

# Outcome Evaluation of Disaster Risk Management Programme in Bhutan

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## **List of Acronyms**

ADB	Asian Development Bank
ACO	Austrian Coordination Office
CBDRM	Community Based Disaster Risk Management Program
CCA	Climate Change Adaptation
CSO	Civil Society Organization
DANIDA	Danish International Development Assistance
DDM	Department of Disaster Management
DDMC	Dzongkhag Disaster Management Committee
DDMO	Dzongkhag Disaster Management Officer
DES	Department of Engineering Services
DevInfo	Development Information Database
DGM	Department of Geology and Mines
DHMS	Department of Hydromet Services
DM	Disaster Management
DMIS	Disaster Management Information System
DMPG	Disaster Management Planning Guidelines
DoC	Department of Culture
DoSE	Department of School Education
DoR	Department of Roads
DPRPS	Disaster Preparedness and Response Program for Schools
DRM	Disaster Risk Management
EMS	Emergency Medical Services
EOC	Emergency Operation Center
ERRRP	Earthquake Risk Reduction and Recovery Project
EWS	Early Warning System
FYP	Five Year Plan
GEF	Global Environment Facility
GFDRR	Global Fund for Disaster Reduction and Recovery
GLOF	Glacial Lake Outburst Floods
GNHC	Gross National Happiness Commission
HFA	Hyogo Framework for Action
HRD	Human Resource Development
ICIMOD	International Center for Integrated Mountain Development
JICA	Japan International Cooperation Agency
LDPM	Local Development Planning Manual
LDCF	Least Developed Countries Fund
MDG	Millennium Development Goals
MoAF	Ministry of Agriculture and Forests
MoE	Ministry of Education
MoF	Ministry of Finance
MoH	Ministry of Health
MoHCA	Ministry of Home and Cultural Affairs
MoIC	Ministry of Information and Communication
MoWHS	Ministry of Works and Human Settlement
NAPA	National Adaptation Program for Action
NDMA	National Disaster Management Authority

NDRMF	National Disaster Risk Management Framework
NDRMS	National Disaster Risk Management Strategy
NEOC	National Emergency Operation Center
NEC	National Environment Commission
NGO	Non-Government Organization
NRRP	National Recovery and Re-construction Plan
PDNA	Post Disaster Needs Assessment
PEMS	Public Expenditure Management System
PlaMS	Plan Monitoring System
RBM	Results Based Management
RGoB	Royal Government of Bhutan
SAR	Search and Rescue
SCI	Save the Children International
SDMPG	School Disaster Management Planning Guidelines
SPBD	School Planning and Building Division
SQCA	Standards and Quality Control Authority
SSI	Safe School Initiative
ToR	Terms of Reference
UNDAF	United National Development Assistance Framework
UNDP	United Nations Development Program
UNICEF	United Nations Children's Education Fund
WBG	World Bank Group
WHO	World Health Organization



## EXECUTIVE SUMMARY

1. Bhutan is vulnerable to a number of multiple hazards owing to its geological settings, vulnerable ecosystems, variable climatic conditions and increasing exposure. Every year recurrent hazards cause extensive damages to infrastructures, lives and properties. The challenge is further aggravated by emerging trends in the climate systems rendering the Bhutanese communities vulnerable to glacial lake outburst floods and its impacts on lives and properties.
2. The purpose of this evaluation was to assess the outcomes of the results-based framework of the Disaster Risk Management program for the 10th Five Year Plan period encompassing all the major programs and projects implemented within the period. The main objectives of the evaluation were:
  - To assess the program outcomes as compared to stated objectives;
  - To assess the effectiveness, efficiency, sustainability and relevance of the program in delivering the outcomes;
  - To identify major issues and challenges faced during program implementation;
  - To identify lessons learned and provide recommendations following good international practices in the region and globally; and
  - To document and generate information based on good practices
3. The outcomes were assessed against four criteria of effectiveness, efficiency, sustainability and relevance. The assessment also aimed to identify major issues and challenges faced during program implementation and identify lessons learned to provide specific recommendations.
4. The evaluation team adopted an outcome-based approach, which allowed the evaluation to make inferences about the level of achievements in relation to program interventions and expected outcomes. Target groups, beneficiaries and stakeholders at various levels – household, Dzongkhag, Sector/ Agency, Donor/partner agency and program/project implementation were covered in the evaluation. The evaluation used a combination of qualitative and quantitative data collection and analysis instruments with two sets of structured questionnaires.
5. A major effort has gone toward DRM legislation, policy development, raising awareness, institutional strengthening, risk reduction and preparedness during the 10th Five Year Plan. The Disaster Management Division was upgraded to a full-fledged Department in 2008. The Disaster Management Act of Bhutan was enacted in 2013. Since 2009, DDM has been implementing national disaster management awareness and risk reduction programs such as the Community-Based Disaster Risk Management (CBDRM) program, the Safe Schools Initiative Program, Search and Rescue Training Programs and Dzong Fire Safety Programs. In addition to this, various awareness, capacity building and risk reduction

projects supported by development partners such as the UN, WB, GFDRR, SCI and other International Agencies, have been implemented by DDM in collaboration with other national implementing partners.

6. The degree of effectiveness for the program outcomes is 'good'. At the policy level, there are visible high quality results that contributed to the policy and regulation strategies of the country, including legislation, country frameworks and institutional arrangements to create an enabling policy environment for DRM in the country. At the operational level, there are several observed visible quality results with strategic trainings, guidelines, and framework that allowed DDM and IPs to deliver on its mandates and enabled organizational capacities to work toward the DRM goals. There are visible short-term change in knowledge and ability to respond to emergencies by target groups.
7. The outcomes were fairly efficient in terms of resource use and most planned programs were completed on time.
8. The potential to sustain program outcomes and benefits were assessed at 'modest' levels. Although, there is national commitment to create financial mechanisms within the policy framework to support scaling up of the program there is still a need for continued financial and technical support to make programs sustainable and have meaningful impacts in the long run.
9. The level of relevance was very good. Outcomes are consistent with the national plans and policies, Hyogo framework and MDGs supporting environmental sustenance and poverty reduction themes. Outcomes are also consistent with national policies and global priorities in terms of contributing to use of knowledge, enhancing innovation and education, building a culture of safety and resilience at all levels, reducing underlying risk factors, while strengthening disaster preparedness for effective response at all levels.
10. The evaluation identified various issues and emerging challenges, including impacts of climate change vis-à-vis development progress, increasing frequency of hazards and extreme events, vulnerable traditional construction practices, lack of multi-sector coordination, technical, human resources and financial capacities of DDM and implementing partner agencies.

Corresponding to the issues, challenges and lessons identified by the evaluation, recommendations are provided for immediate and short to long term timeframes. Nine different themes emerged including an enabling environment for DRM, reducing risks and underlying vulnerabilities, information sharing and risk communication, strengthening response, building DM capacities, financial arrangements, enhancing awareness and school level recommendations.

## CHAPTER 1 – INTRODUCTION

### PURPOSE AND OBJECTIVES OF THE EVALUATION

11. The main purpose of this evaluation was to assess the achievement of the Disaster Risk Management program at the outcome level in terms of prevention, mitigation, preparedness, response, recovery and reconstruction during the 10<sup>th</sup> Five Year Plan Period. In addition, the study was expected to identify issues and challenges faced during implementation and provide lessons and recommendations, which could facilitate in evidence-based planning and decision making in disaster risk management processes.
12. The main objectives of the evaluation were:
  - To assess the program outcomes as compared to stated objectives;
  - To assess the effectiveness, efficiency, sustainability and relevance of the program in delivering the outcomes;
  - To identify major issues and challenges faced during program implementation;
  - To identify lessons learned and provide recommendations following good international practices in the region and globally; and
  - To document and generate information based on good practices.

### SCOPE OF EVALUATION

13. This evaluation assessed the outcomes of the results-based framework of the Disaster Risk Management program during the 10<sup>th</sup> Five Year Plan period (Table 1 – DRM Program Results Framework). It encompasses all major programs and projects implemented within the framework during the 10<sup>th</sup> FYP period.
14. Target groups, beneficiaries and stakeholders at various levels including households, dzongkhag, sector/ agency, and donor/partner agency were covered in the scope of evaluation. Eight dzongkhags – Tsirang, Chukhha, Samtse, Trashigang, T/yangtse, Mongar, Paro, Punakha and two Thromdes – Thimphu and P/ling were covered on the basis of program coverage and regional representation.
15. In addition to the four specific criteria of effectiveness, efficiency, sustainability and relevance, the evaluation assessed visible short-term impacts and linkages or contribution to cross-cutting themes such as gender mainstreaming and climate change adaptation.

**Table 1 for 10th FYP: DDM Results Framework**

<b>Impact</b>	<b>Outcome</b>	<b>Output</b>	<b>Project/ Activities</b>
Effective and coordinated disaster management, preparedness, response and ability to conduct relief activities to ensure a disaster resilient nation.	Create an enabling legislative framework for disaster risk management	Disaster management bill, guidelines for planning, risk assessment, compensation and relief etc.	Project 1: Regulation and policy strategies
	Capacity building of disaster responder/ professionals at all levels	Capacity national focal institutions and their staff developed	Project 2: Disaster Information system
		Training of disaster management committee members, officers, cadres and agencies entrusted with disaster mitigation, preparedness and response related activities initiated at the Dzongkhag level	
		Capacities of local communities in disaster prevention, preparedness and response built	
		Partnership with national, regional and international institutions for capacity building support in place	
	Improved access to information and data on disasters	Disaster Information System and Database in place	Project 3: Regulation and Policy strategies
	Inculcate a culture of disaster preparedness and risk reduction at all levels	Raise public awareness on disaster preparedness and recovery at all levels	Project 4: Earthquake Risk Reduction and Recovery Preparedness Project
		Increase awareness and preparedness levels of all disaster management authorities/committees and build community resilience	
		Raise awareness in schools and implement through the formulation of School Disaster Management Plans (SDMPs) and the conduct of mock drills	
		Facilitate sharing of national and regional information, lessons and best practices	
Establish an	Initiate establishment of Emergency	Project 5:	

	effective disaster communication network to provide speedy information and decision making during a disaster	Operation Centers and disasters/emergency communication in the Dzongkhags	Emergency/ Disaster Communication
	Sustainable financial mechanism in place	His Majesty's Relief Fund	Project 6: Sustainable financial mechanism for disaster management
		National Disaster Mitigation and Preparedness Budget established	
		Major Disaster Emergency Fund Founded	
	Effective multi-hazard disaster preparedness and response plans developed	Multi-hazard Atlas developed	Project 7: Multi-hazard Atlas and Plans
		Dzongkhag and Community Disaster Management Plans developed	

#### EXPECTED CONTRIBUTION

16. The evaluation findings and recommendations will contribute to the following:

- Evaluation of progress towards achievement of the Disaster Risk Management Outcomes in the 10<sup>th</sup> FYP.
- Review and assessment of effectiveness of outcomes in terms of extent to which the outcomes were achieved as per the results framework.
- Review and assessment of efficiency of outcomes in terms of how resources (financial, technical, human, etc.) have been used appropriately and cost effectively.
- Review and assessment of outcomes for financial and institutional sustainability.
- Review and assessment of relevance of outcomes to national and global priorities and goals.
- Identification of gaps/weaknesses in the current program/ project designs and provide recommendations for improvement;
- Identification of major issues, challenge and lessons learnt during program implementation and practices, to improve future program development and implementation.

17. Key expected outputs from this outcome evaluation are:

- An Inception Report
- Outcome evaluation report including detailed evaluation

methodology, evaluation findings, performance conclusion, lessons, recommendations and a way forward.

## CHAPTER 2 – DISASTER MANAGEMENT PROGRAM

### DISASTER MANAGEMENT CONTEXT – OVERVIEW OF HAZARDS, VULNERABILITIES, AND RISKS

18. Bhutan is located in one of the most seismically active regions of the world. Risks of earthquakes are imminent proven in the past seismic events, and most recently by the earthquake events of 21<sup>st</sup> September, 2009 earthquake in eastern Bhutan and 18<sup>th</sup> September, 2011 Sikkim earthquake. The total losses from the two events amounted to more than Nu.3,600 million.
19. More pertinent to the issue of reducing risk and climate change is the presence of 2,674 glacial lakes, of which 25 are 'potentially dangerous' with the impending risk of generating Glacial Lake Outburst Floods (GLOFs). The October 1994 GLOF event, triggered by the outburst of *LuggyeTsho* in Lunana caused massive damages downstream in the Punakha-Wangdue valleys and claimed 21 lives.
20. Bhutan is also vulnerable to recurrent and seasonal hazards such as landslides, flashfloods, windstorms and forest fires, which account for huge damages and losses on a continuing basis. The effects of climate change further impact seasonal hazards and Bhutan has also witnessed more extreme events in recent years. The Cyclone Aila precipitated floods in 2009 affected the whole of Bhutan and caused loss of more than Nu. 700 million and 12 human lives. Fires on human settlements have also claimed lives and affected families and communities and outbreak of pests and epidemic diseases such as the bird flu and H1N1 influenza, have also become evident in Bhutan.
21. Disaster events faced by Bhutan so far may not appear large-scale in comparison with disasters affecting other countries, but such events coupled with frequent losses to recurring and seasonal hazards has a serious impact on the assets and livelihoods of the people and on development gains made so far by Bhutan. Therefore, there is need to urgently step up disaster risk reduction activities in addition to making serious efforts to coordinate risk reduction, poverty reduction and climate change adaptation initiatives.

### INSTITUTIONAL ARRANGEMENTS AND DISASTER MANAGEMENT PROGRAM

22. The 10<sup>th</sup> FYP introduced and adopted the results-based management

(RBM) planning framework for the first time to ensure that a sector or agency's process, products and services contribute to the achievement of clearly stated results, articulate its planning and budgeting in a more efficient and responsive manner in the face of emerging challenges.

23. The Department of Disaster Management's results framework has been an evolving document, especially since the DDM started as a division in the Ministry of Home and Cultural Affairs (MoHCA) at the beginning of the 10th FYP. Key strategies of the Disaster Risk Management Programme are:

- Create an enabling environment for disaster risk reduction through a multi-sectoral approach;
- Build capacity of sectors and the dzongkhags right down to the community levels for disaster risk management;
- Enhance disaster preparedness at all levels;
- Strengthen response and early warning systems;
- Raise awareness on disaster risk management at all levels; and
- Mainstream disaster risk reduction concerns in all development activities and in all walks

**Table 2: Major Programs and Projects during 10th FYP**

	<b>Major Programs and Projects</b>	<b>Dzongkhags/ areas covered</b>	<b>Stakeholders</b>	<b>Related Outcomes</b>
1	Community Based Disaster Risk Management (CBDRM) Program	16 Dzongkhags (except Trongsa, Dagana, Samtse, Pemagatshel)	Communities, Local leaders, District Disaster Management Committees (DDMCs), CBDRM planning teams, Focal Persons, DDM, Key donor agencies/ partners	Outcome 2 – Capacity building of disaster responder/ professionals at all levels;  Outcome 4 - Inculcate a culture of disaster preparedness and risk reduction at all levels;  Outcome 7 - Effective multi-hazard disaster preparedness and response plans developed
2	Disaster Preparedness and Response for Safe School Program	All 20 dzongkhags	Principals, teachers, students, focal persons, DEOs, communities, DDM, MoE, MoH, RBP, Key donor agencies/ partners (UNDP, UNICEF, Save the Children, Bhutan, ADB, DIPECHO)	Outcome 2 – Capacity building of disaster responder/ professionals at all levels;  Outcome 4 - Inculcate a culture of disaster preparedness and risk reduction at all levels;  Outcome 7 - Effective multi-

				hazard disaster preparedness and response plans developed
3	DM initiative in the Cultural sector	Paro, Trongsa, Punakha, Wangdue, Gasa, T/Yangtse, Lhuentse, Bumthang, Zhemgang, Tsirang, Sarpang	Dzongkhag administration, DDMC, Focal Persons, RBP, DoC, DES, DDM	Outcome 2 – Capacity building of disaster responder/ professionals at all levels;  Outcome 4 - Inculcate a culture of disaster preparedness and risk reduction at all levels;  Outcome 7 - Effective multi-hazard disaster preparedness and response plans developed
4	Glacial Lake Outburst Flood (GLOF) Project	Wangdue, Punakha, Bumthang	Pilot Dzongkhags, vulnerable communities, Focal persons, SAR Teams, NaSART, DDMC, DGM, DHMS, DDM, GEF/WB, UNDP, ACB	Outcome 1 – Create an enabling legislative framework for disaster risk management;  Outcome 2 – Capacity building of disaster responder/ professionals at all levels;  Outcome 4 - Inculcate a culture of disaster preparedness and risk reduction at all levels;  Outcome 5 - Establish an effective disaster communication network to provide speedy information and decision-making during a disaster;  Outcome 7 - Effective multi-hazard disaster preparedness and response plans developed
5	Earthquake Risk Reduction and Recovery Preparedness Project (ERRRP)	Thimphu, S/Jongkhar, Chukhha	Dzongkhags Administration, City Administration, Engineers, Local Masons and Carpenters, BSB, DDM, UNDP	Outcome 2 – Capacity building of disaster responder/ professionals at all levels;  Outcome 4 - Inculcate a culture of disaster preparedness and risk reduction at all levels; Outcome 7 - Effective multi-hazard disaster preparedness and response plans developed

6	Search and Rescue (SAR) program	Paro, Mongar, Zhemgang, Gelephu Thromde, S/Jongkhar Thromde, P/ling Thromde, Trashiyangtse, Trashigang, NaSART	NaSART, SAR teams, Dzongkhag Administrations, Focal Persons, DDMCs, RBP, DDM, Donor agencies	<p>Outcome 2 – Capacity building of disaster responder/ professionals at all levels;</p> <p>Outcome 4 - Inculcate a culture of disaster preparedness and risk reduction at all levels;</p> <p>Outcome 5 - Establish an effective disaster communication network to provide speedy information and decision-making during a disaster</p>
7	DMIS	Regional (IT and focal persons)	IT personnel, Focal persons, DDM, Donor agencies	<p>Outcome 2 – Capacity building of disaster responder/ professionals at all levels;</p> <p>Outcome 3 – Improved access to information and data on disasters;</p> <p>Outcome 5 - Establish an effective disaster communication network to provide speedy information and decision-making during a disaster;</p>
8	Bhutan Recovery and Reconstruction Project (BRRP)	Trashiyagtse, Lhuentse, S/Jongkhar, Trashigang, Mongar, Pemagatshel	Focal Persons, Engineers, Masons and Carpenters, DES, DoC, DDM, SAR Teams, DDMC, Communities, UNDP	<p>Outcome 2 – Capacity building of disaster responder/ professionals at all levels;</p> <p>Outcome 4 - Inculcate a culture of disaster preparedness and risk reduction at all levels;</p> <p>Outcome 7 - Effective multi-hazard disaster preparedness and response plans developed</p>
9	Mainstreaming Disaster Risk Reduction (DRR) initiatives	Regional	Focal Persons, Planning officer, DDMC, DDM, GNHC, UNDP, GFDRR	<p>Outcome 1 – Create an enabling legislative framework for disaster risk management;</p> <p>Outcome 2 – Capacity building of disaster responder/ professionals at all levels;</p> <p>Outcome 4 - Inculcate a</p>

				<p>culture of disaster preparedness and risk reduction at all levels;</p> <p>Outcome 6 - Sustainable financial mechanism in place;</p> <p>Outcome 7 - Effective multi-hazard disaster preparedness and response plans developed</p>
10	Disaster Management (DM) related assessments	Health and Education Sector	Focal Persons, SPBD, DES, HIDD, DDM, Engineers, GHI, GFDRR, WHO, SEARO	<p>Outcome 2 – Capacity building of disaster responder/ professionals at all levels;</p> <p>Outcome 7 - Effective multi-hazard disaster preparedness and response plans developed</p>
11	UNDAC Disaster Preparedness Mission	Disaster Preparedness	DDM, UNDP, Sectors, Dzongkhags	<p>Outcome 1 – Create an enabling legislative framework for disaster risk management;</p> <p>Outcome 7 - Effective multi-hazard disaster preparedness and response plans developed</p>
12	Regional GLOF risk Reduction Initiative in the Himalayas	Punakha, Wangdue, Bumthang	DDM, Dzongkhag Administrations, UNDP,	<p>Outcome 2 – Capacity building of disaster responder/ professionals at all levels;</p> <p>Outcome 4 - Inculcate a culture of disaster preparedness and risk reduction at all levels;</p>
13	GLOF Hazard mapping, Punakha, Wangdue and Chamkhar	Punakha, Wangdue, Bumthang	DGM, GEF, UNDP, Dzongkhag Administrations	Outcome 7 - Effective multi-hazard disaster preparedness and response plans developed
14	Thimphu Valley Earthquake Risk Management Project, UNDP	Thimphu city	SQCA, DDM, UNDP, Thimphu City	<p>Outcome 2 – Capacity building of disaster responder/ professionals at all levels;</p> <p>Outcome 7 - Effective multi-hazard disaster preparedness and response plans developed</p>
15	Earthquake Response Coordination, including CERF	Eastern Dzongkhags for 2009 earthquake event and	DDM, UNDP, Dzongkhag Administrations, Communities	Outcome 2 – Capacity building of disaster responder/ professionals at all levels;

	grant	Western Dzongkhags for 2011 earthquake event		
16	Build Back Better Project	Post-disaster recovery and risk-reduction	DDM, UNDP, Sectors, Dzongkhag Administrations	Outcome 2 – Capacity building of disaster responder/ professionals at all levels;
17	UNOCHA support for – 2012 Bumthang fire incident, 2011/ 2013 Windstorm events, Wangdue Dzong fire incident	Bhutan	DDM, UNDP, Dzongkhag Administrations	Outcome 2 – Capacity building of disaster responder/ professionals at all levels;

24. For the purpose of the assignment and related evaluation criteria, the seven outcomes as per the results framework in the 10<sup>th</sup> FYP were evaluated:

- *Outcome 1 – Create an enabling legislative framework for disaster risk management;*
- *Outcome 2 – Capacity building of disaster responder/professionals at all levels;*
- *Outcome 3 – Improved access to information and data on disasters;*
- *Outcome 4 - Inculcate a culture of disaster preparedness and risk reduction at all levels;*
- *Outcome 5 - Establish an effective disaster communication network to provide speedy information and decision-making during a disaster;*
- *Outcome 6 - Sustainable financial mechanism in place;*
- *Outcome 7 - Effective multi-hazard disaster preparedness and response plans developed.*

### **CHAPTER 3 – APPROACH AND METHODOLOGY**

#### **EVALUATION APPROACH**

25. The evaluation team adopted an outcome-based approach, allowing for objective conclusions about the level of achievements in relation to program interventions and expected outcomes. Assessment was based on the 10<sup>th</sup> FYP results-based framework and the various projects, programs and activities implemented within it. Evaluation findings are expected to meet information needs of the program management team, implementing partners and donors, for future directions especially in terms of decision-making, planning further interventions and making investments choices.

26. The evaluation essentially:
- Assessed whether the program outcomes were adequately achieved;
  - Measured changes in outcomes; and
  - Established if, how and what intervention caused the changes, including linkages between intervention and outcomes.
27. The team adopted standard evaluation methodologies practiced by international organizations and adapted it to the area of disaster risk management in the context of Bhutan. Reference guidelines such as – The Handbook on Planning, Monitoring and Evaluating for Development Results, UNDP, 2009, or PME Handbook; Outcome-level Evaluation: a Companion Guide to the PME Handbook for Development Results for Programme Units and Evaluators, UNDP, 2011 – were used to guide the evaluation process.
28. The team used a participatory and evidence-based triangulation process and ensured important principles such as independence, impartiality, transparency and confidentiality were maintained as per standards for evaluation processes.

#### EVALUATION CRITERIA AND KEY QUESTIONS

29. As per the Terms of Reference and comprehensive discussions during the inception phase, program outcomes were assessed against four criteria - Effectiveness, Efficiency, Sustainability and Relevance (See Table 3).
30. All national, UN and other international and bilateral program partners and stakeholders were identified and their roles and partnerships examined against the evaluation criteria. In addition, the evaluation assessed the extent to which initiatives have considered cross cutting issues such as gender and social inclusions, role of indigenous knowledge and climate change adaptation.

**Table 3: Evaluation Questions against Criteria**

	Evaluation Criteria	Criteria objective	Key Questions
1	Effectiveness	This will measure the extent to which the outcomes have been achieved as per the results framework.	<p>What proportion of outcomes have been achieved?</p> <p>What is the quality of the results in terms of observed changes contributed by the activities?</p> <p>Are the indicators for the outcome appropriate and are they being reported against?</p> <p>To what extent did women and marginalized groups benefit from the program?</p>
2	Efficiency	This will measure how resources (financial, technical, human, etc.) have been used appropriately and cost effectively.	<p>To what degree are outcomes achieved on time? If delayed? Why?</p> <p>To what degree were outcomes achieved within estimated costs? If there is over-expenditure, why?</p> <p>Is a workplan schedule available and used?</p> <p>How well are activities monitored and corrected?</p> <p>Are the outputs achieved likely to contribute to intended outcome results?</p>
3	Sustainability	This will assess the extent to which the outcomes are practicable and whether sustainable mechanisms have been put in place.	<p>Are there financial mechanisms to support scaling up of program?</p> <p>Can the benefits be sustained if financial support changes?</p> <p>How far are programs integrated into Dzongkhag and gewog structures?</p> <p>Have the local partner capacity been adequately developed? Have institutional capacity been adequately built?</p>
4	Relevance	This will measure the extent to which the outcomes have contributed to national, international, global priorities and goals.	<p>Is the outcome consistent with government policies and global priorities?</p> <p>Do the outcomes respond to needs of target groups?</p> <p>Does a results matrix exist? What is the quality of the matrix? Are outcomes, outputs and activities clear and logical? Are risks and</p>

			assumptions appropriate?
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#### EVALUATION FRAMEWORK

31. The key evaluation questions, sub-questions, indicators and information sources were further discussed in relation to the results framework (**Annexure I**) and finalized with the reference group during the inception period. The evaluation framework guided the team in coming up with the most appropriate methods of information collection and in the design of the data collection tools. The evaluation was carried out at three levels – household level, at the level of the focal and key individuals in the Dzongkhags and various sectors/ agencies and at program and project implementation level.

#### SAMPLING STRATEGY

32. For the household level survey, as per the desk review, eight Dzongkhags and two Thromdes (Table 4) were selected based on program coverage and the need for regional representation.

**Table 4: Sampling Frame**

	Dzongkhag	Gewogs	HHs
1	Paro	10	7118
2	Samtse	15	11,634
3	Punakha	11	4564
64	Trashigang	15	10281
5	Mongar	17	7348
6	T/yangtse	8	3764
7	Chukhha	11	14482
8	Tsirang	12	3651
		<b>Total</b>	<b>62,842</b>

33. A purposive stratified random sampling for the selected Dzongkhags was carried out based on the total number of households in the Dzongkhag to determine the sample size (See Table 5) for each Dzongkhag.

**Table 5 – Sample size per Dzongkhag**

Dzongkhag	No. of HH	Sample Size	Interviewed
Paro	7118	125	128
Samtse	11634	204	205
Punakha	4564	80	89

Trashigang	10281	180	177
Mongar	7348	129	142
T/Yangtse	3764	66	69
Chukha	14482	253	250
Tsirang	3651	64	57
<b>TOTAL</b>	<b>62842</b>	<b>1100</b>	<b>1117</b>

34. For the focal person and key individuals, number of individuals in the selected Dzongkags were determined (See *Table 6*), and validated during the Inception Report presentation.

**Table 5: No. of Key Individuals**

	Dzongkhag	SAR	School	DDMC	Total	Interviewed
1	Paro	11	23	17	51	28
2	Samtse	20	30	22	72	35
3	Punakha	12	20	18	50	29
4	Trashigang	16	60	22	98	38
5	Mongar	14	57	24	95	34
6	T/yangtse	12	30	15	57	32
7	Chukhha		48	18	66	35
8	Tsirang		15	19	34	20
9	P/ling Thromde	12	6		18	10
10	Thimphu Thromde		30		30	25
		<b>97</b>	<b>319</b>	<b>155</b>	<b>575</b>	<b>286</b>

35. The key individual/focal person survey aimed to cover at least 50% of the total identified (approximately 285). A total of 286 focal persons/key individuals were interviewed. In addition to this, the assessment covered 18 others (disaster management focal persons from the remaining Dzongkhags and key individuals from Ministries and agencies). A total of 304 focal persons/key individuals have been covered.

36. Additionally, project managers in the key donor agencies (UNDP, GFDRR, UNICEF, WHO, Save, ADB), partner implementing agencies (DGM, DHMS, MoH, MoE) and the main stakeholder agency, the Department of Disaster Management (DDM) were interviewed separately.

#### DATA COLLECTION

37. The evaluation used a combination of qualitative and quantitative data collection and analysis instruments. It was largely a qualitative assessment relying on exhaustive desk review of available information and in-depth

interviews with key informant including program staff, national counterparts and local stakeholders at government, institution and NGO levels to inform the assessment. However, surveys were carried out at the household level to assess visible impacts while a substantial number of respondents for the key informant interviews allowed for triangulation and quantifying the evaluation.

38. Two sets of structured questionnaires (*See Annexure III – Data Collection Tools*) were used to survey households and focal persons/key individuals.

39. A semi structured interview (SSI) guide was used to interview project managers in DDM, donor agencies and partner implementing agencies.

40. Secondary data sources consisted of documentary evidence that has direct relevance to the purpose of this assessment - policy documents, guidelines, demographic data, published reports, progress reports, evaluation reports, monitoring reports, strategic plans, and so forth (*See Annexure II – List of Documents Reviewed*).

**Table 6: Data Collection Tools, Data Sources and Objectives**

	Method/Tool	Data Source	Objective
<b>Secondary Data</b>			
1	Desk review of existing DM related documents	Project reports, documents, Project evaluation and assessment documents, existing studies, research documents, mid-term review documents, evaluation reports, annual work plans, progress reports, etc.	Review achievement of key indicators and progress of outcomes Identify progress of projects, project achievements, impacts, lessons, issues and challenges
<b>Primary Data</b>			
1.	Semi-structured Interview Guide	Key staff, project managers in DDM, UN agencies and other main international/ donor agencies, implementing partners, etc.	Obtain in-depth qualitative information on projects, and outcomes and stakeholder perspectives and issues
2.	Focal Person/ Key Individual – In-depth Questionnaire	Dzongkhag and Sector/Agency disaster management focal persons, Dzongkhag Disaster Management Committee (DDMC) members and Search and Rescue (SAR) team members	Gather information, opinion and gauge knowledge and perceptions of target groups on the implementation of the DRM program as per evaluation criteria.
3.	Household Survey	Household respondents in the selected eight Dzongkhags.	Gather information from target groups on the implementation of the DRM program as per evaluation criteria.

4.	Observations	Project and program sites for in-person observation and assessment	Information regarding on-ground realities.

#### DATA PROCESSING AND ANALYSIS

41. Qualitative analysis was carried out to understand stakeholders' and/or beneficiaries' purpose, change in knowledge/behavior, desires, perceptions and needs based on data/information collected through literature reviews, household surveys, semi-structured interviews and key informant interviews.
42. Quantitative analysis was carried out using SPSS and Excel for data collected primarily through the household and focal person surveys mainly to triangulate and gauge visible change in behavior, perceptions, awareness, and knowledge in relation to the four evaluation criteria.
43. The team adopted standard reporting procedures and formats as discussed and agreed during the inception report finalization. The firm's editing consultant carried out professional editing of the report to meet standard reporting format and language requirements.

## CHAPTER 4 – EVALUATION FINDINGS

### OUTCOME 1: CREATE AN ENABLING LEGISLATIVE FRAMEWORK FOR DISASTER RISK MANAGEMENT

#### ACHIEVEMENTS

44. The National Disaster Risk Management Framework (NDRMF) was formulated and endorsed in 2006 with the objective of promoting a disaster risk management approach to deal with disasters, recognize the respective roles of the different organizations and to establish linkages between disaster risk management and other development sectors.
45. As per the requirements in the NDRMF, the Disaster Management Act of Bhutan was enacted in 2013 following intensive stakeholder consultations and workshops. The Act provides for institutional development at various levels, capacity building, mainstreaming or integration of disaster management into plans and programs, with specific focus on community participation and defines the roles and responsibilities for agencies involved. The act also provides for financial arrangements, specific disaster management facilities and relief and compensation provisions.
46. Along with the enactment of the DM Act of Bhutan, 2013, several DRM related policies and procedures established. This includes incorporation of

'improved disaster resilience and management' into the Sixteen National Key Result Areas identified in the 11<sup>th</sup> Five Year Planning Guidelines, incorporation of DRR as a criteria in the GNH Check Planning Toll in the Local Development Planning Manual, inclusion of DRR as a cross-cutting issue in the Protocol for Policy Formulation.

47. Following the DM Act of Bhutan 2013, several legislative and policies documents were initiated. These include the draft Disaster Management (DM) Planning Guidelines, draft Contingency Plans, the National Disaster Risk Management Strategy, and the draft DM Rules and Regulations.
48. A standard operating procedure (SOP) to disseminate GLOF early warning information for the Punatsanchu River basin was developed by the Department Hydromet Services.
49. Two key ministries, MOE and MOH have formulated and adopted National Action Plans for School Earthquake Safety and National Action Plan for Safe Health Facilities to provide necessary and urgent direction in reducing and mitigating risks and enhancing preparedness levels in schools and health facilities.
50. The School Disaster Management Planning Guidelines document was formulated in 2008 and successfully implemented by all schools across Bhutan. The guidelines were further improved and a comprehensive disaster preparedness and response for safe school program curriculum was developed in 2013. Improved disaster resilience and management has been incorporated into the 11<sup>th</sup> Five-Year Plan guidelines and its sixteen National Key Result Areas. It has also been incorporated in the standards for annual planning at the dzongkhag and gewog levels as specific criteria to be considered in the GNHC Planning Tool.

#### *GAPS*

51. The Disaster Management Act lacks exclusive gender sensitiveness in terms of language and provisions although there is an inherent reference under the Relief and Compensation clauses. Meanwhile, there is limited climate change impacts and adaptation requirements.
52. Similarly, there is no reference made to the role of indigenous knowledge systems in disaster risk reduction, specific purpose and measures for marginalized and vulnerable groups to mitigate, prepare for, respond to, and recover from the effects of disasters.

53. Though the act has risk reductions as one of its main objectives, there are no specific financial provisions for Dzongkhags to carry out related activities.
54. More than 50% of the focal persons and key individuals respondents pointed out the need for DM and Contingency Planning Guidelines to develop the DM plans. Delay in the guidelines led to delays in DM plans.

#### OUTCOME 2 – CAPACITY BUILDING FOR DISASTER RESPONDERS/ PROFESSIONALS AT ALL LEVELS

#### OUTCOME 4 – INCULCATE A CULTURE OF DISASTER RESILIENCE AT ALL LEVELS

##### ***ACHIEVEMENTS***

55. This outcome aimed at strengthening the capacities of partner institutions, the implementing agency (DDM), Dzongkhags and gewogs through technical inputs, human resource development, and equipment supply. The ultimate aim of building disaster response capacities at the national, dzongkhag and community level was to ensure the ability of communities and local governments to respond to emergencies independently.

##### *National level capacity building:*

56. At the national level, the National Search and Rescue Team (NaSART) is comprised of relevant agencies and have *undergone* a series of trainings. Bhutan also became a member of the International Search and Rescue Group (INSARAG), signed the UN customs facilitation agreement and ratified the SAARC Rapid Response Agreement.

57. All relevant sector focal persons were trained in mainstreaming DRR concerns into development plans and programs.

58. Engineers from partner ministries were trained in the use of vulnerability assessment checklist/tool for schools and basic health units.

59. As per the Disaster Management Act of Bhutan 2013, the National Disaster Management Authority was instituted and is functioning with specific roles and responsibilities.

##### *Dzongkhag level capacity building:*

60. At the Dzongkhag level, 12 Dzongkhags and three Thromdes have formed SAR Teams and received trainings in search and rescue under seven different projects implemented by the DDM with fixed training modules

developed for future training need, and distribution of standard SAR equipment.

61. More than 535 local officials and functionaries have been trained in 16 Dzongkhags through CBDRM program. The program aims to raise awareness in communities, ensure a decentralized and locally empowered disaster management system and develop community based disaster management plans in Dzongkhags.
62. A total of 102 engineers, 99 technicians, 103 gups, 201 masons from various gewogs, including 58 female masons were trained in Earthquake Resistant Stone Masonry Construction and safe construction practices. This was done in collaboration with Department of Culture (DoC) and the Bhutan Standards Bureau (then Standard Quality and Control Authority under the Ministry of Work and Human Settlement).
63. Eight dzongkhags formed Dzong Disaster Management Committees that carried out dzong vulnerability assessments, formulated fire drill and evacuation plans and increased the overall awareness level of districts administrative staff and monastic body.
64. Bhutan Disaster Assessment Tool was drafted streamlining rapid assessments during emergencies for appropriate humanitarian response and relief. Focal persons and IT officials in 20 dzongkhags received training in the use of the tool.
65. Engineers in all dzogkhags and thromdes received training in the use of Vulnerability Assessment checklist/tool for schools and basic health units.
66. At the focal person/ key individual level more than 90% were aware of DDM's responsibilities and more than 80% were aware of the correct actions to take during emergencies (earthquake and floods).

*School and community level capacity building:*

67. At the school level, 819 principals and school disaster focal persons covering all 20 dzongkhags were trained in sensitization on natural hazards, NDRMF and DM Act, SDMP components, education in emergencies, first aid, fire safety and basic search and rescue techniques. Approximately 57% reported having SAR teams in place, more than 80% reporting 'yes' were school focal persons. In terms of SAR equipment. Most of the respondents reporting 'yes' for response equipment were from schools where they had received or bought first aid kits, fire safety equipment and were using improvised SAR materials.

68. At the school level, more than 95% of the respondents have reported functional school plans and established teams for SAR, first aid and communication. Regular drills are performed and schools conduct hazard assessment through 'hazard hunt' exercises and many have carried out non-structural mitigation by clearing and fixing falling hazards.
69. Advocacy and awareness programs were disseminated through various media to cover 20 dzongkhags and 205 gewogs. This includes three earthquake and flood safety to reduce risk, preparedness and protective actions (Ap Naka I, II, and Azha Churi).
70. Numerous posters and pamphlets (12,00+) and Emergency safety and first aid handbook were developed and distributed to all dzongkhags, schools and institutions on disaster safety and preparedness measures for prevalent hazards.
71. Annual school preparedness Day is observed in all schools to mark the anniversary of the 21<sup>st</sup> September Earthquake event. International Disaster day observed key ministries and selected Dzongkhags and majority of the schools.
72. A majority of school level focal persons agreed that they are adequately prepared to respond to emergencies.

#### *GAPS*

##### *National level:*

73. At the national level there is insufficient technical skills, equipment and procedures in emergency response agencies such as the medical and fire services and NaSART.
74. There is observed insufficient skills and human resources in program management and coordination with agencies.
75. Inter-ministerial task force (IMTF) has yet to be formed which impeded sector coordination and technical support for DM programs.

##### *Dzongkhag level:*

76. At the Dzongkhag level, there is observed insufficient skills and human resources to carry out DM and contingency planning, mainstreaming, coordination and response to emergencies. More than 60% of the key individual/ focal person respondents had not participated in SAR training.

77. There is inadequate tools and equipment for SAR, first aid and other emergency response materials. More than 70% reported not having or having very limited fire safety and SAR equipment

*School and community level:*

78. There is a definite lack of capacity to ensure safety of special need children during emergencies and advanced training on disaster management for SAR teams, Fire Safety teams and First Aid teams in schools to respond effectively to emergency situations.

79. There is insufficient equipment and advocacy materials (fire extinguishers, first aid kits, SAR materials and poster/awareness materials)

80. Despite advocacy programs covering all dzongkhags, there is low awareness and knowledge change at the community level in terms of disaster management preparedness and response.

**OUTCOME 3: IMPROVED ACCESS TO INFORMATION AND DATA**

**OUTCOME 5: ESTABLISH AN EFFECTIVE DISASTER COMMUNICATION NETWORK TO PROVIDE SPEEDY INFORMATION AND DECISION MAKING DURING A DISASTER**

***ACHIEVEMENTS***

81. Three sets of database were established to enhance access to information. The Disaster Management Information System (DMIS) is a web-based database system to record pre-disaster information including infrastructure, SAR, capacity building activities and contact information of disaster related entities, Bhutan Disaster Assessment tool is available online through the Dev.Info/BhutanInfo System and DISINVENTAR is a system to record past disasters and information.

82. Very basic EOC was initiated at the national level comprising one hotline for disaster emergencies. Basic EOC equipment and communications sets were distributed to 20 dzongkhags. At least one EOC structure was built in Punakha.

83. An automatic early warning system was set up in Punatsangchu River Basin with standard operating procedures for early warning dissemination along with community sensitization on GLOF risks and early warning system in GLOF risk areas.

84. Community based early warning system was initiated distributing mobile phones to focal persons in 21 vulnerable communities in 5 Dzongkhags. Of the 20% who said they received early warning, majority were from Punakha receiving information and early warning on GLOF risks.
85. Majority of the school focal persons agreed that they have easy access to hazard and risk information and have clear procedures during emergencies.

#### *GAPS*

86. The database and website established to enhance access to information and to facilitate communication is not performing as expected. DMIS exists online but its purpose is unclear. Meanwhile the data is outdated and information on DMIS is not used for any decision making purpose. Similarly, Dev.Info/BhutanInfo System is non-functional and the Dzonkhag focal persons do not find the feed-in process (forms) user friendly. Data on DISINVENTAR is also incomplete and outdated.
87. The national EOC consists of one hotline and does not serve as an information hub during disaster emergencies as it was intended and mandated.
88. At the Dzongkhag level, emergency procedures and access to information (eg. hazard risk and vulnerability) seems to be weak.

#### OUTCOME 6: SUSTAINABLE FINANCIAL MECHANISMS IN PLACE

##### *ACHIEVEMENTS*

89. There is provisions for Disaster Management Fund in the DM Act for response and relief expenditure, budget activities such as immediate restoration of essential public infrastructure and services; budget for capacity building, maintenance of DM facilities, and preparedness.
90. Additionally, there are external interventions in terms of financial mechanisms complimenting provisions within the DM Act. The HM relief Fund and His Majesty's Kidu Fund have been established and are in operation with disbursements during recent year disasters. National insurance companies have initiated risk transfer schemes within their insurance policies.
91. The national recovery and reconstruction plan was formulated for two earthquakes to mobilize resources.

#### *GAPS*

92. There is no provision for funding risk reduction and mitigation activities. From past experiences in recovery and reconstruction, mobilizing financial resources is difficult if there are no contingency funds in place.

#### OUTCOME 7: EFFECTIVE MULTI-HAZARD DISASTER PREPAREDNESS AND RESPONSE PLANS DEVELOPED

##### *ACHIEVEMENTS*

93. Community-based hazard, vulnerability and capacity assessment mapping was initiated in 16 dzongkhags through the CBDRM process.

94. All schools have functional School Disaster Management Plans and 16 dzongkhags have initiated the process of Dzongkhag Disaster Management Plans.

##### *GAPS*

95. Although process of Dzongkhag Disaster Management Plans has started, no plans are functional due to delays in DDMP guidelines.

96. There is a lack of strategy to conduct assessments and develop a multi-hazard atlas for Bhutan and there is little focus on consolidating existing maps and information in coordination with other sectors and agencies.

#### PERFORMANCE CRITERIA AND CONCLUSIONS

The level of achievement scoring is as follows: 4 (Very Good) = More than 75%; 3 (Good) = Between 56% - 74%; 2 (Modest) = Between 35% - 55%; 1 (Poor) = Less than 34%.

The following table summarizes performance conclusions for the outcomes as per the four criteria of – Effectiveness, Efficiency, Sustainability and Relevance. The performance conclusions are an average rating of a focal person survey rating and expert judgment based on key findings, including literature review and surveys.

EFFECTIVENESS	A (Very Good)	B (Good)	C (Modest)	D (Poor)
<p><i>What proportion of outcomes have been achieved?</i></p> <p><i>What is the quality of the results in terms of observed changes contributed by the activities?</i></p>	<p>Outcome 1: 97% achieved (4); Outcome 2: 82% achieved (4); Outcome 3: 44% achieved (2); Outcome 4: 75% (3); Outcome 5: 50% achieved (2); Outcome 7: 50% (2).</p> <p>At the policy level, there are visible high quality results that contributed to the policy and regulation strategies of the country, including legislation, country frameworks and institutional arrangements to create an enabling policy environment for DRM in the country. The policy framework for disaster management includes (i) a Disaster Management Act that provides the legal basis for instituting a DRM system in the country; and mainstreaming of disaster management into policies and programs specially integrating into the 11th FYP guidelines to support instituting a DRM system.</p> <p>At the operational level, there are several observed visible quality results with strategic trainings, guidelines, and framework that allowed DDM and IPs to deliver on its mandates and enabled organizational capacities to work toward the DRM goals. There are visible short-term change in knowledge and ability to respond to emergencies by target groups.</p> <p>Most planned activities for capacity building were carried out covering 20 dzongkhags. School-based programs have the most visible qualitative result and 100% geographical coverage, contributing strongly to the 2<sup>nd</sup> outcome. Training at the community level, emergency equipment, contingency planning guideline and standard operating procedures lacked focus and achievement contributing less than expected. It may be noted that most dzongkhag level DM progress was dependent on the guidelines and operating procedures. Inadequate human resources in terms of numbers and technical skills resulted in DMCs not being able to draft the DMPs.</p> <p>There has been efforts toward a centralized system with three databases established at the DDM and a website with existing information. However, the frequency of feeding data into the system and acquiring information for decision-making is not happening as expected. There is no vertical or horizontal communication linkages among the database users and therefore, most information/data are outdated.</p> <p>Basic equipment for EOC was distributed in 20 dzongkhags but there is no monitoring carried out to assess its usage for appropriate purpose at the local level. An automatic early warning system with a functional standard operating procedure in the Punatsangchu River Basin for GLOF hazard and vulnerability contributed the most to the 2<sup>nd</sup> outcome. There is a large gap in terms of establishing an efficient information and communication system with adequate equipment and technical skills.</p> <p>All proposed advocacy interventions were completed covering its target population and geographic area. Advocacy programs also covered various prevalent disasters in Bhutan communicated through televisions, drills, posters, pamphlets etc. Although, there seemed to be early visible knowledge change at the school and dzongkhag levels, awareness is still low at the community level. Advocacy was also successful within the GLOF pilot area with over 80% responding positively to correct measures and action in times of GLOF emergencies.</p> <p>Except for a GLOF hazard zonation map, there is very little achievement in terms of assessing and developing multi-hazard maps. However, all schools have disaster management plans developed and functional, while 16 dzongkhags have initiated DM planning processes contributing the most to this outcome. The gewog disaster management plan was not initiated as per the DM Act provisions.</p> <p>The SDM plans indicate very good quality results and there is visible change in</p>			

<p><i>Are the indicators for the outcome appropriate and are they being reported against?</i></p> <p><i>To what extent did women and marginalized groups benefit from the program?</i></p>	<p>knowledge at the school level.</p> <p>Although, the results framework developed for the 10<sup>th</sup> FYP does not include indicators, risks and assumption, externally funded projects have monitoring and evaluation frameworks with qualitative and quantitative indicators to carry out implementation, monitoring and evaluation. All project related outputs that contributed to the outcomes were monitored and individual funding agencies carried out external evaluations.</p> <p>There are very less gender sensitive provisions (eg. participation, response, indicators etc) and the role of indigenous knowledge within the policy framework and DRM program activities. There is little reference made to the specific needs of marginalized groups (people with disabilities, women, children, elderly etc) within the policy framework or at the implementation level.</p>			
<p><b>EFFICIENCY</b></p>	<p><b>A (Very Good)</b></p>	<p><b>B (Good)</b></p>	<p><b>C (Modest)</b></p>	<p><b>D (Poor)</b></p>
<p><i>To what degree are outcomes achieved on time? If delayed? Why?</i></p> <p><i>To what degree were outcomes achieved within estimated costs? If there is over-expenditure, why?</i></p> <p><i>Is a workplan schedule available and used?</i></p> <p><i>How well are activities monitored and corrected?</i></p> <p><i>Are the outputs achieved likely to contribute to intended outcome results?</i></p>	<p>All projects contributing to the outcomes were achieved on time except for ERRP and GLOF, which were delayed by 6 months each because of external, unforeseen circumstances by partner IPs and accessibility issues due to Cyclone Aila floods in 2009.</p> <p>However, there are major delays in achieving outcome 7, especially in terms of multi hazard mapping/atlas and developing disaster management plans; and aspects of outcome 5 in terms of establishing emergency operation centers and standard operating procedures, mainly because of limited financial and technical capacities at the DDM and IPs.</p> <p>Generally, expenditure over the 10<sup>th</sup> FYP exceeded the overall budget outlay. For instance, the national budget outlay for DDM for the 10<sup>th</sup> FYP (Nu. 13 Million), according to audited statement for 2013 have exceeded by 150%. However, this kind of expenditure happened as a result of IP commitment and financial input toward DM programs considering the needs of the target population.</p> <p>The DDM was initially instituted as a division and later up-graded to a department within the 10<sup>th</sup> FYP. This also had implications on the overall budget outlay and expenditure apparently leading to over-expenditure.</p> <p>In the case of externally funded individual project outlay, there is efficient use of resources for most outputs as per planned costs. There are visible cases of innovation and commitment from DDM and partner organizations in carrying out mainstreaming and delivery of outputs using IP technical inputs (eg. CBDRM) saving cost of activities.</p> <p>Budgets were monitored by development partners for externally funded projects, therefore, there has been transparent and standardized reporting at regular intervals.</p> <p>Prior to 2011, there were no workplans for DDM or partners in the Dzongkhags and schools. Workplan schedules were available with the initiation of externally funded projects and activities were carried out accordingly with appropriate monitoring plans at the project and DDM levels (following monitoring systems of funding partners like SAVE and UNDP). All externally funded projects that contributed to the outcomes were eventually evaluated by external consultants.</p> <p>Although, most projects were carried out as a result of available funding and interests from development partners, outputs achieved have contributed highly to the intended outcome results of the planned results-based framework.</p>			

SUSTAINABILITY	A (Very Good)	B (Good)	C (Modest)	D (Poor)
<p><i>Are there financial mechanisms to support scaling up of program?</i></p> <p><i>Can the benefits be sustained if financial support changes?</i></p> <p><i>How far are programs integrated into Dzongkhag and gewog structures?</i></p> <p><i>Have the local partner capacity been adequately developed?</i></p> <p><i>Have institutional capacity been adequately built?</i></p>	<p>There is national commitment to create financial mechanisms within the policy framework to support scaling up of the program within recurrent DM budget for capacity building, facility and infrastructure development, equipment procurement, restoration, response and relief. However, there are no financial provisions for risk reduction programs, although the Act mandates local governments and sectors to mainstream risk reduction programs into their development plans and programs.</p> <p>At the same time none of the financial mechanisms are operational, except for His Majesty's Relief Fund, which is beyond the purview of DDM. In addition, there are numerous technical and financial restrictions and challenges that impede the integration of DRR programs into local government and sector development agenda.</p> <p>It is highly recommended that DDM follow up with the Ministry of Finance to clarify financial modalities as mandated in the DM Act 2013 and take into consideration changes within the financial/budget system.</p> <p>With RGOB's policy commitment, legislative framework support for DM and mainstreaming opportunities for DRR during the 11th FYP period at both the national and local levels, some benefits of the outcomes can be sustained. However, at the capacity and technical input level, DDM has only been implementing programs for one FYP, and there is a need for continued financial and technical support to make programs sustainable and have meaningful impacts.</p> <p>Concerted efforts to build capacity of partner institutions (ministries, dzongkhags and sectors) through ToTs and specialized trainings, and institutional arrangements developed through the establishment of NDMA, DDMCs, SDMCs are progressive but inadequate. Scaling up DRM programs would require further capacity development and institutional support, including the enhancement of multi-sector coordination.</p>			
RELEVANCE	A (Very Good)	B (Good)	C (Modest)	D (Poor)
<p><i>Is the outcome consistent with government policies and global priorities?</i></p> <p><i>Do the outcomes respond to needs of target groups?</i></p> <p><i>Does a results matrix exist? What is the quality of the matrix? Are outcomes, outputs and activities clear and logical? Are risks and assumptions appropriate?</i></p>	<p>Outcomes are consistent with the national plans and policies, Hyogo framework and MDGs supporting environmental sustenance and poverty reduction themes. Outcomes are also consistent with national policies and global priorities in terms of contributing to use of knowledge, enhancing innovation and education, building a culture of safety and resilience at all levels, reducing underlying risk factors, while strengthening disaster preparedness for effective response at all levels.</p> <p>The program and outcomes consider prevalent disasters in the country and overall impacts of events on economic, social and environmental states.</p> <p>A results framework for the 10<sup>th</sup> FYP exists with clear linkages between outputs, outcomes and impacts. However, the quality of the results framework could be enhanced with proper stakeholder analysis, understanding of problems and needs, specifying the theory of change, identifying critical risks and assumptions, assigning appropriate indicators and data sources, and M&amp;E plans.</p>			

## CHAPTER 5 - CONCLUSIONS

### EMERGING ISSUES, CHALLENGES AND LESSONS

#### *INCREASING RISK*

97. Climate change will affect the nature and frequency of climate related hazards leading to increasing challenges, and the need to dovetail climate adaptation and disaster risk reduction measures to make development sustainable and disaster resilient. Apart from increased threats from Glacial Lake Outburst Floods (GLOFs) due to accelerated glacier retreat, Bhutan has been experiencing increased frequency and intensity of seasonal hazards and extreme events over the past few years due to effects of climate change on temperature and precipitation levels. The 2009 floods prompted by Cyclone Aila in the Bay of Bengal, caused a record rise in river levels and triggered damaging floods across the country. Similarly, intense windstorms, thunderstorms and aggravated landslides are being experienced with increased frequency.

98. In addition to the exacerbated natural hazards due to climate change, there are other hazards, which emerged out of survey responses, such as road accidents, aircraft crashes, building collapses, blizzards/ avalanches, droughts and human wild-life conflicts that needs serious attention at the policy and program intervention levels.

#### *VULNERABLE TRADITIONAL CONSTRUCTIONS*

99. The past two earthquake events caused extensive damages to rural homes all over Bhutan demonstrating high vulnerability of traditional buildings to earthquakes and other natural hazards. The Bhutan Building Codes, 2003 mandates inclusion of earthquake-resistant design features in engineering structures but there are no codes yet for non-engineered constructions like rural homes, and community built structures. There is need for research and consolidation of indigenous knowledge related to traditional structures that would help strengthen and conserve traditional construction practices.

100. Another important dimension to this issue is the safety and disaster resilience of heritage buildings and monuments. The loss of such heritage structures and more importantly their contents are irreplaceable. The destruction of Wangduephodrang Dzong is a case in point and other heritage buildings and monuments (lhakhangs, dzongs, chortens, etc.) are equally vulnerable.

#### *IMPROVE PERFORMANCE OF KEY FACILITIES*

101. It is imperative for key facilities such as health centers, schools, disaster management facilities and key public and administrative buildings to be disaster resilient to ensure their functionality during emergencies. Performance of schools and health facilities were unsatisfactory during the past disaster events. There is a need to prioritize vulnerability assessments of these key facilities (including critical disaster management and telecommunication facilities) to enable systematic and mandatory incorporation of seismic resistant and other hazard resilient features particularly for schools, hospitals and other health centers.

*ENHANCING CAPACITIES FOR RISK REDUCTION, RESPONSE AND PREPAREDNESS*

102. With the enactment of the Disaster Management Act of Bhutan in 2013, the challenge now is to effectively implement the provisions of the Act. This would require continued awareness and sensitization of local governments and communities, establishment of institutional and critical structures equipped and adequate technical skills, human resources and equipment. At the same time, financial arrangements for disaster management need to be put in place along with the formulation and adoption of various rules, procedures, mechanisms, standards, procedures and plans as mandated by the Act.

103. There is need for a comprehensive assessment of existing capacities and assets through engagement with stakeholders to understand areas that require additional trainings and formulate a capacity development and advocacy response strategy.

104. During the 10<sup>th</sup> FYP period, DDM provided awareness and basic skills training at the National, Dzongkhag, School and Community levels. However, there is still a need to prioritize and provide specialized trainings for disaster management committees and teams in the areas of search and rescue, fire safety and first aid with adequate corresponding equipment supply.

105. There is especially a need to develop technical capacities of concerned agencies in weather, climate and hydrology for providing appropriate hydrological, meteorological, flood, glaciers and related forecasts, hazard information and services. This kind of information is necessary to develop hazard zonation maps, build standards and codes, and establish effective early warning systems and communication strategies.

106. The Department of Disaster Management is the designated coordinating agency for disaster related policies and programs. However, it is difficult for the agency to fulfill its mandate without functional decision-making and coordinating bodies. Therefore, the formation and functional

National Disaster Management Authority (NDMA), the Inter-Ministerial Task Force (IMTF), the Dzongkhag Disaster Management Committees and Dzongkhag Disaster Management Officers needs immediate attention to step up its role of coordinating multisector disaster management and risk reduction programs and activities.

107. There is a need to continue advocacy and education programs at various levels to share knowledge that can help with identifying hazards and risks, taking actions to build safety and resilience, and reducing impacts of hazards.
108. Continuation of developmental activities and infrastructure building in hazard/red-zone areas, for example in the GLOF red zone areas in Punakha and Wangdue valleys is a looming concern. These kinds of development lead to increasing exposure and higher vulnerability resulting in irrecoverable losses during disasters.
109. Mainstreaming of DRR into development agenda for various sectors is still lacking due to insufficient understanding among stakeholders on the inter-linkages between disaster risks reduction, climate change adaptation and sustainable development.
110. There is need for developing clear mainstreaming guidelines with suggested list of actions/projects formulated and made available to all local governments and key sectors to enable them to integrate DRR into their annual and five year development plans and programs. There is also a need to review available instruments such as the environment impact assessment, vulnerability assessment checklists, and planning guidelines and building codes and standards to facilitate integration at the national and local levels.
111. As a land-locked country with high seismic risks and fragile road and communication networks, it would be important to have bilateral, regional and international pre-agreements for response and relief during major disasters. Emergency communication arrangements and a network of emergency operation centers at the national level and strategic areas would help in early warning dissemination and information sharing and management.

***LACK OF CAPACITY AND COORDINATION TO DEVELOP A MULTI-HAZARD ATLAS FOR BHUTAN***

112. The development of a multi-hazard atlas for Bhutan has been a priority since the formulation of the National Disaster Risk Management framework in 2006. However, to put together such a map there is need to

coordinate capacities in various technical agencies and to consolidate the existing information and maps on different hazards. There is also a need to coordinate efforts towards the development of a multi-hazard atlas and the conduct of a multi-hazard risk assessment and mainstream disaster risk concerns and promote risk sensitive development and land use planning. The generation of maps and accumulation of risk information, would enhance decision-making in terms of investment and development plans, land use and inform mitigation and preparedness plans of local governments and different sectors/agencies.

#### *RECOVERY/ RE-CONSTRUCTION LESSONS*

113. Recovery and re-construction processes/ activities undertaken after the 2009 and 2011 earthquake events have demonstrated numerous challenges and lessons. There was a lot of confusion not only in terms of immediate response but also in the sequencing and conduct of various damage/ rapid assessments. Immediate post disaster information gathering and assessment efforts have a bearing on the ability to mobilize resources and raise funds for recovery and re-construction.

114. In the case of past events, damage assessments were carried out by the dzongkhag administrations and it was a challenge standardizing damage assessment tools and reporting procedures. Joint post-disaster needs assessments with UN and WB were also conducted, based on which the National Recovery and Re-construction Plans (NRRP) were formulated. Implementation for both the NRRPs required extensive prioritization within the sector and dzongkhag budgets and many planned activities were foregone to accommodate recovery and re-construction activities. Mobilizing resources for the NRRPs have been difficult and many activities under 2011 NRRP still remain unimplemented due to lack of funds.

115. Both the NRRPs have highlighted the need to “build back better”, however the opportunity for risk reduction and making structures safer and more resilient during the re-construction process has been overlooked. This may due to financial reasons however it would be extremely cost effective to make structures more resilient during the re-construction period rather than having to wait for similar losses during future disasters or trying to strengthen structures after completion.

#### *RISK FINANCING*

116. A well-designed risk financing program enables a disaster-prone country to avoid major economic disruptions following natural disasters by meeting its post-disaster funding needs without resorting to major budget reallocations, additional taxation, or external borrowing. At present, the

Rural Housing Insurance Scheme (RHIS), a highly subsidized government program implemented through the Royal Insurance Corporation of Bhutan (RICB) is an excellent example of social insurance. Rural homes are insured on a mandatory basis and this provides them with some finances to recover from disaster events. There is need for Bhutan to have a well-designed risk- financing program to enable meeting post-disaster funding needs and to facilitate families to have the means to rebuild after a disaster.

117. Another barrier has been the lack of financial resources to implement risk reduction and adaptation activities prioritized by local governments and national agencies. Lack of tools, required information and capacities to monitor and assess the risks has also hindered integration and implementation of risk reduction/adaptation activities.

#### RECOMMENDATIONS

118. Recommendations have been provided below as short-term and medium to long-term recommendations. It is expected that the short-term recommendations may be implemented within the course of the 11<sup>th</sup> FYP and the medium and long-term recommendations may go beyond two or more five-year plan periods. There are 25 short-term recommendations and 15 medium to long-term recommendations.

#### *SHORT TERM RECOMMENDATIONS*

119. The evaluation highly recommends finalization and implementation of DM Rules and Regulations to further clarify roles and responsibilities of different stakeholders and provide clear direction and standard procedures for risk reduction and response.
120. The DM Rules and Regulations should incorporate specific provisions for inclusion of marginalized communities; recognize the importance and role of indigenous knowledge systems in DRR; mainstream gender perspectives as disaster events often highlight gender imbalances in a community especially in terms of vulnerabilities, capacities, and socio-economic standing; and provide specific provisions for climate change adaptation (CCA) as DRR and CCA are closely linked.
121. Disaster events faced by Bhutan may not appear significant in comparison with disasters faced by other countries. However, such events coupled with frequent losses to recurring and seasonal hazards have serious impact on the assets and livelihoods of the people and on development gains made so far. Therefore, the evaluation recommends that the NDRMF 2006 be reviewed and updated to include strategic risk

reduction and preparedness strategies and measures, including policies for construction in GLOF red zones and other hazardous areas, CCA and DRR linkages, disaster resilient building designs and construction standards for schools and health facilities among others.

122. The evaluation recommends putting in place a strategic national risk reduction plan. This could be part of the National Disaster Risk Management Strategy or in the form of the National Disaster Management Plan. This strategy or plan should identify key vulnerabilities, risks, and capacities required and detail out projects/ activities for risk reduction and mitigation on a prioritized basis.
123. Risk reduction and mitigation measures are supposed to be mainstreamed into development plans and programs. This has been challenging due to insufficient understanding of the importance of incorporating risk reduction measures for sustainable development and due to lack of mainstreaming tools. Therefore, mainstreaming guidelines, tools, sensitization on the need to mainstream DRR and establishing clear linkages between DRR, CCA and sustainable development needs to be expedited to facilitate integration into plans and programs over the 11<sup>th</sup> FYP.
124. The evaluation recommends vulnerability and risk assessments of critical structures such as – schools, health facilities, important public and administrative buildings and critical disaster management facilities - be conducted and recommendations to either replace or strengthen structures be implemented in a prioritized and phased manner.
125. There is need to urgently reduce disaster risks and enhance preparedness levels in cultural heritage sites and monuments. The evaluation recommends vulnerability and risk assessments for heritage sites and putting in place structural and non-structural mitigation measures as well as fire safety, emergency evacuation and communication plans.
126. Database systems such as the Disaster Management Information System (DMIS), DevInfo, Desinventar, have been developed and are available on the DDM website. However, they are dysfunctional due to incomplete data and lack of usage. The evaluation recommends scrutinizing the existing tools, clarifying objectives and use of each tool, and coming up with a comprehensive system that could be both web-based and mobile-based to facilitate efficient data collection and sharing.

127. The evaluation also recommends DDM to make serious efforts to have in place up-to-date database/information on – past disasters/ incidents, pre-disaster information, program/project related information and post-disaster information. This would ensure quick and effective decision-making during emergencies.
128. Serious efforts have been made at school and Dzongkhag levels to build disaster management capacities. However, there is still a lot that needs to be done in terms of building response capacities, including infrastructure and equipment, and in terms of building technical capacities in various sectors to undertake risk reduction and preparedness works. The evaluation recommends conducting a comprehensive capacity needs assessment to identify capacity needs at all levels.
129. It is recommended that DDM formulate and adopt Planning guidelines and Contingency planning guidelines urgently to facilitate the development of disaster management and contingency plans at various levels.
130. More than 90% of the key individual/ focal person respondents have prioritized training in response (first aid, search and rescue, psycho-social trauma management and fire safety) for their committees and teams and have specified having SAR equipment, first aid kits and fire safety equipment as a necessity. Therefore, the evaluation recommends providing specialized and focused capacity building to dzongkhag and school teams and committees and positioning adequate SAR equipment, first aid kits and fire safety equipment to enable them to respond effectively during emergencies. Search and rescue teams should also be formed at community levels and they should be provided with the necessary training and resources.
131. The evaluation recommends putting in place a National Contingency Plan with clear response system and procedures, including the institution of Incident Command System and a Cluster Approach to streamline information needs and clarify roles and responsibilities during response.
132. The evaluation recommends clarifying and developing a post disaster assessment framework. This framework should clarify the various types of assessments (damage assessment, safety assessment, needs assessment, etc.), the objective of the assessment, the time frame in which the assessment should take place, the assessors and the use of the assessment information/data. Assessment tools should be formulated and trainings conducted for the recommended assessors. In view of this and learning from recent post-disaster experiences the Bhutan Disaster Assessment Tool should be reviewed, adapted and instituted urgently.

133. To support risk reduction and preparedness programs and activities and to facilitate the role of the DDM as the national coordinating agency, the evaluation recommends instituting and making the financial funds and budget specified in the DM Act, 2013, functional. The study also recommends putting in place clear financial mechanisms and procedures to access the financial provisions as per the Act.
134. To aid resource mobilization for response and recovery, projects and activities could be prioritized so that reallocation of funds in times of disasters, if needed, can be made from low priority projects. This would ensure that critical development projects are not hampered due to a disaster. Based on recent recovery and re-construction efforts, the government should also insist on pooling all assistance and contribution made towards recovery and re-construction works under one financing code to make it easier for allocation of funds and for effective monitoring and reporting of activities and expenditures.
135. Household level survey results indicate very low levels of awareness at community level and it is at the community level where families and individuals need to be aware of safety measures and protective actions during various natural hazard events. There is need for DDM to reassess its awareness programs and strategies and refocus on communities. The evaluation therefore recommends the development of a comprehensive awareness and education strategy that would include the necessary risk information, safety messages, protective actions to take, target audience, and appropriate risk communication channels and mediums. Respondents at community level identified advocacy through television, radio and gewog and dzongkhag level meetings as their preferred source of information. Awareness should also be provided to communities/ families on preparing family preparedness plans and on taking care of children/people with special needs.
136. There is also need to continue and intensify safe construction training programs for local masons and carpenters and also include homeowners, as far as possible, during sensitization or in the training.
137. The evaluation recommends forging partnerships with various media channels to create and disseminate advocacy and safety programs for the public through their corporate social responsibility arrangements.
138. The evaluation also recommends conducting awareness programs for the monk body, especially for the caretakers of lhakhangs, goendeys, dzongs and other cultural heritage sites.

139. Efforts should be made to include families and communities in ongoing awareness events like the marking of the International Disaster Reduction Day and the Annual School Preparedness Day. The annual school preparedness drill could be extended to include government offices, private businesses and families.
140. At the school level, the need for specialized training of trainers in disaster risk reduction and response to ensure safety of special needs children was reflected as an important priority and the evaluation recommends the same. Another important need expressed by school respondents was the positioning of tools and equipment in schools. The evaluation recommends providing standard SAR equipment, first aid kits, fire safety equipment and other standard resources in all schools.
141. More than 40% of key individual/ focal person respondents mentioned the need for appointing Dzongkhag Disaster Management Officers (DDMO) as per the DM Act. Currently there is a high turnover of disaster management focal persons at dzongkhag and sector level, which impedes continuity and sustainability of DM programs. In the short term, to efficiently facilitate DM committees, improve coordination and implement DM programs and activities at local level, the evaluation recommends issuing a policy directive from the NDMA to the Dzongkhags, directing them to appoint Dzongkhag DM officers from among their staff and formally fixing their roles and responsibilities. The DDM should draw up an official ToR for the DDMOs in coordination with the RCSC and the dzongkhags.
142. To improve DRM program management, the evaluation recommends basic principles to be followed in terms of program planning, monitoring and coordination and to ensure building an enhanced culture for effective results based management. Situational analysis including background studies, needs assessments, stakeholder analysis, etc., will clarify needs, interests, priorities and resources for DRM and help establish realistic and strategic program goals and an effective results framework.
143. DDM should put in place an effective monitoring and evaluation plan or performance measurement framework to assess and demonstrate progress toward expected results. The evaluation strongly recommends developing monitoring and evaluation tools concurrent with results based management.

#### *MEDIUM TO LONG TERM RECOMMENDATIONS*

144. Though the NDRMF and the Draft National Disaster Management Act envisions a more proactive and risk reduction approach to disaster management, in reality, disaster management is still approached in a reactive and ad hoc manner. Fund allocation for risk reduction needs to be considered seriously and creative means to finance risk reduction should be explored.
145. Risk reduction could also be supported by advocating for development grants and projects funded by donor agencies to integrate disaster risk reduction/ resilience in the project activities and to maintain provisions for disaster recovery, if required. This will ensure that pressure is not put on government resources should a disaster occur during the implementation of the project.
146. Risk assessment and hazard maps need to be developed to support informed land use planning. At present, though the framework and the Act specify the development of a multi-hazard atlas as a priority, hazard maps and risk assessments for different hazards are conducted and exist in various different agencies for many different purposes. To mainstream disaster risk concerns and promote risk sensitive development planning, there is need to make serious and coordinated efforts towards a development of a multi- hazard atlas and the conduct of a multi-hazard risk assessment.
147. In addition, it is recommended that hazard risk assessments form an important component of any investment project so that mitigation measures are put in place to reduce losses from a disaster. This may mean spending more but studies conducted in the past indicate that this increase in cost is minimal but with increased benefits in the future. The evaluation also recommends a policy decision be taken on the issue of development in already identified GLOF red-zone and other high hazard areas.
148. In view of a large stock of rural homes/ traditional structures, the evaluation recommends conduct of research and development of codes for safe construction of various traditional structures.
149. The National Emergency Operation Center needs to be established along with a network of prioritized emergency operation centers at local levels to facilitate information sharing, communication flow and unified and efficient decision making. Evaluation recommends having in place clear

information sharing and risk/emergency communication procedures. Attention should also be given to the involvement and usage of various media channels for information sharing and dissemination.

150. The evaluation also recommends the establishment of GLOF early warning systems, similar to the end-to-end automatic system established in the Puantsangchu river basin, in the other GLOF vulnerable valleys and river basins. Establishment of early warning systems should also look beyond GLOF to include common and seasonal disaster events such as windstorms, floods, landslides and thunderstorms. Community centered early warning systems are recommended, which would also include schools, health facilities and other essential service facilities in the vulnerable area.
151. The evaluation recommends establishment of a National Emergency Operation Centre to facilitate a unified information and command flow during emergencies and to also serve as an information and decision making hub. A network of prioritized emergency operation should be pursued in a phased manner.
152. The evaluation also recommends strengthening capacities of other response/emergency agencies such as – emergency medical services in the Ministry of Health and the fire services division under the Royal Bhutan Police. There is need for standard fire stations to be established in each dzongkhag and thromde with adequate manpower and equipment. It may be worthwhile to consider forming a Fire and Emergency Services Department under the Ministry of Home and Cultural Affairs that would encompass the fire services division and take on the additional responsibilities of search and rescue in various circumstances (river rescue, road accidents, building collapse, etc.).
153. There is also high turnover of trained personnel, teams members, committee members, that all result in human resource and capacity issues. The evaluation recommends certifying trained personnel (especially SAR member and other specialized trained personnel) and for DDM to maintain a database and have arrangements with parent ministries/ agencies to keep track of trainees and ensure that their skills and knowledge are being used.
154. There is need for skills and capacity development in weather forecasting, developing climate/ hydrology modeling, in seismology/ glaciology and in conducting hazard and risk assessments. The evaluation recommends building these capacities in the relevant sectors/ agencies to enable weather/ climate forecasting, generating hazard/risk information,

and generating and communicating early warning information related to various hazards.

155. To ensure smooth relief and recovery processes, the evaluation also recommends formulation and adoption of standards for relief as per international standards and guidelines.
156. Learning from the experience of past recovery and re-construction efforts, there is need to streamline, enhance and adopt resource mobilization strategies and mechanisms. This could be developed in coordination with UN, WB and other International Agencies and Donor partners in Bhutan. A disaster contingency fund could be created to raise resources that could be used for disaster recovery and re-construction purposes
157. The RICB recently re-evaluated the RHIS to meet emerging damage compensation needs and challenges. Houses are now categorized in more detail and their premiums and insurance compensations are based on building type. In addition to this, innovative insurance schemes also need to be developed and promoted for the housing sector and for agricultural assets such as livestock and crops, which would ensure families the ability to rebuild their lives. Present Rural Housing Insurance Scheme and others could be reviewed to encompass emerging needs and be incentivized for both premiums and payouts to be linked to the undertaking of identified mitigation measures, adoption of building codes, fire safety provisions, etc.
158. More than 60% of respondents at school level reported the need to have hazard and disaster risk information incorporated into school curriculum. The evaluation recommends pursuing the possibility and effectiveness of reviewing relevant school curriculum and incorporating DRR concerns.

#### WAY FORWARD

159. The DDM needs to immediately review and provide clear focus to the national DRM program facilitated by them. It would be important to take stock of progress made, activities undertaken, current needs and of programs and achievements in other sectors/ agencies and formulate a clear vision, mission and objectives for the DDM led program. This will help them prioritize key areas of intervention and formulate strategies and projects accordingly.
160. Another important step would be to concentrate on consolidating the efforts taken so far. The Disaster Management Planning Guidelines, the Contingency Planning Guidelines, DM Act – Rules and Regulations and

the National Disaster Management Strategy need to be finalized urgently to support the formulation of Dzongkhag and Sector plans and provide further clarity on roles and responsibilities and Act related procedures.

161. Another priority would be to pursue establishment of various institutions, mechanisms and human resource (IMTF, DDMCs, DDMOs) mandated in the DM Act and formulate related procedures, rules, guidelines and standards. It would also be important to provide sensitization on the provisions of the Act
162. DDM's main responsibility is to provide awareness and information on disaster management and facilitate building disaster management capacities at various levels. There is need to conduct a comprehensive capacity needs assessment and formulate a capacity and awareness building strategy for all levels (community, schools, dzongkhags, sectors).
163. Another important priority would be to capture the opportunity provided by the 11<sup>th</sup> FYP to mainstream "disaster management and resilience" into sector and dzongkhag development plans. DDM should proactively support and facilitate dzongkhags and sectors by providing sensitization, knowledge, tools, guidelines, etc. to incorporate elements of disaster resilience into their activities, projects and programs.
164. For more evidence and for the effective establishment of linkages between disasters and development, more research needs to be conducted. Some of the immediate research could focus on – status of the NRRP activities, the progress and challenges in achieving national and sector key result areas – problems and challenges faced, the impact of the recent disaster events on the performance of local governments, the effect of damages on schools on the academic performance of students, the number of hygiene and sanitation facilities affected and corresponding impact, the allocation and use of maintenance budgets provided to schools and the relationship between poverty and disasters.
165. Successful implementation of the DRM program and the recommendations would also require building partnerships at local, national, regional and international levels. There is need to forge innovative partnerships with local civil society organizations to support communities to build sustainable and resilient lives. Partnerships should also be forged with volunteer groups and the armed forces to enable smooth coordination during for response during emergencies.

ANNEXURE I – EVALUATION MATRIX

Criteria	Key Questions	Indicators	Data Sources	Methods and Tools
<p><b>Effectiveness</b></p> <ul style="list-style-type: none"> <li>• Extent to which the outcomes and intended impacts have been achieved as per the results framework</li> <li>• Measuring change in the observed output or outcome</li> <li>• Determining contributions toward observed changes</li> <li>• Judging the value of the change (positive or negative)</li> </ul>	<p>What proportion of outcomes have been achieved?</p> <p>What is the quality of the results in terms of observed changes contributed by the activities?</p> <p>Are the indicators for the outcome appropriate and are they being reported against?</p> <p>To what extent did women and marginalized groups benefit from the program?</p>	<p>Outcome 1</p> <ul style="list-style-type: none"> <li>• Proportion of policy documents, guidelines and SOPs in operation against planned target</li> </ul> <p>Outcome 2</p> <ul style="list-style-type: none"> <li>• Frequency (#) of Skills and knowledge training by gender</li> <li>• # of participants in training by gender</li> <li>• Number of HHs adopting risk reduction measures</li> <li>• # of sector and dzongkhags reflecting DRR concerns</li> <li>• # of dzonkhags with DM plans</li> <li>• # of schools with DM plans</li> <li>• # of linkages and MOUs signed</li> </ul> <p>Outcome 3</p> <ul style="list-style-type: none"> <li>• # of database, websites, information systems</li> <li>• Frequency of data updates and report</li> <li>• Number of early warning stations/systems</li> <li>• # of dzongkhags receiving early</li> </ul>	<p>Outcome 1</p> <ul style="list-style-type: none"> <li>• NDRMF, DM Act, SOPs, DM planning guidelines, SDMP guidelines, contingency planning guidelines, Standards for relief, compensation, pre &amp; post assessment guidelines, DM rules and regulations, DDM staff</li> </ul> <p>Outcome 2</p> <ul style="list-style-type: none"> <li>• Progress/monitoring report, training report, DDM program staff, project managers, dzongkhag/sector focal persons.</li> <li>• Beneficiaries</li> <li>• DDM staff, Dzongkhag and sector planning officers, GNHC, focal persons</li> <li>• Dzongkhag focal persons, DDMC, DDM staff</li> <li>• School focal persons, principals, EIE (MOE)</li> <li>• DDM staff</li> </ul> <p>Outcome 3</p> <p>DDM staff, Dzongkhag IT officers, focal persons DDM staff, Dzongkhag IT officers, focal persons Hydromet services</p>	<p>Desk review and key informant interview, questionnaire</p> <p>Desk review, questionnaire and key informant interview</p> <p>Key informant interview Survey using questionnaires</p> <p>Desk review and key informant interview</p> <p>Desk review and key informant interview, field observation</p>

		<p>warning</p> <p>Outcome 4</p> <ul style="list-style-type: none"> <li>• Frequency of IEC materials</li> <li>• Frequency of advocacy programs</li> <li>• # of schools observing IDRR day/national DRR events</li> </ul> <p>Outcome 5</p> <ul style="list-style-type: none"> <li>• EOC manual</li> <li>• # of EOCs and SOPs</li> <li>• Frequency and number of households benefiting from emergency/relief funds</li> </ul> <p>Outcome 6</p> <ul style="list-style-type: none"> <li>• # of HHS receiving funds</li> <li>• Amount of funds released</li> <li>• Ease of accessibility</li> </ul> <p>Outcome 7</p> <ul style="list-style-type: none"> <li>• Number of assessments per hazard</li> <li>• # of maps</li> </ul>	<p>DDM staff, focal persons, schools, community members</p> <p>DDM staff, focal persons, schools, beneficiaries</p> <p>DDM, Dzongkhag focal persons</p> <p>Program document, stakeholder analysis, M&amp;E protocol, reports, program staff, partners</p> <p>Community members, RICB, DDM, MOF</p> <p>DGM, Hydromet, Soil Services Centre, Dept. Roads, Dept of Human Settlement, RSPN, DES</p>	<p>Desk review, field observation and key informant interview/questionnaires</p> <p>Desk review, field observation and key informant interview/questionnaires</p> <p>Desk review, questionnaires and key informant interviews</p> <p>Desk review and interviews, questionnaire</p>
<p><b>Efficiency</b></p> <p>Measure how resources (financial, technical, human, etc.) have been used appropriately and cost effectively.</p>	<p>To what degree are outcomes achieved on time? If delayed? Why?</p> <p>To what degree were outcomes achieved within estimated costs? If there is over-expenditure, why?</p> <p>Is a workplan schedule available and used?</p> <p>How well are activities</p>	<p>Proportion of achievement of outputs/outcomes against planned targets</p> <p>Proportion of time per output/outcome</p> <p>Proportion of costs per output/outcome</p> <p>Proportion of outputs/outcomes not achieved against</p>	<p>Progress/monitoring report, DDM staff, DGM, DHMS, Culture, Health, education, UNDP, GFDRR, UNICEF, WHO, SCI, ADB</p> <p>Progress/monitoring report, DDM staff, DGM, DHMS, Culture, Health, education, UNDP, GFDRR, UNICEF, WHO, SCI, ADB</p>	<p>Desk review, key informant interviews, questionnaires</p> <p>Desk review, key informant interviews, questionnaires</p>

	<p>monitored and corrected?</p> <p>Are the outputs achieved likely to contribute to intended outcome results?</p>	<p>planned targets and reasons for non-achievement</p> <p>Proportion of resources spent per outcome</p> <p>Percentage of resources spent per outcome</p>	<p>Progress/monitoring report, DDM staff, DGM, DHMS, Culture, Health, education, UNDP, GFDRR, UNICEF, WHO, SCI, ADB</p> <p>DDM staff, progress/monitoring reports</p>	<p>Desk review, key informant interviews, questionnaires</p> <p>Desk review, key informant interview, case stories/individual responses</p>
<p><b>Sustainability</b></p> <p>Assess the extent to which the outcomes are practicable and whether sustainable mechanisms have been put in place.</p>	<p>Are there financial mechanisms to support scaling up of program?</p> <p>Can the benefits be sustained if financial support changes?</p> <p>How far are programs integrated into Dzongkhag and gewog structures?</p> <p>Have the local partner capacity been adequately developed? Have institutional capacity been adequately built?</p>	<p># of Self help groups HR, equipment, committees, teams, authority, monitoring system</p> <p>Funds, fundraising strategies, budgets</p> <p>Guidelines, policies,</p> <p># of strategies and plans integrating DRR</p> <p># of Dzongkhag/community level HR and institution</p> <p># of unanticipated threats resolved</p> <p>Strategies and plans</p>	<p>Community members, DDM staff, focal persons, MOF, OGZ, Donor Agencies</p> <p>DDM staff, Strategies and budgets documents</p> <p>DDM staff, Strategies and budgets documents</p> <p>DDM staff, Strategies and plan documents</p> <p>DDM staff, focal persons</p> <p>Progress reports, evaluation reports, DDM staff, focal persons</p> <p>DDM and strategic documents</p>	<p>Questionnaires, desk review, key informant interviews</p> <p>Desk review, key informant interview, survey using questionnaires</p> <p>Desk review, key informant interviews</p> <p>Desk review and key informants</p>
<p><b>Relevance</b></p> <p>Measure the extent to which the outcomes have contributed to national, international, global priorities and goals.</p>	<p>Is the outcome consistent with government policies and global priorities?</p> <p>Do the outcomes respond to needs of target groups?</p> <p>Does a results matrix exist? What is the quality of the matrix? Are outcomes, outputs and activities clear</p>	<p>No. of plans and documents that support DRM</p> <p>Proportion of activities and output contributing to outcome</p> <p># of stakeholders involved in program design</p>	<p>National strategies, program documents, DDM staff</p> <p>DDM staff, strategies, plan documents</p> <p>National strategies, program documents, DDM staff</p>	<p>Desk review and key informant interview</p> <p>Desk review and key informant</p>

	and logical? Are risks and assumptions appropriate?			Desk review and key informant interviews
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## ANNEXURE II - LIST OF DOCUMENTS REVIEWED

1. UNDP Guidance on Outcome Level Evaluation, 2011
2. Handbook on Planning, Monitoring and Evaluating for Development Results, UNDP, 2009
3. Terminal Evaluation Report, Reducing Climate Change-Induced Risks and Vulnerabilities from Glacial Lake Outburst Floods in the Punakha, Wangdue and Chamkhar Valleys (GLOF), January 2014
4. Terminal Evaluation Report of the Bhutan Recovery and Re-construction Project, 2012
5. Final Report of the Outcome Evaluation for UNDAF Outcome 5 – Environmental Sustainability, Disaster Management, Energy and Biodiversity Conservation, 2012
6. GLOF EWS Punakha-Wangdue valley lessons, DHMS, 2012
7. 10<sup>th</sup> FYP documents
8. National Disaster Risk Management Framework, 2006
9. Disaster Management Act of Bhutan, 2013
10. Contribution from Bhutan to the HFA 2, DDM, 2014
11. HFA online monitoring reports.
12. Examples of Lessons Learnt and Good Practices from Bhutan, DDM, 2014
13. PIP Study Report on Mainstreaming in the Education and Road Sector, ADPC, 2011
14. Department Achievement Reports (2010-2013), DDM
15. National Adaptation Programme of Action (NAPA), 2006, NEC
16. NAPA – Update of Projects and Profiles, 2012, NEC
17. UNEG Quality Checklists for Evaluation Terms of Reference and Inception Reports, 2010
18. Learning Lessons from Natural Disasters, Lessons Learned from Bhutan, 2011
19. National Recovery and Re-construction Plan, 2009
20. National Recovery and Re-construction Plan, 2011
21. Joint Rapid Assessment for Recovery, Risk Reduction and Reconstruction, 2009
22. UNESCO-Ritsumeikan Post Earthquake Technical Mission to Bhutan, November, 2009
23. Narrative Report on CBDRM ToTs for Paro Dzongkhag and roll out to

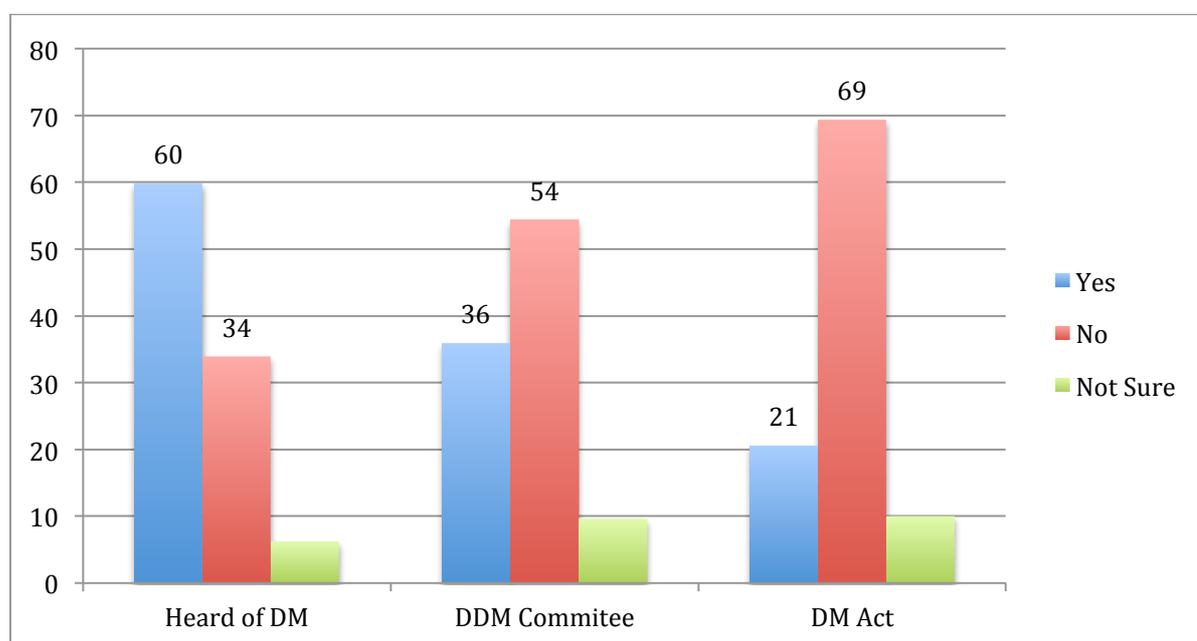
- Wanchang Gewog from 20<sup>th</sup> – 26<sup>th</sup> January, 2014 at Paro
24. Training of Trainers on Community Based Disaster Management for the Dzongkhag Disaster Management Committee of Thimphu Dzongkhag from 23<sup>rd</sup>-28<sup>th</sup> November 2009.
  25. Report for the Consultative Workshop on Consolidation of Disaster Management Plan for Paro Dzongkhag, 2014
  26. External Evaluation of the Project - Child Centered Disaster Risk Reduction, Bhutan, Save the Children Bhutan, 2011-2012
  27. Workshop on “School Safe from Disasters” for the Principal and Focal Teacher of Schools in Bumthang Dzongkhag conducted in Wangdi Chholing Lower Secondary School, Bumthang from 25<sup>th</sup>-28<sup>th</sup> May 2010.
  28. Report on “Workshop on Disaster Preparedness and Response for Safe School”, 2013.
  29. Report on “Training of Trainers for Core Group on Disaster Preparedness for Safer School – Making Schools Disaster Resilient” from 5<sup>th</sup> – 14<sup>th</sup> October, 2013 at Bumthang

#### ANNEXURE III – DATA COLLECTION TOOLS

1. Household Beneficiary Survey
2. Focal Person/ Key Individual Questionnaire
3. Semi-structured Interview Guide

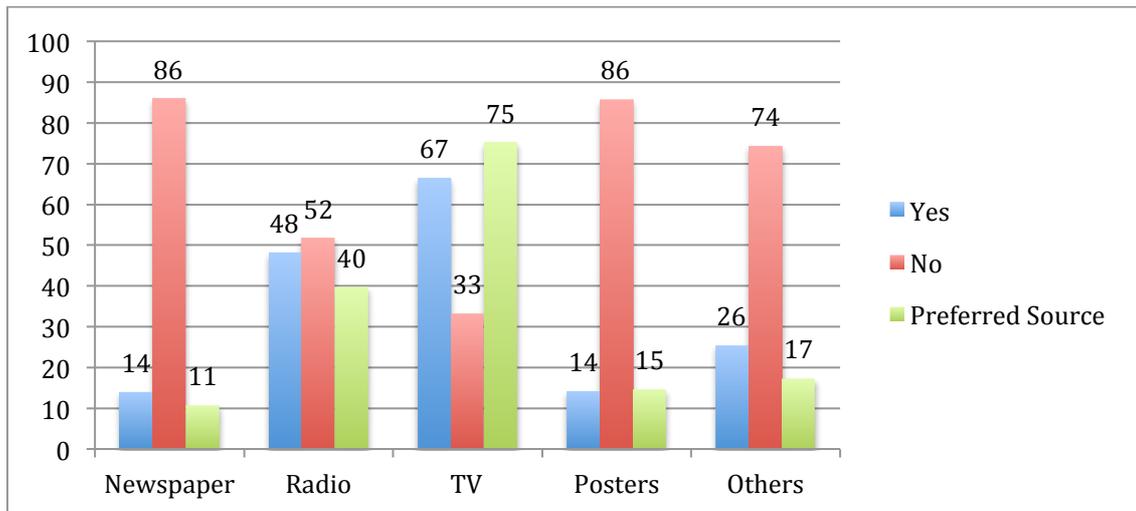
## I. Graphs – Household level survey

### a. Level of awareness about disaster management



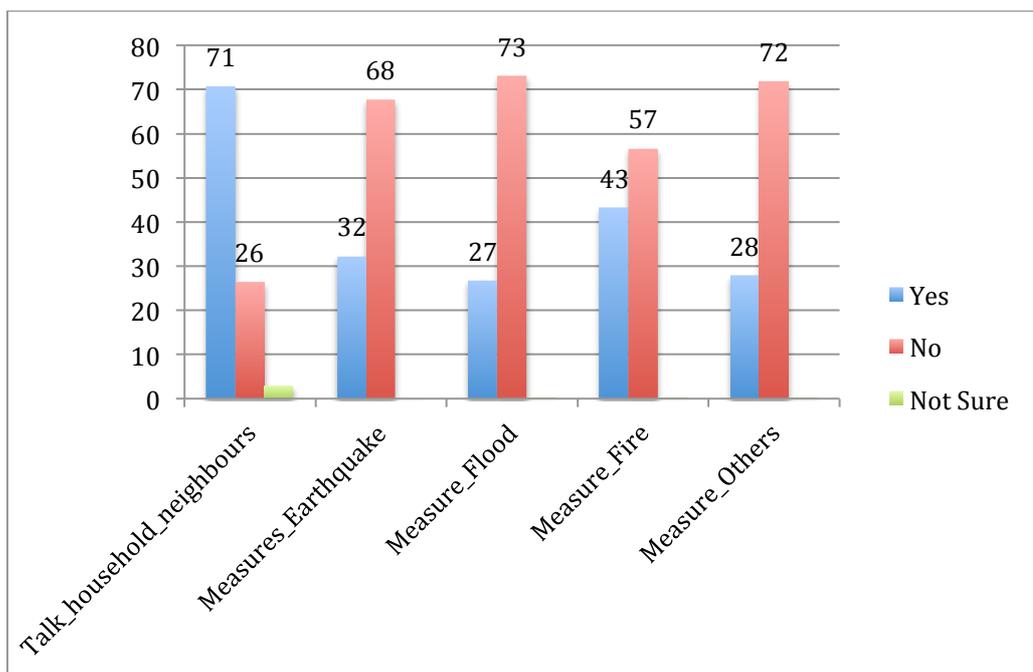
- At least 60% out of the total household respondents have heard about disaster management.
- However, a majority of the respondents did not comprehend the term disaster management. Most of them equated it to disaster events such as earthquakes, floods, and windstorms. Many also defined disaster management as the impacts associated to disaster events. Only a handful had an understanding of disaster management as prevention, preparedness, response and recovery.
- At least 54% of the total respondents in seven Dzongkhags was aware of the Dzongkhag Disaster Management Committee/School Disaster Management committee while 69% was aware of the National Disaster Management Act of Bhutan.
- Awareness on dos and don'ts during an earthquake is low with majority (75%) responding negatively to right actions to be taken during an event. For example, only 29% in Trashigang responded positively to 'drop, cover hold' (when inside) during an earthquake while
- Awareness on dos and don'ts during flooding events seems to be higher at over 80% responding positively to 'climbing higher grounds' but it can be attributed to common sense rather than the impact of advocacy.

**b. Disaster management information sources and preferred information channels**



- The major sources of information on disaster and disaster management at the household level are television (67%) and radio (48%). Twenty six percent of the respondents also heard about disaster management from others including Gewog/Dzongkagh meetings and schools.
- Newspapers and posters have very low impact in terms of raising awareness on disasters and disaster management for reasons attributable to lower literacy.
- At least 75% and 40% of the respondents preferred television and radio respectively, as their main sources of information.

**c. Changes in behavior**



- At least 71% of the respondents talked to neighbours or family members about disaster and/or disaster management after receiving training or hearing about it from one of the various sources of information.
- Behavior change in terms of taking measures against any disaster is low with less than 43% responding positively to fire measures, less than 35% to Flood measures and 32% to earthquake measures..
- On an average, more than 67% of the households do not have any safety measures against earthquake, fire, flood or other disaster including windstorm and landslide.

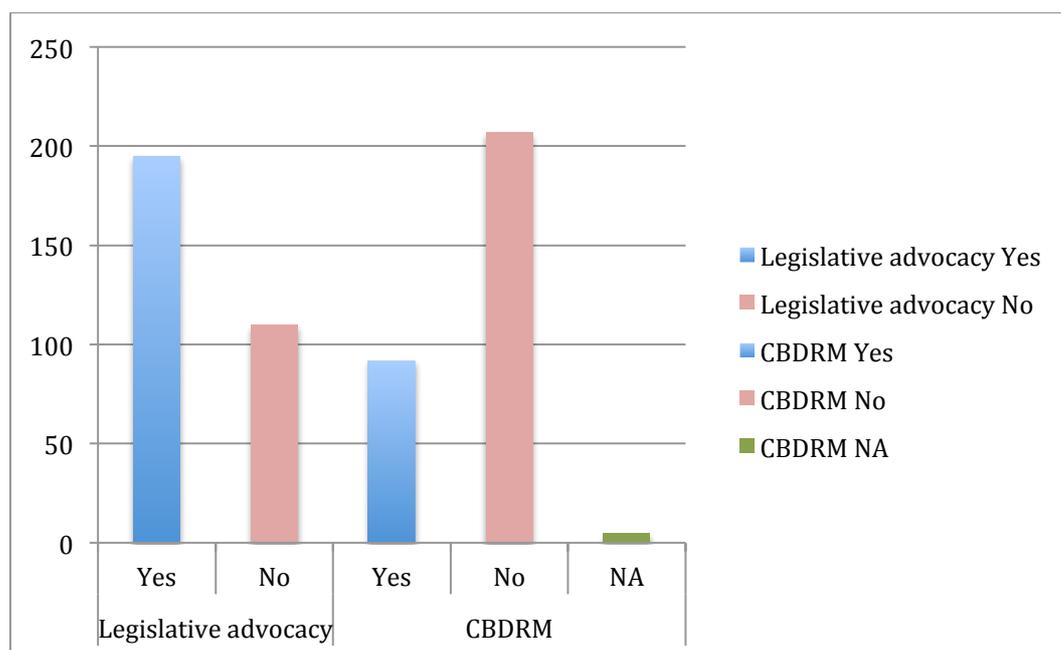
### Capacity Building for Community Members

- Out of 912 households interviewed in seven target Dzongkhags, only 94 (10.3%) households were trained in community based disaster management and 91 (9.9 %) households received training in first aid.
- More than 90% of the respondents wanted some form of training in preparedness, mitigation, and response.

## II. Focal person and key individual survey

### a. Participation in CBDRM and legislative advocacy

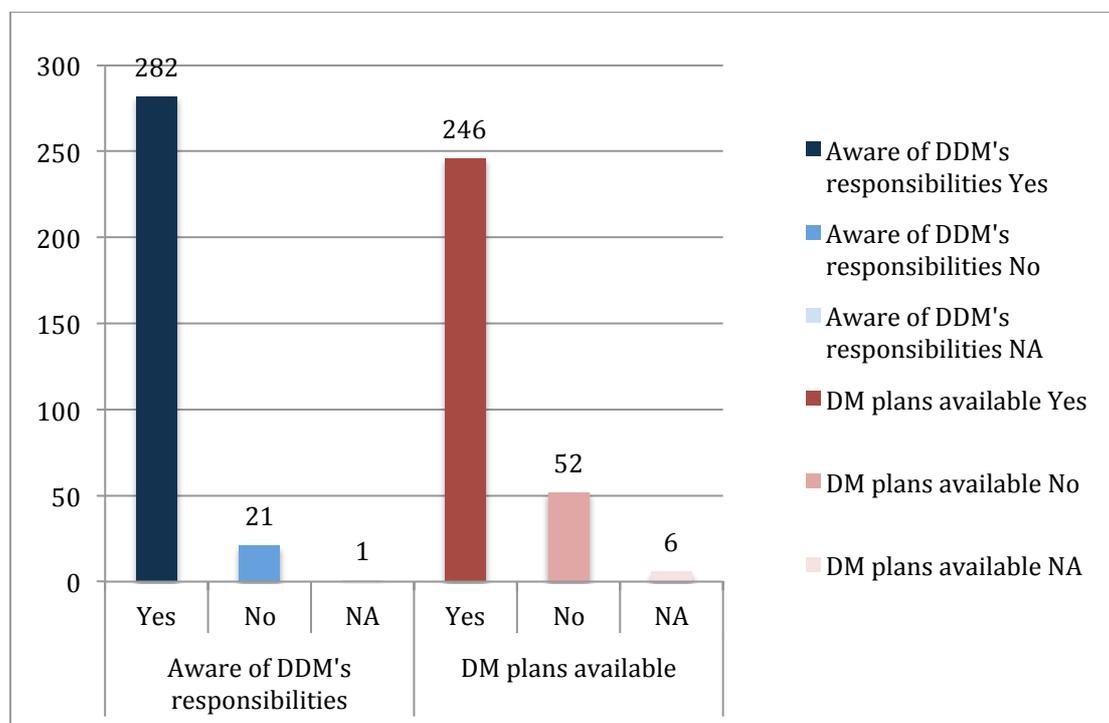
	Participation in CBDRM	%	Participation in Legislative Advocacy	%
Yes	92	30	194	63.8
No	207	68	110	36
NA	5	1.6	0	
Total	304		304	



- More than 60% of the key individual/ focal person respondents had participated in at least one or more awareness/advocacy forums and were aware of the DM Act and various guidelines
- 30% of the respondents had been trained under CBDRM and almost all of them were local government officials. School and sector respondents had not be trained under CBDRM as this is a process for local government officials to come up with their local DM plans.

***b. Aware of DDM's responsibilities and availability of DM plans***

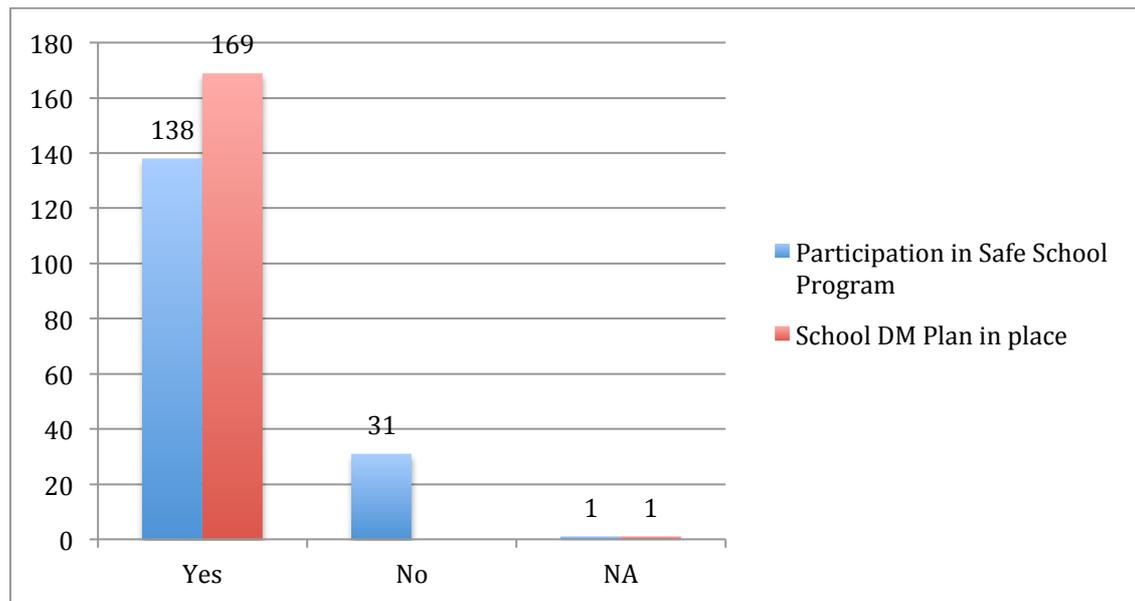
	Aware of DDM's responsibilities			DM plans available		
	Yes	No	NA	Yes	No	NA
Nos.	282	21	1	246	52	6
%	92.8	6.9	0.3	80.9	17.1	2.0



- Almost all respondents (93%) reported as being aware of the Department of Disaster Management and their roles and responsibilities.
- More than 80% of the respondents reported as having some form of DM plans in place. Out of those reporting “yes” , more than 95% were school respondents. At the Dzongkhag level it was only in Punakha, Paro and Tsirang where officials reported that Dzongkhag level DM plans were being formulated.

**c. Participation in School Based DM Programs and Availability of School DM plans**

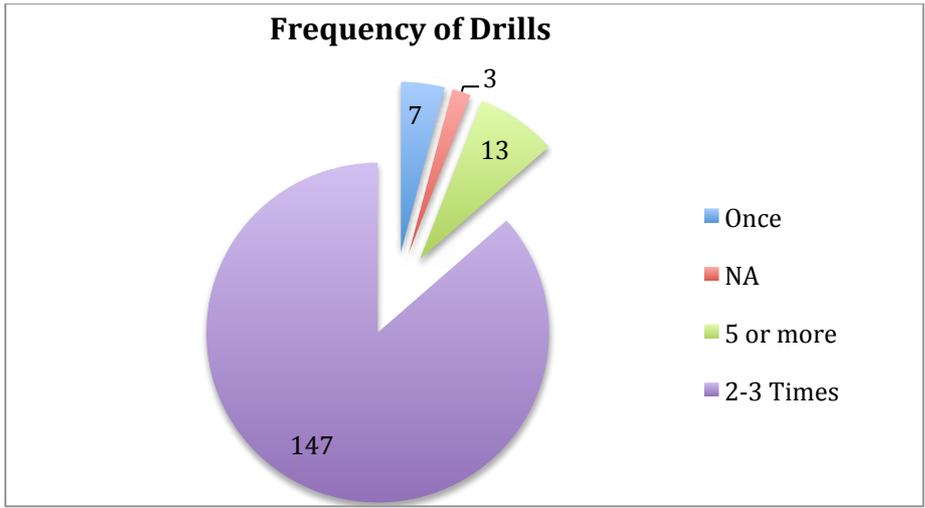
	<b>Participation in Safe School Program</b>	<b>School DM Plan in place</b>
Yes	138	169
No	31	-
NA	1	1
	170	170



- Of the 170 school level respondents, 138 respondents (81%) reported having participated in school based disaster management training and advocacy programs
- All schools have functional school disaster management plans in place. Only one school based participant was unsure of whether the school has a SDMP in place or not.

**d. Frequency of School Drills**

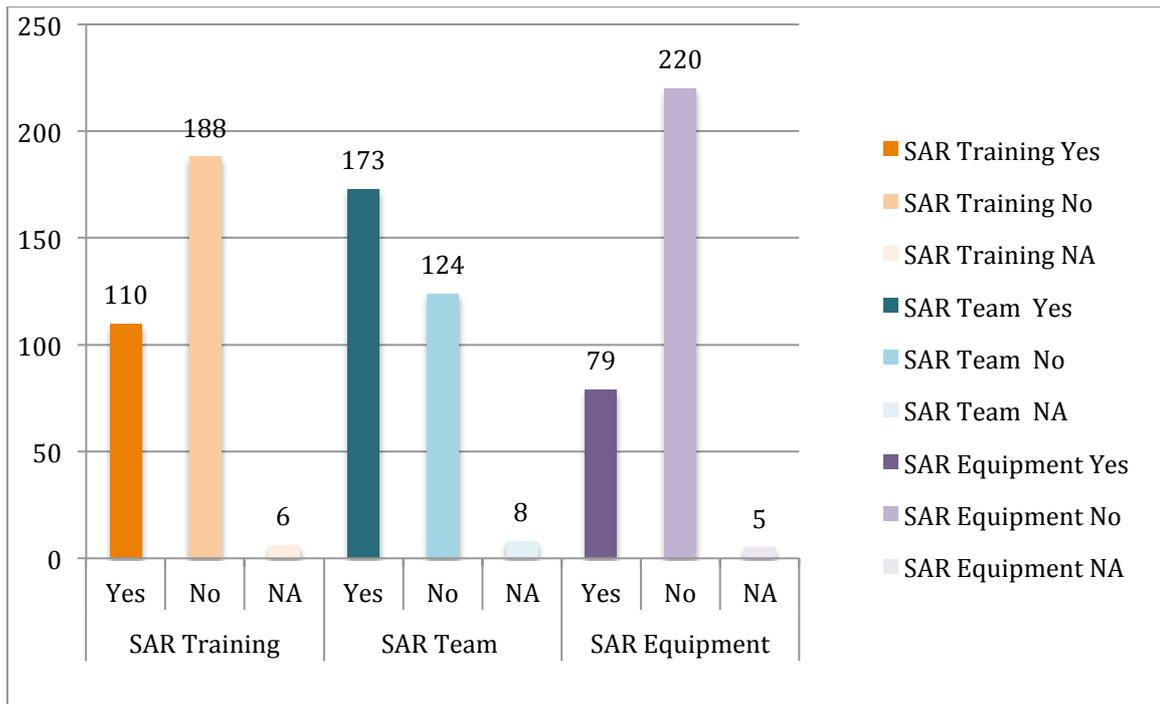
	<b>Frequency of Drills</b>
Once	7
NA	3
5 or more	13
2-3 Times	147



- Of the 170 school level respondents, 147 respondents (86.5%) reported conducting disaster management related drills 2-3 times in a year.
- About 13 schools reported conducting drills more than 5 times a year and 7 reported conducting drills only once a year.

**e. Search and Rescue Training and Equipment**

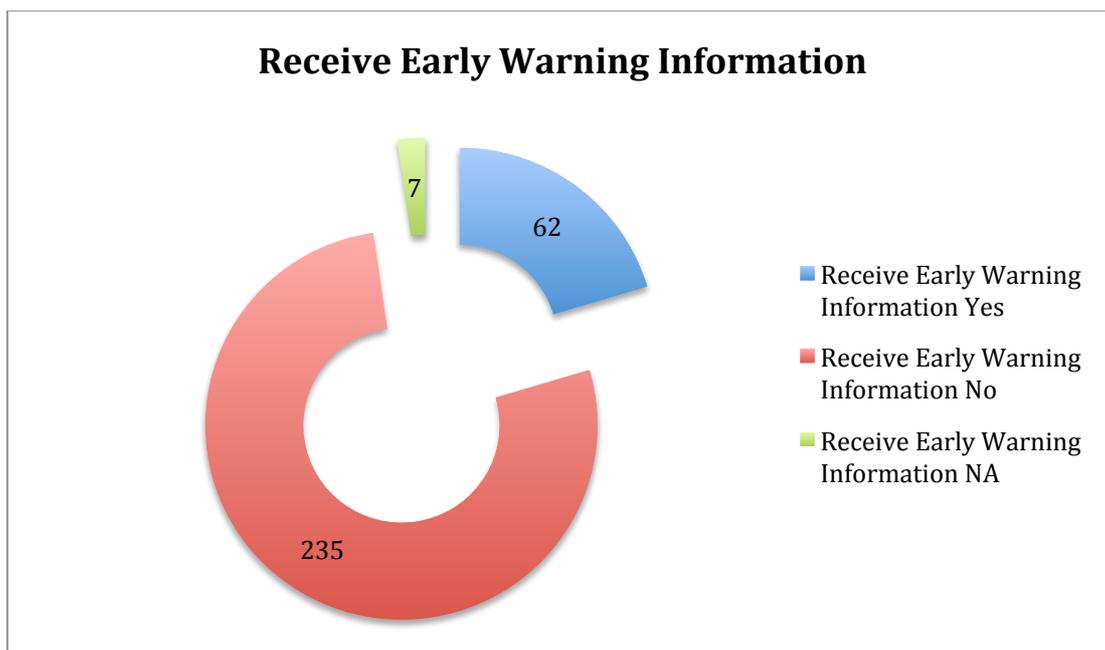
	Participation in SAR training?			SAR Team			SAR Equipment		
	Yes	No	NA	Yes	No	NA	Yes	No	NA
Count	110	188	6	173	124	8	79	220	5
%	36.2	61.8	2.0	56.9	40.8	2.6	26.0	72.4	1.6



- More than 36% of the respondents reported having participated in SAR trainings.
- Almost 57% of the respondents reported having SAR teams in place. Majority of those reporting SAR teams in place were school level respondents as each school is supposed to have an SAR team in place. Most Dzongkhag officials were unaware of SAR teams in their Dzongkhags even though teams had been instituted.
- More than 70% of the respondents reported not having SAR equipment in place. Few Dzongkhags such as Punakha and Paro reported having SAR equipment. Some schools reported procuring safety equipment from their School Development Fund and using improvised SAR materials.

**f. Early Warning System**

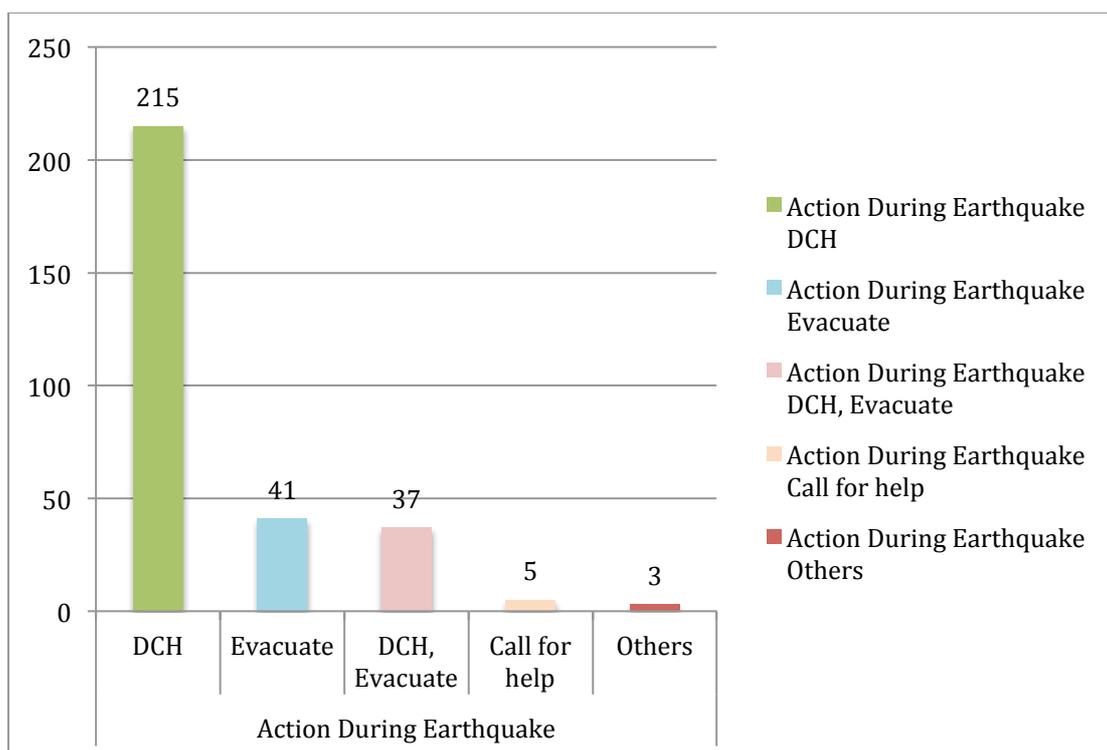
	Receive EWS Information			EWS In Place		
	Yes	No	NA	Yes	No	NA
Count	62	235	7	7	232	65
%	20.4	77.3	2.3	2.3	76.3	21.4



- More than 755 of the respondents reported not having received any early warning information at all and not having early warning systems in place.
- Only respondents from Punakha were aware of the GLOF automatic early warning system and reported receiving EWS information.
- Few schools quoted examples of creating their own Early Warning System during heavy rainfall/ thunderstorms and when there was fear of flooding, to inform parents about accessibility to school and for safety of children.

***g. Awareness of protective action during earthquake***

Action During Earthquake					
	DCH	Evacuate	DCH, Evacuate	Call for help	Others
Nos.	215	41	37	5	3
%	70.7	13.5	12.2	1.6	1.0

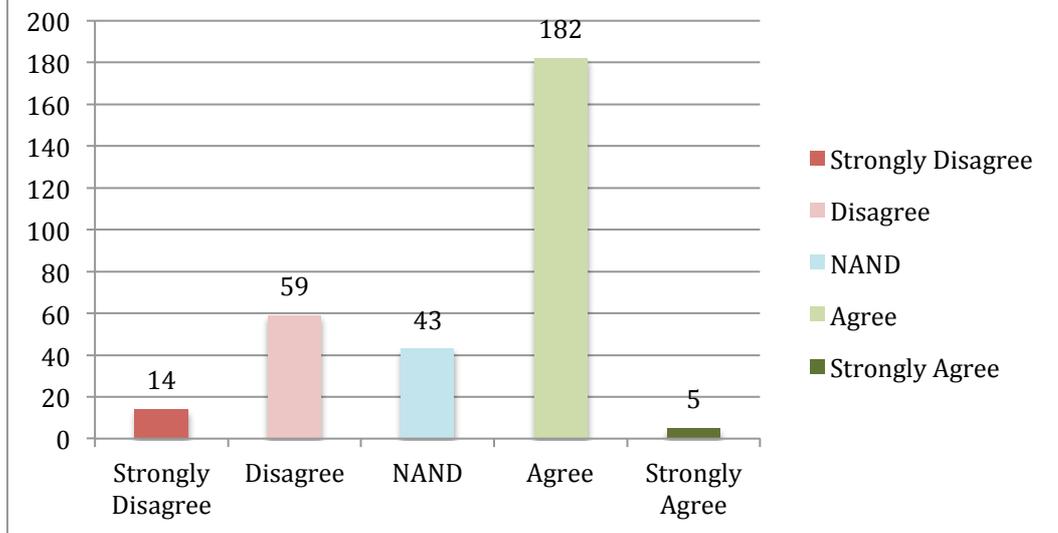


- More than 80% of the participants were aware of the correct action (DCH and DCH, Evacuate) to take during an earthquake.
- Only 3% of the respondents were unaware of the correct action to take in case of an earthquake.

***h. Perception regarding level of preparedness; access to risk/hazard information and; availability of clear emergency procedures***

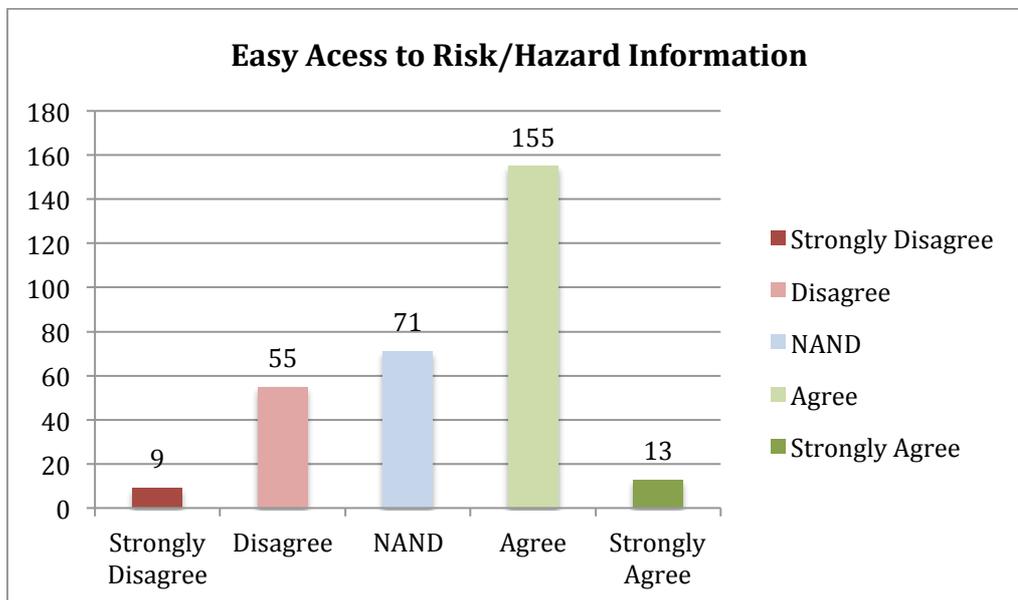
	Adequately Prepared?					Easy Access to Risk/Hazard Information?					Clear Emergency Procedures				
	SD	D	NAND	A	SA	SD	D	NAND	A	SA	SD	D	NAND	A	SA
No.	14	59	43	182	5	9	55	71	155	13	7	57	51	154	34
%	4.6	19.4	14.1	59.9	1.6	3.0	18.1	23.4	51.0	4.3	2.3	18.8	16.8	50.7	11.2

### Is your Dzongkhag/School/Organization Adequately Prepared?

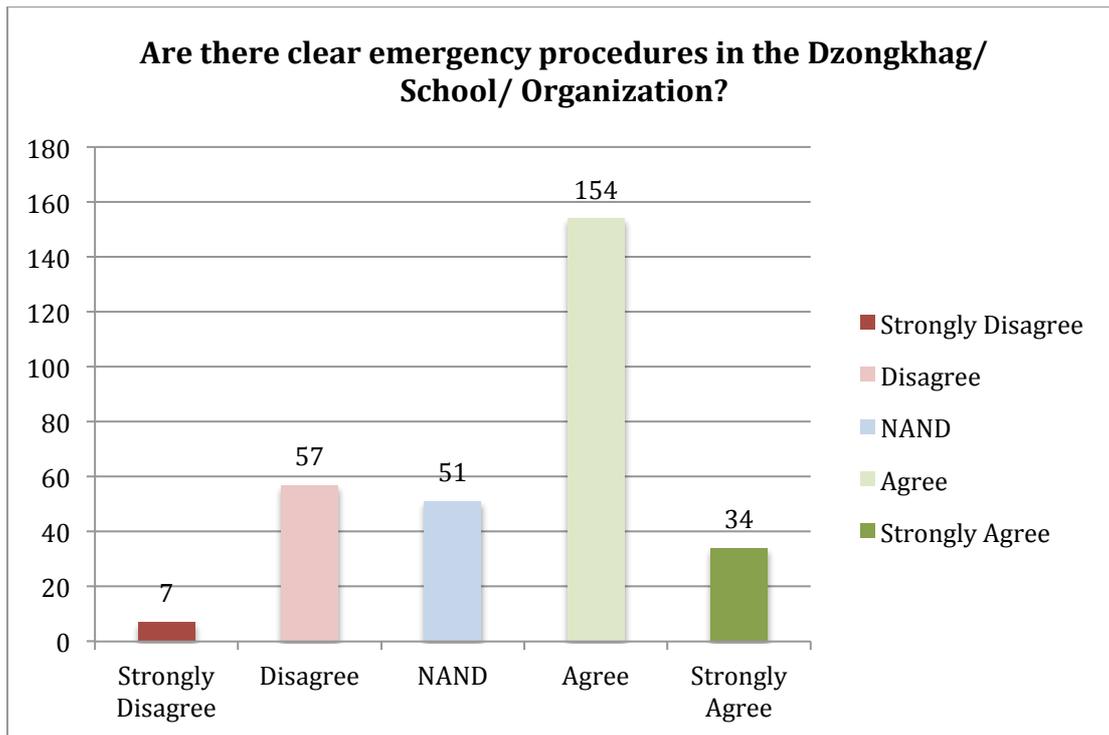


- Almost 60% of the respondents (of which more than 80% were school respondents) felt that they were adequately prepared.
- The rest (mostly dzongkhag and sector respondents) felt that they were not adequately prepared.

### Easy Access to Risk/Hazard Information



- About 50% of the respondents (mostly from schools) felt that they had access to risk and hazard information through DM awareness programs and materials.
- More than 45 % of the respondents did not agree or were unclear on access to risk and hazard information.



- Most of the school level respondents agreed that they had clear procedures to follow during emergencies as they had functional SDMPs in place.
- Most of the Dzongkhag and sector level respondents did not agree that they had clear emergency procedures in place.

***i. Awareness on DM financial mechanism***

	<b>DM financial mechanism?</b>	
	<b>Yes</b>	<b>No</b>
Nos.	78	226
%	25.7	74.3

- Almost 75% of the respondents reported being unaware of existing DM financial mechanisms and provisions.

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