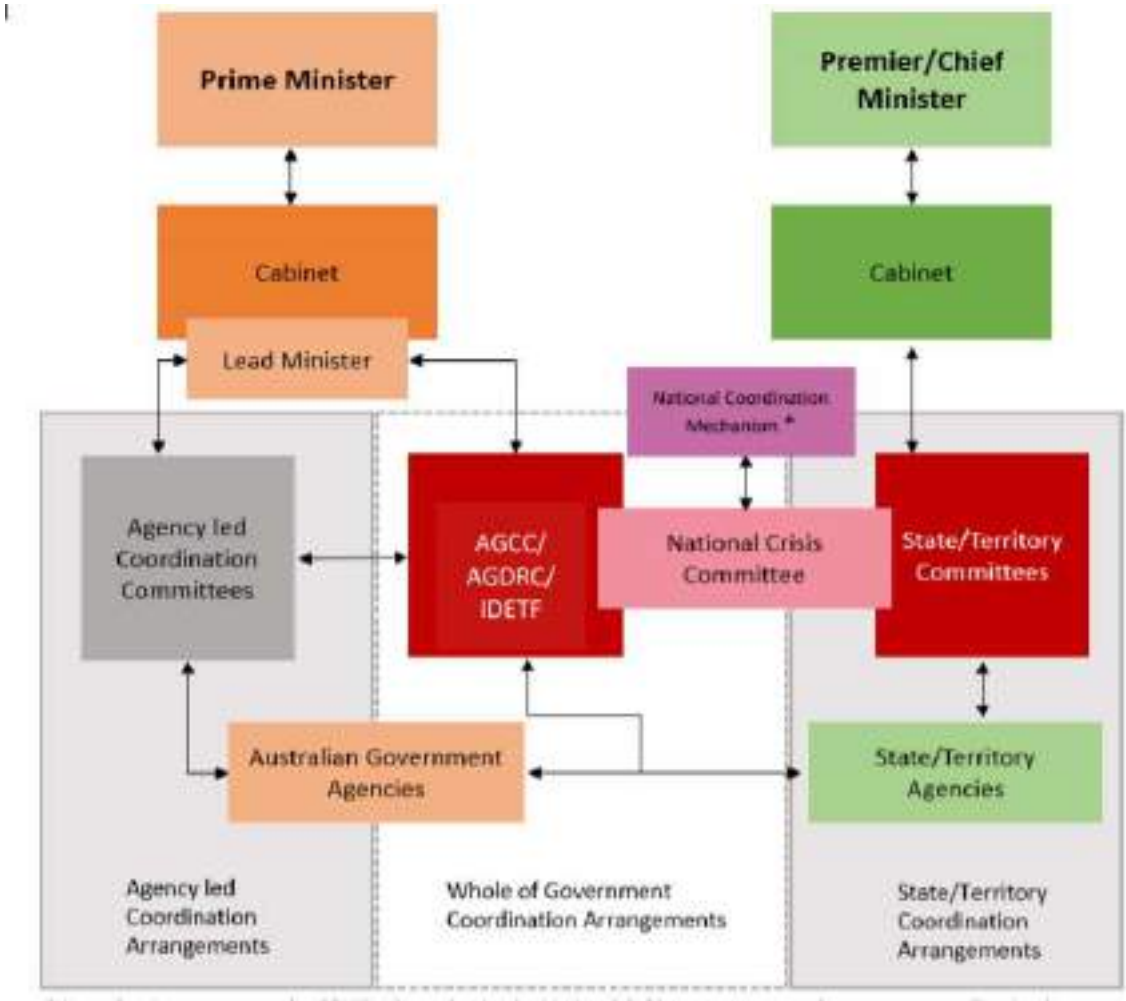

Figure 9: Position of lead agency with horizontal and vertical linkages, Source: Australian Government Crises Management Framework (as formulated for COVID-19)

Strengths of agencies in terms of Human Resource (staff, management practices, linkages, training etc.)

The respective Ministerial offices are responsible for the staffing. The respective Ministerial offices are also responsible to ensure that the required resources, capabilities and services can be efficiently mobilised and deployed as and when necessary.

Funding mechanism

Under the joint Australian Government-State Disaster Recovery funding arrangements, the State or Territory government determine which areas receive assistance and what assistance is available to individuals and communities. Further, assistance from the Australian Government is provided to the States and Territories based on request. The Australian Government may fund up to 75 per cent of the assistance available to individuals and communities. This contribution is delivered through a number of assistance measures which include subsidies and allowances, concessional loans and grants to non-profit organisations. Recovery grants may be made available to assist businesses, including farm businesses, to resume trading as soon as possible. The grants may be used for clean-up activities, replacement of damaged equipment and stock, and other general repairs. The type of help available depends on the impacts of the natural disaster. The Disaster Recovery Funding Arrangements are categorized in four categories:
Category A: assistance to individuals to alleviate personal hardship or distress (provided automatically by the States and Territories)
Category B: assistance to State, Territory or local governments for the restoration of essential public assets, counter-disaster operations and assistance to small businesses, primary producers, non-for-profit organisations and needy individuals (provided automatically by States and Territories)
Category C: to establish a community recovery package(s), that provides assistance for severely affected communities which may include clean up and recovery grants for small businesses and primary producers and not-for-profit organisations (the Prime Minister is the decision maker; upon request from the States and Territories)
Category D: assistance beyond Categories A to C, usually upon request from the States and Territories and in response to exceptional circumstances (the Prime Minister or Cabinet is the decision maker).

The Emergency Response Fund (ERF) was established which allows the Australian Government to draw up to $200 million in any given year, beyond what is already available to fund emergency response and natural disaster recovery and preparedness, where it determines the existing recovery and resilience-building programs are insufficient to provide an appropriate response to natural disasters.

The Australian Government Disaster Recovery Payment (AGDRP) provides one-off, non means tested financial assistance of $1000 per eligible adult and $400 per eligible child to those adversely affected by a major disaster (in Australia or overseas). The Disaster Recovery Allowance (DRA) provides income support payments (for up to 13 weeks) to employees, primary producers and sole traders who can demonstrate a loss of income as a direct result of a major disaster.

7.1.2. Thematic Good Practices

1. Climate Risk Adaptation

Australia is facing the effects of Climate Change through global warming, increasing episodes of heat wave, increased bushfire weather, increased intensity of extreme rainfall events and detectable rises in sea level.

The Australian Government had established the National Climate Change Adaptation Research Facility. The Australian Government is also working together with the CSIRO and the Department of the Environment and Energy so as to bring together the expertise on climate resilience and adaptation to support climate risk management. The Department of Agriculture, Water and the Environment has the responsibility of climate change adaptation strategy and climate science activities (Department of Agriculture, Water and the Environment, 2020). The disaster and climate resilience are being integrated in the government agencies through their policies, programs and asset management. There is a coordinating group called the Australian Government Disaster and Climate Resilience Reference Group which comprises of senior officials to consider the risks and opportunities arising from climate change and natural disasters. The funding for the National Climate Change Adaptation Research Facility has been stopped as of now.

Key Highlights:

1. Australia follows the dual approach of mitigation and adaptation for climate risk management. It identifies the key sectors and their inter-dependencies to work together in a holistic and whole-of-government approach. The example of State of Victoria Heat Action Plan depicts the vertical and horizontal coordination mechanism at the governance level.

2. The practice of three-day heat forecast and the Heat Alert system shows the engagement of society through social media. The online decision-making tool of CoastAdapt allows community interface.

3. India is currently facing the issue of Climate change along with increase in frequency and intensity of heat waves. Similar to Australia, heat waves do not occur uniformly but are more intense at local levels. India also needs the coordinated approach of management of climate change with disaster risk reduction plans.

Key Characteristics of the Climate Risk Adaptation Strategy:

The Australian Government's strategy focuses on ensuring that everyone within society can make informed decisions and adjust their behaviour in response to climate risks, by providing climate information. The Australian Government adopts the dual approach of mitigation and adaptation.

The Australian Government has implemented initiatives to achieve low-cost emissions reductions including working with Council of Australian Governments' Energy Ministers to develop a National Energy Productivity Plan to improve the efficiency of vehicles, phasing down potent hydrofluorocarbons, delivering the Renewable Energy Target and developing a strategy to improve the use of solar power and other renewables, and developing a low

emissions technology roadmap. The figure 10 depicts the identified key sectors and traces their inter-dependence as identified in the National Climate Resilience and Adaptation Strategy,

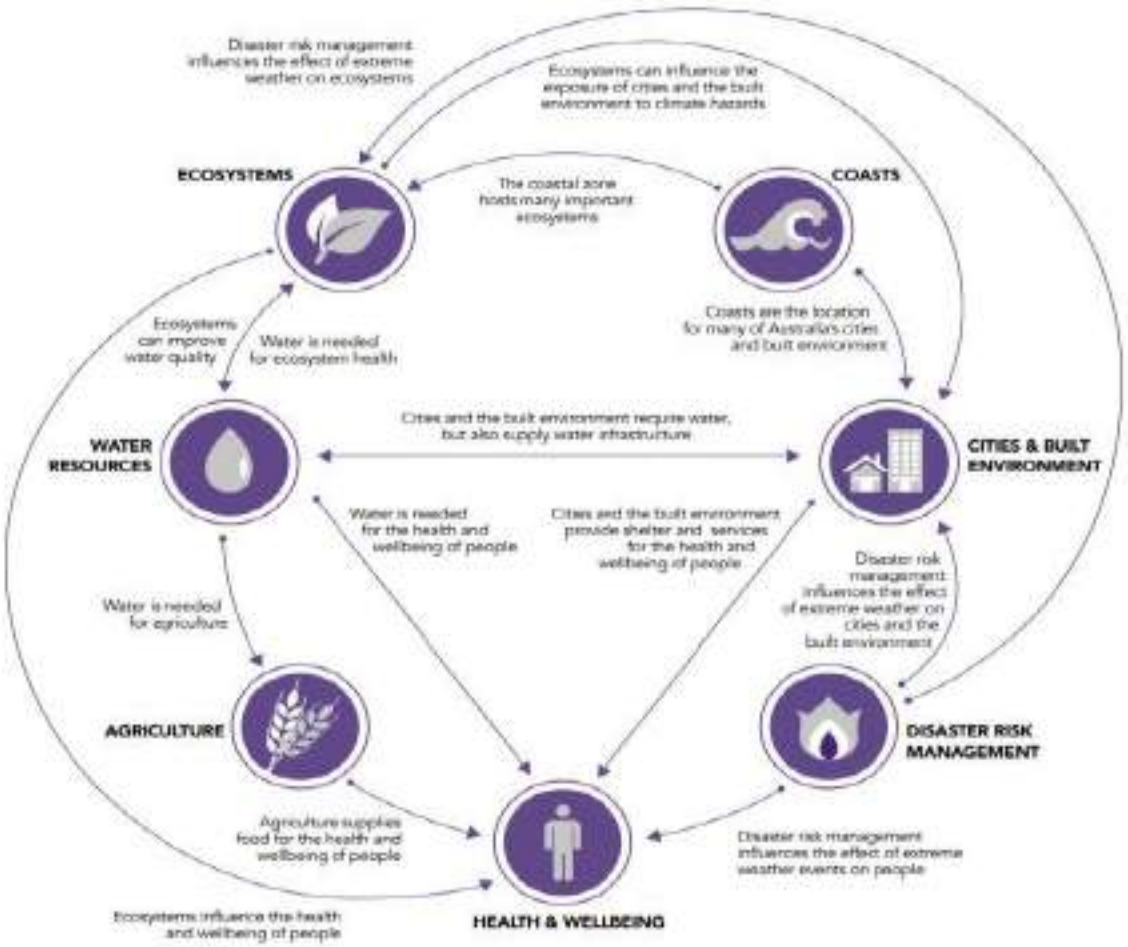

Figure-10 Key sectors and inter-dependencies

Source: National Climate Resilience and Adaptation Strategy, 2015

2015. Some of the adaptation strategies include strategic investment in built infrastructure such as seawalls and levees, and the protection of natural infrastructure such as sand dunes and mangroves.

Over the past 100 years, **heatwaves** have caused more deaths than any other natural hazard (The Climate Council, 2014). In Australia, a heatwave is defined operationally as a period of at least three days where the combined effect of high temperatures and excess heat is unusual within the local climate (ibid). In Australia, the number of heatwave days are increasing and heatwaves are occurring more frequently.

The governance arrangement for the state of Victoria is stated as in figure 11. The key authority is derived from the Emergency Management Act of 1986 and 2013 under which the states and territories prepare their State Emergency Plan, under which comes the State extreme Heat Sub-Plan. The Department of Health and Human Services (DHHS) leads the heat health plan.

The Chief Medical Officer issues the Heat Health Alert system. The alert is issued up to three days before the forecast extreme heat conditions and is available to the public through a subscription service.

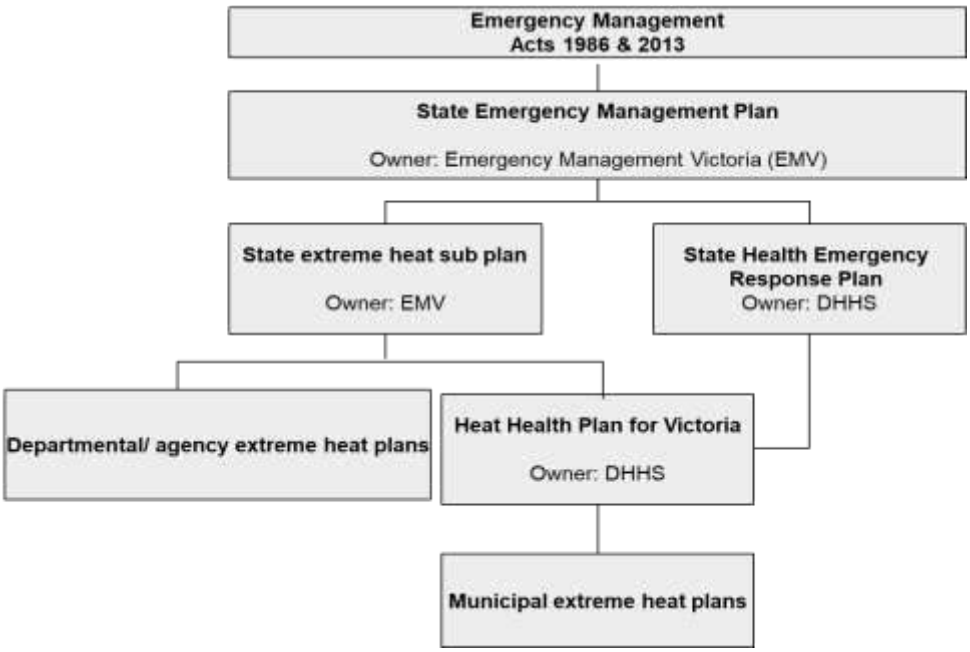

Figure-11 Victorian Government arrangements for extreme heat preparedness and response

Source: Heat Health Plan for Victoria

Advice on forecast certainty and climate outlooks assists the emergency management teams to position resources with greater confidence. Extensive education material to support the service has also been developed. Pre-recorded audio and video interviews with climatologists and meteorologists embedded within radio and TV news are featured. Social media and twitter is used to alert the public for heat wave alert service. Figure 12 represents the three-day heat-wave service alert. The public health messages communicated through these stakeholders include recommedations of preparatory and preventive actions to reduce the risks.

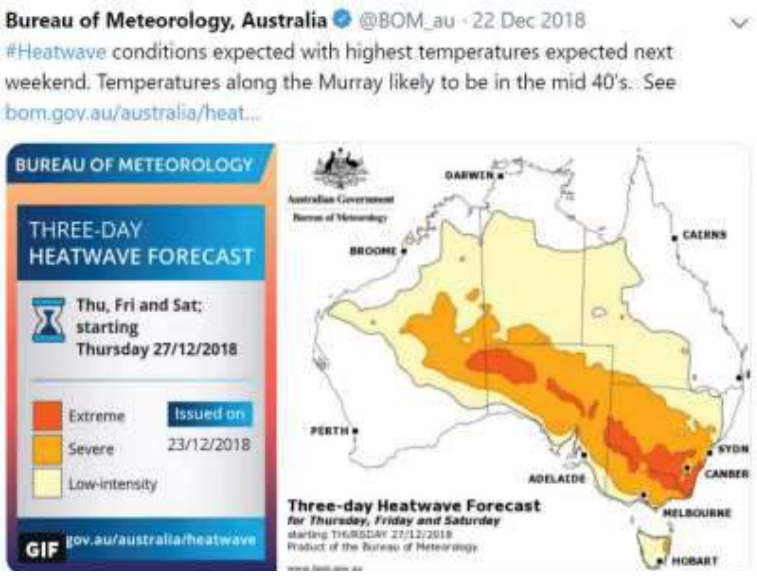

Figure-12 Three-Day Heatwave forecast on twitter

Source: (Bettio et al., 2019)

Key Stakeholders and Actors Involved

The National Climate Resilience Strategy, 2015 highlights the complementary role of all sectors: Governments at all levels, businesses and communities. State and territory governments have the leading role in adaptation actions, primarily through their planning laws and investments in public infrastructure. Local governments are on the frontline in dealing with the impacts of climate change.

The Australian Government engages with public by providing information and knowledge on climate science information so as to enable understanding on potential impacts of climate change to through the website. It also provides comprehensive regional-level data that projects future climate. The Australian Government also engages with private sector to provide guidance and information on best practice adaptation to assist businesses and communities to manage their climate change risks through an online tool called CoastAdapt. It is an online tool to support local governments and businesses to identify, assess and respond to climate risks in the coastal zone.

Key Takeaway lessons for Indian Context

1. The inter-connected approach of disaster risk reduction, climate action and heat wave involving all sectors and identification of linkages in the plan can be used for India's strategy on integration of climate risk concerns in disaster risk reduction planning.
2. The heat-wave action plan engages the stakeholders in mitigation and adaptation activities prior to the summer. Such approach allows participation of concerned agencies in the mitigation efforts.
3. ***Community Empowerment:*** The CoastAdapt online tool, supports the local governments and businesses through:
    - Map support to local organisations to understand future sea-level scenarios
    - Supporting decision-making process
    - Providing guidance on prioritising what to protect and how and when to protect it through community engagement
    - Providing information on insurance and legal issues, engineering solutions and undertaking risk assessments.

   This tool enhances the decision-making, coordination and community engagement in climate risk adaptation effort.
4. Adelaide Airport Ltd (AAL)'s strategy of using ***climate change as both a business risk and an opportunity*** for sustainable development is particularly unique and beneficial. It has identified key climate risks and, where the existing comprehensive controls and operational plans required additional mitigation actions, these have been specified and will be integrated into key business documents and guidance. For example, treatments for heat-related risks include integration of appropriate actions within various asset management plans.
5. A national **heatwave alert service** as delivered by the Bureau supports a coordinated awareness and response across the nation. The ability to diagnose, forecast and observe heatwaves, assists with decision making. Increased awareness of heatwave impact has resulted in briefing products now incorporating a focus on interpretation of upcoming heatwaves.

Key References

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Heat Health Plan for Victoria, 2020

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2. Disaster Response-Bushfires

Bushfires are a common hazard in Australia. The unprecedented crises have equal impact on rural areas, the highways as well as mountains. Bushfires are important for regeneration of land fertility, however the unprecedent scale and ferocity have made them into a hazard. This is further magnified by the dry climate conditions, less rainfall and low soil moisture. The high temperatures and fierce winds accentuate the conditions of the bushfire (Ryan, 2020).

There are two mechanisms in which the Australian Government coordinates the disaster response. The Australian Government Disaster Recovery Committee (AGDRC) coordinates the disaster response and recovery efforts. The second is through a dedicated agency e.g. the National Bushfire Recovery Agency. The lead minister for response and recovery is the Minister responsible for Emergency Management Lead Agency and the lead minister for response and recovery is the Department of Home Affairs. Emergency Management Australia coordinates the Australian Government's disaster assistance to states and territories. The Australian Government Disaster Response Plan (COMDISPLAN) is the mechanism through which the states and territories can request for non-financial assistance from the Australian Government. The National Bushfire Recovery Agency has been provided with fund of $2 billion to coordinate the recovery efforts and rebuild the communities (Bushfire Recovery Agency, 2020).

Key Highlights:

1. The Australian Bushfire response highlights the importance of the coordination mechanism, the use of technology and the aerial response capabilities of the Australia with example of Australian Capital Territories' bushfire strategic management plan.

2. The Strategic Bushfire Management Plan provides the legislative provisions for response coordination and operations. The Fire Danger Index helps in awareness and prevention through early response. The land-use planning based on fire management zones integrates the evacuation plans in construction and development activities.

3. The inter-agency response process can be useful for India. While bushfires are not very prevalent, India witnesses wildfires in various part of the country. The aerial response capabilities along-with tracking and intelligence gathering through the use of helicopters are of particular help in remote and inaccessible areas of forests during the wildfires.

Key Characteristics of the Strategic Bushfire Management:

The Strategic Bushfire Management (SBM) Plan, 2019-2024, of the Australian Capital Territory (ACT) will be considered to understand the practice of response (ACT Government, 2020). The plan is prepared by Emergency Services Agency (ESA) under the Emergencies Act, 2004. The current SBM plan captures the recommendations of previous councils and report and builds on previous two SBM plans.

The figure 13 below captures the linkages of plans from legislations and operational plans. The SBM plan highlights the important role of the community, technology and the need for climate change adaptions.

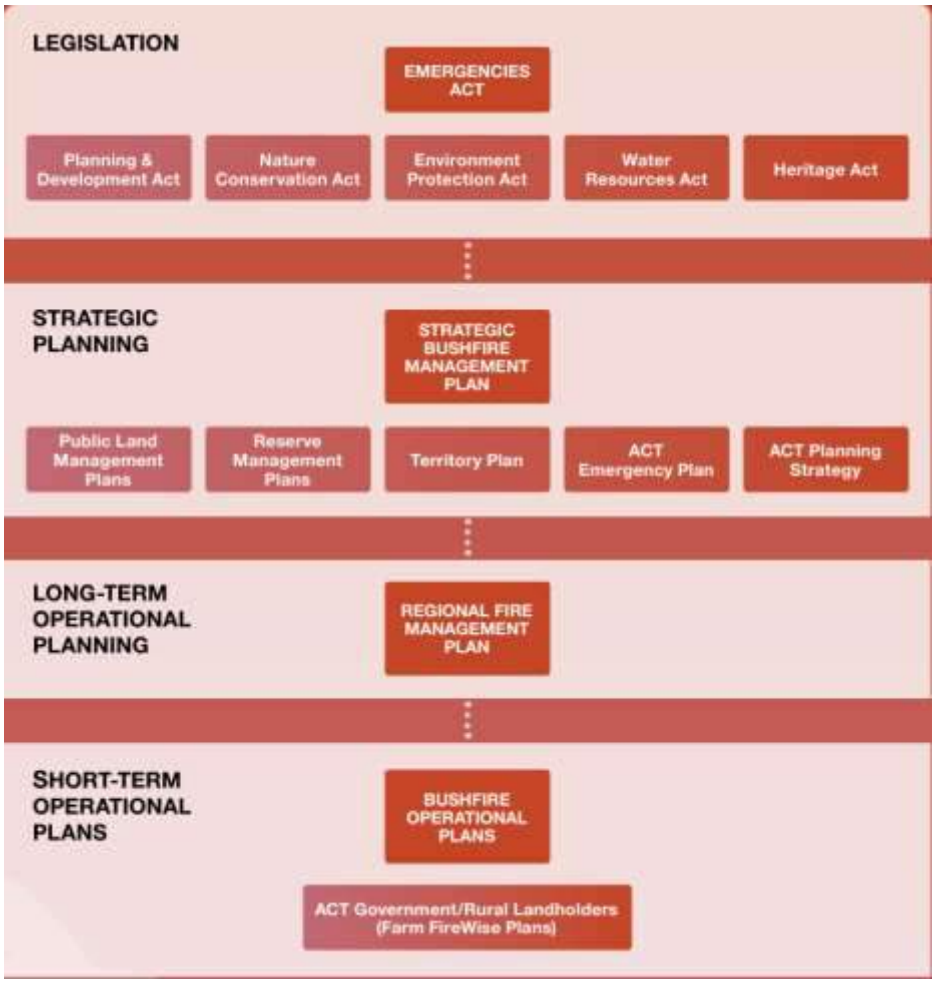

Figure 13: The vertical and horizontal planning mechanisms
Source: Strategic Bushfire Management Plan 2019-2024

The plan identifies the factors of risk of bushfire including fuels. The type of vegetation is a fuel for the bushfire specifically grasses, leaf litter and small twigs. Other than vegetation weather including temperature, humidity and wind play an important factor. In this regard, the Bureau of Meteorology gauges these factors and provides information on *Fire Danger Index*. This index is used to determine preparedness activities. This index indicates the possible consequences of a fire. The SBM Plan identifies the Bushfire Prone area in the ACT. It allows the community to assess personal level of risk through education and awareness campaigns. The new residential developments or redevelopments account for bushfire risk assessment. The

Bushfire Management Standards identifies the fire management zones (Figure 14) and also prescribes the treatment standards for each zone. The Bushfire Management Standards include the requirement of emergency and evacuation arrangements including the water infrastructure requirements.

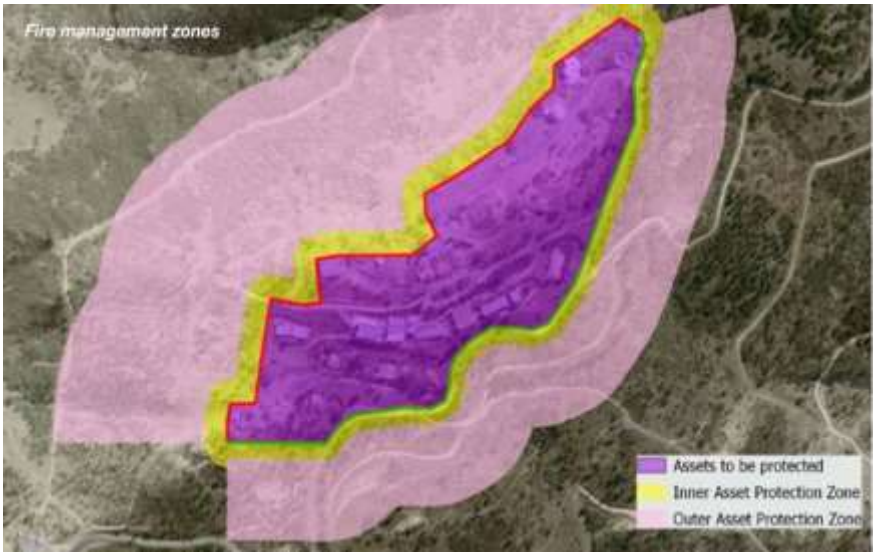

Figure 14: Fire Management Zones
Source: Strategic Bushfire Management Plan 2019-2024

The primary response responsibility for bushfire response in urban areas is on Fire and Rescue agency. In the rural areas, the Rural Fire Service has primary legislative responsibility for bushfire response. Further, the community members living close to bushland areas are trained and equipped in fire response as part of fire response units. The government also identifies Bushfire Abatement Zones (BAZ) to manage the fire hazards. Within BAZs, all landholders are required to make Bushfire Operational Plans. The community engagement is enhanced during response through Public Information Coordination Centre as was done during Pierces Creek Bushfire in 2018. Since *speed* is crucial for response, dedicated fire trails are maintained to allow ease of access to fire vehicles. Such Fire trails are specified in dedicated farm wise fire plans. The MOUs are developed to coordinate response between Emergency Service Agency and Environment department. Further, to ensure the *speed* of the response, constant training is provided to the firefighters with regular mock drills. The strategy of containment or attacking the fire is decided based on the terrain and in case of fast spreading fire, containment is prioritised. The firefighters follow an Incident Management System. The Incident Management room is equipped with electronic displays, functional areas and is aligned with bureau of meteorology and social media.

The Australia's response to Bushfire Response is enhanced through the use of aerial capabilities. Aircrafts are used for water-bombing, rapid delivery of firefighters, fire detection, command and control services and logistics support (NAFC, 2020). National Aerial Firefighting Centre (NAFC) provides a cooperative national arrangement for the provision of aerial firefighting resources for combating bushfires. The Special Intelligence Gathering Helicopter provides military level information for mapping the bushfire from the air in real time. It is also equipped with infrared technology to see through smoke. This helicopter was

used seven times in ACT region alone. The early detection of the bushfire provides enough time to inform the communities.

The Australian Government also have the template for sectors on identification of national level good practices.

Key Takeaway lessons for Indian Context

1. The whole-of-agency approach of the Emergency Service Agency to facilitate communication platforms during pre-incident communication and non-operational activities is important to the understand resource sharing at governance level.
2. Aerial response capabilities in coordination with Emergency Service Agency to support the Fire-Bombing Air Base and large air tankers can be studied and integrated for Indian wildfire response.
3. Technological capabilities such as Fire Danger Index in cooperation with meteorological agency allow for enhanced awareness and prevention planning.
4. Use of Special Intelligence Gathering Helicopter which provides real time incident intelligence directly to Incident Management Teams for coordinating the bushfire responses, can also be utilised for tracking purposes and remote detection of wildfires in India.

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3. Australia Bushfire Recovery Planning

The National Bushfire Recovery Agency was established by Prime Minister on 6th January 2020. The Agency leads and coordinates the national response to rebuilding communities affected by the 2019-20 bushfires. It is led by the National Coordinator who reports to the Prime Minister through the ***Minister for Emergency Management***.

To enable the implementation of the recovery plans, the Australian Government has committed more than $2 billion to the National Bushfire Recovery Fund (NBRF). The fund is provided to the bushfire-affected councils in order to speed up the recovery and to help strengthen the community resilience. The councils utilise it to fund the projects to upgrade the local infrastructure in rebuilding, generation of economic activity to support community resilience.

Figure 15: Functions of the National Bushfire Recovery Agency
(Source: The National Bushfire Recovery Agency)

The Australian Government has a local level recovery plan in place for community, economic, environment recovery and reconstruction. Section 57 of the Act details the legislated requirements of local governments to prepare disaster management plans. The key roles of local governments in the recovery and reconstruction process include developing a recovery plan in collaboration with local communities to manage and coordinate recovery and reconstruction efforts.

Local Recovery Groups are convened by the local/district disaster management groups after a disaster to provide a management forum for the recovery and reconstruction processes in respect to the affected area and the community. There is a provision to create recovery sub-groups which concentrate on the human and social, economic, environmental and infrastructure (building, and roads and transport) aspects of recovery.

Each local government is responsible for developing its Local Recovery Plan in consultation with the community and key stakeholder groups. Having a local recovery plan enables the communities to track their recovery process. The communities are also encouraged to review their recovery requirements and priorities and update their local recovery plan on a regular basis.

Key Highlights:

1. A local recovery plan describes the local interagency arrangement for managing recovery plan operations. It describes the priorities, strategies, issues and activities ans action being taken to address these for a specific disaster.

2. The local recovery plan in Australia is undertaken at the level of district to enable community engagement and prioritisation of funding arrangements for the recovery options.

3. In India, disaster management planning is implemented at local level, the recovery planning would strengthen the community resilience.

Key Characteristics: The methodology for the same is as per the five stage planning process:

1. Preliminary Scoping: This step includes the possible impacts of the disaster and anticipated recovery requirements based on risk assessments, previous learning, experience and legislative requirements.

2. Problem Analysis: This step defines the recovery objectives and effects identified by the community and the disaster management group. It considers capability and capacity of the delivery agents, resources available and limitations to recovery activities.

3. Recovery Options: This step sees the development of a number of options to address the recovery requirements identified during Problem Analysis and considers the most effective way to deliver effective and timely recovery activities and possible risks to the implementation of these initiatives.

4. Recovery Options Analysis: This step assesses the recovery options developed, addressing identified risks and the inclusion of prevention, preparedness and resilience effects.

5. Decision, Implementation and Review: This step discusses the analysed recovery options with disaster management group and implements the same in the local recovery plan. The recovery plan is then monitored and reviewed to assess the effectiveness and to revise the actions if necessary.

Key Takeaway lessons for Indian Context:

1. The best practice provides example of planning for recovery at the community level. This allows community participation as well as tracking of the recovery process by the communities.

2. The local recovery plans enables planning for the financial requirements for the recovery options.

3. The five-step methodology for recovery planning allows scope for analyses of suitable recovery options and implementation in the plan.

Key References:

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CANADA


Russia
Arctic Ocean
Kalaallit Nunaat
(Greenland)
(Denmark)
Iceland
Alaska
(USA)
Arctic Circle
Yukon Territory
Whitehorse
Northwest Territories
Nunavut
CANADA
Atlantic Ocean
British Columbia
Alberta
Saskatchewan
Manitoba
Ontario
Quebec
Newfoundland
Victoria
Saskatoon
Regina
Ottawa
Nova Scotia
United States of America
LEGEND
National capital

7.2 Canada

7.2.1 DRM Governance structures for Canada

Organization of lead disaster management agencies

In Canada there has been a steady transition from a response focused civil-defence organized disaster management approach to one reflecting awareness, mitigation, and prevention. As a result of a number of acts (1988, 2005, 2007) Public Safety Canada (PSC) became the institutional focus of disaster management. Prior to PSC's organization, emergency management was largely under the guise of the Canadian Armed Forces.

Public Safety Canada is led by the Minister of Public Safety and Emergency Preparedness. Emergency Management and Programs is one of PSC's five branches with the others being: Community Safety and Countering Crime, Portfolio Affairs and Communications, National and Cyber Security, Corporate Management.

The ***Emergency Management Act*** of the Canadian government was passed in June 2007. It came into force in August 2007. The act named the Minister of Public Safety and Emergency Preparedness as its enforcer, who is responsible under the Act for many things, including conducting exercises and providing education and training related to emergency management.

Furthermore, each ministry is responsible under Section 6 of the Act to identify the risks that are within or related to its area of responsibility — including those related to critical infrastructure — and to do the following in accordance with the policies, programs and other measures established:

1. Prepare emergency management plans in respect of those risks;
2. Maintain, test and implement those plans; and
3. Conduct exercises and training in relation to those plans.

Disaster Management Functions of these Agencies/Department/Institutions

With a nationwide mandate and substantial economic resources, the Government of Canada's role in disaster risk management is primarily to support provincial and local efforts to mitigate, prepare for, respond to, and recover from emergencies. It provides this support in several ways. Table 2 provides an example of the Federal Government's role with respect to flood disaster management.

Table 2: Federal departments and their roles in flood risk management

Department	Role
Environment and Climate Change Canada	Provides meteorological information, weather forecasts and severe weather warnings through the Meteorological Service of Canada
Indigenous Services Canada	Preparation and recovery support for Indigenous communities
Infrastructure Canada	Infrastructure standards, codes and funding
National Defense	Canadian Armed Forces deployment
Natural Resources Canada	Floodplain mapping, data collection
Public Safety Canada	Emergency management, disaster recovery and mitigation funding, flood insurance

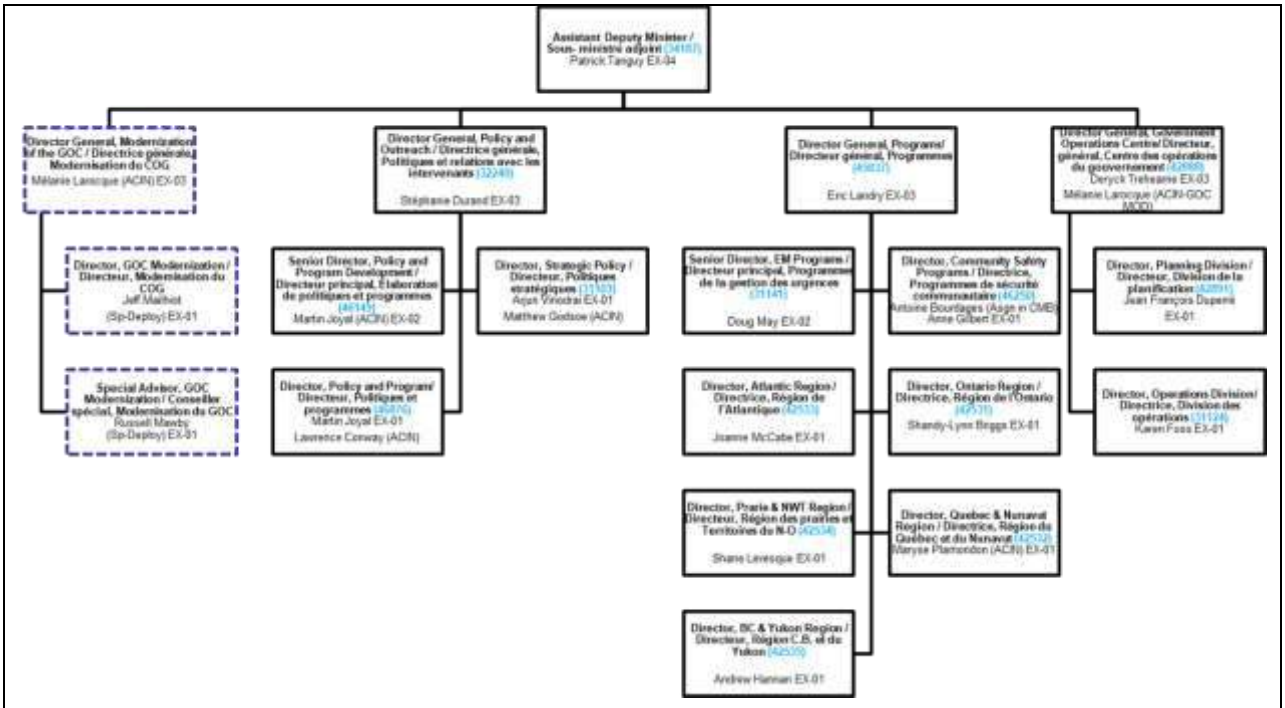

Figure 16: Organogram for the Emergency Management Branch of Public Safety Canada

Vertical and Horizontal Linkages

Relationship with Provinces and Territories

DRM in Canada is conducted under a multilevel structure were legal authority and relevant policy tools are divided between the federal, provincial, and municipal governments. Provincial governments are institutionally the strongest level of government in Canada, owing to their extensive powers over natural resources, health, the environment, and market control within their borders. Provinces also have significant taxation powers, with the authority to impose income and consumption taxes on top of those of the Federal Government. On the other hand, Municipalities are granted their power by provincial legislation and have limited fiscal capacity. Yet, municipalities in Canada have gradually inherited greater responsibility for DRM, including approval of local development projects. These divisions of authority and revenue constraints, as well as the land use planning approval hierarchy, are central to understanding the evolution of FRM in Canada. Federal authority is largely based on its deep financial and organizational capacity and level of expertise of its support.

Provincial and Territorial governments

Provincial governments have control over key policy tools such as land use planning and building standards, as well as constitutional authority over municipal institutions. For example, they set the regulatory flood standard, such as the return period of a flood, which is used as the baseline for planning flood protection. They specify and enforce standards on the design, construction and maintenance of buildings and infrastructure systems. They also set expectations for municipal emergency management programmes, the quality of which influences the effectiveness of local responses to hazards and the efficacy of recovery. Provinces have formal disaster financial assistance programmes that provide funds to eligible

individuals and organisations to facilitate recovery after a disaster. If the costs exceed a threshold based on the province's population, federal disaster assistance is made available.

Municipal governments

Municipalities are largely responsible for the enforcement and implementation of disaster regulations. They implement provincial mandates and legislation on land use, enforce standards for the design and maintenance of buildings and infrastructure, and build and maintain defense structures. Municipalities also contribute to DRM via emergency management. Thus, municipalities are often the first to respond and to disasters and to lead the recovery.

Indigenous communities

Numbering nearly 1.7 million, Indigenous peoples are the fastest growing and youngest population in Canada. Disasters, particularly floods, are a constant source of disruption in Indigenous communities. Forced settlement and resource exploitation have increased flood risk exposure for many communities. Indigenous Services Canada plays a role in supporting mitigation projects, flood monitoring, forecasts and warnings.

Social and cultural conditions within Indigenous communities are often ignored in DRM strategies. Many communities have been leading and managing their own risks for generations using local and traditional knowledge. Some federal projects, such as the Pan-Canadian Framework on Clean Growth and Climate Change, which is supporting adaptation in Indigenous communities to "address climate change impacts…" are attempting to engage more with traditional knowledge (Thistlethwaite et al. 2020).

Strengths of agencies in terms of Human Resource (staff, management practices, linkages, training etc.)

There are multiple levels at which human resources are handled within the Emergency Management branch of PSC. Some aspects of employment are handled by PSC's Internal Services office while other aspects, such as sector specific training (e.g. hazard risk assessment training) are handled within PSC itself.

The PSC undertook a Public Service Employee Survey (PSES) that highlighted that Public Safety Canada staff is experiencing considerable workload pressures and work-related stress. The Department continues to engage employees through various fora including taskforces, working groups and committees on staffing and efficiencies. Taskforces have been established to continue to engage employees in proposing concrete actions and implementing change. For example, the efficiencies taskforce focuses on implementing initiatives which aim to improve decision making processes.

Funding mechanism

The federal government provides economic resources to mitigate disaster risk. This is done through a number of programs in which local governments and provinces apply for funding under different project classifications, ranging from risk assessment to large-scale infrastructure.

The Government of Canada supports the restoration of infrastructure and personal property following a flood event, primarily through the "ger" program or DFAA. The program was established in 1970 to reimburse provinces and territories for part of the cost of disaster response and recovery (Golnaraghi et al., 2020). Since its inception, the program has provided more than CAD 5 billion in post-disaster assistance, the bulk of which has been linked to flood events.

Additional Remarks

A key to addressing the hodgepodge approach to DRR in Canada is education. As mentioned earlier mindsets of emergency response and rescue run throughout the DRM sector in Canada. Canadian DRM strategy uses a bottom-up approach but local (district/municipal level) institutional structures are highly variable with some locations hiring trained disaster risk management experts with salaries while the preponderance of communities delegating emergency preparedness to unpaid volunteers or as added work for the fire department.

Today, DRM in Canada is largely the domain of first responders, largely fire departments. DRM institutional structures were built on the USA's Incident Command structure which is focused on responding to large, wildland fires. This structure emerged from the military and allows the mobilization of large numbers of wildland firefighters to battle and contain wildland fires. This command structure makes sense in an emergency response context, either in terms of stopping a current hazard's expansion or rescuing lives. Here, information is channeled to the incident commander who will direct groups of people to combat and contain the hazard or will direct teams of rescue personnel to areas in need. Since theatre-wide total situational awareness is not possible. Since speed and coordination is essential in disaster response, it is necessarily hierarchical. Information flows upward to incident command where strategy is decided and orders given to those on the ground. Disaster recovery and preparation are less urgent and as such require less of a command-and-control structure. Nonetheless, disaster recovery is urgent for those whose lives have been disrupted by a disaster.

Disaster mitigation is the least reliant on command and control, and such structures can even hinder truly mitigatory action.

The literature highlights the value of formalizing an education in disaster risk management. A DRM education would provide a key to changing the institutional structures of DRM in Canada is the improvement in mitigation. Improving the mitigatory institutional structures in Canada will require the mindsets, methods and tools of planning and the social sciences. This will require a system for professional education. At present this does not exist.

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7.2.1 Thematic Good Practices

1. **Education: Degrees and Certificates for Disaster Management**

Canada's disaster management system is built on the USA's Incident Command structure which is focused on wildland fire response. This structure is ideal to meeting immediate and coordinated need for action to a clear and present hazard. Like in many places through the world, this gives Canadian DRM more of a response footing. With Canada's signing of The Hyogo Framework for Action, the conversation in Canada has shifted to one where mitigation and resilience have gotten more attention. With this new interest comes the realization that enhancing opportunities for life-long-learning and "interprofessional" education are needed to build these capacities (Atack et al., 2009, Siriwardena et al., 2013).

Mitigation requires a holistic, multi-sector approach where dialogue and activity need to be coordinated across multiple fields such as planning, social sciences, civil engineering and disaster response, this can be very challenging. As noted by Atack et al., (2009) students and professionals "spend years developing attitudes, beliefs and insight into what their profession means" yet have little to know knowledge of other sectors, their terminology or even the people working within them.

A big challenge in Canada is there is not really a recognition that disaster and emergency management is a profession. (L. Pearce, personal communications, 17 December 2020). The governance structure puts the onus of responsibility for disaster management at the local level yet the financing, training, and stature in most locales are not established.

The challenge is that the mitigation need of Disaster Management has not yet been built into the culture in the way it needs to fulfil its calling. It is still too often seen as a second career for returning retired police officers, firefighters or military which favours maintaining the top-down hierarchical culture inherent in those fields. In many locales the disaster officer is a volunteer or the work is added to the other responsibilities of someone within the fire department.

The Incident Command system, when brought to the local community level, begins to get altered and adapted to the local conditions. For the purposes of planning and mitigation, you begin to have multiple goals and multiple issues, and the command system starts to fall apart. So in the end a top-down command system which was set up to fight fires and that has a single focus, a single goal gets modified in multiple different ways to meet local needs obviating any benefit such a structure may have offered.

There is a need to move towards a model based more on collaboration with management operations, more on a model of cross sectoral collaboration, communication and connection. Though the culture is slow to change, this change in approach and training is underway. Key to this transformation has been the establishment of degrees and certifications which have raised the stature of mitigation and the systemic thinking and approach needed.

Key Highlights:

1. Brandon University was the first with a bachelor program for emergency management with a focus on rural and First Nations. Royal Roads University followed with the first master's level education in Canada. This was followed very shortly by York University who has recently expanded to have both an undergraduate and master's degree programme.

2. The Wilfrid Laurier University online Graduate Diploma in Emergency Management is a postgraduate credential designed for active professionals looking to build their career in public safety. Developed by industry experienced public safety professionals and created to align with the current initiatives of Public Safety Canada, this online program focuses on delivering practical knowledge in emergency management that can be immediately applied in the office and in the field.

3. The Justice Institute of British Columbia offers a post-baccalaureate diploma in Disaster Management (PBDDM) for those who already possess a bachelor's degree to pursue or advance their career in the fields of disaster and emergency management.

4. Altering a culture of response is not an easy process and it is impossible to do without the mindsets, tools, and training needed to do mitigation work. This includes trans-sector thinking, collaborative approaches, facilitation and other skills. Key to establishing these new cultures are the training programs needed to train professionals. A key challenge for Canada has been acceptance of the new approach within the field. Where the process has worked well, key government actors have been champions leading to systemic change.

Key Characteristics of the Policy / Good Practice

- The educational system has a major impact on interprofessional (IP) practice because it is during professional training that IP values are instilled in students (Martin-Rodriguez et al., 2005).
- Students in undergraduate health and allied programs spend years developing attitudes, beliefs and insight into what their profession means, however, they often complete these programs with insufficient knowledge of other professional groups, reducing their ability to work together effectively (Steinert, 2005).
- The online course provided students with a virtual practice setting where they learned valuable disaster management content and also had the opportunity to engage in experiential learning with their colleagues and develop interprofessional relationships and skills (Atack et al., 2009).
- The lack of involvement with the industry and the lack of research and development activities on disaster management by built environment professionals act as hindrance to effective disaster management education (Siriwardena et al., 2013).

Key Stakeholders and Actors Involved

- National, Provincial, and Local disaster management offices
- Universities (public and private)
- Mayors, Governors, other leadership to drive change

Key Takeaway lessons for Indian Context

Education and training in systems thinking and holistic disaster planning is needed.

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GERMANY


6°
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Denmark
14°
Baltic Sea
North Sea
Canal
Kiel
Hamburg
Schwerin
Bremen
Elbe R.
Havel R.
Poland
Netherlands
Ems R.
Mittelland
Hannover
Potsdam
Berlin
Spree R.
Canal
Magdeburg
52°
Rhine R.
Weser R.
Elbe R.
Essen
Leipzig
Dresden
Düsseldorf
Belgium
Cologne (Köln)
Weimar
Bonn
Germany
Frankfurt
Main R.
Czech Republic
Wiesbaden
Mainz
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Luxembourg
Saarbrücken
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7.3 Germany

7.3.1. DRM Governance Structures

Organization of lead disaster management agencies

In Germany storms are the most frequent hazards followed by floods and extreme temperatures with low temperatures more frequent than high temperatures. However, fatalities were highest in heat waves, followed by storms. In economic terms floods accounted for highest losses (e.g. Aug 2002 and May/ June 2012 floods). Other hazards are earthquakes, avalanches and epidemics.

It is important to understand different terminologies used in the DRR context in Germany-civil protection, disaster control and "protection of people". While civil protection is part of national defense policies and is responsibility of the ***Federal Ministry of Interior (BMI),*** disaster control is the responsibility of states. And, "protection of people" implies both, civil protection and disaster control. Hence "protection of people" (Bevölkerungsschutz_in German) that includes all non-military/ non-police measures taken to protect people from disasters, encompasses all actions viz. prevention, mitigation, preparedness and risk transfer, needed as part of DRR.

At the national level the BMI has main role in crisis management. It houses two major bodies that work together on crisis management: a) the ***Federal Office of Civil Protection and Disaster Assistance (BBK)***; and, the Federal Agency for Technical Relief (THW).

The BBK was established under the New Strategy for Protecting the Population in May 2004 as a central organisation to ensure safety of the population. The structure of BBK is as shown below.

The Federal Agency for Technical Relief (THW-Gesetz), was setup under the Federal Civil Protection and Disaster Relief Act. It has only one percent (approx. 1000) of staff employed while 99 percent work as volunteers.

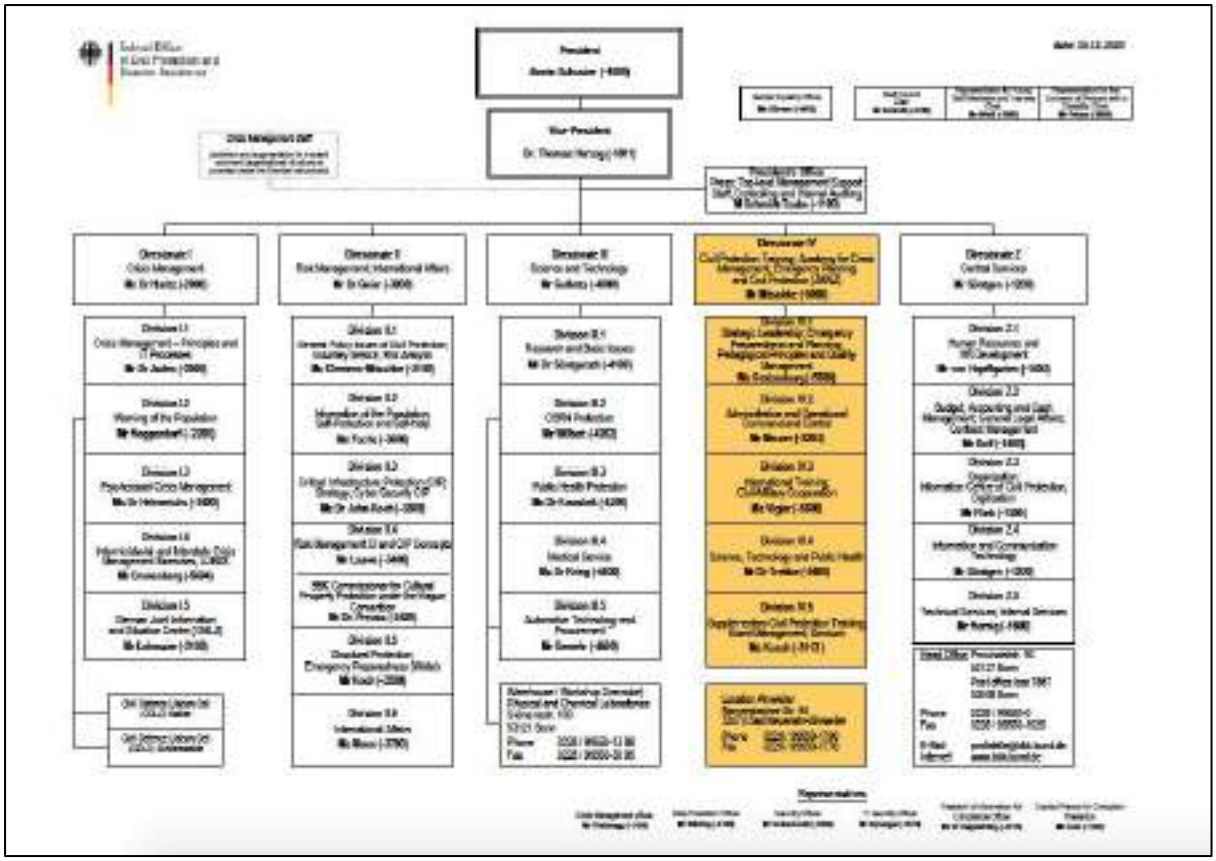

Figure 17: Structure of BBK
(Source: Bundesamt für Bevölkerungsschutz und Katastrophenhilfe - Organisational Chart, 2020)

Disaster Management Functions of these Agencies/Department/Institutions

The functions of BBK include: develop national risk analysis, and standards and frameworks for civil protection; Warning and information of the general public; Development of a modular warning system satellite-based modular warning system, and warning media; information on population protection and population needing support; Education and training of general public, decision makers and managers on civil security measures; and, support municipalities on self-protection measures.

Vertical and Horizontal Linkages

The state governments are responsible for formulating policies on civil security and enacting legislations on rescue and emergency services, fire protection and disaster control and management. They support the districts and municipalities who are the first responders on crisis management. As per The Basic Constitutional Law (GG, Article 83), disaster relief is largely planned and implemented at the local level.

In addition, for Vertical Coordination specific committees/ groups have been setup (Marx et al. 2017):

- Inter-Ministerial (Crisis Management) Coordination Group (IntMinKoGr) of the governments at the Federal and the State level: It deals with coordination issues on

crisis management in case of disasters affecting more than one state over a longer period of time.

- Joint information and Situation Centre of the Federal Government and the States (GMLZ): As a single national contact point for 20 national and international information and alert mechanisms, it ensures that the Federal and State governments, and relief organisations have same information on disaster. This is achieved through situation analysis and assessment, and resource management that involves procurement and distribution of resources where bottleneck exists.
- National Risk Analysis: The federal government and the states have to jointly create a national risk analysis for civil protection as per law for informed decision-making and risk-based planning of prevention and preparedness measures.
- Crisis Management Exercises: are carried out jointly by the Federal and State governments which serves as an opportunity to check/ test crisis management plans and structures.

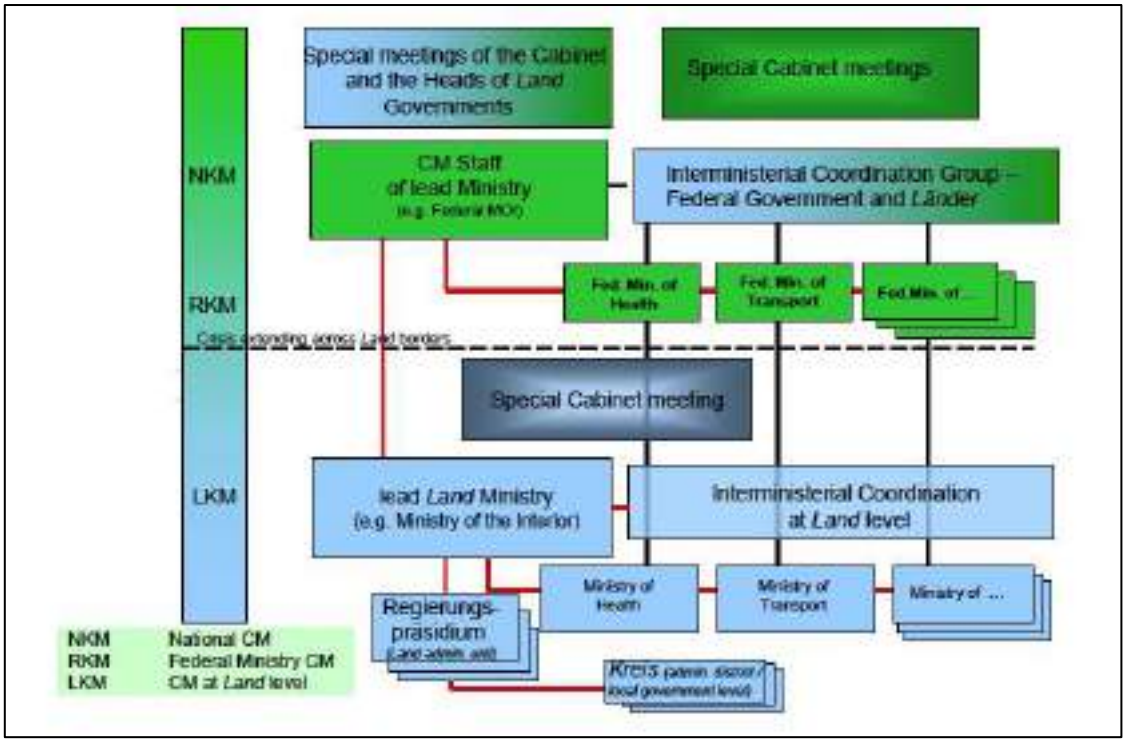

Figure 18: Organisation of Crisis Management (CM) in Germany- Source: (Bundesministerium des Innern, 2015)

Strengths of agencies in terms of Human Resource

Nationwide there are about 80000 volunteers with the technical relief agency (THW) who are trained in 668 sections on operations. In addition, specialized advanced trainings are provided at two locations of the Federal Training Centre. Around 6000 volunteers are trained every year.

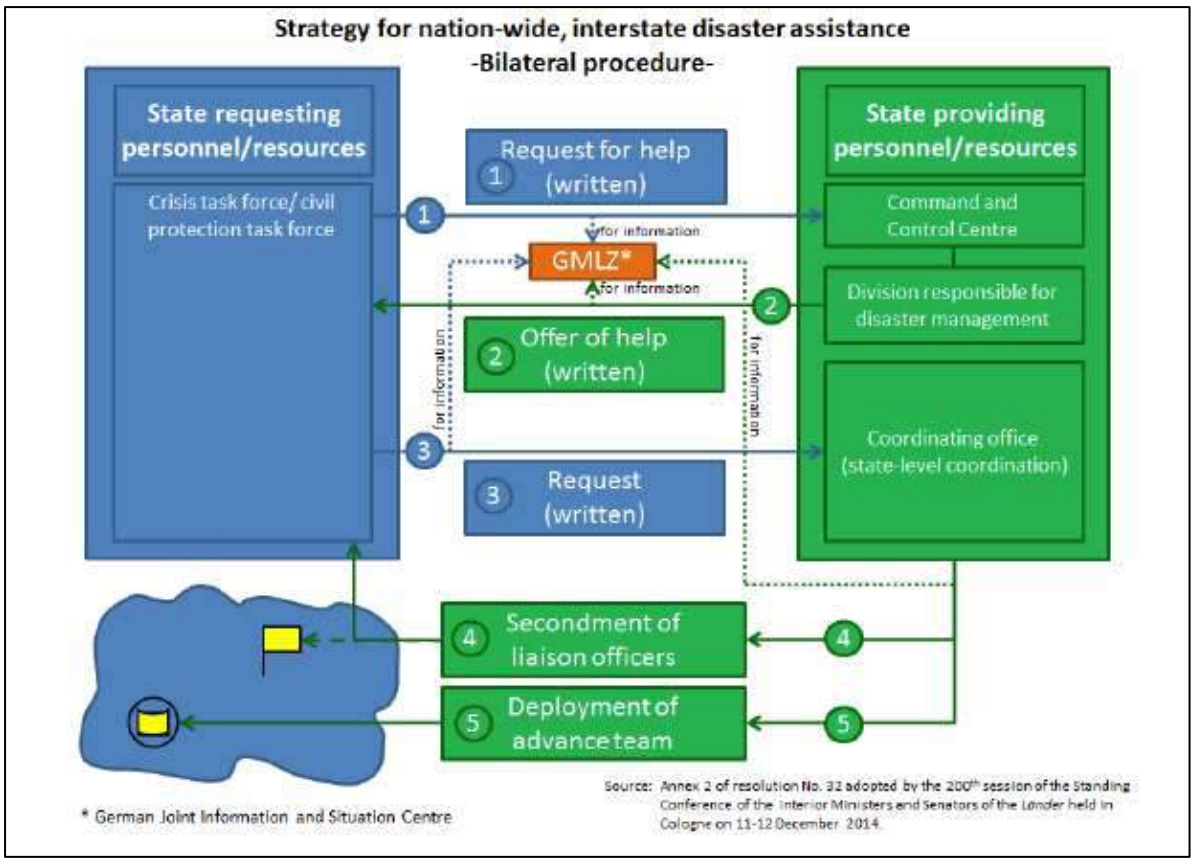

Figure 19: Horizontal linkages (inter-state) on Crisis Management in Germany
Source: (Bundesministerium des Innern, 2015)

Funding mechanism

The funding is through budget allocations to various Ministries by the Federal government. In addition, the risk is financed through private insurance companies.

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7.3.2 Thematic Good Practices

1. Flood-insurance as a tool to catalyse resilience building

Any building insurance in Germany covers windstorms and fire hazards but flood insurance supplement has to be signed and is voluntary. The voluntary supplement also covers other disasters including earthquakes, avalanches, snow buildup etc. The building insurance has been provided since 1991.

The Germany Insurance Association (GDV) has developed comprehensive flood risk maps showing demarcation of zones of high (once in 10 years), moderate (once in 10-50 years) and low or even rarer flood risk zones in 1991. The low or even rarer risk zone were further split into once in 50-200 years and once in 200 years flood risk zones after the catastrophic floods of 2002. These maps have been further updated with recently available official more detail flood hazard maps for all flood-prone urban areas with the net result that areas under high risk zones have reduced. These maps form the basis for deciding if insurance can be provided for a building. In high-risk zones insurance coverage is generally not provided. However, the coverage is provided if risk mitigation measures are implemented at the property level.

The GDV has been tracking flood losses over a considerably longer timelines. Further, flood insurance coverage details are available for 99 percent of areas of Germany. The insurance coverage provides building's sliding replacement value as per trend of market prices.

German Government has provided billions of disaster assistance for reconstruction following major floods in past (2002 and 2013). This has hampered deeper penetration of building insurance. However, the overall penetration of insurance (flood and other disasters included) has increased from 19 percent in 2002 to 37 percent in 2015.

We draw lessons from two states (Bavaria and Saxony) on ways flood insurance has catalyzed to build resilience of homeowners. Bavaria experienced floods in 2003, 2005 and 2013 while Saxony in 2003, 2010 and 2013.

Key Highlights:

1. Flood insurance is a voluntary supplement over regular building insurance. Through a multi-pronged approach by various stakeholders there has been increasing penetration of flood insurance that has brought about positive changes in flood-resilient practices at building/ property level.

2. Comprehensive flood-risk maps demarcating zones of varying probabilities of hazard and damage have been developed for all the urban areas of Germany.

3. Homeowners who opted for flood-insurance have received higher pay-outs as compared to uninsured ones who relied on governmental aid and in some cases did not receive compensation given the regional character of floods including in recent flood events.

4. Homeowners who opted for flood-insurance are seen to have adopted various risk mitigation options at their building/ property level including flood-adapted designs, water resistant interiors and water barriers.

5. The German Insurance Association (private sector) and the state governments alongwith other stakeholders have jointly worked in partnership to promote a culture of prevention and safety in buildings/ homeowners.

6. Given that India has witnessed large-scale damage to housing due to recurrent disasters, India can promote risk prevention and mitigation measures through such a joint multi-stakeholder initiative.

Key Characteristics of the Policy / Good Practice

Triggered by massive drain on government budgets for disaster assistance and ways to explore options to promote flood insurance, the two states of Bavaria and Saxony passed a directive in 2011, whereby disaster assistance will only be provided if a homeowner can prove that insurance was denied. In addition the GDV (The German Insurance Association) held large-scale campaigns with state water authorities for creating risk awareness on flood exposure and insurance options in Bavaria and Saxony in 2009 and 2012, respectively. The campaign subsequently spread to other eight states and in two states it is under preparation.

GDA supported civil and water engineers in developing and launching a "building certificate" for homeowners in 2014. These certificates also included advise on property-level risk-mitigation options.

All the above efforts lead to significant changes in resilience of homeowners who had opted for the voluntary supplemental flood-insurance:

- Due to regional character of floods, an area might not be eligible for governmental disaster assistance despite suffering damages to buildings. It was observed that insured homeowners received higher pay-outs as compared to uninsured ones who relied on government assistance. In addition, higher percentage of insured homeowners restored their houses quicker while also investing in risk-mitigation options (such as adapted building use, water –resistant interiors and water barriers) than uninsured homeowners. It is noteworthy that the percentage of homeowners implementing the mitigation options was higher before each of three flood events than after the flood events.
- Higher percentage of homeowners signed the voluntary flood-insurance contract before each of the three flood events than after the event.
- Even in case of homeowners who lived behind the dikes and had false sense of security, higher percentage of homeowners signed insurance-contracts before the each of the three flood events.

Key Stakeholders and Actors Involved

- BBK (Federal Office of Civil Protection and Disaster Assistance)
- State governments of Bavaria and Saxony
- Insurance Association (GDA)
- Civil and water engineers
- Water authorities

Key Takeaway lessons for Indian Context

- Policy and institutional level changes such as the directives passed by the state governments in this practice are key to success of such an initiative.
- India can promote such a multi-stakeholder initiative in major disaster-prone urban areas, to begin with, to promote a culture of safety, prevention and mitigation in housing sector.

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2. Changes in Policies and Institutions related to Flood Risk Management triggered by recent large-scale floods in Germany

In the past couple of decades major floods (e.g. floods of 2002 and 2013) have triggered significant changes in policies and institutions for Flood Risk Management (FRM) in Germany. Climate Change is likely to double in frequency the extreme flood losses by 2050 (Jongman et al. 2014). Given the uncertainty associated with climate change projections any country needs to continually use lessons to revise policies and institutions for risk reduction, in an iterative manner. It is noteworthy that Germany has adopted lessons learnt from recent major flood events and revised their FRM systems at the Federal, State and Local Authority levels.

The changes in the FRM system have been realised due to active participation of diverse stakeholders including government, private sector, civil society and academia.

Key Highlights:

1. A multi-pronged approach of generating detail flood-risk maps, enacting policies, stricter zoning regulations, formulation of large programmes, and incentivising risk prevention and mitigation measures has been promoted based on lessons learnt from recent major floods in Germany.

2. The Federal and State governments, local authories, GDV (German Insurance Association-private sector) and homeowners/ commercial enterprises have been actively involved in formulation and implementation of this multi-pronged approach.

3. Some major urban areas have implemented a multi-stakeholder innovative approach to promoting FRM

4. Such a multi-pronged approach that varies in characters across states depending on nature and extent of flood-risks and socio-economic contexts can be adopted in India.

Key Characteristics of the Policy / Good Practice

The salient features of improvements in flood risk management triggered by recent major floods include (Thieken et al. 2016; Surminsky et al. 2020)

- The Federal and State Ministries along with various agencies have developed comprehensive flood-hazard maps in December 2013 that are accessible through the geo-portal of German Federal Institute of Hydrology (BfG). In Germany the key agencies have developed probabilistic, pluvial, fluvial and coastal risk maps for use by diverse stakeholders.
- The GDV (German Insurance Association) with support of water authorities increased awareness of the general public on flood risk.
- The BBK, the central agency for crisis management in Germany, has been preparing yearly flood risk—ex-ante and ex-post analysis of floods, as part of Parliamentary reports since 2012.
- Two Acts were passed—the Flood Contract Act 2005 and changes were made to Federal Water and Spatial Planning Act. This resulted in stricter zoning regulations in flood-prone areas in statutory inundation areas.
- Different safety standards have been set by states along the rivers ranging from 1 in 30 years to 1 in 1000 years.
- Using a multi-stakeholder approach (as in the previous good practice, above), risk mitigation measures have been promoted at property/ building level.
- Local authorities are being requested (/put as condition) by state government to opt for insurance of their assets in order to receive additional disaster assistance. In addition, cities such as Hannover and Cologne have taken innovative measures for FRM by adopting a multi-stakeholder approach.
- A National Flood Protection Programme was agreed in a joint effort between the governments of all federal states and the Federal Ministry of the Environment, Nature Conservation and Nuclear Safety, in 2014 covering around 100 measures with the goal of taking stock of flood protection works, identifying gaps and prioritizing investments. Significant part of the programme focused on upgrading existing dikes/ levees that breached during the 2002 and 2014 floods.
- The accuracy of flood forecasts and early warning has been enhanced and tailored to make them user-friendly.

Key Stakeholders and Actors Involved

- National and state governments, and local authorities/ municipal level.
- German Insurance Association (GDV)
- Homeowners/ commercial enterprises
- Scientific institutions

Key Takeaway lessons for Indian Context

- Such a multi-pronged approach needs to be promoted in India considering the socio-economic and political context of India
- Few major flood-prone basins covering both urban and rural areas) in India can be taken up on pilot-basis to implement a comprehensive set of interventions related to prevention and mitigation, preparedness, and recovery.

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3. Volunteers in Disaster Management System

It is a proven fact that communities are first-responders to disasters. They have knowledge of local conditions, vulnerable groups, available resources and capacities to respond to disaster events. In general a well capacitated citizenry is key to effective disaster management.

Disasters exert pressure on finances of a country, especially for response and relief, which otherwise could be used to promote socio-economic development. As also effective preparedness and response can aid speedy, effective and early recovery.

Engaging volunteers from within the communities and citizenry in general, for disaster response can promote effective and cost-efficient disaster response.

A key feature of Germany's disaster management system are the volunteers. The government lays adequate emphasis in encouraging volunteerism by promoting selection, training and deployment of volunteers for crisis prevention. Germany has around 1.8 million volunteers that estimates to approximatley two percent of total population. The overall approach of volunteerism fosters a win-win situation for both the government and volunteers. The German society and culture in general has very high regard for social service.

Key Highlights:

1. German society and culture have high regard for volunteers.

2. There are several spheres for volunteers to engage with such as social service including crisis management and ecological conservation. The programmes have been successful because they are supported by legislations, standardised training and certification programmes, and budget.

3. The volunteer programs are win-win situation for both volunteers and government. The government is able to effectively reach out to its citizens especially the vulnerable while the volunteers gain from training, practical experience, and higher recognition for apprenticeship or getting admission for a university degree or job.

4. The select five voluntary organisation contribute significantly in developing cadre of trained volunteers in crisis management through programs such as Voluntary Social Year and Voluntary Ecological Year.

5. The large-fleet of volunteers that comprise an estimated two percent of total population of Germany is a very important asset for its disaster management system.

6. Similar volunteer base can be promoted under programmes of Government of India such as Skill India Mission and Aapda Mitra scheme of NDMA.

Key Characteristics of the Good Practice

Germany has volunteer opportunities in many spheres. There are over 1.2 million volunteer fire-fighters, around 500,000 across the five voluntary organisations (the German Red Cross, ASB, DLRG, the Johanniter Unfall-Hilfe, and Malteser Hilfsdienst), and 80,000 are associated with the THW (The Federal Agency for Technical Relief which is housed in BMI (Federal Ministry of Interior).

Germany has a system of *Voluntary Social Year* (FSJ). It provides an opportunity of 12 months for young people (after completing schooling and aged between 16 and 26 years) to gain insights into social service careers before they begin apprenticeship or a university degree. It is recognised as a pre-internship for certain apprenticeship. The system enables the youth to understand, *inter alia*, importance of citizen's involvement in the event of widespread crisis. The volunteers support the full-time staff of organisations/ agencies they are associated with and gain practical experience. While people above 27 years of age can volunteer under BFD (*Federal Voluntary Service*) opportunity/ program of German Government, people between 16-26 years age have the option to join either FSJ or BFD. Under the FSJ opportunity volunteers have to work full-time while the requirement of the BFD is atleast 21 hrs in a week.

There are several incentives for associating as volunteers. The volunteers receive a monthly pocket allowance, their statuatory social insurance is paid-for, they are entitled for holiday claim, attend at least 25 training days over the 12-month period of the program, their voluntary practice is recognised—they receive testimony, and get a certificate on completion. Also, such a recognition is seen as an important qualification when applying for a university degree or jobs.

The training days are in form of seminars and are part of voluntary service required by the law. Specifically, in case of the BFD program, atleast five of the training days are exclusively reserved for political education seminar at a Federal Training Centre. Holidays cannot be taken on training days.

Interestingly in Germany, apart from technical aspects of disaster response, there are structured programs for building capacities of volunteers in mitigation and critical infrastructure resilience and restoration. Further, there are other similar programs such as *Voluntary Ecological Year* on environment protection and conservation.

The volunteer programs have been successful as they are backed by legislations, standardised training and certification programs and adequate government funding.

Key Stakeholders and Actors Involved

- Concerned Federal Ministries such as the BMI (Ministry of Interior)
- THW (Federal Office for Technical Relief)
- The five voluntary organisations (the German Red Cross, ASB, DLRG, the Johanniter Unfall-Hilfe, and Malteser Hilfsdienst)

- Civil Society
- Citizenry

Key Takeaway lessons for Indian Context

- Such volunteer development programmes can be designed and promoted under Government of India programmes such as Skill India Mission and Aapda Mitra.
- A separate section in National and State Disaster Management Plans can be devoted on Engaging Volunteers.
- The funds for incentivising citizens to associate as volunteers in disaster management can be sourced from National and State Disaster Risk Management Fund.

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WEST SUMATRA
JAMBI
BANGKA-BELITUNG
Palembang
SOUTH SUMATRA
BENGKULU
LAMPUNG
Jakarta
BANTEN
Bogor
Bandung
CENTRAL JAVA
Semarang
Surabaya
WEST JAVA
YOGYAKARTA
EAST JAVA
BALI
WEST NUSA TENGGARA
EAST NUSA TENGGARA
NORTH KALIMANTAN
WEST KALIMANTAN
CENTRAL KALIMANTAN
SOUTH KALIMANTAN
GORONTALO
NORTH SULAWESI
CENTRAL SULAWESI
WEST SULAWESI
SOUTH SULAWESI
Makassar
SOUTHEAST SULAWESI
NORTH MALUKU
MALUKU
WEST PAPUA
PAPUA

7.4 Indonesia

7.4.1 DRM Governance Structures

Organization of lead disaster management agencies

In the backdrop of the 2004 Indian ocean earthquake and tsunami, the national disaster management system in Indonesia witnessed a paradigm shift through the enactment of Indonesian Law No. 24/2007. This law stipulates the formulation of disaster management plans at national and local level, including measures for all disaster management phases in explicit manner. The regulation clearly outlines the roles and responsibilities of central and local governments, including the role of community, private sectors, and international partners in disaster management.

In accordance with the Presidential decree No. 8/2008, ***Bedan Nasional Penanggulangan Bencana (BNBP)*** was established as the National Agency for Disaster Management in Indonesia. ***Headed by a minister-level official***, BNBP functions as a non-ministerial government agency, which ***reports to the President***. In lines with the Law 24/2007, the BNBP consists of a steering committee and an executive body. Comprised of government officials and professional community members, the steering committee works to formulate DRM policies, and also focus on their monitoring and evaluation. The executive body is more focused on the everyday management of BNPB's activities. It comprises 8 key sections (4 'Deputies' together with a Chief Secretariat, Chief Inspectorate, a Center and a Technical Implementation Unit). Recently, a separate division has been established for strategy planning (as shown in Figure 20).

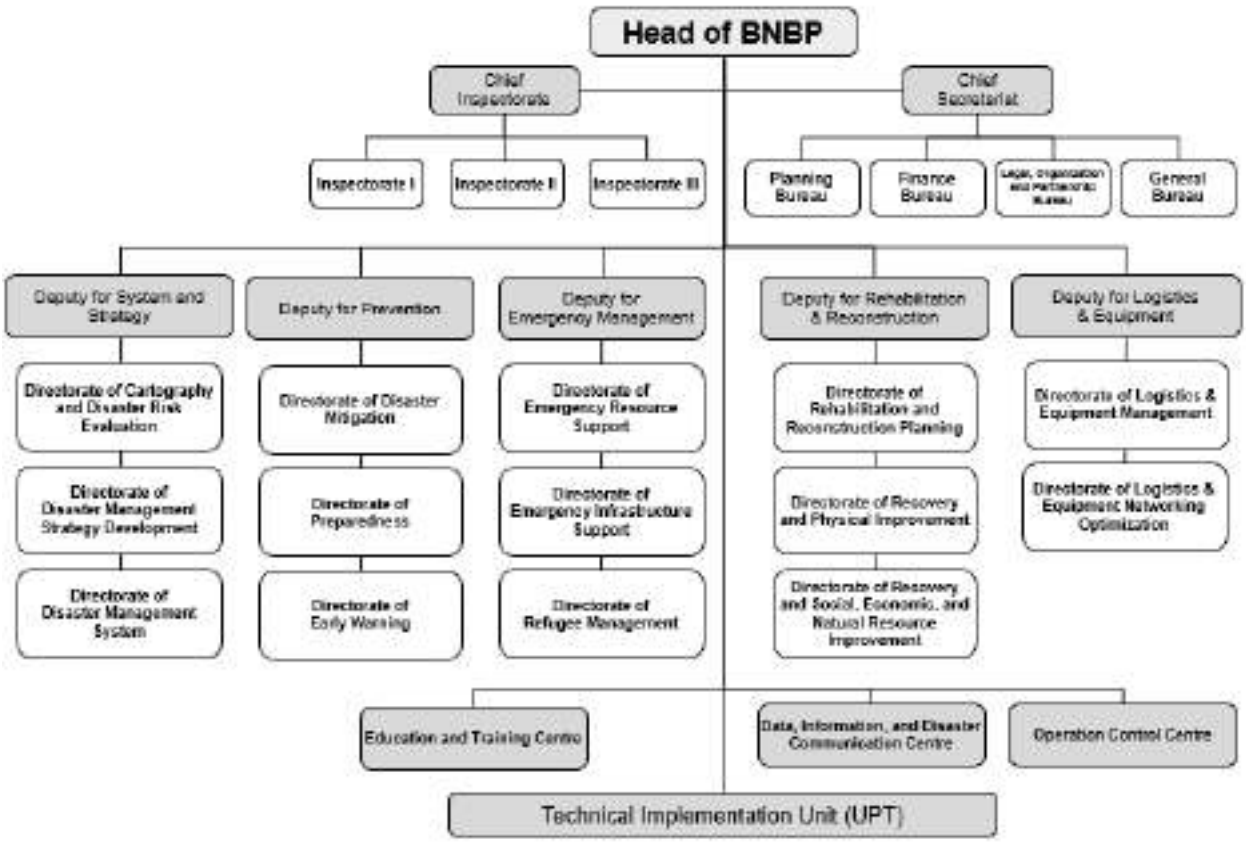

Figure 20: Organization Structure of BNPB (https://bnpb.go.id/struktur-organisasi-bnpb)

In lines with the Indonesian Law 24/2007, regional level agencies for disaster management (Bedan Penanggulangan Bencana Daerah or BPBD) have also been established at Provincial and District/Municipality level. Like BNPB at the central level, the BPBDs are responsible for the formulating DRM policies at local level. All the BPBDs have similar structure, tasks, and functions as that of BNBP (refer to Figure 21). Supported with a steering committee and executive body, they also have separate departments focusing on different aspects of disaster management like 'Prevention & Preparedness', 'Response & Emergency', and 'Rehabilitation & Reconstruction'.

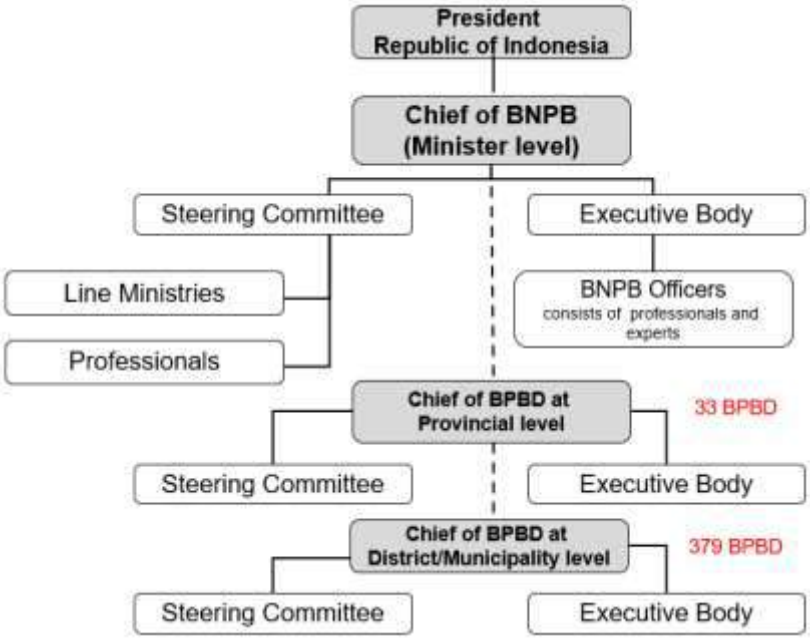

Figure 21: Disaster management system in Indonesia

Disaster Management Functions of these Agencies

In accordance with the Indonesian Law 24/2007, BNPB is mandated to manage the disaster management activities in all the disaster phases (pre-, during, and post-disaster). The agency is responsible for formulation and implementation of the disaster management plans, conducting risk assessments, educating, and training the people, implementing DRM technical standards, etc. At the national level, BNPB is also required to coordinate with the line ministries, the BPBDs, international donors, civil society organizations and the private sector. The BPBDs are required to do the same at the local level.

In the wake of large-scale disasters, BNPB plans and coordinates recovery activities. However, BPBD is responsible for the recovery activities in the aftermath of small-scale disasters. The recovery plans are formulated by BNPB/BPBD and implemented by the respective sectoral ministries and/or local government work units with the technical competence to implement those activities. Notably, the National Disaster Management Plan for 2015-2019 listed 48 national ministries/authorities (besides BNBP), that have disaster management-related mandates, including Health, Social Welfare, Environment, Agriculture, Public Works, and Planning. BNPB works in close cooperation with all these agencies (refer to Figure 22). Like for search and rescue of disaster victims, BNPB works closely with the national armed forces, the national police, Basarnas (the national SAR) and PMI (Indonesian Red Cross). Furthermore, eight national clusters have been created in Indonesia (in 2014) for devolving responsibility for coordination of individual sectors to relevant government departments.

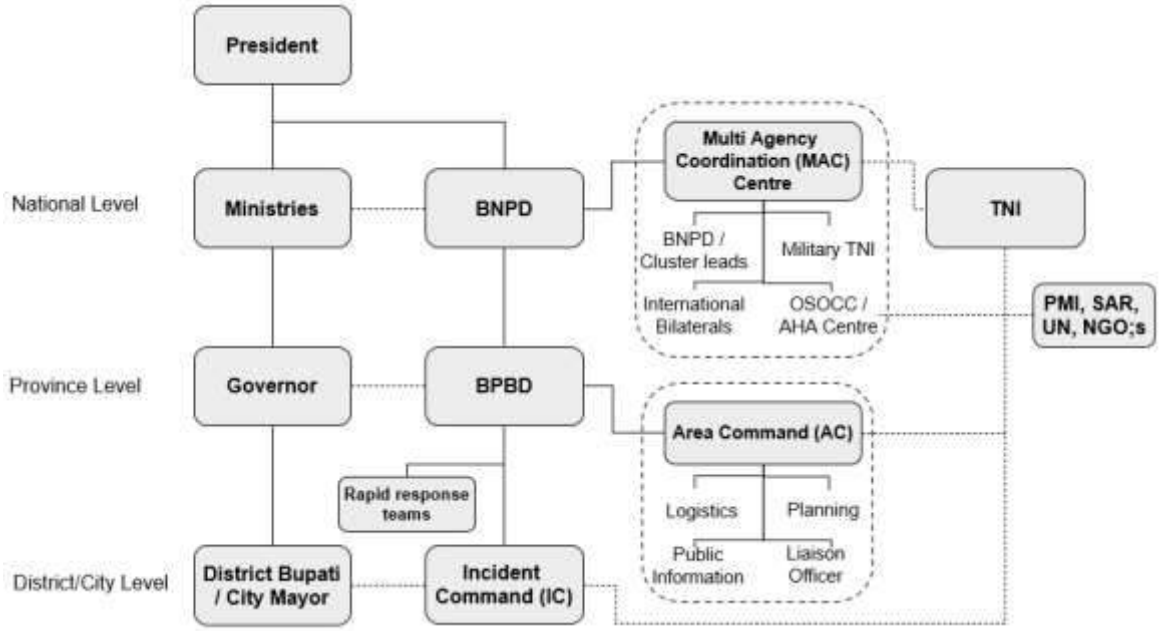

Figure 22: National disaster management coordination structure

BNBP also established an independent forum called 'the National Platform for DRR (Planas PRB) in 2009 for facilitating multi-stakeholder cooperation in DRR activities. Comprising of representatives from government agencies, civil society, private sector, higher education institutions/ universities, media, and international institutions, the forum covers the disaster related interests of all stakeholders and helps to synchronize the DRR policies, programs and activities at the national level. Along with Planas PRB at the central level, there are also several other local and sectoral DRR forums that have been established by the multi-stakeholders to advocate for specific issues like the 'University Forum for DRR', 'Consortium for Disaster Education', and 'Coastal and Small Island Disaster Mitigation Forum'.

Vertical and Horizontal Linkages

Indonesia consists of 34 provinces, each of which have their own Legislature and Governors. These provinces are subdivided into regencies and cities, which are further subdivided into districts, and again into administrative villages. Each level of government have their own disaster management organizations, governance frameworks and budgets. In lines with the Law Number 24 of 2007, the BNPB and BPBDs have the mandate to coordinate, command, and execute disaster management related activities at national and local level. While BNPB is established as an independent agency at national level, BPBD offices are established under the authority of the Ministry of Home Affairs (MOHA). BPBDs therefore report to MOHA rather than to BNPB. Although some coordination and information-sharing occurs through the joint meetings held twice a year, BNPB has no legal or institutional authority over the BPBD agencies. However, BNBP does provides guidance to BPBDs, works on developing policies, capacity building, SOPs, training programs, budget allocation for equipment's and O&M.

Strengths of these Agencies in terms of Human Resource

In Indonesia, high emphasis is put on training and capacity building of the government staff. The training budget is allocated, and staffs from all departments (including the army and ministries) undertake various training programs including GIS, search and rescue, disaster drills etc. There is also a specific center for training within the BNBP structure. Further, high

staff rotation is practiced at the BPBD level in Indonesia. In that manner, the staffs often comprise of officials from different backgrounds and different experiences (with diverse skills and capabilities).

Funding Mechanism

After the Disaster Management Law 2007, the source of budget finance in Indonesia have expanded beyond National Budget, and now include Philipp. The national level disaster budget is regulated by the BNBP, as per the government regulation (GR) on disaster management funding (GR No. 22, 2008), and for the local government disaster management budgets (regencies/districts), the respective BPBDs are the main actors. Overall, there are five key source of funding to support the DRR activities namely:
1. Routine Funding: Allocated to support routine and operational activities of ministries and departments, including disaster risk reduction.
2. Contingency Funding: Allocated budget for disaster preparedness
3. On-call funding: Allocated for emergency response (humanitarian assistance/relief)
4. Social assistance funding: Allocated for post-disaster assistance to local government.
5. Self-help funding from the community: Funds voluntarily contributed by community.

Indonesia has also developed a multi-donor fund mechanism called the Indonesia Disaster Fund (IDF), together with the UNDP and the World Bank to easy any operational gaps. It was established in 2010 as a standing mechanism to help fund implementation of the Government's Rehabilitation and Reconstruction Action Plans (RENAKSI) that were formulated following disasters, and for which the Government accepted international support.

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7.4.2 Thematic Good Practices

1. Disaster Resilient Village Program (DESTANA)

BNPB was established as the National Agency for Disaster Management in Indonesia, in the backdrop of 2004 Indian Ocean earthquake and tsunami, with the key function of formulating the DRM policies at national level and ensuring their implementation. In due consideration to the local level impacts of disasters, BNBP recognized that the capacity building and preparedness of local communities is imperative to build disaster resilient communities. Therefore, BNPB initiated an umbrella program called as the 'Disaster Resilient Village' (or

Desa Tangguh Bencana; DESTANA) program through the Chief of BNPB Regulation No. 1/2012 (Koesuma et al. 2020), and the 'General Guidelines of Disaster Resilient Village' were enacted. A disaster resilient village mainly relates to a self-contained village, which has the ability to adapt and respond to any potential disaster threat, and to rapidly recover from their adverse impacts. The key element of this program is the involvement of local communities as the key actors, wherein they are trained to do the risk assessments, develop and implement DRR plans etc. A village-level disaster planning group is specifically prepared under this program, which consists of community representatives including the youth, women, and other vulnerable groups. As part of this forum, the local communities are also engaged in reviewing, evaluating, and monitoring the local disaster risks by utilizing locally available resources (Wardani and Putra 2017; Oktari et al. 2020).

In the initial stages, the program was piloted in few selected communities in 21 Provinces that were prone to tsunami. Since then, the programme has covered more than 5000 villages, and is today recognized as the backbone of community-based DRM efforts in Indonesia. Based on the concept of DRR community, the program aims at empowering the village communities against the potential risks, and improve their capacities to recognize, mitigate and manage the disaster threats. More notably, the program is in lines with the global frameworks of Sendai Framework for Disaster Risk Reduction 2015–2030 (SFDRR) and was developed under the Hyogo Framework for Action 2005–2015 (HFA).

Key Highlights:

1. Initiated by the BNBP to enhance community resilience at local level, the Disaster Resilient Village Program is an effort to engage vulnerable village communities in DRR activities and build their capacities for adapting and responding to any potential disasters.

2. The program is based on the concept of resilient communities, and it serves for several purposes including for mainstreaming DRM into culture and society, risk mitigation, improved emergency response, enhancing citizen participation, DRM capacity building and fostering leadership for risk governance, with due consideration to all social groups.

3. While the funding aspect is imperative for sustainability of community-based programs, several different funding sources have been uncovered for supporting the implementation of Disaster Resilient Village Program, including the notion of self- funding community. The integration of this program with the village development planning also enhances the DRR capacities in these villages.

Key Characteristics of the Disaster Resilient Village Program

The BNBP regulation (No. 1/2012) defined six key components as a point of reference for building disaster resilient villages (highlighted in Table 3). In reference to Nurhayati (n.d.), these components are as explained below:

Table 3: Components of Disaster Resilient Village

No.	Component	Component of resilience
1	Legislation	▪ Village regulations governing DRR and disaster management
2	Planning	▪ Contingency plans ▪ Community-based action plan for DRR

		▪ DRR as an integral part of the Development
3	Institutional	▪ DRR village forum ▪ Cooperation among sectors and stakeholders
4	Funding	▪ Resource mobilization ▪ Community and private fund
5	Capacity building	▪ Training, education, and deployment information to the public, especially the volunteers and the disaster management actors
6	Implementation of disaster management	▪ Mitigation activities ▪ Early warning systems ▪ Preparedness for emergency response ▪ Recovery

Source: BNBP Regulation, Nurhayati (n.d.)

1. Legislation: This includes the preparation of regulations for governing disaster management activities and risk reduction at the village level.

2. Planning: This covers the development of village level disaster management plans, contingency plan, and community based DRR action plan. The program also mandates to make DRR as an integral part of the village development plan.

3. Institutional arrangement: This includes the establishment of DRR forum comprising of the members from government and society, group/team of disaster relief volunteers in the village, and cooperation among sectors and stakeholders in DRR efforts.

4. Funding: This covers the planning for mobilization of funds and resources from varied sources (like district/city budget, self- funding community, private sector, or other parties).

5. Capacity building: This relates to the training, education, and dissemination of information to the public, particularly to the group of volunteers and other key actors who play an active role in the planning and implementation of DRR activities in the village.

6. Implementation of disaster management: This includes the structural and non-structural mitigation activities like the installation of early warning systems, risk mapping for various disaster risks (flooding, earthquakes etc.), evacuation drills, emergency preparedness and response planning, and all other DRR measures through development interventions.

Key Takeaway lessons for Indian Context

- The establishment of DRR forums in the villages not only provides a platform to bring together the diverse stakeholders at local level (including civil society, government, private sector), but also opens up several avenues for collaboration, like in terms of training and capacity building.
- The involvement of local communities (all social groups, regardless of age and gender) in DRR forums as main actors enhances the community capacities, and also serves for gender mainstreaming and inclusivity.

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2. Disaster-Safe Schools Programme

Prone to a range of hazards like earthquakes, tsunamis, landslides, volcanic eruptions, etc. Indonesia is one of the most disaster-prone countries in the world. While the Indonesia population is spread across 6,000 inhabited islands, children are often reported to be the biggest victims in disaster situations. After the 2004 Indian ocean earthquake tsunami, children and women reportedly comprised of 75% of all victims, as more than 2000 school buildings were damaged or destroyed. Similar trends were also observed in the subsequent earthquakes in different parts of Indonesia (eg. 2009 West Sumatra earthquake). An assessment made by the BNBP and the World Bank revealed that around 75 percent of school buildings in Indonesia are located in disaster prone areas (GFDRR 2014).

Deriving lessons from these disaster events, the Government of Indonesia has taken significant steps towards enhancing school safety. In 2009, the National Government launched a DRR schools project which was originally known as Disaster-Prepared Schools (or Sekolah Siaga Bencana in Bahasa), but is now called Disaster-Safe Schools (or Sekolah/Madrasah Aman Bencana in Bahasa). In 2010, the National Secretariat for Safe Schools (Sekretariat Nasional Sekolah Aman – SEKNAS) was established by the Ministry of Education and Culture, and a Special Allocation Fund (DAK) was created for safe school rehabilitation (ASEAN 2015). During the same year, the Ministry of Education and Culture issued a Circular (No.70a/ 2010) addressed to the Governors, and Heads of Districts all over Indonesia, urging them to encourage the mainstreaming of DRR in all schools.

The National Disaster Management Plan of Indonesia (2010-2014) specified a plan for the implementation of disaster preparedness in schools and madrasas (Islamic school). In 2012, the BNBP also issued the Guidelines for Safe Schools/Madrasas in Disaster, which has now become the basis for the implementation of Safe Schools program in Indonesia, in lines with the UN One Million Safe Schools Campaign. As per the BNBP guideline, a ‘safe school’ complies with the predetermined standards for facilities and infrastructure and realizes a culture that protects school communities and surrounding environment from potential disaster threats.

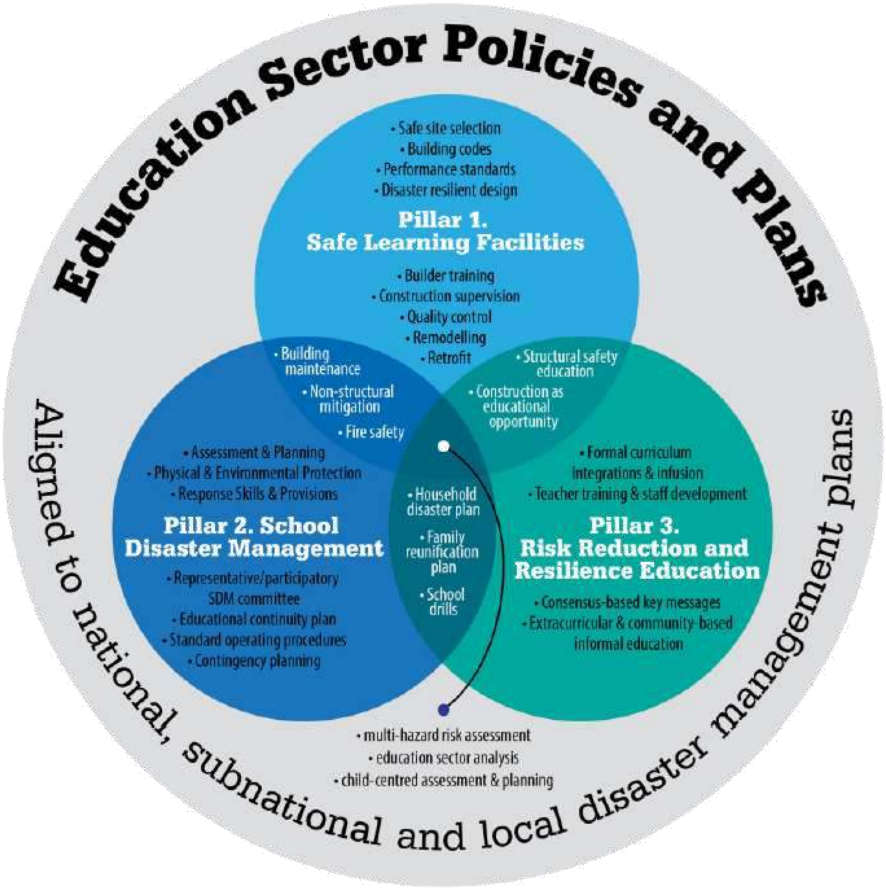

Figure 23: Three Pillars of Comprehensive School Safety (Image source: ASEAN 2015)

Key Highlights:

1. The Disaster Safe School program in Indonesia is a comprehensive approach for enhancing the school capacities to create safer learning places for students, teachers, members of the school community and communities around the school.

2. By strengthening the knowledge and skills of school students and teachers (and other actors), the program not only enhances risk mitigation and emergency response functions, but also builds the resilience of school members, and wider communities.

3. A dedicated program (like Disaster Safe School) can be an effective means to mainstream DRR in education sector, as it engages the students, teachers, and other actors in DRR activities.

Key Characteristics of Disaster-Safe Schools Programme

The implementation of the safe school program includes two basic aspects namely structural (building location, design, structure etc.) and non-structural (capacity building, preparedness etc.). In lines with the three pillars of Comprehensive School Safety (refer to Figure 23), the key achievements of Indonesia's school safety programme are as explained below:

1. Safe Learning Facilities: This pillar is focused on the aspects like the vulnerability of school location, safe design, and construction of school buildings, retrofitting of school buildings, provision and maintenance of education facilities and infrastructure etc. To enhance the same,

the Government of Indonesia annually allocates 250 Million USD to the DAK Fund since 2011 (on top of national budget), which is transferred directly to the local governments.

2. School Disaster Management: This pillar is focused on the aspects of disaster management activities like establishment of disaster management teams at schools, preparedness planning in form of contingency plan, building response skills, standard operating procedures, etc. Since 2007, several provinces and districts in Indonesia have developed education contingency plans.

3. Risk Reduction and Resilience Education: This pillar is focused on disseminating disaster knowledge to the wider community (including the students, teachers, and other education personnel) through school education and includes the aspects of teacher training and staff development. In Indonesia, DRR has been integrated into the education curriculum from primary to secondary schools, starting from Grade 4.

Amri et al. (2017) highlighted that more than 25,000 schools had implemented the Disaster-Safe Schools programme by 2013, with support from government agencies and NGOs. The participating schools are typically selected based on the recommendations from local education institutions and DRM offices, and priority is given to the schools with bad conditions.

Key Takeaway lessons for Indian Context

- The establishment of a National coordinating body (like National Secretariat for Safe Schools) and dedicated funding for the local governments (like DAK) can guide the implementation of Disaster Safe schools at local level.
- The three key pillars of Comprehensive School Safety provide an overarching framework to build the capacities of schools through a range of structural (like retrofitting the school buildings) and non-structural measures (like mainstreaming DRR in education curriculum).

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3. Indonesia Disaster Database (Data dan Informasi Bencana Indonesia- DIBI).

Launched in 2008, the Indonesian Disaster Data and Information Management Database 'DIBI' (http://dibi.bnpb.go.id) is a digital database, hosted by the BNBP. It accommodates all the historical disaster data (since 1815) in Indonesia, which has been validated from 1997 to 2007 by the assistance of UNDP. The disaster data before 1997 were collected through a range of information sources like government reports, universities, mass media, internet, etc. Whereas the new disaster data is collected by the districts at the lowest level (sub-district or village). The district/city BPBDs verify and validate this data before reporting to the provincial level BPBD, from where the information is sent to the BNBP. The data entry can also be directly done through Provincial DIBI where established, otherwise the data is sent to BNBP for entering to the National DIBI. Herein, the form for recording disaster data has been

standardized, after the agreement by Government of Indonesia. Due to its digital interface, DIBI also makes it easy to update, review and retrieve disaster information. Figure 24 highlights the mechanism of disaster data management in BNPB, wherein the Center of Data, Information, and Public Relation manages the DIBI.

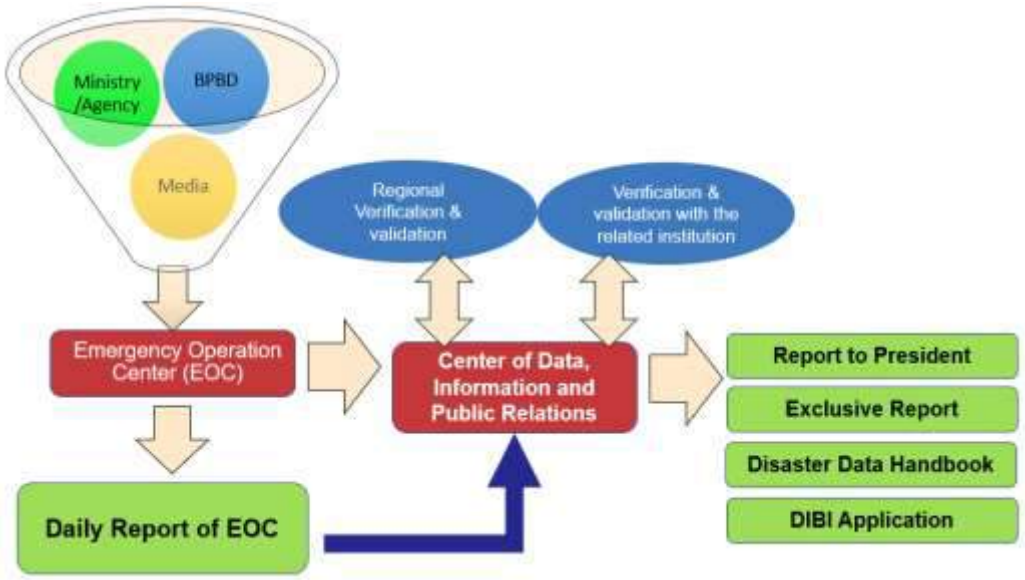

Figure 24: Mechanism of Disaster Data Management in BNPB (Hasbullah 2016)

Key Highlights:

1. Hosted by BNBP, DIBI is a digital database that provides access to historical disaster data and information (since 1815) in Indonesia. Launched in 2008, DIBI maintains the new disaster data (verified and validated) collected at the local levels (sub-district or village) in Indonesia.

2. DIBI was mainly intended for developing the disaster-prone area index. However, it also serves as an excellent reference point and information source for enhancing risk mitigation and promoting risk-informed development planning.

3. With a defined mechanism of data collection from the local level, development of a digital database (like DIBI) can be highly useful for disaster risk reduction in India.

Key Characteristics of DIBI

As the historical disaster losses are proxy indicators of risk, the historical data and information accessed through DIBI serves for several DRR activities like risk mapping and formulation of DRM plan. DIBI also provides an opportunity to identify the disaster trends, analyze the risks and vulnerabilities. After its launch, DIBI has been utilized for several DRR related purposes at local and national level in Indonesia, like as follows:

1. The historical database through DIBI was used to develop disaster-prone area index (IRBI) for Indonesia, which helped to determine which district should or should not have BPBD.
2. DIBI was used as a proxy indicator for risk mapping.
3. DIBI has also been used in the Disaster prone area index of Ministry of Finance, to allocate funds for disaster management in district/city level.

4. DIBI has been used in the development of the National Disaster Management Plan and National Action Plan for Disaster Risk Reduction.
5. DIBI has supported several national programs for reducing the disaster vulnerability like the National Rural Community Empowerment Programme (PNPM Mandiri), Safe School and Hospital programme, etc.
6. DIBI is used in the monthly Disaster Information Bulletin, annual Indonesia Disaster Data Book, annual Indonesia Disaster Atlas, etc.
7. DIBI has supported the development of Provincial Disaster Management plans as well as Action plans for DRR.
8. DIBI has also been used by the Universities and other agencies for research purposes.

Key Takeaway lessons for Indian Context

- The development of a disaster database (like DIBI) can generate insights for understanding historical disaster trends and help in analyzing the future risks and vulnerabilities. It can also provide inputs for risk informed development planning from local to national level.
- The maintenance of grassroot level data (like in DIBI) can also be highly effective means to keep track of the global targets (like SDGs and SFDRR) alongside the other aspects of community risks, socio-economic characteristics, poverty levels, etc.

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JAPAN


JAPAN
RUSSIA
KYŪSHŪ
HOKKAIDŌ
Sapporo
Daisetsuzan National Park
East China Sea
Tokara-shotō
Amami-shotō
Sea of Japan (East Sea)
Aomori
Okinawa-hontō
Okinawa City
Miyako-shotō
Yaeyama-shotō
Niigata
Sendai
Noto-Hanto Peninsula
HONSHŪ
JAPAN
PACIFIC OCEAN
SOUTH KOREA
Matsue
Mt Fuji
TOKYO
Yokohama
Hiroshima
Kyoto
Osaka
Nagoya
Nagasaki
KYŪSHŪ
SHIKOKU
Kirishima National Park
Seagaia
See Inset
0 400 km
0 240 miles

7.5 Japan

7.5.1 DRM Governance Structures

Organization of Lead Disaster Management Agency

The Disaster Countermeasures Basic Act (legislated in 1961; after the 1959 Ise-wan Typhoon) provides a comprehensive disaster management framework in Japan and sets the foundation for implementing DRR measures. The legislation clearly defines the roles and responsibilities of national and local governments for all phases of disasters. It also stipulates the need for cooperating with relevant entities of public and private sectors in disaster management.

At the National level in Japan, ***the Cabinet Office*** serves as a focal point agency. In parallel to a series of reforms, the disaster management office in Japan was moved from a coordinating body to the Cabinet Office in the year 2001, with an objective to integrate and coordinate DRM policies and measures of all line ministries and agencies. Accordingly, the post of '***Minister of State for Disaster Management***' was newly established (refer to Figure 25). While the Cabinet Office works to enhance the cooperation and partnerships among government agencies in wide-ranging issues, the department of Director-General for Disaster Management is mandated to undertake the planning of basic DRM policies and emergency response to large-scale disasters, as well as to conduct the overall coordination. Under the Basic Act on Disaster Management, the Central Disaster Management Council (CDMC) is established within the Cabinet Office with an aim to ensure comprehensive planning of matters related to disaster management. Chaired by the Prime Minister of Japan, the council comprises of Minister of State for Disaster Management, all members of the Cabinet, heads of major public institutions and experts. This council develops the Basic Disaster Management Plan and promotes comprehensive countermeasures including the deliberations on important issues on DRR according to the requests from the Prime Minister or Minister of State for Disaster Management.

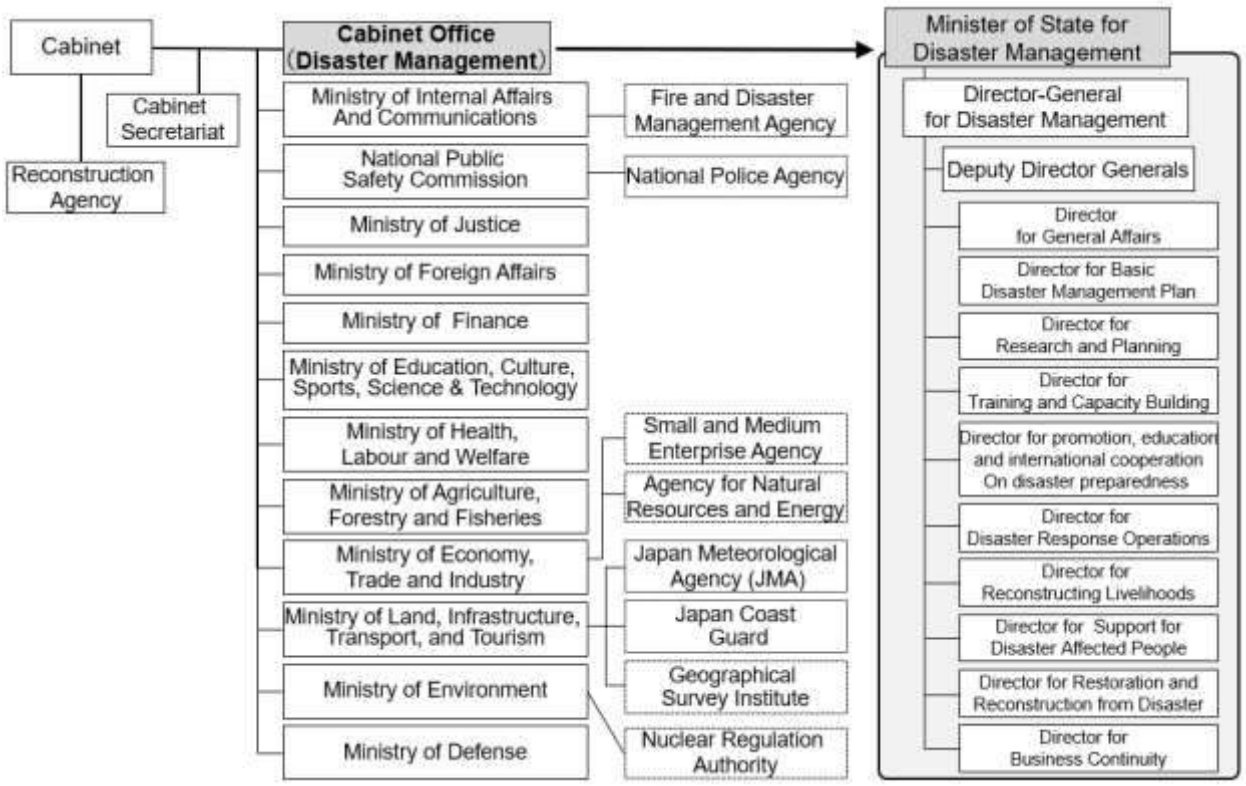

Figure 25: **Organization Chart of the National Government of Japan (Cabinet Office 2015)**

Disaster Management Functions of these Agencies

As highlighted in Figure 26, the members of the CDMC come from different line ministries, semi-public organizations (such as Public Broadcasting, the Bank of Japan, the Japanese Red Cross, and a telecommunications company) and representatives from academia. The Cabinet Office also establishes expert panels (Technical committees), such as the panels for reviewing countermeasures for the Great East Japan Earthquake 2011 and assessing risks and damages of potential mega earthquakes. The recommendations from these panels guide line ministries to promote DRM policies and measures.

The key role of the CDMC is to formulate and promote DRM policies, including the Basic Plan of Disaster Management. Prepared by the CDMC in accordance with Article 34 of the Disaster Countermeasures Basic Act, the Basic Disaster Management Plan serves as the foundation of the Japan's DRM measures. The plan clarifies the duties assigned to the Government, public corporations, and the local government in implementing measures. Herein, all the public and legal bodies, including banks, companies, lifeline utilities, are obliged to participate in CDMC and prepare the Disaster Risk Reduction Operation Plans as per the guidelines of the Basic Plan for Disaster Risk Reduction. Likewise, the Disaster Countermeasures Basic Act obliges the other key actors (like private sectors) to fulfill their responsibilities. The act also promotes the participation of stakeholders in DRR efforts and activities, like to encourage them to take their own preparedness initiatives to cope with disasters and mitigate the adverse effects.

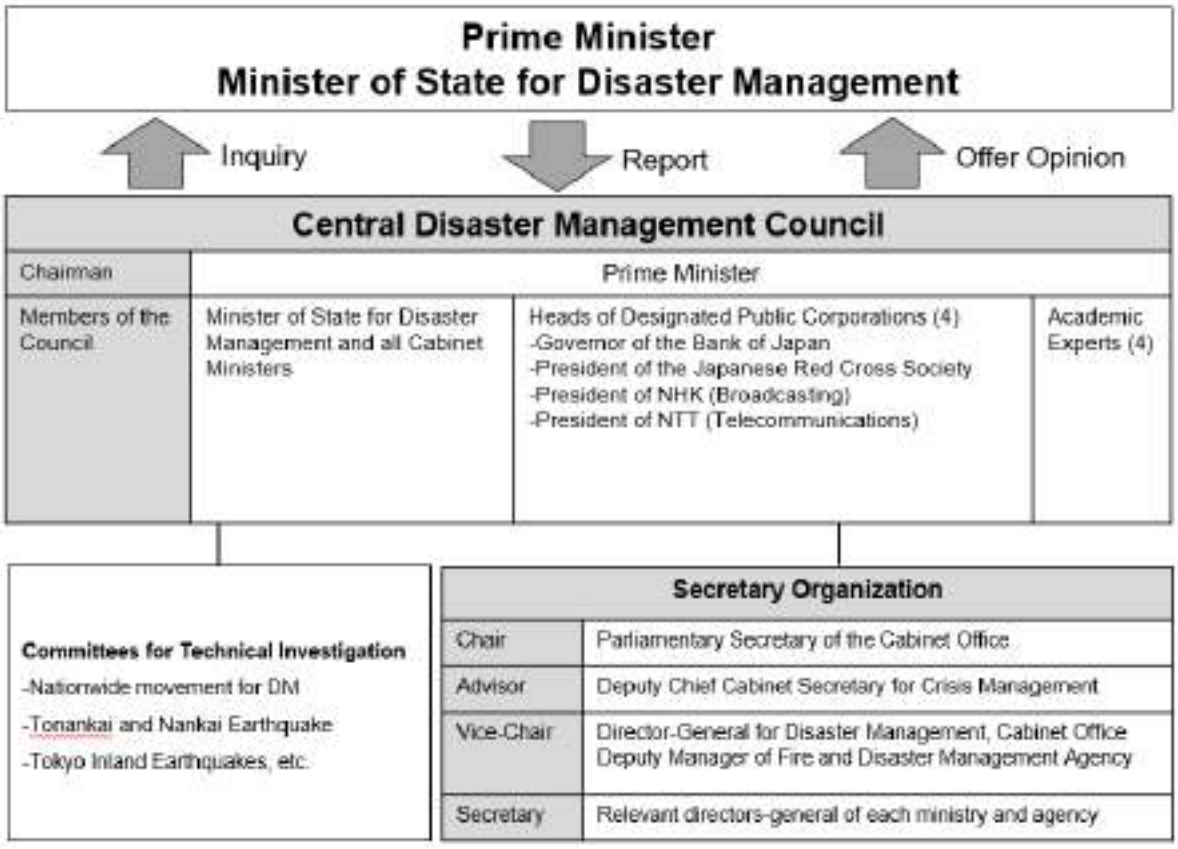

Figure 26: Structure of the CDMC, Japan (Cabinet Office 2015)

In lines with the National level Basic Plan for Disaster Management, similar plans are also prepared at Prefecture level, Municipality level and Community level (refer to Figure 27). The Prefecture Basic Plan for DRR are approved by the Prefecture Council on Disaster

Management, which is chaired by the Governor. Likewise, the Municipality Basic Plans for DRR are approved by the Municipality Councils on Disaster Management, which are chaired by respective Mayors. The Community DRR plans have been newly introduced in the system, which are drafted by the citizens and are considered for including in the Municipality Basic Plan.

Figure 27: **Outline of the Disaster Management System in Japan (Cabinet Office 2015)**

Vertical and Horizontal Linkages

The governance structures in Japan are based on a three-tiered administration (the national government, prefectures, and municipalities). At the National level, the Cabinet Office closely works with relevant ministries and agencies in different phases of disaster management. Within the Cabinet Office, the Minister of State for Disaster Management receives assistance from the Department of Director-General for Disaster Management, his mandate being to manage the planning and coordination for data gathering, dissemination and the implementation of emergency matters relating to the Basic policy on DRR

Further, the national government guides (issuing bye laws, guidelines, etc.) the local governments to establish DRM mechanisms, in terms of enacting new laws and budgetary systems. In Japan, the prefectural and City/town authorities have the primary responsibility for DRM activities within their jurisdiction, while the central government has responsibility for developing large-scale DRM infrastructures, such as dams and embankments for managing floods and droughts in major rivers. A Crisis Management Unit is established in all Prefectural and City offices. These units work for disseminating hazard information, DRR planning, managing evacuation centers, collaborating with stakeholders etc.

Strengths of these Agencies in terms of Human Resource

One of the key characteristics of the staff of the Cabinet Office in Japan (including those at the management level) is that they are assigned from line ministries. Through these staff members, the coordination of the Cabinet office with other line ministries is enhanced.

The disaster management councils formed at various governance levels also consist of technical committees that comprise of technical experts, private sector, civil society, researchers etc. Herein, the experts belonging to academic and research institutions in Japan, work closely in partnership with national and local institutions as the members of the Disaster Management Councils or of the specialist study groups which are its subordinate organizations.

Further, the local governments actively engage with various stakeholders including the private sector, through MOUs, agreements, collaborations, table talk simulation exercises etc.

Funding mechanism

The Cabinet Office assists the Minister of State for Disaster Management for the formulation and general coordination of basic policies concerning disaster management and measures against large-scale disasters, for which a Indo has been assigned from the State Treasury. At the local level, the prefectural and municipal governments have the primary responsibility for DRM in Japan. Thus, each local government develops local disaster management plans in reference to the unique characteristics of each area. While these plans mention the need to cooperate with private sector at local level, each local government also raises disaster control funds (in terms of the budget) to manage finances smoothly during a disaster. The responsibility over these funds is stated clearly in Article 101 of the aforementioned Disaster Countermeasures Basic Act.

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7.5.2 Thematic Good Practices

1. Japan Disaster Medical System

The 1995 Great Hanshin Awaji Earthquake (7.3 magnitude) caused massive destruction in terms of human life and property. Later, it was revealed that several lives could have been saved (around 500 people reportedly died of trauma) if adequate disaster medical response was available. For the first time then, the term 'preventable disaster death' was recognized. Deriving important lessons from this tragedy, the Japanese national medical response system was developed in the following years. Referring to Kobayashi (2013), Homma (2015) and Egawa et al. (2017), there are five key components of Japan's disaster medical system:

1. Disaster Base Hospital (DBH): These are usually the tertiary hospitals which have been strengthened against disaster risks and have the capacity to handle multi-casualty events [more than 600 designated DBHs across the country].

2. Disaster Medical Assistant Teams (DMATs): The mobile teams of health professionals, who have the basic knowledge of disasters and are trained in Command, Safety, Communication, Assessment, Triage, Treatment and Transport [more than 880 teams registered across Japan].

3. Wide Area Transportation and Staging Care Unit (SCU): A system to transport the critical patients from disaster affected areas to the distant areas for quality medical care.

4. Emergency Medical Information System (EMIS): An internet-based GIS system that shows the locations, properties, and function of DBHs, the exact locations of DMATs, affected healthcare facilities, evacuation centers, and field hospitals in real time [installed in more than 41 Prefectures].

5. Disaster Medical Coordinators: Those who coordinate the medical and public health relief operations and logistics in the headquarters of local government, DBH and SCU.

Among these, the Disaster Medical Assistance Teams (DMATs) were established in 2005, after the Japanese government's CDMC revised its Basic Disaster Management Plan to include full deployment of DMATs in disaster areas (Fuse and Yokota 2010). Later, the Japan Medical Association (JMA; Japan's representative medical organization), also created JMATs in 2010 [around 1400 JMATs comprising nearly 5500 health workers], with the key purpose of establishing a wide spectrum of disaster medical support system, including support for damaged medical institutions and for evacuees in shelters (Ishii and Nagata 2013).

Key Highlights:

1. The Japanese disaster medical response system consists of five components namely, DBH, DMATs, SCU, EMIS, and Disaster Medical coordinators.

2. The Japan disaster medical system was enhanced to ensure effective emergency response across Japan and save more lives in disaster situations. It also serves as a classic example for risk-informed planning, as it was mainly established in anticipation of the future earthquakes.

3. Dedicated disaster medical teams can help meeting the post-disaster medical needs in affected areas, and also support the recovery of damaged local medical systems.

Key Characteristics of DMATs and JMATs

A DMAT typically comprises of 5–6 members (mainly the physicians and nurses of the DBHs), all of which are registered specialists in disaster medicine and have received training in mobility for critical care during disasters. During the acute phase of a disaster (the first 72 hours after disaster occurs), the DMATs provide medical assistance to hospitals in devastated areas with the 3 Ts (triage, treatment, transport). The DMATs mainly attend to the trauma patients (those severely wounded or sick patients) in affected areas that could involve confined space medicine (CSM) and provide in-flight treatment of the victims being evacuated.

A JMAT typically consists of 4 members (one physician, two nurses, and one coordination staff personnel). JMATs play a key role after the acute phase of disaster, like in terms of providing healthcare assistance at evacuation shelters and first-aid stations, assisting the local hospitals and clinics in affected areas, and providing medical care for in-home patients. They work closely with the field medical coordinators, and ensure smooth information sharing among the JMA members, prefectural medical associations, and affected areas.

One of the key characteristics of Japan's disaster medical system is the role sharing between DMATs and JMATs (refer to Figure 28). The DMATs provide assistance in the acute phase, whereas the JMAT take care for the sick people at shelters and first-aid stations. The time frame of operation for DMAT is during the first 48–72 hours, whereas the JMAT operations extends from 3 days to several months, until the local medical institutions recover. Herein, the DMATs are part of government organization of Ministry of Health, Labour and Welfare of Japan (MHLW), and JMATs are private-sector organization associated with JMA.

The effective role sharing of DMATs and JMATs was notable during the Great East Japan Earthquake, 2011, wherein their coordinate response efforts lead to the complete recovery of local healthcare system in the affected areas within 3 months (Ishii and Nagata 2013).

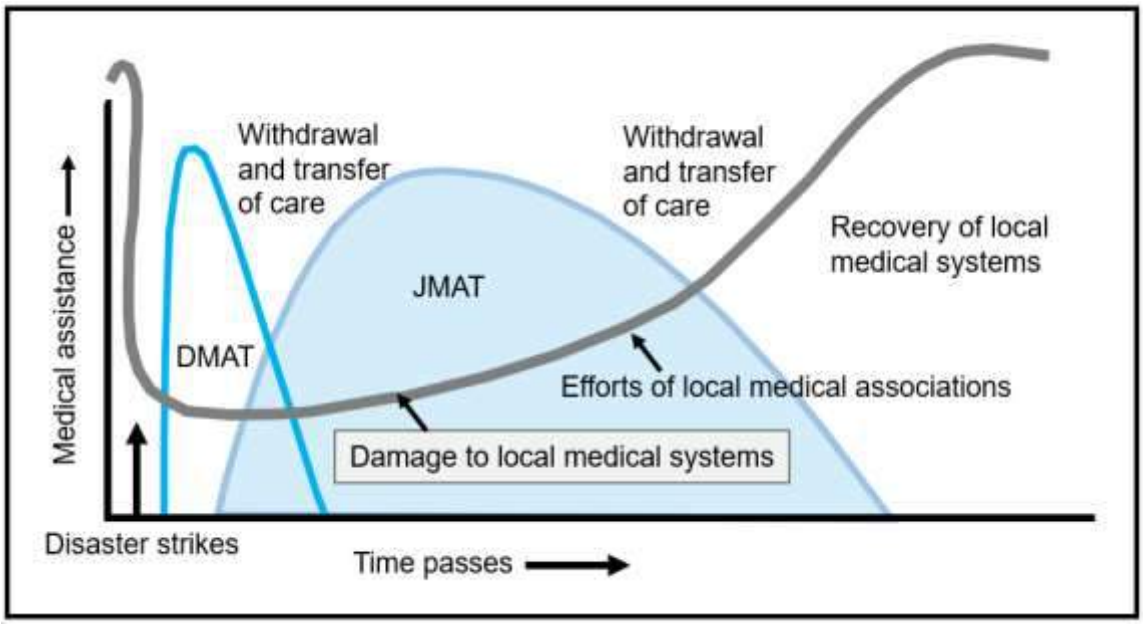

Figure 28: Role sharing between the DMAT and JMAT programs (Kobayashi 2013)

Besides the National level, the DMAT projects also operate at the prefectural level in Tokyo, Osaka, Kanagawa, Oita, and other prefectures. All the regional and nationals DMAT are aimed at timely responding to major accidents within their defined jurisdiction. The dispatch requests

for DMATs are issued from the disaster-affected prefectures to MHLW of Japan and the other prefectures. These agencies then request the designated DMAT medical institutions for responding to specific requests. The key information relating to the disaster is collected through EMIS, and the DMAT dispatch request is also made through EMIS.

Key Takeaway lessons for Indian Context

- Deriving lessons from the past disaster experiences is important to enhance the future disaster management capacities, and the establishment of DMATs in Japan is an ideal example of how these lessons could be incorporated into decision making.
- Although coordinated by a private-sector organization (JMA), JMATs effectively support in addressing the post-disaster medical needs in the affected areas during the extended period of a disaster, taking due care of the people in evacuation shelters and in-home patients.

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2. Community Based Organizations in Disaster Risk Reduction

After the 1995 Kobe earthquake, it was found that 80% of the rescued people were saved by their relatives, neighbors, and community members. Since then, it was recognized that citizens and local communities are always the first responders to any calamity, even though the local and national authorities have the key responsibilities of civil protection in emergency situations.

In Japan, several types of community-based organizations (CBOs) have for long been managing the disaster risks at grassroot level. Ishiwatari(2012) explained that four types of CBOs (Table 4) are widely recognized in Japan for enhancing community-based efforts in DRR:

1. Suibo-dan (Flood Fighting): Suibos have historically played a crucial role in flood disaster management in Japan, like for reinforcement of riverbanks and supporting for community evacuation during floods. Over the years, each community has developed various countermeasures, and this indigenous knowledge is transferred from generation to generation.

2. Syobo-dan (Fire Fighting): It is a non-standing agency for firefighting in Japan. The members of Syobo-dan have other main jobs and businesses, but they voluntarily participate in Syobo activities.

3. Jisyubo (Earthquake Disaster Management): The Japanese government started to encourage local communities for organizing Jisyubos (CBOs for managing earthquake disasters) in the 1970s. As per the Basic Act on Disaster Control Measures, Jisyubos are voluntarily organized in the spirit of neighbors' collaboration.

4. Non-governmental Organizations: The year of 1995 was called as the 'first year of volunteers' in Japan, as (around 1.5 million) volunteers were engaged at a large scale in rehabilitation works following the earthquake. Several NGOs and NPOs in disaster management also substantially contributed to the disaster management activities. To further strengthen the role of these organizations, the Act to Promote Specified Non-profit Activities was enacted in 1998.

Following the Kobe earthquake of 1995, the Japanese government has put high emphasis on promoting the voluntary disaster preparedness organizations, which has strengthened the community capacities. The positive impact of these initiatives was notable after the Great East Japan Earthquake in 2011, wherein the CBOs effectively supported for a range of activities including for the search and rescue of victims, monitoring of tsunami, community evacuation, firefighting, and operating evacuation shelters.

Table 4: CBO's in Japan

Organization	Targeted Disaster	Act	Supervising Government Organizations	Period of Formation	Number of Staff or Organization
Suibo-dan	Flood	Flood Fighting Act	Ministry of Land, Infrastructure, and Transport	17th century	Staff: 900,000 (duplicated between two organizations)
Syobo-dan	Fire	Fire Defense Organization Act	Fire & Disaster Management Authority (FDMA)	18th century	
Jisyubo	Earthquake	Basic Act on Disaster Reduction	Cabinet Office FDMA	1970s	Organization: 140,000
NPO	All	Act to Promote Specified Non-profit Activities	Cabinet Office	After Kobe earthquake in 1995	Organization: Over 2,000

Source: Ishiwatari (2012)

Key Characteristics of Syobo-dan

As explained, the Syobo-dan (volunteer fire corps) members have regular jobs and businesses, but they voluntarily join the DRM activities in their own communities as and when the disasters strike. As highlighted in Table 4, there are more than 900,000 active volunteers across Japan, which is six times higher than the actual number of career firefighters. The key characteristics of the volunteer fire corps is that their roles and responsibilities as part-time government staff (including the compensation and allowances) have clearly been defined as per the Fire Defense Organization Act and its bylaws. Here, the local governments have the principal responsibility

for the fire corps, whereas the national government subsidizes their facilities. Likewise, the activities and roles of all CBOs are supported by the governments in different ways. The importance of communication and participation between residents and local government as well as among the residents themselves has also been reflected in the amended 'Basic Act for Disaster Countermeasures'. During the Great East Japan Earthquake (GEJE) 2011, the staffs in local authorities suffered extensive losses, but around 250 volunteer members of firefighting CBOs were also reportedly dead or are still missing, during their functions of disaster management. Based on lessons learned during the GEJE earthquake, the Fire and Disaster Management Agency urged the local governments to reinforce the volunteer fire corps with more equipment and increase their allowances up to the level stipulated by law, and also work for the recruitment of new members.

Key Highlights:

1. CBOs play an important role in disaster management activities in Japan, and their role is formally recognized and supported by the national and local governments.

2. The local communities are always the first responders to any emergency situation, and building their capacities is essential for emergency response functions and risk mitigation. The legal recognition to CBOs in Japan has also contributed for enabling large-scale citizen participation, sustained volunteerism, and mainstreaming of DRM into culture and society.

3. Empowering the local communities is key to ensure effective emergency response, as they are always the first responders to any emergency situation.

Key Takeaway lessons for Indian Context

- The legal provision of financial and technical assistance for the volunteers can be key to institutionalizing the role of CBOs in disaster management at grass root level.
- The local volunteers can effectively enhance the emergency response capacity of government authorities (like for evacuation, search and rescue etc.), and the governments need to engage with the local communities to reflect their efforts in local DRR plans.

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3. Self-Help and Mutual Support System

Recognizing the importance of self-help (like help from own family) or mutual support (like assistance of neighbors) initiatives in the aftermath of the 1995 Great Hanshin-Awaji Earthquake, the Japanese government has been putting high emphasis on mainstreaming these aspects at local level, like through evacuation drills, preparation of evacuation plans etc. In 2014, the community-based DRM system was also integrated within the national level DRR planning, (through the amendment of the Basic Act on Disaster Management) to enhance

community resilience at local level. This policy allows the community residents (including the business operators in the area) to formulate a community DRM plan and present it for consideration in the Municipal DRM plan. A recent survey by the Cabinet Office highlighted that more than 3200 communities have worked on developing community DRM plans, among which the DRM plans from 248 communities were reflected in municipal DRM plans as of April 2018. The 2019 White paper (prepared annually by the Cabinet Office) also highlighted a range of other activities that are being conducted to reduce disaster risk through self-help and mutual support initiatives, in close cooperation with diverse stakeholders. Few of these initiatives are as explained below:

National Council for Promoting Disaster Risk Reduction (NCPDRR): Established in September 2015, the NCPDRR is aimed at promoting information sharing, enhancing opinion exchange and coordination among various sectors to promote DRR awareness among the public

Comprehensive disaster risk management drills: September 1 is designated as the Disaster Preparedness Day in Japan, wherein extensive operational drills are conducted every year with a range of stakeholders involved in disaster management, like rescue and relief drills, official videoconferences at national and prefectural level, water discharge exercises, etc.

Community-based Integrated Care System (CbICS): Considering the high proportion of elderly population (over 65 years of age) in Japan, and declining population, the Japanese government is urging all municipalities to establish the 'CbICS' by 2025 to build comprehensive life support services in each community, building on four key elements of self-help (Ji-jo), mutual aid (Go-jo), social solidarity care (Kyo-jo), and government care (Ko-jo) (Sudo et al. 2018).

Japan Bosai-shi Certification (https://bousaisi.jp/): Established in 2003, the Japan Bosai-shi Organization (private agency) works to encourage disaster prevention efforts by citizens in their respective communities, and thus contributing to disaster management in Japan. As of November 2020, more than 200,000 people have attended their training, and have been certified as a Disaster Management Instructors.

As explained in Figure 29, the 'Self Help' mainly refers to how one can protect themselves and their family, like through stabilizing their furniture, preparing stockpiles, pre-planning about emergency situations, etc. The 'Mutual Assistance' mainly refers to cooperating with the neighbors and local residents to minimize the damages of disaster and help in rescuing the people. Lastly, the 'Public Help' refers to the rescue and relief activities by the self-defense forces, fire station, Police etc.

Figure 29: Schematic understanding of Self-help, Mutual-Assistance and Public Help system (Source: Crisis Management Office Yokohama 2018)

Key Highlights:

1. The importance of self-help and mutual support is now reflected in several government policies of Japan, and high emphasis is being put on raising community awareness and engaging with the communities for DRM activities.

2. The self-help and mutual support programs are intended to enhance the capacities of communities for effectively responding to future disasters, and also to raise adequate awareness amongst all the stakeholders to save more lives.

3. The institutionalization of self-help and mutual support initiatives can serve as an effective means of engaging local communities in DRM activities and enhancing emergency response functions at grassroot level.

Key Characteristics of the My-TimeLine initiative

The 'My-TimeLine' initiative was recently introduced in Joso city (Ibaraki Prefecture) after Kanto-Tohoku torrential rain in September 2015 and is increasingly being promoted to enhance the self-help and mutual-support capacities of the local communities in Japan. During the 2015 torrential rains, evacuation delays occurred during the flooding, and the need for building a flood conscious society was realized. The local authorities then decided to develop a 'My-TimeLine' tool in close cooperation with the local communities, that will allow each resident to share knowledge and preparedness for flood disaster prevention in order to develop in advance an effective crisis management plan. Satomura et al. (2020) highlighted that the 'Joso City My-TimeLine Study Commission' was established under the Disaster Reduction Measures Council, that consisted of the local residents who were the main actors in the study, government officials from Joso City, Ibaraki Prefecture, and Shimodate River Office, and experts from the police, fire department, and meteorological observatory. The key purpose was to set up a structure that would enable the residents to conduct the study smoothly with the support of the government. Focusing on 'when', 'who', and what' if a disaster will occur, the 'My-Timeline' was created by the residents in accordance with their own family composition

and living environment. The tool is an attempt to achieve zero evacuation delay by raising the awareness of residents and urging them to determine their own standardized personal or household disaster response plan in reference to the incoming disaster information.

Based on the effectiveness this social experiment, the 'My-timeline' tool is now increasingly been promoted across Japan to improve flood disaster prevention awareness, by urging the residents to consider what actions they need to take for self-help (eg. ARMMC 2020). Various such initiatives have also previously implemented to create Timelines at Community and District level, but the 'My-Timeline' is in lines with the idea of strengthening the 'Self-help' capacities of residents.

Key Takeaway lessons for Indian Context

- Taking due consideration of the past disaster experiences and their aging society, the Japanese government has taken comprehensive measures (like through education and training, opinion exchange, stakeholder coordination etc.) for engaging local communities in DRM.
- Customised tools like 'My-timeline' can be an effective means to enhance DRM planning at household level and supporting disaster prevention efforts by citizens in their communities.

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4. Disaster Recovery and Reconstruction Approach in Japan

The 9.0 Magnitude (March 11) 2011 Great East Japan Earthquake (GEJE) was the most powerful earthquake ever recorded in Japan. Accompanied with an enormous tsunami along the northeastern part of Japan (over 650 kilometers of coastline) and (Fukushima Daiichi) nuclear power plant accident, it is regarded as a triple disaster event. The devastation from these subsequent disasters killed around 18,500 people (and thousands missing) and caused tremendous damage (costing billions of dollars) to infrastructure and public utilities, specifically in the Fukushima, Iwate, and Miyagi prefectures. Around 400,000 houses were partially or completely destroyed, and transportation networks (highways, expressways, railways, etc.) came to a standstill. The GEJE also put forth serious concerns of debris management (20 million tons of debris was left behind) and loss of livelihoods (for around 160,000 people), specifically in the Fukushima area due to radiation exposure (JICA 2013; Ranghieri and Ishiwatari 2014).

To cope with the wide ranging impacts of GEJE, Japan swiftly established a reconstruction planning framework - based on mutual trust and collaboration with diverse stakeholders – which is now considered as a model for future mega-disasters. While more than 200 municipalities were affected by the GEJE, the Government of Japan released several budgetary supplements and supported the effective recovery and reconstruction planning at the prefecture and municipal levels. The disaster recovery and reconstruction policy and planning of Japan mainly comprised of the following three stages:

Stage 1. (0 to 4 months): Immediately after the disaster occurred, the Government of Japan established the Extreme Disaster Management headquarters (chaired by the Prime Minister) and an independent Reconstruction Design Council (RDC). Based on the council's recommendation, the Basic Guidelines and a Basic Act for Reconstruction were issued within the first four months.

Stage 2. (4 to 11 months): The Provisional headquarters were established for reconstruction in the affected areas, and the Basic Recovery Plans were prepared by the Prefectures and Municipalities in close cooperation with the affected populations.

Stage 3. (11 months to 10 years): 11 months after the tsunami in February 2012, a designated Reconstruction Agency (and three Regional Bureaus in the three worst affected Prefectures) was established by the Japanese cabinet for a period of 10 years (envisaged period of reconstruction). Headed by the Prime Minister, the agency serves as the one-stop-shop for supporting the local authorities in affected areas and coordinating the reconstruction measures.

Key Highlights:

1. The Great East Japan Earthquake (GEJE), 2011 is seen as the first disaster instance ever recorded, which was accompanied with a tsunami, nuclear powerplant accident, and large scale disruption of services. The efficacy of Japan's DRM systems was also widely recognized as it helped to minimize the losses, despite the unprecedented scale of earthquake.

2. The establishment of a designated Reconstruction agency and participatory recovery planning at municipal and prefectural level serve as good examples for how to 'Build-back-Better'.

3. The establishment of pre-disaster arrangements with the private sector proved to be highly effective in enabling prompt emergency response operations and should therefore be prioritized.

Key Characteristics of Japan's Disaster Reconstruction Approach Post-GEJE

In Japan, the national government enters into pre-disaster agreements with the private sector for quick rehabilitation of infrastructure in the event of disaster. This ensures that the needed workforce is quickly mobilized for the post-disaster activities (like construction, engineering consulting, surveying, telecommunications, and broadcasting) without any tedious paperwork. The rehabilitation and reconstruction activities are thus swiftly started by the concerned organizations and are to a greater extent (two-thirds of the project costs) subsidized by the national government (under the 1951 National Government Defrayment Act for Reconstruction of Disaster Stricken Public Facilities). For requesting the national subsidies, the local governments usually report their infrastructure damages to the national government within 10 days of disaster occurrence, and the government conducts a situation assessment within two months before approving the same.

Taking account of the massive devastation brought forth by the GEJE, the national government in Japan established the Reconstruction Agency (refer to Figure 30), for temporarily facilitating the Prefecture and Municipality-led recovery and reconstruction by setting up Special Zones for Reconstruction. Supplementary budget and flexible grants (including concessions and incentives) were designated for companies that set up new facilities in these zones. While the three disaster affected Prefectures (with more than 120 affected municipalities) prepared their own recovery plans, Leelawat et al. (2015) explained that the affected municipalities also separately proposed their recovery and reconstruction plans (in lines with the national and prefectural government policies). The afflicted municipalities applied for the Special zone reconstruction grants in their Prefectures, which were then coordinated with the Regional Offices of each Ministry, and accordingly proposed to the national level Reconstruction Agency. As these plans were intended to reach consensus among residents on the core vision and principles of reconstruction, the planning committees also comprised of the experts, residents, and community representatives.

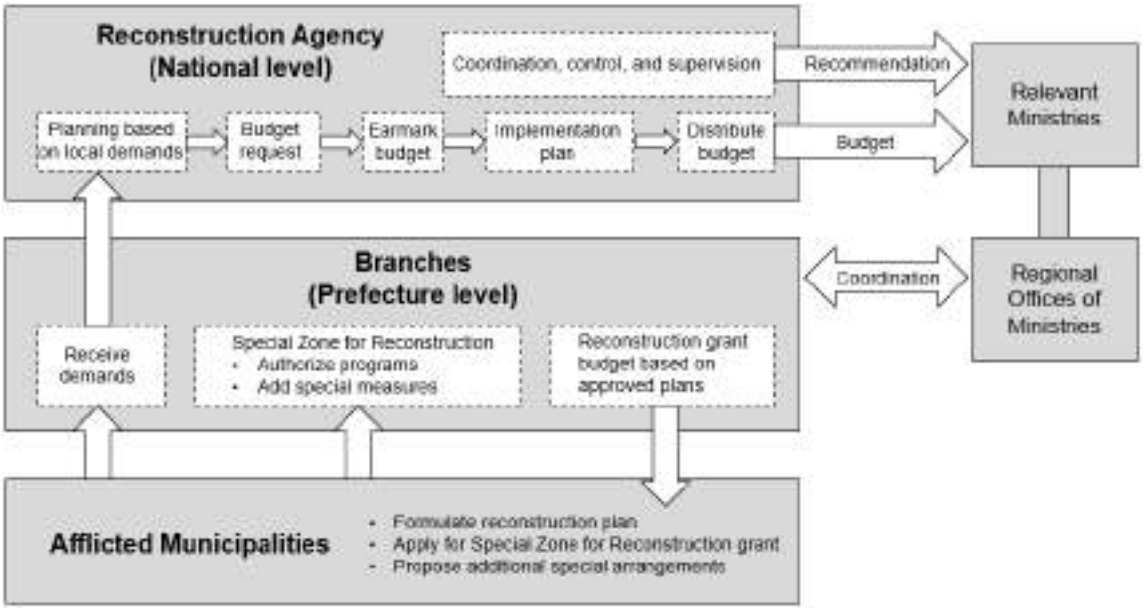

Figure 30: Coordination Framework for Reconstruction Agency (Ranghieri & Ishiwatari 2014)

A range of other initiatives were also taken to address the specific concerns raised by the GEJE:

Livelihood Restoration: An innovative (cash-for-work) emergency job creation project was initiated, which provided direct employment to more than 31,700 jobless people. Apart from the reconstruction related work, the project also opened up job opportunities in the areas of providing clerical and support work for affected people, hence reaching out to women and elderly populations (who were traditionally excluded from manual work) (Ranghieri and Ishiwatari 2014).

Transitional Shelter: Depending on the geography, disaster impacts and local preferences, the Japanese government offered a range of shelter options for the displaced populations, including the prefabricated temporary housing units; government-owned accommodations, and private rental apartments. The private rental housing units were highly preferred due to their lower prices, higher comfort, and greater versatility. Overall, around 120,000 accommodation units were provided to the displaced populations (JICA 2013).

Temporary Towns: In consideration to the massive devastation brought forth by the triple disaster, and the necessity of long term evacuation for some areas (like near the Fukushima nuclear plant), the Government set up temporary towns outside the original locations. This initiative helped to guarantee a safe and secure living environment for the evacuees.

Key Takeaway lessons for Indian Context

- Pre-disaster agreements with the private sector can help to ensure swift emergency response by quickly mobilizing the available resources for disaster recovery and reconstruction.
- Pre-disaster strategic planning between the national and local governments is important to ensure coordinated response to large scale emergency situations like the GEJE.
- To ensure effective recovery planning from large scale disasters like the GEJE, it is important to empower the local governments and enable a participatory approach for recovery planning that is suited to the local conditions and culture.

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PHILIPPINES

7.6 Philippines

7.6.1 DRM Governance Structures

Organization of lead disaster management agencies

The Philippine Disaster Risk Reduction and Management Act of 2010 is the foremost legal instrument across various governance levels. ***The National Disaster Risk Reduction and Management Council (NDRRMC)*** serves as the highest decision-making body, comprising members from different departments, government agencies, LGUs, Civil Society Organizations and private sector. There are multi-tiered bodies down to the community/Barangay level which constitute the Disaster Risk Reduction and Management Office (DRRMO) in every province, city and municipality. The Barangay Disaster Risk Reduction and Management Committee (BDRRMC) is responsible for operations requiring vertical coordination.

The organogram of the NDRRMC is as depicted in figure 31 below with details of the chairpersons as below:

- The **Secretary of Department of Defense is the Chairperson** for the NDRRMC.
- The Secretary of the Department of the Interior and Local Government (DILG) is the Vice Chairperson for Disaster Preparedness.
- The Secretary of the Department of Social Welfare and Development (DSWD) is the Vice Chairperson for Disaster Response.
- The Secretary of the Department of Science and Technology (DOST) is the Vice Chairperson for Disaster Prevention and Mitigation
- The Director-General of the National Economic and Development Authority (NEDA) is the Vice Chairperson for Disaster Rehabilitation and Recovery
- The Administrator of the Office of Civil Defense (OCD) is the Executive Director

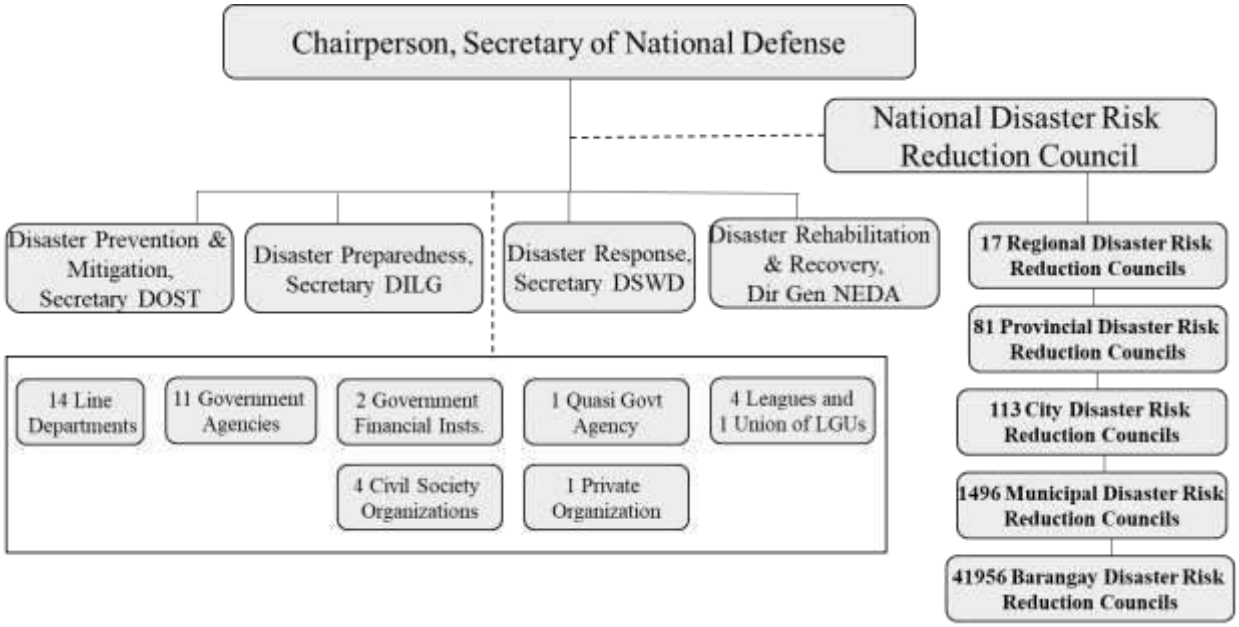

Figure 31: Organogram for the Philippines DRM Structure
Modified from (ADRC, 2018) and (ADRC, 2009)

To ensure Disaster Risk Management at grassroot level, the replication of the NDRRMC from the national down to the regional, provincial, city, municipal and barangay levels is done as shown in Figure 1. The Act mandates that Local Disaster Risk Reduction and Management Office be established in every province, city, and municipality, and a Barangay. These are the permanent offices under the office of the governor, city or municipal mayor and the barangay captain respectively.

The Office of the Civil Defense (OCD) has the primary responsibility of administering and executing disaster risk reduction and management programs. The organizational structure of Office of Civil Defense is as below in figure 32. The Administrator of the OCD is also the Executive Director of the National Council; therefore, he/she has the same duties and privileges of a department undersecretary. Similarly, the regional officers of OCD serve as secretaries for Regional Disaster Risk Reduction Councils. The LGUs are provided with a checklist of actions to be taken and supplies to be procured together with providing communications and contingency templates for disaster preparedness.

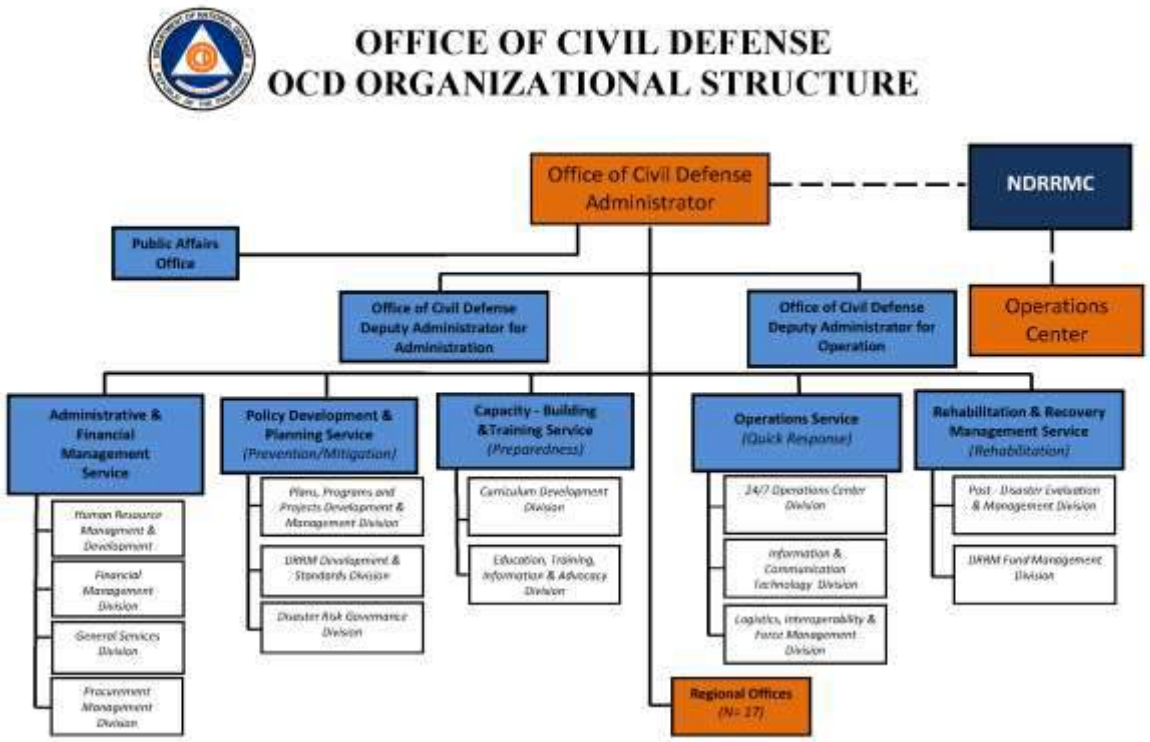

Figure 32: Organogram of Office of Civil Defense (*Source: Office of Civil Defense, 2020)*

Disaster Management Functions of these Agencies/Department/Institutions

As per the Republic Act, the National Disaster Risk Reduction and Management Council (NDRRMC) has the functions of overall coordination, integration, supervision and monitoring. The NDRRMC also looks after the enforcement by agencies and organisations of the various laws, plan, programs, guidelines, codes and technical standards as per the requirement of the Act. The Office of Civil Defense (OCD) oversees the i) Disaster Preparedness, ii) Disaster Prevention, iii) Response, and iv) Rehabilitation and Recovery.

Vertical and Horizontal Linkages

The national level offices have designated officer for disaster management or any other officer is given additional charge of disaster management. This helps in horizontal communication and coordination. Further, the provision of permanent offices of disaster management at local level and the replication of NDRRC to the regional, provincial, city, municipal and barangay level enables the vertical communication. The LDRRMCs are chaired by the local chief executives and the members are the heads of various offices with the four members from the CSOs and one private sector representative.

The Regional Offices of Office of Civil Defense communicate with the LGUs, CSO, private groups, volunteers and communities and conduct trainings for them. At the national level, the implementing agencies for the project are identified along-with a lead agency.

To enhance the localization, the LGUs are empowered in the many ethnic languages. The Barangay DRM community prepares their own DRM plan through empowerment of Local Chief Executive.

Strengths of agencies in terms of Human Resource (staff, management practices, linkages, training etc.)

The Office of Civil Defense is tasked to conduct periodic assessment and performance monitoring of member-agencies of the NDRRMC and the RDRRMCs as indicated in the NDRRMP. Further, the Office of Civil Defense monitors and evaluates the delivery and implementation of training programs at national as well as regional level. It is also tasked with development of standard accreditation system for the training partners and institutions.

Funding mechanism

At the national and local levels, the following sources can be tapped to fund the various DRRM programs and projects:

1. General Appropriations Act (GAA) – through the existing budgets of the national line and government agencies
2. National Disaster Risk Reduction and Management Fund (NDRRMF)
3. Local Disaster Risk Reduction and Management Fund (LDRRMF)
4. Priority Development Assistance Fund (PDAF)
5. Donor Funds
6. Adaptation and Risk Financing
7. Disaster Management Assistance Fund (DMAF)

As per the Philippine Disaster Risk Reduction and Management Act of 2010, the use and appropriation of the Local Calamity Fund has been modified to denote the paradigm shift from disaster response and recovery towards risk reduction, preparedness and mitigation. It states, *"Not less than five percent (5%) of the estimated revenue from regular sources shall be set aside as the Local Disaster Risk Reduction and Management Fund (LDRRMF)".*

- This allows scope and flexibility to increase funding beyond 5% amount. The balance of the current year's LDRRMF can be carried forward as Special Trust Fund which can be

spent in the next five years. Extended budget provision is provided for COVID-19 in the year 2020.

- 30% of the amount appropriated as LDRRMF, is to be allocated as the Quick Response Fund for relief and recovery projects.
- The 70% of the amount is to be utilised for prevention, mitigation and preparedness. The 70% allocation is to be used for the implementation of structural and non-structural activities, including risk-mitigation infrastructure, purchase of equipment, stockpiling of basic emergency relief supplies, training, planning, capacity including, development of Information, Education and Communication (IEC), and risk transfer mechanisms.
- The establishment of the DRRMF at all levels of government ensures that LGUs have adequate budget available.
- All departments/agencies that are allocated with DRRM fund are required to submit to the NDRRMC their monthly statements on the utilization of DRRM funds and make an accounting thereof in accordance with existing accounting and auditing rules.
- The OCD is allocated a budget of one billion pesos revolving fund starting from the effectivity of the Act.
- Autonomy is provided to LGUs to generate their own funds at local level.

References:

ADRC, 2018. *The Philippine Disaster Risk Reduction And Management System*. [online] ADRC. Available at: <https://www.adrc.asia/countryreport/PHL/2018/Philippines_CR2018B.pdf>

Ocd.gov.ph. 2020. *Office Of Civil Defense*. [online] Available at: <https://ocd.gov.ph/index.php>

7.6.2 Thematic Good Practices

1. Private Sector Engagement

The private sector is an important stakeholder in Disaster Risk Reduction. Traditionally, the role of private sector is restricted to disaster relief and in the form of donations only. However, the Sendai Framework for Disaster Risk Reduction has emphasized the role of private sector in a more formalized and institutionalized manner.

In this regard, the National Disaster Risk Management Council, the highest decision-making body in Philippines has four slots for external stakeholders with one slot for private sector's representative. This allows for direct engagement of private sector in DRR with the government. In addition to, there are three main private groups who work in DRR:

a) Philippine Disaster Resilience Foundation (PDRF)
b) ARISE Philippines
c) National Resilience Council (NRC)

The engagement of private sector in DRR is however limited to large conglomerates who are binded together as industry but not at the level of MSMEs yet. While PDRF is more focussed on relief, recovery and rehabilitation, the NRC focuses on resilience through preparedness and capacity building initiatives. This case study discusses the engagement of private sector in Philippines through National Resilience Council as well as other initiatives in the country with a leading role of private sector in DRR.

Key Highlights:

1. The National Resilience Council (NRC) in Philippines engages in disaster risk reduction through various initiatives. Philippines also supports private sector engagement through representation in National Disaster Risk Management Council.

2. Private sector's engagement in disaster risk reduction beyond the response phase shows the scope for engagement with community in disaster risk reduction initiatives and building a strong corporate-community partnership.

3. India's private sector faces economic loss during disasters. It has also been witnessed during the COVID-19 pandemic. Thereby, private sector becomes an important stakeholder in Disaster Risk Reduction. Further, India is a signatory to SFDRR which requires enhancement of the role of private sector in disaster risk reduction.

Key Initiatives of National Reslience Council (NRC):

The National Resilience Council (NRC) is a science and technology-based public private partnership with focus on enhancing the internal capacities of local government units (LGUs). It strengthens the collaboration between government, civil society, academia and private sector for DRR by undertaking action-oriented research, training and mentorship programs. The NRC anchors its work by building intersections between the SFDRR, SDGs, and the Paris Climate Agreement. NRC lays its vision with three keywords: Prepare, Adapt and Transform.

It has led the following three important initiatives:

a) Resilient Local Government Units Program
b) Resilience Scorecard
c) Adopt-a-City Program

The Resilient Local Government Units Program is a two-track three-year program designed to build capacity in evidence-informed risk governance. The two tracks being the i) leadership and governance, and ii) Science and Technology as shown in figure 33. The program includes providing training to LGUs and their internal and external stakeholders. It includes undertaking climate and disaster risk assessment and strengthening the management information system. It also includes formation of core resilience team at local level with representatives from LGUs, civil society and private sector representatives. It focuses on

Figure 33: Resilient Local Government Units Program

practicing co-ownership through establishment of trust-based partnerships among the different sectors to institutionalise the system.

Resilience Scorecard is a system of metrics featuring over 90 indicators that are based on local and international resilience rating standards. The scorecard enables the local governments to determine their preparedness, adaptation and transformation towards resiliency. The scorecard is essentially localised with the indicators, minimum requirements, means of verification and references being in accordance with local governance systems. The five key elements of the scorecard are: i) Leadership and Governance, ii) Human Development, iii) Local Economy, iv) Infrastructure and v) Environment

Adopt-a-City is yet another innovative city specific partnership model for the corporations to collaborate with city governments. It allows the private sector to directly invest in the city's disaster risk reduction and long-term resilience efforts. It follows whole-of-society approach through engagement of academia, community members in co-creating science-based solutions.

The discussants in the web-based consultations also stated certain challenges in the engagement of private sector in DRR with respect to the procurement laws and limited incentivisation. The current incentives are limited to CSR norms and tax breaks. However, the local governments are more engaged with the private sector and they look for ways of incentivisation at local level.

The participation of private sector is high at Barangay level (village level) also through development of Community Based DRM Plans. This corresponds to the corporate community interface model (Shaw, 2018). This model can essentially be promoted at local level and with small corporates as well.

Further, some of the private malls have developed underground flood water catchment areas to help in flood mitigation. The Philippine private sector is also investing in technologies of early warning and hazard detection to enhance risk communication. The telecommunication corporations are also investing in observation equipment for climate modelling and risk forecasting including automated weather stations and rain gauge to enable open end data support.

Key Takeaway lessons for Indian Context

1. The practice of representation of stakeholder from private sector in decision-making council allows for more scope of engagement of private sector in DRR
2. The engagement of private sector with local level government units along with participation from community allows for development of corporate community interface model. This model is more sustainable due to co-ownership of DRR with community, private sector as well as local government.
3. The private sector resources can be utilised in undertaking structural mitigation measures e.g. the flood water catchment in malls.
4. The private sector's engagement in disaster risk reduction does not only lead to reduction of existing risks but also prevents against creation of new risks.

References:

Resiliencecouncil.ph. 2020. *National Resilience Council – PREPARE. ADAPT. TRANSFORM.*. [online] Available at: <https://resiliencecouncil.ph/> [Accessed 16 December 2020].

Shaw, R., 2018. Role of Private Sectors in Disaster Risk Reduction: Potential and Challenges. *Journal of Disaster Research*, 13(7).

2. Community Based Disaster Risk Reduction

Community is the first responder to disasters. The SFDRR perpetuates the role of community in preparedness, mitigation and well as recovery and rehabilitation. The community-based disaster risk reduction management approach allows the local community to build on their own experiences of disasters and participate actively in disaster risk management planning. Further, the community-based disaster risk reduction provides co-ownership of local initiatives so that they are implemented well.

Key Highlights:

1. The community-based disaster risk reduction approach bases itself on the enabling legislative provisions for engagement of community in disaster risk reduction. The legislative provisions support the engagement of student volunteers and provide adequate protection to them.

2. The initiative of community based early warning and evacuation system undertaken at Barangay level is made possible due to flexibility provided at Barangay Disaster Risk Reduction Council Level.

3. India has various hazards owing to the diverse geography. In this regard, localisation of disaster preparedness and response can be achieved through community-based disaster risk reduction approach. Similar to Philippines, India faces hazards of floods and cyclones which require the approach of local and community based early warnings. India can also utilise the practice of strengthening the youth community disaster volunteers considering the population base.

Key Characteristics of Community Based Disaster Risk Reduction Approach:

Some of the key legislative provisions which strengthen the community-based disaster risk reduction approach in Philippines are stated below:

Legislative Provisions:

1. As required by the Republic Act 10121, National Disaster Risk Reduction Management Framework (NDRRMF) is required to develop a community-based approach to disaster risk reduction and management.
2. The Act also mandates the criteria for enlistment of accredited community disaster volunteers (ACDVs). The act also provides for protection of such ACDVs by the agencies which recruit them. A national roster of ACDVs, National Service Reserve Corps, CSOs and the private sector is maintained by the OCD through the LDRRMOs.
3. All the levels have disaster risk management councils starting from national to local level. Some councils are also up-to the Barangay level. The barangay is the basic territorial and political unit of the Philippines. Such decentralisation of the participatory decision-making councils enhances the role of community in the DRR activities. The law allows/empowers the communities to establish their own resources so that they are not entirely dependent on the government for post disaster assistance. The Barangay

Disaster Council works in close coordination with community members to ensure preparedness by all community members in case of a disaster event.

4. The risk assessment in Local Disaster Risk Reduction Management Plans is done in a participatory manner and can be accessed by anyone.
5. As per the NDRRMF, disaster preparedness essentially revolves around enhancing the capacity of the community to the threats and impacts of all hazards through awareness and engagement. The framework mentions the need to strengthen linkage of community based and science-based risk assessment, mapping, analysis and monitoring.

Community Based Early Warning System:

In case of Dagupan city, the community felt the need to develop their own early warning system and an evacuation plan to guide them during floods. As part of *the Program for Hydro-Meteorological Disaster Mitigation in Secondary Cities in Asia* (PROMISE), the community preparedness was strengthened with capacity building on developing their own early warning system. As part of the project, training sessions on participatory risk management were undertaken. The participatory risk assessment techniques helped to build the community's perception of risk and enhanced their engagement with city EOC on warning signals and subsequent evacuation plans. To ensure sustainability of CBDRM, the civil society organisation train local level task forces, form barangay disaster committees and encourage the use of locally made products as part of preparedness, response, relief and recovery. The local chieftain or dedicated focal person on early warning checks the warning from weather bureau and then reinforces the preparedness and evacuation plan with the help of village committee. In this way, the local volunteers ensure evacuation to safe places through door-to-door persuasion. Such practices are undertaken for flooding as well as typhoon(cyclone) warnings.

Key Takeaway lessons for Indian Context:

1. Institutionalisation of community-based disaster risk reduction is important at all government levels.
2. Community based disaster risk reduction can be increased by empowering the local government units with decision-making powers.
3. Science and community interface can be explored in development of community based early warning systems and in conducting risk assessments.
4. The community volunteer base in disaster risk reduction should be enhanced with due legal provisions and protection.

References:

1. The National Disaster Risk Reduction and Management Plan (NDRRMP)
2. The Philippine Disaster Risk Reduction and Management System, Office of Civil Defense, Department of National Defense.
3. Republic Act No. 1012 Republic of the Philippines
4. ADPC, 2006. *Community Based Early Warning System And Evacuation: Planning, Development And Testing Protecting Peoples' Lives And Properties From Flood Risks In Dagupan City, Philippines*. [online] ADPC.

3. Disaster Risk Insurance

Philippines being a high disaster risk country has taken initiative in the field of disaster risk insurance and risk transfer mechanisms. The disaster insurance improves the financial resilience of the cities and governments to bounce back. It also allows for sound budget utilization in terms of premium payments for disaster financing.

As per the Republic Act of 10121, the criteria for defining the calamity includes provisions like: a) at least 15% population is in need of emergency b) at least 30% of means of livelihood is affected c) critical and lifeline infrastructure is damaged etc.

Key Highlights:

1. The Disaster Risk Insurance lies on the legal provisions which enable the government to plan for insurance of public buildings and also for post disaster recovery activities. Further, the case of Philippine City Disaster Insurance Pool as a city level risk insurance and re-insurance mechanism, developed with support for ADB depicts the scope of cities coming together and creating a collective resource pool.

2. The theme of disaster risk financing is important to build financial resilience. It also helps to strengthen the risk and damage assessment models to forecast disaster losses.

3. In India, currently the disaster losses are compensated through public funds. However, an institutionalised disaster risk insurance approach will help India to plan for disaster financing and encash the opportunity of investment through various mechanisms, specifically at the local government level.

Further, the with respect to utilization of funds, the Local Disaster Risk Reduction Management Fund Investment Program indicates activities to be funded from Quick Response Fund e.g. prepositioning of emergency supplies and procurement of emergency equipment. The Act also contains the mitigation provisions which are to be followed after declaration of a calamity, some of which are as below:

a) Price ceiling can be introduced on basic necessities and commodities
b) The Local Price Coordination Council undertakes the monitoring, prevention and control against overpricing and hoarding.
c) Reprogramming of funds for repair and upgrading of public infrastructure.
d) Provision of no-interest loans by government financing and lending institutions
e) Utilization of Quick Response Fund for relief, rehabilitation, reconstruction and recovery.

Key Characteristics of the Disaster Risk Insurance:

Some of the enabling legal provisions which allow for disaster risk insurance are discussed below:

Legal Provisions:

1. The Republic Act 10121 defines risk transfer as the process of shifting the financial consequences of particular risks from one party to another to pre-finance the rehabilitation

and recovery of impacts of natural disasters. The Act also mandates to develop appropriate risk transfer mechanisms for social and economic resilience.

2. The National DRRM Plan aims that the communities have access to effective disaster risk financing and insurance. The Department of Finance provides for Disaster Risk Financing and Insurance strategy which focuses on insurance of government assets as one of the key highlights.
3. In this regard, the Act requires the government bodies to insure the properties to compensate the government from any damage from earthquake, storm or other calamity. The National DRRM Fund provides for earmarking of one billion pesos for insurance coverage of government facilities. The insurance proceeds are also to be deposited with the National Treasury. The Act also provides for negotiated procurement in times of emergency.
4. A Technical Working Group, under the leadership of Department of Finance is established to ensure implementation of the disaster risk insurance mechanisms.

The specific roles and responsibilities are also given in the Act as below (table 5):

Table 5: Roles and Responsibilities as per the Act

Agency	**Function**
GSIS	Insurer and design the policy structure
Bureau of Treasury	Policyholder
Commission on Audit	Audit the use of Payouts
Department of Budget and Management	Timely issuance of budget release documents for premium payment
Department of Interior and Local Government	Coordination with Local Government Units
National Economic and Development Authority	Monitoring
Office of Civil Defense	Needs Assessment

Parametric Insurance Contract:

Parametric insurance payouts are determined on the physical features of a natural hazard such as wind speed for typhoons and ground-shaking for earthquakes. It does not depend on actual losses suffered. The payouts based on parameters of the hazard help in early assessment and release of insurance money recovery. It assures the payouts to be expected within 15 days of the trigger event.

As per the Act, the insurance payouts should be solely for post-disaster activities relating to repair of government infrastructure and restoration of basic services. The emergency procurement guidelines apply to the use of such insurance payouts.

Case Study of Philippine City Disaster Insurance Pool

The Philippine City Disaster Insurance Pool (PCDIP) is one of the foremost mechanism to provide early access of funds to the cities. It is developed by the Philippine Department of Finance with technical support from Asian Development Bank. The PCDIP also follows the Parametric Insurance system and considers two hazards of typhoons and earthquakes. The quantification of flood risk modelling is also being considered to add in the future.

Figure 34: Proposed Structure of PCDIP (Source: ADB, 2018)

Ten cities were engaged for the PCDIP project. The proposed structure of the PCDIP is as in figure 34. As a first step, an exposure dataset of public and private vertical assets was developed with the support of each city. This dataset is used earthquake and typhoon risk models to quantify the level of risk. Secondly, the existing disaster risk financing arrangements in each city were assessed to determine the additional need for financing. The risk modelling is to be done by independent agencies. After taking due feedback from cities, the final model was prepared.

GSIS will pass the premium through to the PCDIP company, which will act as a reinsurer to GSIS. PCDIP company will directly reinsure with the domestic and international reinsurance markets. The initial pool capital is to be supported by ADB in the form of loan.

Under the risk pooling arrangements, the city governments, collectively buy insurance through a single platform. The risk pooling system provides the benefits of diversification, economies of scale and the scope of profit retention.

Key Takeaway Lessons for India:

1. The disaster risk insurance can be weaved into the disaster mitigation mechanism through the required legal provisions. The provision of disaster insurance provision of safety net for quicker economic recovery.
2. India can also adopt the parametric insurance payouts to shorten the period of damage and loss assessment and provide for available resources in a shorter time period.
3. The disaster insurance mechanism requires regulatory and monitoring provisions as stated in the Philippines with pre-designated roles of each agency in the insurance.
4. The city disaster insurance pool can be used a pilot mechanism with few high-risk cities and based on HRVA assessment. The insurance mechanism also provides for independent and scientific risk assessment and forecasting models.
5. The insurance mechanism also provides for early recovery and restoration of basic services through ease of financial access, specifically for recurring disasters of cyclones.

Key References:

ADB, 2018. *Philippine City Disaster Insurance Pool*. ADB.

NDRRMC Guidelines for Declaration of Emergency, 2019, Office of Civil Defense

Guidelines on the Implementation, Monitoring, and Reporting on the use of Php 1 Billion Allocation Under The National Disaster Risk Reduction Management (DRRM) Fund For Insurance Of Government Facilities, 2017, Office of Civil Defense

TURKEY


BULGARIA
GREECE
RUSSIA
GEORGIA
ARMENIA
AZER
IRAN
IRAQ
SYRIA
LEBANON
CYPRUS
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MEDITERRANEAN SEA
TURKEY
Burgas
Edirne
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Bolu
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Bartın
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Malatya
Adıyaman
Diyarbakır
Batman
Siirt
Bitlis
Van
Hakkâri
Şırnak
Mardin
Kahramanmaraş
Gaziantep
Urfa
Key to Provinces
(Shown by number on map)
1 KOCAELİ
2 SAKARYA
3 AFYONKARAHİSAR
4 İÇEL
5 HATAY
For all other provinces, the name of the province is the same as the name of its capital city.
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7.7 Turkey

7.7.1 DRM Governance Structure

Organisation of lead Disaster Management Agency

Based on the experiences of 1999 Marmara earthquakes, the Turkish disaster management system witnessed some important changes in the year 2009. In accordance with the Law No. 5902, the three core bodies of 'Directorate-General of Civil Defense', 'Directorate-General of Disaster Affairs', and 'Directorate-General of Turkey Emergency Management' were merged, and the '***Disaster and Emergency Management Authority***' (AFAD; derived from 'Afet' meaning disaster in Turkish) was established as an umbrella organization for emergency management. AFAD was established under the Prime Ministry, but it presently reports to the ***Turkish Ministry of Interior***. The founding law passed in 2009 also lead to the establishment of Provincial Disaster and Emergency Management Directorates attached to Governorates under the Provincial administrations established at the local level. While AFAD is presently the core agency for disaster management in Turkey, there are 81 Provincial DEM directorates and 11 Search and rescue (SAR) directorates for responding to any disaster at local level. Overall, AFAD comprises of more than 5000 staff (500 in Ankara Headquarters only), and 2000 SAR personnel.

As highlighted in Figure 35, AFAD consists of six key departments namely, the Deparment of Planning and Mitigation, Deparment of Response, Deparment of Recovery, Deparment of Civil Defence, Deparment of Earthquake, and Deparment of Administrative Affairs. AFAD also comprises of three high level boards namely 'Disaster and Emergency Management High Board, Disaster and Emergency Management Coordination Board, and Earthquake Advisory Board.

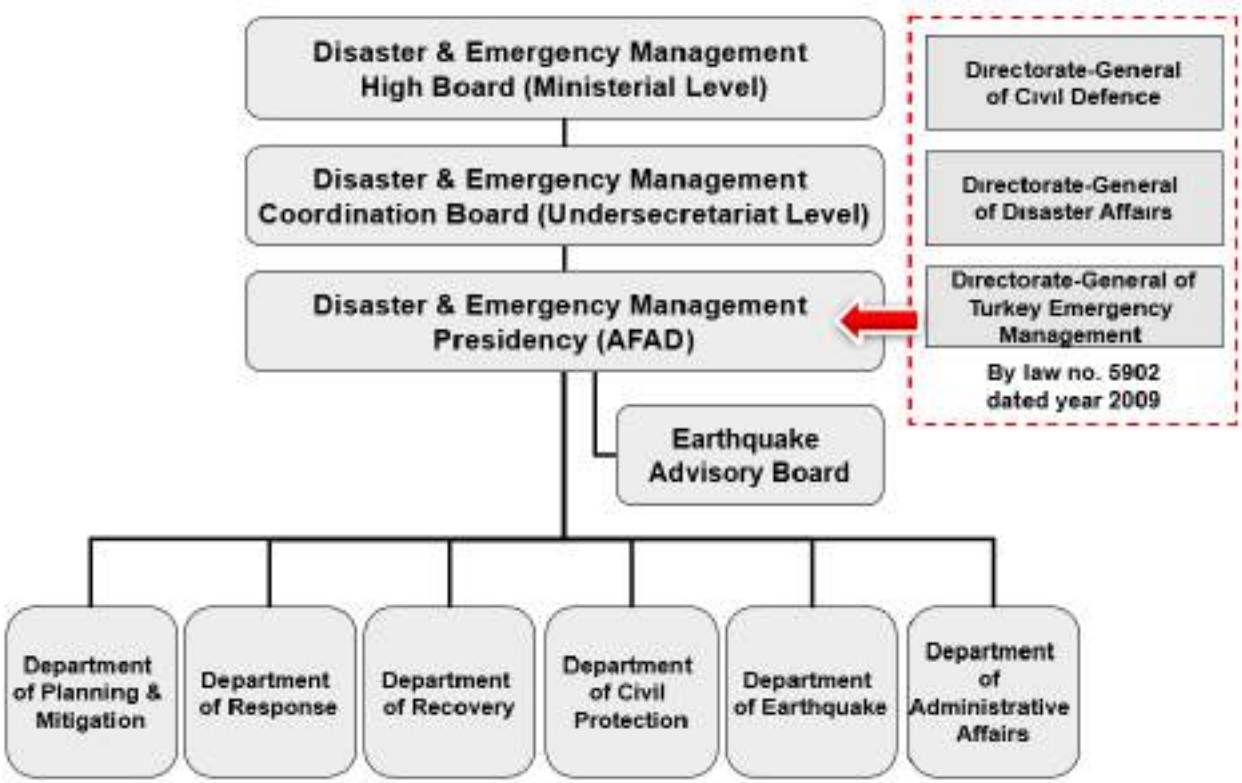

Figure 35: Disaster and Emergency Management Authority' (AFAD) structure

Disaster Management Functions of these Agencies

At national level in Turkey, AFAD's role in disaster risk governance framework are characterized as a coordinator, for facilitating cooperation between 'solution partners' in government agencies, scientists, civil society organizations, private sector and local communities. In coordination with all governmental institutions, AFAD is responsible for implementing and coordinating a) pre-incident works, like preparedness, mitigation and risk management, b) during-incident works, such as response and emergency aid, and c) post-incident works, like for recovery and reconstruction. Likewise, the Provincial Directorates of AFAD operate under the Governorship of the province and are responsible for all coordination activities at local level.

AFAD is also responsible for coordinating the National Platform for DRR and for working the roadmap for implementation of the Sendai Framework for DRR. Established by the Cabinet Decision No 2011/1320, the National Platform is a multi-stakeholder forum that brings together several actors from disaster community, including the public institutions, universities, local administrations, civil society, professional associations, media, and the private sector. It has a reasonably large participation from government and semi-government bodies.

In the backdrop of Van Earthquake in 2011, AFAD together with government and non-government actors developed the Turkey Disaster Response Plan (Türkiye Afet Müdahale Planı – TAMP in Turkish) in 2014. The plan defines the basic principles of action, activities and institutional roles and responsibilities in anticipation of, during and after disasters or emergency situations. The plan also the defines roles and responsibilities of all parties involved, and the basic principles for emergency response are established. In lines with that, the Provincial level disaster response plans have also been developed, which determine the roles and responsibilities of all actors at local level.

As per TAMP, there are 28 service groups, that are formed according to the quality of service carried out during response. TAMP defines the roles and duties and responsibilities of service groups and coordination units for different types of disasters like earthquakes, landslides, avalanches etc. These service groups cover all the main sectors of disaster response and are grouped in four types of services: operation, information, logistics and maintenance, and finance and administration (refer to Table 6). Depending on the expertise and staff capacities, AFAD defines related Ministries as their solution partners. All the defined service groups actors then coordinate with AFAD to ensure the sustainability of services in disaster and emergency situations.

Table 6: National level response service groups (Source: Oktay 2015)

No.	Name of Service Group	Name of Institution/ Ministry/ NGO	Service
1	Purchase and lease	AFAD	F&A
2	Accounting, budgeting and financial reporting	AFAD	F&A
3	National and international donations (in-cash)	AFAD	F&A
4	Loss assessment (financial)	Ministry of Finance	F&A
5	Information management, evaluation & Monitoring	AFAD	I&P
6	Service group logistics	AFAD	L&M
7	In-kind donations, warehouse management and distribution	Ministry of Family and Social Policies	L&M

8	Technical support and supply	Ministry of Transport, Maritime Affairs and Communications	L&M
9	Resource management	AFAD	L&M
10	International support & cooperation	AFAD	L&M
11	Search and rescue	AFAD	Ops
12	CBRN	AFAD	Ops
13	Accomodation (shelter)	AFAD	Ops
14	Energy	Ministry of Energy and Natural Resources	Ops
15	Damage assessment	Ministry of Environment and Urban Planning	Ops
16	Infrastructure	Ministry of Environment and Urban Planning	Ops
17	Debris removal	Ministry of Environment and Urban Planning	Ops
18	Psychosocial support	Ministry of Family and Social Policies	Ops
19	Food, agriculture, and livestock	Ministry of Food, Agriculture and Livestock	Ops
20	Health	Ministry of Health	Ops
21	Fire	Ministry of Internal Affairs	Ops
22	Evacuation and placement planning	Ministry of Internal Affairs	Ops
23	Security and traffic	Ministry of Internal Affairs	Ops
24	Interment	Ministry of Internal Affairs	Ops
25	Nutrition	Turkish Red Crescent	Ops
26	Communications	Ministry of Transport, Maritime Affairs and Communications	Ops
27	Transportation (infrastructure)	Ministry of Transport, Maritime Affairs and Communications	Ops
28	Transportation	Ministry of Transport, Maritime Affairs and Communications	Ops

Vertical and Horizontal Linkages

The Turkish government is widely involved with all the main international organizations (like United Nations, European Union, Organization for Economic Co-operation and Development, JICA etc.) and has signed many bilateral and multilateral international agreements. AFAD also works in close cooperation with several international organizations, including the United Nations Office for Disaster Risk Reduction, UN OCHA, UNDP, the World Bank, WHO, the World Food Programme and the International Organization for Migration.

At the national level in Turkey, the key agencies are AFAD, eight ministries and 'solution partners' such as Turkish Red Crescent. The local level is made up of Governorships, 81 Provincial AFAD directorates and the eight ministries local agencies. Herein, the Provincial directorates do not function directly under AFAD, as they fall under the Governorship in respective Provinces. But the AFAD passes on the guidance (e.g., on plans and risk assessments) to regional/county level for emergency and contingency planning. The response and recovery activities are divided between the national and the regional level. As highlighted in Figure 36, the AFAD and all Provincial directorates function during the emergencies as per the developed disaster response plan and service group plan at different levels, which ensures vertical-horizontal coordination.

The provincial level disaster and emergency directorates are mainly responsible for managing local emergency response functions, including search and rescue (SAR) operations and coordination between institutions. Although there are no regional level disaster management units, 11 regional SAR brigades have been created as per the AFAD Search and Rescue

Association and Regulations. Also, 23 Regional logistics warehouse have been built across the country for emergencies.

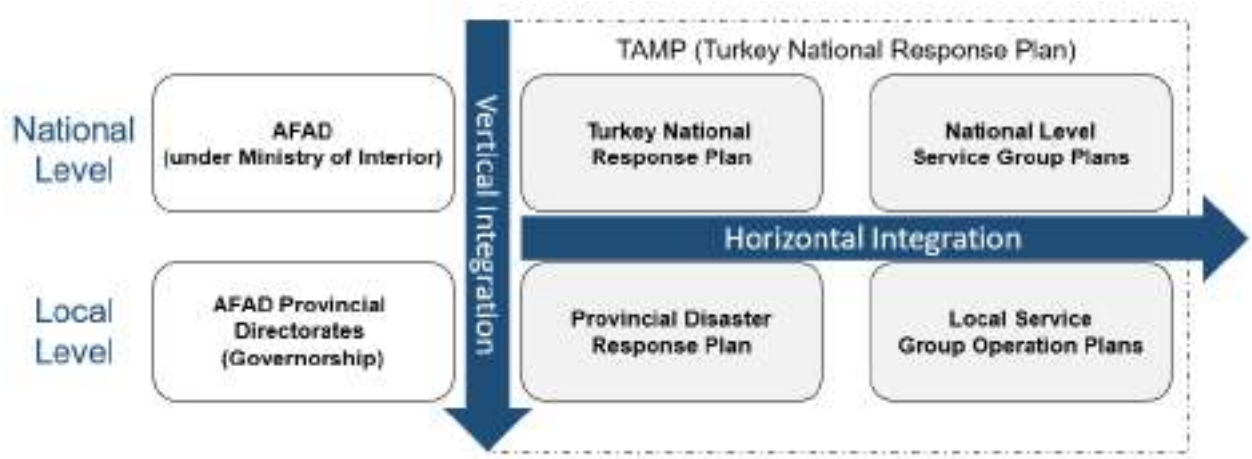

Figure 36: Horizontal-vertical integration of TAMP (Ozmen 2019)

Strengths of these Agencies in terms of Human Resource

The structure of AFAD consists of disaster management experts, engineers from related disciplines, instructors, technical staff and administrative staff. It further has a strong intention to enhance human resources development, and high emphasis is being put on training younger generations, and public education etc. For different departments in different directorates, several training programs are also organized like on geology, statistics, psychology, etc.

Funding mechanism

The disaster management activities in Turkey are funded through national and international sources. The budget allocation at central government and local government levels form the main source, alongside the funds through national disaster insurance and other sponsorships, donations etc. (both national and international). Noticeably, there are two types of budget for DRM issues namely the Project/Investment budget (with the approval of Ministry of Development) and Current Expenditures Budget (proposed by the AFAD). After thorough evaluation, both the budgets are legalized, and put into practice with publishing in Official Gazette.

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7.7.2 Thematic Good Practices

1. The Disaster Management And Decision Support System (AYDES)

'AYDES' is a geographic information system (GIS) based software and data platform that is developed by AFAD to manage all phases of disaster management in a digital environment. It is aimed at providing the necessary informatics infrastructure and decision support system base needed to efficiently monitor and manage the needs and demands of resources such as vehicles, personnel, material, equipment, service group coordination, and other aspects during disaster situations. AYDES is mainly an information substructure of Turkish Disaster Response Plan (TAMP), which clearly defines the roles and responsibilities of all stakeholders (including for all 28 service groups) in times of an emergency. In accordance with the contents of TAMP, AYDES is designed to be easily used by all stakeholders which are involved in the national disaster management system, including the AFAD, the collaborative Ministries, private institutions, and provincial organizations. As per NETAS (2018), AYDES is presently being used by more than 7,000 active users in all 81 Provinces of Turkey including the core ministries, institutions, NGOs, and Red Crescent. By collecting all useful data from related organizations and stakeholders, AYDES creates an emergency database (reports, statistics, queries, and other data etc.) that can support decision making in response phase and help in effective utilization of resources. The core capabilities of AYDES include:

- Creation of hazard and risk maps, for different types of disasters
- Estimating the impact of a potential disasters
- Management of activities immediately after a disaster via decision support system
- Management of post-disaster recovery and reconstruction processes
- Field data collection through mobile applications and their transfer to central database
- Instant status report on the dashboard with decision support system

Key Highlights:

1. AYDES is a holistic geospatial IT based platform which serves AFAD in all stages of disaster and emergency management, and provides accurate data and information (statistics, task monitoring, etc.). It has three core components namely 'Incident Command System', 'Recovery Information System, and 'Spatial Information System'.

2. Built over the foundation of TAMP, AYDES serves for all stages of disaster management, from risk mitigation to emergency response. Its other key features include the ease of geospatial risk mapping at grassroot level, compatibility with desktop and mobile applications and an effective interface for stakeholder coordination.

3. While timely access to real-time data is key to effective decision making, AYDES can serve as a prominent good practice for enhancing coordination between the diverse stakeholders at various governance levels in India.

Key Characteristics of AYDES

Keskin et al. (2019) explain that AYDES is an integrated platform with many internal and external systems and services, including desktop, mobile and web-based applications that

utilize GIS and Remote Sensing technologies. AYDES mainly consists of three core components (as shown in Figure 37) as explained below:

1. Incident Command System: Through the software-based system, this component allows the holistic management of the disaster preparation processes, DRM planning and response phases at local and national level, in accordance with TAMP. From sending event notifications (through SMS and email) to automatic need assessment (like search and rescue equipment), the ICS covers a range of coordination and management aspects.

2. Recovery Information System: This component helps to digitally coordinate the post-disaster recovery activities like damage detection, geological assessments, right ownership, resettlement site selection, etc. with GIS support. To maintain consistency and accuracy, the incorrect operations caused by repeated or wrong data records are prevented. It also allows for the collection of field data through mobile applications.

3. Spatial Information System: This component is a supplementary part of the whole work to build a sustainable DRM and decision support system by using GIS technologies. Here, the spatial data is collected from different agencies to create a geodatabase, that could serve for rapid decision making by spatial queries and analysis with other data collected during different phases of disasters.

Furthermore, two software tools namely AYDES-RS (Remote Sensing), a desktop image processing and analysis software and AYDES-CS (Crowd Sourcing), a web-based crowdsourcing software tool have also been integrated with AYDES for developing disaster event inventories (vulnerable assets, hazard risk data etc.), through the use of imageries acquired by advanced technologies.

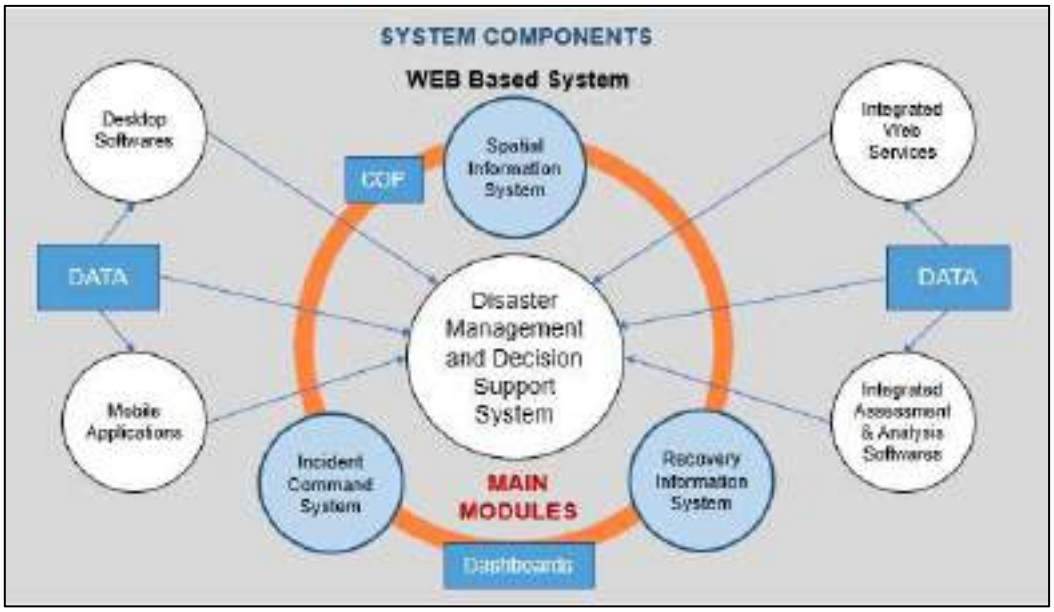

Figure 37: AYDES system components (Keskin et al. 2019)

Figure 38 highlights the coordination structure at national and local level in accordance with TAMP. Within the disaster and emergency operation centers of all Ministries and coordinating organizations, coordination and field support teams are formed. The coordination teams are the administrative teams, who execute the works planned by service groups, while the field support teams go to the disaster region at the first moment for supporting the service groups established in the region. ÇİÇEKDAĞi et al. (2017) explained the application of AYDES, in the landslide

event in Siirt, wherein twenty different service groups belonging to TAMP worked in coordinated way for coordinating the key operation services, information and planning service, logistic and maintenance service, and financial and administrative service.

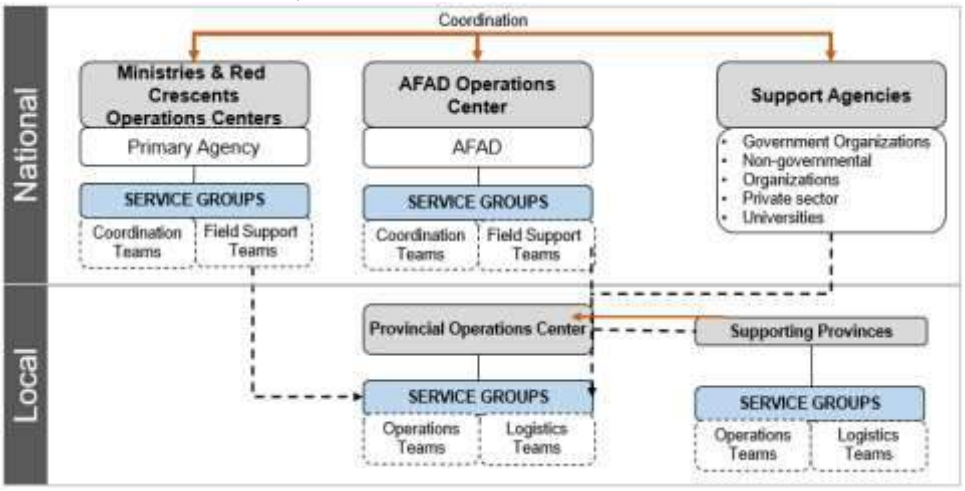

Figure 38: TAMP coordination structure in Turkey (ÇİÇEKDAĞi et al.2017)

Takeaway lessons for Indian Context

- An integrated data platform built on the structure of national DRM plan (like TAMP), can help to enhance coordination between the diverse stakeholders involved in disaster management system at various governance levels.
- The compatibility with desktop, mobile and web-based applications can serve for crowdsourcing information from the affected areas in different stages of disaster management, and also help to ensure effective use of resources alongside the timely access to real-time data.

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2. The Turkish Catastrophe Insurance Pool (TCIP)

The 1999 Marmara earthquakes, that caused heavy loss of life (18,373 people died) and property (93,000 housing units collapsed or damaged), brought enormous burden on the national budget as the Turkish Government had a legal obligation (Disaster Law, No. 7269) to finance the costs of post-earthquake reconstruction (Başbuğ-Erkan and Yilmaz 2015). Learning about the importance of applying pre-DRR measures, the Turkish government then implemented the compulsory earthquake insurance (CEI or Dask-'Doğal Afet Sigortaları Kurumu' insurance) policy to transfer the financial risks of any future earthquakes to other domains. Subsequently, the TCIP was launched in September 2000 pertaining to the CEI that

was made compulsory for all registered homeowners within the municipal boundaries in Turkey. The sole purpose of establishing TCIP was to privatize the potential risk by offering earthquake insurances and then export a major part of this risk to the international reinsurance and capital markets (Gurenko et al. 2006). The key objectives of TCIP are summarized as follows:

1. To offer insurance cover for all the dwellings within the scope of the TCIP policies
2. To enhance risk sharing by distributing the financial obligations caused by any future earthquakes on to the international reinsurance markets
3. To mitigate the financial pressures on the government in times of earthquakes.
4. To promote the construction of earthquake-resistant structures
5. To accumulate long-term reserves for financing the future earthquake losses
6. To develop insurance consciousness in the public.

The annual premiums charged by the TCIP vary based on the size of dwelling, construction type (masonry, reinforced concrete and others), and the seismic zone location (five different seismic zones in Turkey). Accordingly, 15 tariffs are applied (five earthquake hazard zones and three types of buildings). In this, the annual premiums are higher in high-risk regions and lower in low risk regions. A deductible of 2% is imposed in order to avoid small claims and reduce administrative costs. The guarantee for these insurances is provided by TCIP but the marketing authority is given to the authorized insurance companies and other agencies, to provide coverage for the property damages caused by the earthquakes on dwellings.

Key Highlights:

1. TCIP uniquely combines public and private resources into a public-private partnership, and provides a standalone earthquake insurance coverage to all registered homeowners and small and medium enterprises within the municipal boundaries in Turkey.

2. TCIP is mainly intended to reduce the Turkish government's fiscal exposure, and transfer the financial risk of future earthquakes to the shared pool of international reinsurance companies. Parallelly, it also serves to encourage risk mitigation through safer construction practices, and enhance risk sharing between public and private sources.

3. Implementation of a national risk financing strategy (like TCIP) could be challenging in India due to the diverse geo-climatic zones. However, similar models can be implemented at the sub-national level to cover the annual losses caused by the key disasters (like flood and drought).

Key Characteristics of TCIP

TCIP is mainly a non-profit public entity that was established in 1999 (Decree Law 587) with initial funding from the World Bank. Today, TCIP is recognized one of the best practices among national and international insurance regulators and one of its key characteristics is its unique organization structure, which brings tother public and private institutions into public–private partnership. Figure 39 highlights the organization structure of TCIP. While Turkish Undersecretariat of the Treasury is the core administrator of TCIP, the operational manager (pool manager) is a private insurance company. Notably, the TCIP board of directors include the representatives from the government, experts, and the insurance companies. Here, the

Under-secretariat oversees the whole insurance program, auditing of all operations and accounts of TCIP, and the private sector is engaged in the process of administration. The formation of a large pool independent of the national budget has mainly helped to overcome the hurdles of political decision making. More notably, the TCIP also plays an important role in the monitoring and controlling of the necessary building codes required by reinsurers.

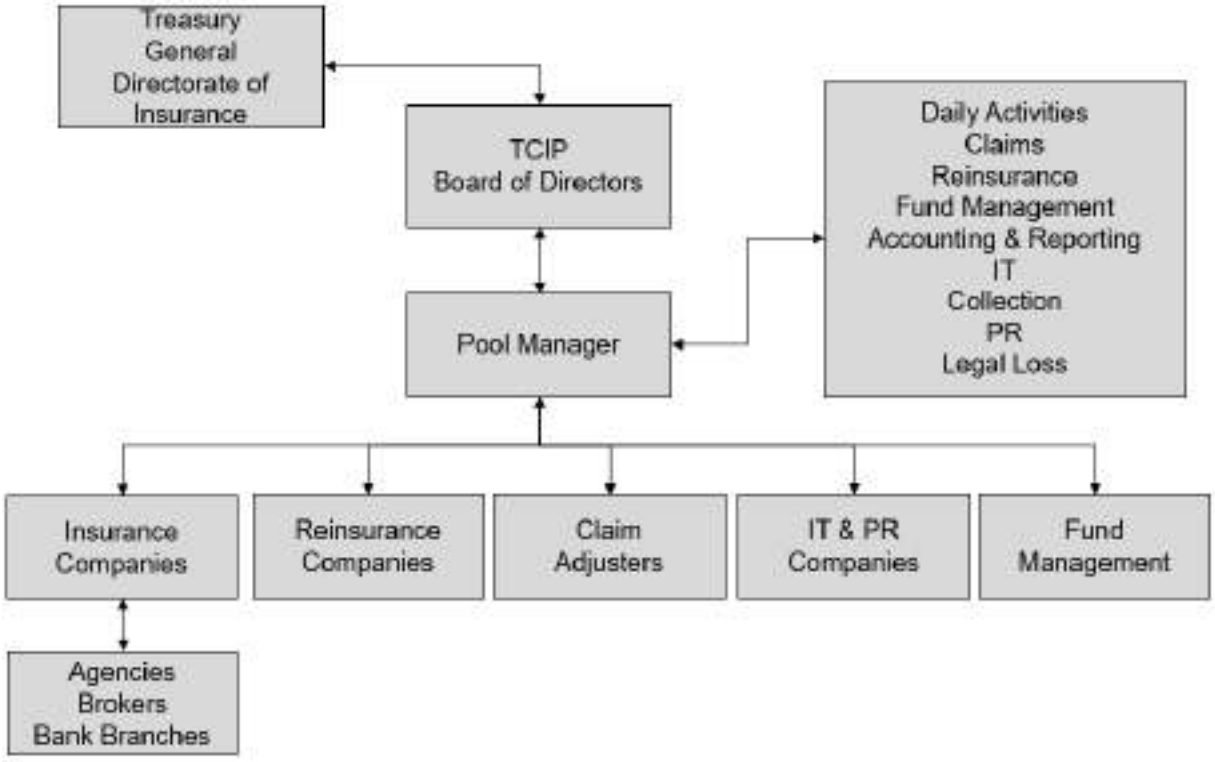

Figure 39: Organizational structure of the TCIP (Başbuğ-Erkan and Yilmaz 2015)

Under the aegis of Turkish Government, TCIP's risk financing strategies try to balance the factors of premium levels, policy coverage and creditworthiness. Başbuğ-Erkan and Yilmaz (2015) underlined that as of 29 January 2015, around 6.8 million policies were sold, and the penetration rate had reached 38.9 percent population. To further enhance the insurance coverage, a range of other initiatives are being taken, like CEI has now become compulsory for many official purposes. Owning a CEI has become mandatory for real estate transactions, and the real estate sales can now only be registered at property deeds offices on proof of CEI insurance. Even to subscribe for water and electricity services in urban areas, CEI has become compulsory.

Since its launch in 2000, the potential of TCIP in risk financing has been tested on several occasions, including the Van earthquake of 23rd October 2011. Burcak et al. (2015) highlighted that 8,232 compulsory earthquake insurance claims were received until 4 May 2012 in the aftermath of Van earthquake. The TCIP also initiated a hotline, DIAL 125 (ALO DASK 125), to enable claims to be processed.

Key Takeaway lessons for Indian Context

- The establishment of public-private partnership model for catastrophe insurance (like TCIP) can effectively serve for risk sharing and financing, while increasing the availability and affordability of insurance packages.

- The implementation of any property catastrophe insurance necessitates both the technical and financial capacity. To price the premiums for catastrophe insurance, it is important to accurately determine the underlying risks in different zones, and also the financial viability.

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3. ISTANBUL SEISMIC RISK MITIGATION AND EMERGENCY PREPAREDNESS PROJECT (ISMEP)

'ISMEP' (https://www.ipkb.gov.tr/en/) represents one of the first new generation projects, which is focused on reducing disaster risks and vulnerabilities in Istanbul as a standalone project, and not as an emergency response or reconstruction project. Taking into consideration the high seismic risk in Istanbul (located near the North Anatolian Fault), it was realized that a major potential earthquake in coming years can cause massive destruction to the dense population and economic sectors. Accordingly, the Turkish Government and the International Bank of Reconstruction and Development agreed upon a loan in 2005 to implement and finance the ISMEP (Elgin 2009). While the Project Owner is Republic of Turkey Ministry of Treasury and Finance, the implementation agency for this project is Istanbul Governorship Istanbul Project Coordination Unit (IPCU). For the overall project duration (2006-2021), the budget is 2.028 Billion Euros.

The core mission of the project is to make the city of Istanbul prepared for any potential earthquake through strengthening institutional, social, and technical capacity of emergency management. To achieve the same, several pathways have been adopted like establishing emergency communication, raising community awareness on DRR aspects, training programs, retrofitting and reconstruction of priority public buildings (mainly schools and hospitals), and executing practical measures for better enforcement of building codes and land use plans. Referring to IPCU (2014), there are four key components of the ISMEP Project as explained below:

Component A- Enhancing Emergency Preparedness: Focused on enhancing the capacities of the provincial and municipal public safety organizations in Istanbul to prepare for, respond to and recover from significant emergencies, especially those arising from earthquakes.

Component B- Seismic Risk Mitigation for Priority Public Buildings: Covers risk mitigation activities on priority public buildings and also those within the scope of cultural heritage.

Component C- Building Code Enforcement: Focused on improving technical and professional capacity of pilot municipalities (Bagcilar and Pendik) for rationalizing the procedures for issuing building-permits and to execute public awareness activities on three target groups (decision makers, technical staff and community).

Component D: Project Management: Focused on the aspects of accounting, purchasing, reporting and other administrative works.

Key Highlights:

1. Taking account of the high seismic vulnerability of Istanbul, ISMEP is being implemented under the Istanbul Governorship Istanbul Project Coordination Unit (IPCU) to better anticipate, prepare for, and respond effectively to any major future earthquakes.

2. ISMEP is recognized as one of the first comprehensive disaster risk mitigation programs, that is implemented as a standalone project, and not as emergency response or reconstruction project.

3. The project management approach like that of ISMEP (mainly the project implementation through Istanbul Project Coordination Unit) can be highly effective for reducing disaster risks in fast growing metropolitan regions in India.

Key Characteristics of ISMEP

Initially housed under the Istanbul Special Provincial Administration, the project is now being implemented under the Istanbul Governorship. The project is mainly conducted by Istanbul Project Coordination Unit (IPCU), which is in charge of implementation and supervision of the operations under ISMEP Project. Chaired by the Governor of Istanbul, the project governance structure is based around a multi-agency steering committee and supporting project beneficiaries across multiple ministries and agencies (shown in Figure 40). Today, ISMEP is recognized as one of the most successful initiatives worldwide for their approach of taking DRR measures before the occurrence of disaster. ISMEP's contribution to improving Istanbul's overall disaster risk-management capacity has also been tested and used in various emergency situations, including flooding and heavy snow (The World Bank 2015).

Figure 40: **Management Structure of IPCU** (IPCU 2014)

Takeaway lessons for Indian Context

- A sub-national governance model with multi-sector approach (like that of Istanbul Project Coordination Unit) can be highly effective for implementing DRR projects in fast-growing metropolitan regions.
- A semi-autonomous professional project coordination unit (outside of line ministries) can ensure effective implementation of a risk mitigation and emergency preparedness project even when dealing with a range of stakeholders and beneficiary agencies.

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UNITED STATES OF AMERICA

7.8. United States of America (USA)

7.8.1 DRM Governance Structures

Organization of lead disaster management agencies

The US Federal Government's agency in charge of responding to disasters is the ***Federal Emergency Management Agency*** commonly referred to by its acronym, FEMA. FEMA was founded in 1979. Prior to 1979 the main focus of organized federal response to cataclysmic events was around civil defense and the preparation for attack on U.S. cities from nuclear warheads.

An important year for FEMA was 1988 when the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act) came into force. The Stafford Act provided clear direction for emergency management and established the current statutory framework for disaster response and recovery through presidential disaster declarations.

There have been a number of important organizational and procedural updates to FEMA that emerged out of the 11 September 2001 terrorist attacks and two major hurricanes, Katrina in 2005 and Sandy in 2012. Most recently, with the Disaster Recovery Reform Act of 2018, FEMA undertook a reorganization focused on increasing state and local preparedness while also aiming to reduce FEMA's complexity.

Disaster Management Functions of these Agencies/Department/Institutions

As of today FEMA is an agency within the ***U.S Department of Homeland Security (DHS)***. The FEMA administrator reports directly to the DHS Secretary who reports to the U.S. President. The administrator also has a direct line of access to the U.S. President during periods of disaster response.

FEMA is headquartered in Washington, D.C. where the Office of the Administrator and various program offices are located. Additionally, FEMA has:

- Ten regional offices that work directly with states, territories and tribes.
- Field offices that manage disaster response and recovery in disaster locations.
- Various warehouses and staging areas throughout the country**.**

What Does It Do ?

Prior to a disaster event

FEMA works to help people understand risks to life and property and motivate them to take action – individually and collectively – to reduce these risks, build capabilities, and prepare for disasters. Their goal is to support national preparedness and self-sufficiency by helping everyone understand their disaster risk. They provide resources and guidance to help communities train, exercise, and build capabilities to reduce their disaster risk, and prepare for

disasters should they occur. Their aim is to empower the whole community to take action through disaster risk awareness building and education.

During a disaster

FEMA communicates, mobilizes, and coordinates to support state, local, tribal, and territorial response efforts to stabilize communities. By law, FEMA is the primary coordination mechanism of the Federal Government for every presidentially declared disaster under the Stafford Act. Their responsibility during disasters is to coordinate and position the Federal interagency response and to apply and manage Federal resources for immediate lifesaving and life-sustaining operations.

After a disaster

FEMA aims to help individuals and communities recover after a disaster and build back stronger. Following a disaster, affected individuals and communities seek resources to address their short-, intermediate-, and long-term needs. These recovery activities must be accessible to survivors with disabilities and survivors with limited English proficiency, among others. Ultimately, outcomes for survivors extend beyond lifesaving and life-sustaining activities. Recovery includes the continuation or restoration of services critical to support the physical, emotional, and financial well-being of impacted community members. Key to this is applying insights from the DRM field on recovery actions to reduce future risk

Vertical and Horizontal Linkages

Formally, FEMA is a support agency of the Federal Government for state governments which have constitutional purview for responding to civil emergencies within their boundaries. State governments serve as agents for the local jurisdictions if Federal disaster assistance is needed. Local governments cannot directly access Federal disaster response and recovery programs without the state government first asking for a Federal response.

The complexity and specialization in disaster management coupled with the financial resources of the national government means that FEMA operates as the *de facto* lead agency for DRM.

In the past quarter century it has become apparent that, even though DRM as a field is complex and specialized enough for expertise to concentrate at the national level, the key to a successful DRM strategy is ensuring that local needs, understandings, processes, and knowledge are thoroughly integrated into DRM plans. With this understanding the Disaster Recovery Reform Act of 2018 was passed to promote resilient rebuilding by allowing greater flexibility to build what is needed rather than just repair or replace what was lost. The law contains 56 distinct provisions that require FEMA policy or regulation changes meant to provide the frameworks, structures, roadmaps, and processes needed for local and state governments to quickly organize and assess disaster impacts and begin the process of engaging the DRM governance structures from the locality of the disaster, through local, state and then Federal governments. The act

also has FEMA exploring new avenues to work with the private sector, such as by issuing catastrophe bonds.

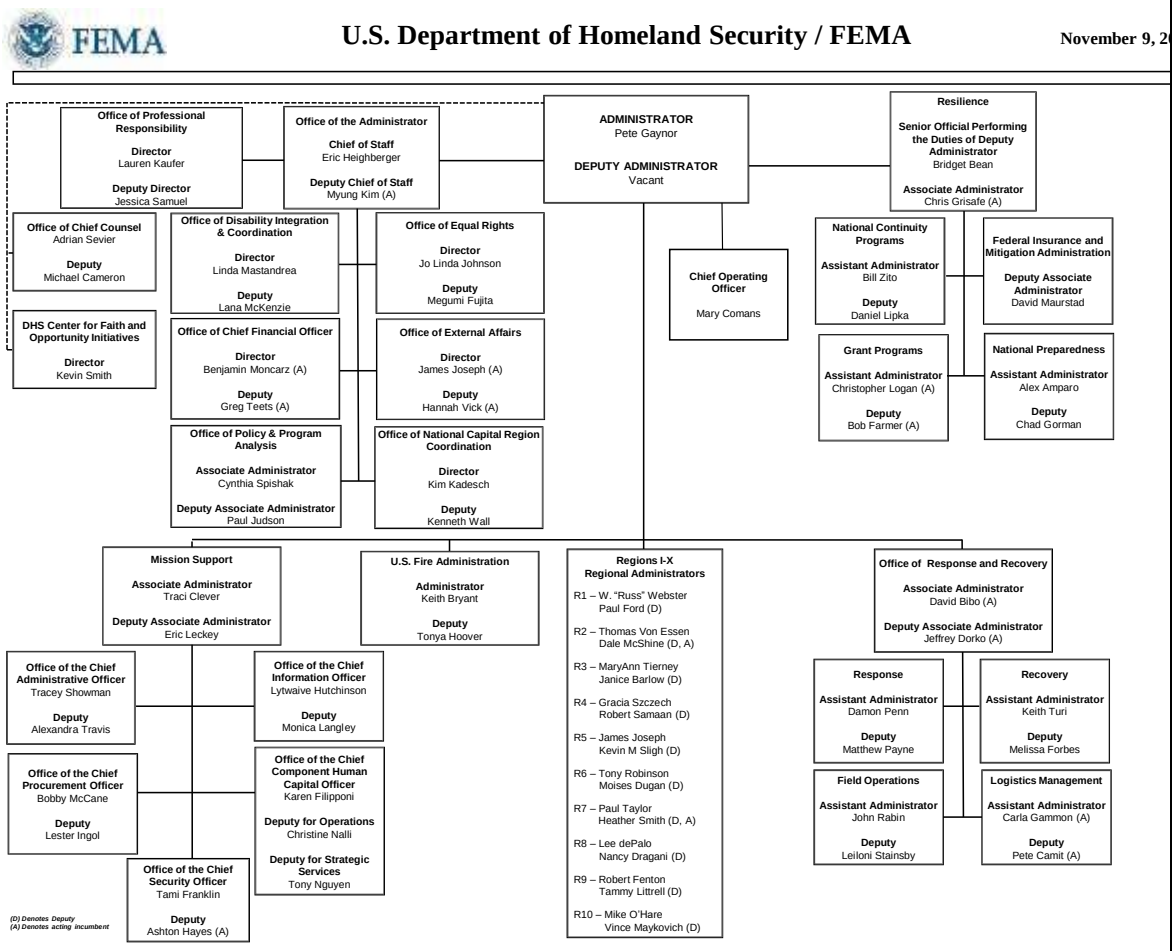

Figure 41: Organogram for FEMA

Strengths of agencies in terms of Human Resource (staff, management practices, linkages, training etc.)

FEMA hires global experts in the field of DRM. FEMA provides training and capacity building both for FEMA staff and for emergency responders and planners nationally. Training is delivered through three different entities: FEMA's Center for Domestic Preparedness (CDP), the Emergency Management Institute (EMI), and the National Training and Education Division (NTED). Workshops and trainings can focus on specific events (e.g. floods) or can be more general or multi-hazard.

- The Center for Domestic Preparedness provides advanced, all-hazards training to approximately 50,000 emergency responders annually from state, local, tribal, and territorial governments, as well as the federal government, foreign governments, and private entities, as available. The scope of training includes preparedness, protection, and response. Responders in 17 different disciplines – Emergency Management, Emergency

Medical Services, Fire Service, Governmental Administrative, Hazardous Materials, Healthcare, Law Enforcement, Public Health, Public Safety Communications, Public Works, Agriculture, Education, Citizen/Community Volunteer, Information Technology, Security and Safety, Search and Rescue, and Transportation – train at the CDP.

- The Emergency Management Institute serves as the national focal point for the development and delivery of emergency management training to enhance the capabilities of State, local, and Tribal government officials; volunteer organizations; FEMA's disaster workforce; other Federal agencies; and the public and private sectors to minimize the impact of disasters and emergencies on the American public. EMI curricula are structured to meet the needs of this diverse audience with an emphasis on separate organizations working together in all-hazards emergencies to save lives and protect property. Particular emphasis is placed on governing doctrine such as the National Response Framework, National Incident Management System, and the National Preparedness Guidelines.
- The National Training and Education Division serves the American first responder community, offering more than 150 courses to help build critical skills that responders need to function effectively in mass consequence events. NTED primarily serves state, local, and tribal entities in 10 professional disciplines, but has expanded to serve private sector and citizens in recognition of their significant role in domestic preparedness.

These trainings delivered from the national level downward, help assure that professionals across all levels of governance share a common understanding of: DRM priorities and needs; preparedness, response, recovery and mitigation processes; and available tools and methods for addressing these.

Funding mechanism

FEMA is funded by the US Government.

7.8.2 Thematic Good Practices

1. Disaster Recovery as a Collaborative Challenge: Working across borders to speed recovery.

In September 2013, Boulder County in Colorado was impacted by an extended period of heavy rainfall. Five days of rains delivered nearly a year's worth of precipitation. Rivers and creek rapidly swelled; the resulting flash flooding destroyed roads and bridges, flooded homes and businesses, and resulted in the evacuation of several smaller (population 200 to 2000) towns. Greater impact to many of the larger towns was avoided only due to years of planning and mitigation, coupled with luck.

The scope and scale of the disaster, covering multiple municipalities within the county and extending into neighboring counties, coupled with the damage to roads and bridges, required declaration of a federal disaster. FEMA arrived on-site while the rains were still falling and retained an on-the-ground presence for at least the first 9 months post-event to support immediate response, short-term recovery, and long-term recovery.

Flood response and recovery required coordination between municipal governments, the county government, the State government, and FEMA (the national government). One of the greatest strengths of the Boulder County flood response and recovery was the level of coordination and cooperation within and across government jurisdictions. This is not always

true; for example, also in 2013, in El Paso County, Colorado, competition between various organizations and agencies in a nationally declared wildfire disaster slowed disaster recovery.

The successful cooperation was facilitated by:

A) Prior disaster experience. County and municipal staff who had been on the front-lines of response and recovery from a major wildfire in 2010 were still on staff within their various governments and able to quickly reactivate and adapt networks and approaches for the new disaster. This highlights the value of recognizing and making sure to retain high-capacity staff with critical skill sets.

B) The County quickly acknowledged where additional expertise was needed, reached out to two different US counties that had been through major, federally-declared disasters in 2012, and asked key personnel from those locations to serve as mentors for the Boulder, County process. This second point in particular was critical in facilitating effective collaboration with FEMA, understanding what support FEMA can and can not provide, maintaining the paper trail necessary for reimbursement for recovery expenses, and correctly documenting things like volunteer labor which can be used to offset community financial contributions to recovery work.

Once the immediate response phase is over, FEMA's role shifts to one of supporting local governments to rebuild by providing both financial support and capacity or capacity development support. In Boulder County, for the 2013 flood recovery, FEMA provided:

- Assistance to individuals – FEMA paid out $221 million in Colorado to individuals and businesses, including over $33 million in Individual Assistance payments (made directly to families; capped at $34,000 for any one household for any one disaster) and $45 million in payments from the National Flood Insurance Program (for homes and businesses that have purchased flood insurance premiums).
- Assistance to local government – FEMA set up Disaster Assistance Centers to meet immediate needs from dealing with flood debris to facilitating discussion on recovery planning for smaller municipalities.
- Assisting the State – FEMA staff worked closely with staff from several Colorado State government agencies in both disaster response and recovery. FEMA was the source of hundreds of millions of dollars in reconstruction funding across the state, which was used to hire additional staff, implement clean-up efforts, rebuild roads, etc. Most FEMA funding was limited to 75% of costs, with state and local governments covering the rest.

However, what will be prioritized in recovery and how things will be rebuilt is left to the direction of the local governments. In principle, this make sense. In practice, it often leaves local governments unclear on what support is available, what FEMA will or will not pay for, and how to go about the recovery most effectively. Following the Boulder floods, local officials in particular noted that it was difficult to understand FEMA's rules and conditions for getting access to recovery money. In an already challenging time, with most staff working long hours to address emergency and recovery needs on top of their regular jobs, this uncertainty added further stress, as well as delaying recovery projects or forcing hard decisions.

Boulder County has the advantage of being high capacity and relatively wealthy. This allowed the county to decide to clear debris from river corridors immediately even though they had no assurance from FEMA that they would be reimbursed. The County chose this action

recognizing that failing to do so would almost certainly guarantee additional flooding in May when the snowpack melted. Smaller municipalities in the county, lacking the same financial resources, were able to proceeded with work only once FEMA had agreed to reimburse a percentage of it. Even with assurance the money would be paid however, the slow speed of reimbursement pushed the towns to the brink of bankruptcy. Had the County and all the impacted municipalities within it not come together to recover as a whole, recovery works in the smaller town would have been much slower at best or failed to be completed at worst. This highlights the way that recovery funding needs to align with recovery needs. For small local jurisdictions without adequate funds of their own, disaster recovery can be dramatically facilitated, slowed, or completely stalled depending on how and when funds are delivered.

Key Highlights:

1. Collaborative networks can be facilitated by higher orders of government. These networks can provide knowledge and assistance during and after disasters.

2.The Regional (cross-border) networks, particularly networks focused on disaster management) can serve to enhance capacity to respond to disasters and serve as knowledge networks to promote a speedier recovery. Formal and informal networks provide platforms for discussing disaster management and knowledge sharing enhancing general resilience.

3. A key value of cross-border networks in this case was being able to access the knowledge on the processes, procedures, paperwork, and terminology needed for the local government to interface efficiently and quickly with FEMA.

Key Characteristics of the Policy / Good Practice

- Speed of recovery is core to resilience, the capacity and knowledge needed to interface with the national disaster management bureaucracy during and in the immediate aftermath of disaster is vital.
- Higher orders of government promoting networks of lower order government units promotes resilience and provides a network of knowledge and capacity needed in disaster response and recovery.

Key Stakeholders and Actors Involved

- The Federal Government
- County Government
- Local city/town governments

Key Takeaway lessons for Indian Context

Knowledge networks, built of local and state governments, can improve engagement efficiency with the national government during and after a disaster reducing waste and improving the speed of recovery.

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2. Building Back Better: Improving recovery with the Disaster Recovery Reform Act of 2018

The Disaster Recovery Reform Act of 2018[1] undertook a reorganization of FEMA to increase state and local preparedness and to enhance the nation's recovery and response capability while also reducing FEMA's complexity. The reforms addressed in the DRRA cover many funding streams and agencies, however one of the key amendments in the act to the Public Assistance (PA Program) promotes resilient disaster recovery by allowing greater flexibility to build what is needed rather than just repair or replace what was lost. Before, if state or local governments, or non-profits opted not to restore a damaged structure, but to implement an alternate project they faced a reduction in the federal funding available to them. The DRRA eliminates these reductions in funding. Stakeholders can now opt to build according to their needs without facing a reduction in the federal assistance available to them[2].

This focus on resilient recovery has been increasingly necessitated due to climate change. The following case study from Houston, Texas illustrates why.

Hurricane Harvey made landfall near Rockport, Texas on August 25, 2017. Over the course of four days Harvey dropped more than 40 inches of rain over eastern Texas. The resulting floods inundated hundreds of thousands of homes, forced more than 30,000 people into shelters and prompted more than 17,000 rescues. Total damage is estimated at USD 125 billion, making it the second-costliest tropical cyclone on record after Hurricane Katrina.

Among other damage, the Harvey flooding severely impacted several wastewater treatment plants in the greater Houston area. Typically, FEMA would unquestioningly cover 75% of the cost of rebuilding those plants as long as they were built in the same location and in the same way. The challenge in this case was that Houston had already started planning to decommission one of the impacted plants and replace it by upgrading another of the impacted plants[3]. To rebuild both of the plants to their previous state, consequently, would be to throw away money.

In an ideal world, the federal government would recognize that the goal of disaster recovery was to support Houston to rebuild their wastewater treatment functionality. Further, they would recognize that if that rebuilding could be done in a way that would make the resulting service delivery both more cost effective and more flood resilient, the end result would be a more robust local economy, which would in turn results in greater tax revenue for the national government. However, prior to the 2018 Act, even if this was recognized, special application needed to be made and the case argued to the federal government, slowing recovery. And, in a

[1] FEMA. Disaster Recovery Reform Act of 2018. 23 July 2020. https://www.fema.gov/disasters/disaster-recovery-reform-act-2018. Accessed 22 December 2020.
[2] Disaster Recovery Reform Act Public Assistance Program Amendments. 2019 July. https://www.fema.gov/media-library-data/1565888669158-0ca15d4ade220a19e54313786ceb013d/DRRA_PA_Program_Amendments_FactSheet07_05_19-v3.pdf. Accessed 22 December 2020.
[3] Interview. City of Houston, Mayor's Office. Chief Recovery Officer. February 2018.

disaster situation, repairing wastewater treatment facilities can only be delayed for so long before a decision must be made and action taken.

Key Highlights:

- Most government disaster funds are earmarked for disaster recovery and are often very constrained on what it can be spent on.
- Such constraints can prevent pre-disaster mitigation efforts and prevent reconstruction with improved disaster characteristics (often referred to as "build back better")
- Disaster Recovery Reform Act of 2018 made changes that allowed greater flexibility in disaster aid funding to allow local governments the flexibility to improve infrastructure in ways that will improve future outcomes.
- An example where financial policy flexibility was added to allow mitigation of future risk.
- Adaptive finance to allow retrofitting current infrastructure as well as in post-disaster reconstruction is a challenge seen throughout the globe. This recent policy innovation in the United States may provide an example that can be contextualized for India.

Key Characteristics of the Policy / Good Practice

Allowing state and local governments the ability to use disaster funding mechanisms flexibly to both retrofit existing infrastructure prior to and rebuild post-disaster in a way that enhances mitigatory characteristics will improve disaster outcomes in the future and ultimately save money.

Key Stakeholders and Actors Involved

- Central government
- State government
- Local government

Key Takeaway lessons for Indian Context

This case offers an example of adaptive finance where funds earmarked for disaster recovery can be used flexibly to ensure that reconstruction can progress through building back better.

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3. Federal Emergency Management Administration (FEMA) Training

FEMA training is extensive and broadly scoped. The audience for FEMA training is wide with training open to federal, state and local government disaster managers and first responders, the NGO sector, the private sector, and the general public. FEMA training centers focus on constructing understandings through study and exercises and also provide technical assistance where gaps emerge. Areas of focus are disasters from natural hazards, wildland fires, industrial accidents, railroad chemical accidents, nuclear hazards, multi-hazard events, and terrorism. The majority of training is focused on operationalizing FEMA's disaster management governance and response frameworks, the National Incident Management System (NIMS) and National Response Framework (NRF).

The National Incident Management System (NIMS)

The National Incident Management System (NIMS) guides all levels of government, nongovernmental organizations and the private sector to work together to prevent, protect against, mitigate, respond to and recover from incidents.

The NIMS provides stakeholders across the whole community with the shared vocabulary, systems and processes to successfully deliver the capabilities described in the National Preparedness System. NIMS defines operational systems that guide how personnel work together during incidents.

NIMS Training

Training components of the NIMS focus on:

- the National Qualification System,
- the Concept of Operations,
- Resource Typing,
- Inventorying, and
- Mutual Aid

The National Qualification System (NQS)

The NQS establishes standard minimum qualifications for specific incident-related positions to provide consistency across the Nation and support nationwide interoperability. Using the NQS approach to qualify, certify, and credential incident management and support personnel ensures personnel deploying through mutual aid agreements and compacts have the capabilities to perform the duties of their assigned roles.

Concept of Operations

FEMA builds on NQS training by using a performance-based approach that focuses on verifying the capabilities of personnel to perform as required in the various incident-related positions. In addition to training, experience is built through exercises that build proficiency and establish performance. Performance is then used as the primary qualification criterion. A performance-based approach is advantageous over a training-based system because it provides greater confidence of on-the-job performance since evaluators have observed the proficiencies of the individual through their performance of a series of pre-designated tasks.

Resource Typing

Resource typing is defining and categorizing, by capability, the resources requested, deployed and used in incidents. Resource typing definitions establish a common language and defines a resource's minimum capabilities. Training in NIMS resource typing definitions serve to build a common language for the mobilization of resources.

Inventorying

Resource owners and providers should inventory and maintain current information on their shareable resources. Resource inventories should be adaptable and scalable. While a resource inventory can be as simple as a paper or electronic spreadsheet, many resource providers use information technology (IT) based inventory systems. FEMA provides a freely available software package, known as the Incident Resource Inventory System (IRIS), for this purpose. Training in Inventorying is a specialization within NIMS training.

Mutual Aid

Training on mutual aid agreements is a specialization with the NIMS training curriculum. Mutual aid agreements authorize mutual aid between two or more neighboring communities, between all jurisdictions within a state and between states. Agreements can also be with and between private sector entities, NGOs and other whole-community partners. New work has focused on regional coalition building and engagement using a resilience lens. The emergency management community should consider resources and capabilities across the whole community, and develop written agreements that facilitate access to potentially needed resources.

National Response Framework (NRF)

The National Response Framework (NRF) is a guide to how the nation responds to all types of disasters and emergencies. It is built on scalable, flexible, and adaptable concepts identified in the National Incident Management System to align key roles and responsibilities.

The NRF represents the interface between the NIMS and the greater community of stakeholders in disaster management. While a full training and exercise in the NIMS is ideal for those with direct responsibility for disaster management, those tasked with managing other sectors (e.g. water supply or stormwater drainage) need to be able to quickly and efficiently interface with disaster managers. Training in the NRF provides this capacity. The NRF aims to manage incident complexity and is on the forefront of new processes and learning as incident complexity increases with climate change.

FEMA Training Governance

With a broad scope of incident types and audience, training is done through several institutions and institutional frameworks.

Training primarily sits within the National Preparedness Directorate which is under FEMA Resilience (which reports to the FEMA director). Within the National Preparedness Directorate (NDP). The NDP's National Integration Center (NDP-NIC) and the Community Preparedness Division (NDP-CDP) are responsible for training. The NDP-NIC primarily trains in the National Response Framework (NRF) and the National Incident Management System (NIMS).

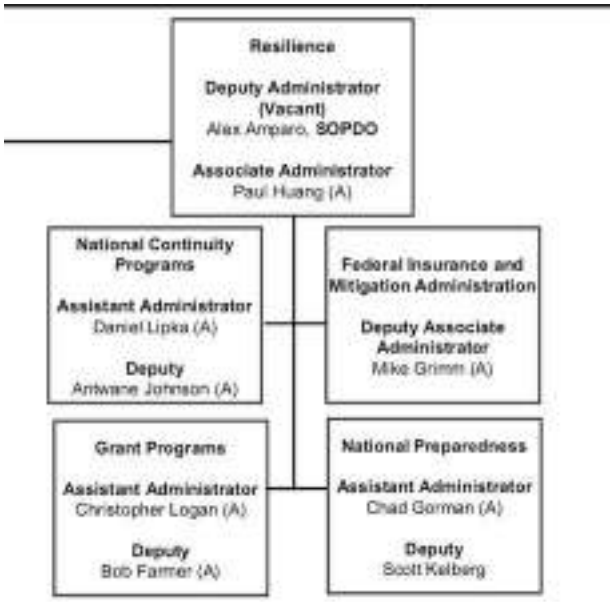

Figure 42: Organogram showing the relationship of the National Preparedness Directorate, which is responsible for training, to FEMA Resilience. FEMA Resilience reports directly to the FEMA director (Source: FEMA).

Training Organizations

Emergency Management Institute (EMI)

The Emergency Management Institute (EMI) serves as the national focal point for the development and delivery of emergency management training to enhance the capabilities of federal, state, local, tribal and territorial government officials, volunteer organizations and the public and private sectors to minimize the impact of disasters.

Center for Domestic Preparedness

The Center for Domestic Preparedness (CDP) provides advanced, all-hazards training exercises to approximately 50,000 emergency responders annually from state, local, tribal, and territorial governments, as well as the federal government, foreign governments, and private entities, as available. The scope of training exercises includes preparedness, protection, and response. The CDP is part of the National Domestic Preparedness Consortium (NDPC).

The National Domestic Preparedness Consortium (NDPC)

The National Domestic Preparedness Consortium (NDPC) is a partnership of several nationally recognized organizations whose membership is based on the urgent need to address the all hazards including all natural hazards as well as chemical, biological, radiological, and explosive Weapons of Mass Destruction (WMD) hazards.

National Fire Academy

The National Fire Academy (NFA) is the nation's premier provider of leadership skills and advanced technical training for local fire and emergency services.

The Rural Domestic Preparedness Consortium (RDPC)

The Rural Domestic Preparedness Consortium (RDPC) is comprised of academic partners that possess extensive experience and niche capabilities in developing and delivering homeland security curriculum to the nation's rural emergency responders.

The Center for Homeland Defense and Security (CHDS)

The Center for Homeland Defense and Security (CHDS) offers a wide range of programs focused on assisting current and emerging leaders in Homeland Defense and Security to develop the policies, strategies, programs and organizational elements needed to defeat terrorism and prepare for and respond to natural disasters and public safety threats across the United States.

FEMA Higher Education Program

The mission of the Higher Education Program is to engage academia, emergency management professional organizations, and practitioners to work together to foster a culture of continuous learning and innovation through education and research to meet the challenges that confront the nation.

Continuing Training Grants (CTG)

Through the Continuing Training Grants (CTG) program, FEMA provides funding for eligible applicants to support and target training solutions to facilitate an integrated, whole community, risk-informed, capabilities-based approach to preparedness. Recipients of CTG awards develop and deliver training to address urgent and emerging preparedness gaps for the nation.

Training for Incident Complexity

Incident complexity

Responding to disasters and emergencies requires the cooperation of a variety of organizations; the larger or more complex the incident, the greater the number and variety of organizations that must respond. For large disasters, such as major hurricanes or earthquakes, the incident complexity is increased as others, e.g. state and central governments, become involved. Businesses, voluntary organizations, and other elements of the private sector are also key stakeholders, providing the essential services that must be restored following an incident. The NRF provides the foundation for how these organizations coordinate, integrate, and unify their response.

In recent years, both threat and incident complexity has increased. This complexity has been recognized in movements toward resilience building, whole of government and whole community approaches. Incident complexity is being incorporated into the NIMS and is presently in draft form.

The draft Incident Complexity Guide: Planning, Preparedness, and Training will support the National Incident Management System (NIMS) doctrine by establishing guidance to support the emergency management community and inform emergency planning, preparedness, and training. This Guide provides a framework for and a common understanding of the tenets of incident complexity for the whole community.

A key institute involved in addressing both incident complexity and broader efforts and the whole community approach is The National Disaster Preparedness Training Center (NDPTC) which is part of the National Domestic Preparedness Consortium.

The National Disaster Preparedness Training Center is the only member of the NDPC to focus primarily on natural hazards. Uniquely positioned geographically and culturally, the National Disaster Preparedness Training Center at the University of Hawaii works collaboratively to develop and deliver training and education in the areas of disaster preparedness, response, and recovery to governmental, private, tribal, and non-profit entities. Combining urban planning and environmental management, the NDPTC addresses the needs of vulnerable at-risk populations, particularly the challenges faced by coastal and island communities.

The NDPTC is focused on building community resilience, the capacity to absorb shock, to recover quickly, and to learn from catastrophic events so that our communities are better prepared and strengthened against damage from future events. This involves all sectors in the community, from front-line responders and emergency managers to those involved in applied scientific research related to the identification of hazards and risks and the design and engineering of mitigation and adaptation strategies through both in-service, functional training venues as well as for those pursuing formal academic credentials in disaster management.

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8. Preliminary Findings:

The below section provides preliminary findings from the study. The table 6 captures the brief details of lead DRM agencies in each eight countries.

Table 6: Lead DRM Agency of eight countries

S. No.	Country	Lead Institute	Location	Political Governance Structure	Snippets
1.	Australia	Emergency Management Agency	Division under Department of Home Affairs	Federal Government	EMA is the lead agency supporting the states and territories, while the states and territories have primary responsibility.
2.	Canada	Public Safety Canada	Minister of Public Safety and Emergency Preparedness	Federal Government	DRM in Canada is conducted under a multilevel structure where provincial governments are institutionally the strongest. Incident Command System is followed for coordination.
3.	Germany	Federal Office of Civil Protection and Disaster Assistance (BBK)	Federal Ministry of Interior (BMI)	Federal Government	State Governments play an important role in drafting required legislations. The state governments support the districts and cities in emergency. Specific committees and groups have been set up at National level to ensure vertical and inter-agency coordination.
4.	Indonesia	Bedan Nasional Penanggulangan Bencana (BNBP)	Headed by a minister-level official, report to President	Presidential Government	Like BNBP, regional level agencies have been established at provincial and district, municipal level called BPBDs.
5.	Japan	The Cabinet Office (Disaster Management)	Minister of State for Disaster Management	Unitary parliamentary constitutional monarchy	The governance structures in Japan are based on a three-tiered administration (the national government, prefectures, and municipalities). Within the Cabinet Office, the Minister of State for Disaster Management works with relevant ministries and agencies in different phases of disaster management.

6.	Philippines	The National Disaster Risk Reduction and Management Council (NDRRMC)	Chairperson, Secretary of National Defense	Presidential Government	To ensure Disaster Risk Management at grassroot level, the replication of the NDRRMC from the national down to the regional, provincial, city, municipal and barangay levels is done. Office of Civil Defense is the executive arm of NDRRMC.
7.	Turkey	Disaster and Emergency Management Authority	Turkish Ministry of Interior	Presidential Government	The Provincial Directorates of AFAD operate under the Governorship of the province and are responsible for all coordination activities at local level. The Provincial directorates are guided by AFAD for emergency response and planning.
8.	USA	Federal Emergency Management Agency	U.S Department of Homeland Security (DHS)	Federal Government	FEMA is an agency within the U.S Department of Homeland Security. State governments serve as agents for the local jurisdictions if Federal disaster assistance is needed.

Table 7: Funding Types of Eight Countries

S. No.	Country	Funding Type
1.	Australia	Disaster Recovery Funding Arrangements are categorized in four categories: Two separate funds for response and recovery.
2.	Canada	Disaster Financial Assistance Arrangements to reimburse states and territories
3.	Germany	Budget allocations to various Ministries by the Federal government; insurance and donations
4.	Indonesia	National, local budget, donor agencies, communities, and private sector
5.	Japan	Budgetary allocation
6.	Philippines	National, Local, Donor agencies
7.	Turkey	National budget, disaster insurance, sponsorships, donor agencies
8.	USA	Federal government funding

Thematic Good Practices:

Some of the broad thematic preliminary findings of good practices are stated briefly as below:

Emerging Risks like Climate Change:

The inter-connected approach of disaster risk reduction, climate action and heat wave involving all sectors and identification of linkages in the plan of Australia can be used for India's strategy

on integration of climate risk concerns in disaster risk reduction planning. Also, the heat-wave action plan of Australia engages the stakeholders in mitigation and adaptation activities prior to the summer. Such approach allows participation of all the concerned agencies in the mitigation efforts.

Disaster Preparedness and Response:

The Australian Bushfire response highlights the importance of the coordination mechanism, the use of technology and the aerial response capabilities of the Australia with example of Australian Capital Territories' bushfire strategic management plan. Use of Special Intelligence Gathering Helicopter in Australia provided real time incident intelligence directly to Incident Management Teams for coordinating the bushfire responses. On similar lines, an integrated data platform built on the structure of national DRM plan (like TAMP in Turkey), helps to enhance coordination between the diverse stakeholders involved in disaster management system at various governance levels. ISEMP, in Turkey is good example to better anticipate, prepare for, and respond effectively to any major future earthquakes. The case study of volunteer system in Germany discusses the organized volunteering system in Disaster Risk Management for strengthening community resilience.

Prevention & Mitigation:

Germany's approach of flood risk management follows a multi-pronged way of generating detail flood-risk maps, enacting policies, stricter zoning regulations, formulation of large programmes, and incentivizing risk prevention and mitigation measures based on lessons learnt from recent floods.

Resilient Recovery:

Knowledge networks, built of local and state governments, can improve engagement efficiency with the national government during and after a disaster reducing waste and improving the speed of recovery as observed in case of Germany. In the USA, the approach of adaptive finance where funds earmarked for disaster recovery can be used flexibly ensures that reconstruction can progress through building back better.

Pre-disaster strategic planning between the national and local governments is important to ensure coordinated response to large scale emergency situations like the GEJE. To ensure effective recovery planning from large scale disasters like the GEJE, it is important to empower the local governments and enable a participatory approach for recovery planning that is suited to the local conditions and culture. As observed from case study of Japan and Australia the localized recovery planning aids in smooth recovery coordination and prioritization of resources for reconstruction.

Disaster Risk Insurance:

Any building insurance in Germany covers windstorms and fire hazards but flood insurance supplement is voluntary. The voluntary supplement also covers other disasters including earthquakes, avalanches, snow buildup etc. In Philippines, the Department of Finance provides for Disaster Risk Financing and Insurance strategy which focuses on insurance of government assets as one of the key highlights. The Philippine City Disaster Insurance Pool (PCDIP) is one of the foremost mechanisms to provide early access of funds to the cities. India can also adopt the parametric insurance payouts to shorten the period of damage and loss assessment and provide for available resources in a shorter time period. The Turkish Catastrophic Insurance

Pool uniquely combines public and private resources into a public-private partnership, and provides a standalone earthquake insurance coverage to all registered homeowners and small and medium enterprises within the municipal boundaries in Turkey.

Community Based Disaster Risk Reduction and Role of Community Based Organisations:

The Disaster Resilient Village Program of Indonesia effectively engages vulnerable village communities in DRR activities and build their capacities for adapting and responding to any potential disasters. In Japan, several types of community-based organizations (CBOs) have for long been managing the disaster risks at grassroot level. In Japan, the roles and responsibilities of volunteers as part-time government staff (including the compensation and allowances) have clearly been defined as per the Fire Defense Organization Act and its bylaws. The importance of self-help and mutual support is reflected in several government policies of Japan, and high emphasis is being put on raising community awareness and engaging with the communities for DRM activities. Customised tools like 'My-timeline'as used in Japan are an effective means to enhance DRM planning at household level and supporting disaster prevention efforts by citizens in their communities. The flexibility provided to the Barangay Disaster Risk Reduction Council provides for community based early warning and evacuation system as observed in Philippines.

Schools and Education:

As per the case study of Canada, education and training emerge as important to shift the focus from response to mitigation. The Disaster Safe School program in Indonesia is a comprehensive approach for enhancing the school capacities to create safer learning places for students, teachers, members of the school community and communities around the school. The establishment of a National coordinating body (like National Secretariat for Safe Schools) and dedicated funding for the local governments (like DAK) can guide the implementation of Disaster Safe schools at local level. The three key pillars of Comprehensive School Safety provide an overarching framework to build the capacities of schools through a range of structural (like retrofitting the school buildings) and non-structural measures (like mainstreaming DRR in education curriculum).

Risk informed development planning:

Indonesia has developed a disaster database called DIBI, such a database can generate insights for understanding historical disaster trends and help in analyzing the future risks and vulnerabilities. It can also provide inputs for risk informed development planning from local to national level. The maintenance of grassroot level data (like in DIBI) can also be highly effective means to keep track of the global targets (like SDGs and SFDRR) alongside the other aspects of community risks, socio-economic characteristics, poverty levels, etc.

Private Sector's Engagement:

The National Resilience Council (NRC) in Philippines engages in disaster risk reduction through various initiatives. Philippines also supports private sector engagement through representation in National Disaster Risk Management Council. The establishment of public-private partnership model for catastrophe insurance (like TCIP, in Turkey) can effectively serve for risk sharing and financing, while increasing the availability and affordability of insurance packages.

Disaster Risk Management Training:

The case study of FEMA for organizing Disaster Risk Management Training depicts the importance of minimum qualification system and categorization of training for specialized focus on disaster management operations. The National Preparedness Directorate within FEMA coordinates the specialized training institutes including fire response, community volunteer training, preparedness training on different hazards and incident complexity training.

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Annexures:

Annex-1 17 Indicative Questions to be explored through country-examples

(i) How are the lead disaster management agencies in these 8 countries (USA, Canada, Germany, Japan, Australia, Turkey, Indonesia and Philippines) organized? What are different parts / constituents of these agencies?
(ii) What are the strengths of agencies in these countries, in terms of professional competence, staff, management practices, linkages, training capacities, etc.
(iii) What are the disaster management functions carried out by these agencies? How is their standing within the overall DRM structure?
(iv) How do these agencies work laterally with other ministries / agencies and horizontally with lower jurisdictions?
(v) How are these agencies funded?
(vi) Are there good examples of structure and functions of DRM institutions (Agencies/ Authorities) in these countries that have demonstrated effective delivery of risk mitigation, emergency response functions, risk informed development planning and can be adapted for the Indian context?
(vii) What can be learnt from good practices for disaster risk reduction (primarily mitigation and prevention/avoidance) measures in these countries, that can be adapted for the Indian context?
(viii) What are some good examples of policies, institutional arrangements or practices for integrating resilience concerns into development and sectoral planning (including interface between DRM agencies and other departments)?
(ix) What are good practices (including policies) for institutionalising and encouraging private sector's role in DRM (including business continuity planning and procurement practices) and governing collaborative action with the government?
(x) What are some good examples regarding how countries have conceptualized overarching risk governance frameworks, for example the principle of „risk- sharing" in Japan underpins the design and functioning of institutions?
(xi) What are good practices for empowering civil society for civil society contributions in DRM and driving collaborative action with the government?
(xii) What are some good examples of policies, institutional arrangements, financing arrangements, or practices for better governance of emerging risks, such as those from climate change and pandemics like COVID-19?
(xiii) What are good examples of policies, institutional arrangements, or practices that have enabled large-scale citizen participation, sustained volunteerism, and mainstreaming of DRM into culture and society?
(xiv) What are some good examples of policies and institutions that enable regulation of risk creation in a political economy context like India's?
(xv) What are good practices for risk financing that can be integrated into/adapted for the Indian context?
(xvi) What are the existing good practices for institutionalising DRM capacity building and fostering leadership for risk governance, especially amongst those who are underrepresented such as women, LGBTQ, persons with disability, and other marginalised social groups?
(xvii) Are there good practices for urban disaster risk management/ urban resilience, that

can be adopted?

Annex-2: Format of Semi-Structured Questionnaire for Interviews with country level experts on web-based consultations

Questionnaire for Web Based Consultations/Interviews

Name of Country Expert	
Designation	
Sector	
Contact	
Key aspects of Governance Mechanism of DRM	
Functions of the Disaster Management Agencies	
Coordination and Communication Mechanisms	
Human Resource Management at DRM Institutions	
Key capacity building initiatives	
Funding Sources for DRM	
Case-study specific questions	

Annex-3 Web-Based Consultations

S.No.	DRM Expert Organization	Sector	Date of Interview
Indonesia			
1	Institute of Technology Bandung	Academia	8 December, 2020
2	Institute of Technology Bandung & U-Inspire Alliance	Research	1 December, 2020
3	UNESCO Jakarta	UN Agency	1 December, 2020
4	Badan Penanggulangan Bencana Daerah (BPBD), Bali	Government	29 November, 2020
Japan			
1	International Research Institute of Disaster Science (IRIDeS), Tohoku University	Research & Academia	2 December, 2020
2	University of Tokyo/ Japan International Cooperation Agency	Academia & Government	3 December, 2020
3	Church Wide Service (CWS) JAPAN	Civil Society	3 December, 2020
Turkey			
1	Middle East Technical University and Advisor of PM Office	Academia & Government	4 December, 2020
2	Independent Consultant	Research	3 December, 2020
3	Ministry of Emergency Affairs of Turkey	Government	4 December, 2020
Philippines			
1	National Resilience Council (President)	Private Sector	9 December, 2020
2	National Resilience Council (Executive Director)	Private Sector	9 December, 2020
3	Office of Civil Defense	National Government	10 December, 2020

Annex-4

The jurisdictional arrangements depend on category of the Disaster as per the table 1 below:

Table 1: Disaster Management Functions
(Source: Modified, National Disaster Risk Reduction Strategy)

Intensity	Response
Catastrophic	• A whole-of-government response. • Crisis plans may be activated. • Significant relief and recovery arrangements may be required. • International assistance may be requested
Major	• Multi-State/Territory and multi-agency command, control and coordination arrangements are in place • Strategic resource coordination may be required • Specific hazard plans may need activation • Specialized assistance from other States and Territories, from the Australian Government, or internationally may be required
Minor	• Response by individual State/Territory • Jurisdictional plans and arrangements sufficient • Jurisdictional recovery plans sufficient

Annex-5 Detailed functions of Office of Civil Defense, Philippines

Table 1: Disaster Management Functions of Office of Civil Defense, Philippines

Concerned Department		Key Functions and Roles
Administrative and Financial Management Service	Human Resource Management and Development Division	Recruitment, selection and Placement
		Human Resource Management and Development
	Financial Management Division	Accounting
		Budgeting
	General Services Division	Records
		Cash Disbursements
		Procurement & Supply Management
		General Administrative Service
Rehabilitation and Recovery	Post-Disaster Evaluation and Management Division	Comprehensive damage and loss assessment
		Periodic monitoring and inspection of rehabilitation programs and projects
		Engage partnership with NGOs, CSOs, and community stakeholders in the monitoring and assessment of rehabilitation programs and projects
		Formulate standards for rehabilitation development for inclusion in the DRR measures
	DRR Fund Management Division	Process and evaluate proposals for funding of projects and activities under NDRRM Fund
		Formulate policies for the NDRRM fund request
		Validate and prepare request for financial assistance for disaster victims
		Monitor the utilization of fund releases under the NDRRM Fund
Operations/Response	24/7 Operations Center	Conduct 24/7 operations for alert and monitoring multi-agency and multi-level operational coordination response
		Monitor the consequences of potential disasters
		Coordinate with responsible agencies for the timely early warning dissemination
		Prepare disaster situation report
	Information and Communications Technology Division	Monitor the running progress of Information systems and communication-electronics resources of OCD
		Update the OCD's Information Systems Plan
		Administer the communication-electronics resources
	Logistics, Interoperability and	Formulate policies, plans and programs on the acquisition of goods and services and infrastructure projects

	Force Management Division	Provide technical assistance on infrastructural project
		Formulate plans, protocols, policies on operational activities and response initiatives
		Prepare criteria and procedures for enlistment of volunteers
		Prepare the manual of operations for volunteers and monitor their mobilization
Policy Development and Planning Service	Project Development and Management	Formulate OCD's Annual Plans and Programs
		Review the National and Regional DRRM Plans
	DRRM Development and Standards	Conduct research and special studies in support of DRRM policy development
		Formulate preventive and mitigation policies such as Infra standard, disaster risk governance
	Disaster Risk Governance Division	Represent the OCD with Institutional and International partners
		Inter-agency disaster rehabilitation and recovery activities
		Coordinate the formulation of Strategic Action Plan for disaster-affected areas
		Manage Special DRRM Projects
Capacity Building and Training Service	Curriculum Development Division	Conduct training needs assessment
		Formulate training policies and standards
		Develop DRRM curriculum
		Develop training plans and programs
		Develop standard accreditation system for training partners and institutions
	Information, Training and Advocacy Division	Monitor and evaluate the delivery and implementation of training programs
		Conduct trainor's training on NDRRM
		Provide capacity building and training services
		Professionalize DRRM in the public and private sector