



National Action Plan for School Earthquake Safety



January 2013

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I. Background

The National Action Plan for School Earthquake Safety is the Royal Government of Bhutan's commitment to reduce future losses of life and property in schools throughout Bhutan due to earthquakes and other natural hazards. GeoHazards International facilitated the formulation of this action plan, in collaboration with the Department of Disaster Management and the Ministry of Education, with funding from the Global Facility for Disaster Reduction and Recovery.

This document provides guidance to the concerned governmental departments regarding actions to take, policies to put into place and projects to undertake in the short, medium and long-term, to ensure that all schools in Bhutan are safe from the impacts of future earthquakes and other natural hazards. The authors recommend that this plan receive regular updates and that progress toward implementing the plan's Priority Areas be reviewed annually.

Schools have proven to be vulnerable in previous earthquakes around the world, resulting in loss of lives, injuries and damage to infrastructure. Recent earthquakes have shown that Bhutan's schools are also vulnerable. Both the M6.1 earthquake of 21st September, 2009 in Eastern Bhutan and the M6.8 earthquake of 18th September, 2011 in Sikkim, which principally affected Western Bhutan, caused extensive damage to school buildings. The damage to some buildings was severe enough that students would have been injured or killed, had they been in the buildings at the time of the earthquake. These two earthquakes disrupted normal school functions in the affected areas, and school officials reported traumatic impacts on students due to the earthquake damage.

Table 1 - Estimates as per the Joint Rapid Assessment Report (2009, 2011)

Earthquake Event	Schools Damaged	Estimated Loss (Nu. Million)	Estimated cost for Recovery and Reconstruction (Nu. Million)
2009	117	593.6	653
2011	36	50.18	82.96
Total	153	643.78	735.96

The foremost responsibility of school management is to ensure a safe environment for both school children and the public, because schools also host important community functions and provide shelter during disaster response. It is therefore urgent and imperative to improve seismic safety and enhance safety and preparedness levels in all schools in Bhutan. Developing and implementing the National Action Plan for School Earthquake Safety is an important initiative towards this end. This initiative fits into the overall National Disaster Risk Management Framework, 2006, which calls for proactive risk reduction and for integration of disaster concerns into national programs and policies. The National

Disaster Management Bill requires each notified department or agency to prepare contingency/action plans for disaster management, while the National Planning Guidelines for the 11th Five Year Plan by the Gross National Happiness Commission identifies "mainstreaming disaster resilience" as one of the 16 National Key Result Areas and "disaster risk reduction" as a cross cutting theme. The Action Plan serves as a tool to incorporate risk reduction and preparedness initiatives/actions into five year and annual plans of the Ministry of Education.

a. Natural hazards in Bhutan

Bhutan is vulnerable to earthquakes and several other natural hazards due to its location in the eastern Himalayas, which, in addition to being one of the most seismically active regions of the world, has landslide-prone slopes, potentially dangerous glacial lakes, and a climate conducive to flooding, windstorms and wildfires. Among the hazards that Bhutan faces, earthquakes have the potential to cause the most severe and widespread damage, because the entire country lies atop or near the major earthquake fault that divides the Indian tectonic plate from the Eurasian tectonic plate. Though recent earthquakes have been moderate in size, geologic evidence shows that the fault is also capable of breaking under most of the country in a single massive earthquake; scientists postulate that such a massive earthquake may have last occurred circa 1100 A.D.¹. Bhutan's two moderate earthquakes (21st September, 2009 and 18th September, 2011) caused 13 deaths, many injuries and losses of approximately Nu. 3698.63 million². The much larger earthquakes that the fault is capable of generating would cause unprecedented damage.

Another major natural hazard that Bhutan faces, especially due to effects of climate change, is the risk from glacial lake outburst floods. Bhutan has 2,674 glacial lakes, 25 of which have been identified as potentially dangerous. Due to climate change and rising temperatures, the threat of glacial lake outburst floods is increasing, as glaciers melt and retreat at record rates³. In October 1994, a massive glacial lake outburst flood from Luggye Tsho in the headwaters of Pho Chhu River damaged the Punakha Dzong, causing numerous casualties. Earthquake shaking can also trigger a glacial lake outburst flood, by causing the natural dam holding back the glacial lake to crack and fail.

In addition to these two major natural hazards, Bhutan is vulnerable to recurring and seasonal hazards that include landslides, flooding, wind and hail storms. These hazards are increasing, with changes in temperature and precipitation levels and patterns. The effects of Cyclone Aila, which hit the Bay of Bengal in May 2009, were felt in all twenty Dzongkhags of Bhutan, disrupting power and water supplies, damaging roads, irrigation channels, bridges and other infrastructure, including schools.

¹Kumar, S. Wesnousky, S.G., Jayangondaperumal, R., Nakata, T., Kumahara, Y. and V. Singh (2010). Evidence for surface rupture along the northeastern Himalayan front, India: Timing, size, and spatial extent of great earthquakes. *Journal of Geophysical Research*, 115 (B12422), 1-20.

²Joint Rapid Assessment Report (JRAR), 2009 and 2011

³Second National Communication, NEC, 2011

Bhutan is also susceptible to fire in both settled and forest areas. The country's rugged terrain, highly combustible forests, erratic wind conditions and shortage of trained fire-fighters and equipment increase the risk of forest fire outbreaks, especially during the dry winter months. Fires in the human settlements of Wamrong, Trashigang and Chamkhar, Bumthang in 2011 and 2012 have had devastating effects on those communities.

In addition to shaking damage, earthquakes can also trigger many of these other hazards, including glacial lake outburst floods, landslides and rock falls, and fires. Strong earthquakes in mountain areas invariably cause numerous landslides and rock falls, especially when slopes are saturated by heavy rainfall. Earthquakes trigger fires that can spread between structures and grow into conflagrations. The Ministry of Education should describe these hazards by identifying the areas and structures threatened by floods, landslides, rock falls, avalanches, Glacial Lake Outburst Floods, and by ensuring measures to reduce the risk from them are incorporated into measures to improve earthquake safety and preparedness of students, teachers, parents and school administrators.

b. Relevant national and education sector policies

Bhutan has always given education high priority, along with the other social sectors. Through consecutive five year plans, the government has tried to make education accessible to all of its citizens. As of 2012, the education system comprises 553 schools (including private schools), which serve more than 170,000 children⁴. In addition to these schools, the Royal University of Bhutan (formed in 2003) consists of eleven member colleges.

Figure 1 - Education Statistics, 2012

Primary Schools	353	NER* (PP-VI) - 96%
Lower Secondary Schools-	94	GER** (PP-VI) - 118%
Middle Secondary Schools	58	NER (VII-VIII) -39%
Higher Secondary Schools	48	GER (VII - VIII) - 107%
Early Childhood Care and Development Centres	96	NER (IX - X) - 29%
Special Institutes - 9 GER (IX-X)	80.00%	
Private Schools - 26NER (XI - XII)	20.00%	
Extended classrooms - 108GER (XI-XII)	53.00%	
Non-formal Centres	953	
Teachers in Schools	7,932	

⁴Annual Education Statistics 2012, PPD, Ministry of Education

Teachers in Institutes	1,186	
Teachers in Non Formal Centres	949	
Teachers in Early Childhood Care and Development	229	
Tertiary Institutes under Royal University of Bhutan	11	
Vocational Institutes under Ministry of Labour and Human Resources	8	
Sanskrit Patshala	1	
Continuing Education Centres	21	
*Net Enrollment Ratio		**Gross Enrollment Ratio

Source - Annual Education Statistics 2012, Ministry of Education

Several national and education sector policy documents summarized in this section were especially relevant to the development of the National Action Plan for School Earthquake Safety. These are the National Disaster Risk Management Framework; the National Disaster Management Bill; Bhutan 2020: A Vision for Peace, Prosperity and Happiness; the Education Sector Strategy; and Education Without Compromise.

The National Disaster Risk Management Framework of Bhutan, endorsed by the Cabinet in 2006, outlines eight components.

Table 2 - Components Outlined in the National Disaster Risk Management Framework, 2009

National Disaster Risk Management Framework Component	
1	Institutional, legislative and policy framework
2	Hazard, vulnerability and risk assessment
3	Early warning system
4	Disaster preparedness
5	Mitigation and incorporation of disaster risk reduction in development sectors
6	Public awareness and education
7	Capacity development
8	Communication and transportation

The Framework's Component 4, disaster preparedness, requires the formulation of disaster preparedness and response plans at national and local levels, including for important sectors such as Education. Component 6, public awareness and education, notes another important role for the

Ministry of Education to introduce modules on disaster management into school and college curricula.

The draft *National Disaster Management Bill 2011* requires each notified ministry or agency to formulate and implement its own disaster management and contingency plans. The Ministry of Education, being a key ministry, would be required to formulate such plans.

Bhutan 2020: A Vision for Peace, Prosperity and Happiness outlines a strategy for Bhutan's development. Its vision for the education sector is to develop a full range of educational and vocational institutions that will instill cultural, ethical and moral values in children. Vision 2020 targets the full attainment of enrollment levels at Class X by 2012 and the realization of full adult literacy levels by 2017. Important educational goals in the 10th Five Year Plan have been to achieve near 100 percent enrollment through various strategies -to build community schools and extended classrooms; to introducing mid-day meals, student living stipends, and inclusive education; and to achieve gender parity at higher and tertiary levels of education.

The *Education Sector Strategy* outlines six strategic objectives: improving the quality and relevance of holistic education; expanding basic education; developing a motivated and competent teaching cadre; increasing access to and quality of education; encouraging establishment of private schools; and establishing a national university.

Education Without Compromise, a comprehensive review conducted by the Education Sector Review Commission in 2008, recommends priority initiatives to improve the quality of education, through implementing various strategies. One important recommendation is to enhance Early Childhood Care and Education, in order to help achieve enrollment of the final 10-15% of children who are now out-of-school and who are hardest to reach, due to persistent poverty at the household level and to other specific policy needs to ensure their enrollment and retention.

The Education Without Compromise report also reviews factors that influence learning achievements in primary education; these include the socio-economic background of students, the education level of parents, and physical factors such as school infrastructure quality and location, instruction quality, and the availability of books and other materials. The report also highlights that many schools were found to be in a "state of disrepair" and that "the maintenance and refurbishing of old schools were neglected."

c. Impact of previous earthquakes on the education sector

The losses attributable to the two moderate earthquakes of 21st September 2009 and 18th September 2011 demonstrate Bhutan's high level of risk in future earthquakes.

1. Impacts of September 21, 2009 earthquake

The Department of Disaster Management consolidated a Dzongkhag damage assessment report that stated that 117 schools were damaged in the September 21, 2009 earthquake; of those, 8 were

damaged beyond repair, 26 required major repairs, 37 required partial repairs, and 46 required minor repairs. The Joint Rapid Assessment Report estimated re-construction costs in the education sector at Nu.653 million.

The report observed that the 21 community schools suffered the most extensive damage, as their constructions were non-engineered and lacked "structural integrity." However, the report also noted with concern that major damage was also found in government-built, "engineered" schools, which pointed to an "urgent need to improve school construction practices throughout the country."

The Ministry of Education carried out a rapid assessment after the earthquake in the six affected Eastern Dzongkhags and found that 37 schools were severely damaged, 23 schools had major damage to classroom blocks, 14 schools required major repairs to principal and staff quarters, and 5 schools had hostels with major damage which made them highly risky for students to occupy.

2. Impact of September 18, 2011 earthquake

The Dzongkhag and Ministry of Education damage assessment reports indicate that a total of 36 schools were damaged in the September 18, 2011 earthquake. The community primary and the primary schools again suffered the most extensive damage. The Joint Rapid Assessment Team for Recovery, Reconstruction and Risk Reduction estimated the total loss due to earthquake damage to schools at Nu. 50.18 million.

The assessment team also assessed the psycho-social impacts of the earthquake on children. Team members found that the children were "affected by shock and anxiety during and immediately following the earthquake." Children who witnessed damage in their homes and schools were more frightened than other children, although there did not appear to be "any long-term trauma as a result of the earthquake." The team noted the need to build counseling and emergency skills capacities among teachers and staff, and to enhance general preparedness of all schools in the country to deal with such disasters and emergencies.

II. National Action Plan for School Earthquake Safety

The main focus of the Action Plan is to enhance earthquake safety in schools. Whenever possible, the plan integrates safety measures for other natural hazards such as fire, windstorms and floods.

a. Action planning process

The Earthquake Safety Action Plan for Schools represents the combined effort of the School Safety Working Group, formed with representation from key Ministries, Departments, and relevant Donor Agencies (*Annexure 1 - School Safety Working Group Members*), facilitated by GeoHazards International.

At a National Stakeholder Workshop on 6th March 2012, working group members and other participants endorsed the Terms of Reference (*Annexure II*) and a Guidance Note on Development of Action Plan (*Annexure III*). The School Safety Working Group met on numerous occasions, and its work was also facilitated via e-mail and other communication tools.

The Working Group presented the action plan development progress, draft action plan matrix, and immediate priorities and recommendations for incorporation in the Ministry of Education's 11th Five Year Plan at the second National Stakeholder Workshop on 21 May, 2012.

b. Action plan objectives

The National Action Plan for School Earthquake Safety has the following objectives:

1. Make school children and teachers safer from earthquakes and other natural hazards;
2. Make buildings safer and more earthquake-resistant;
3. Enhance earthquake and emergency preparedness in schools; and
4. Build overall capacity and awareness about earthquakes and other natural hazards.

c. School earthquake safety framework

The School Safety Working Group first worked to finalize the School Earthquake Safety Matrix or Framework (*Annexure IV*). The framework identifies 5 priority areas that cover all aspects of strengthening natural disaster management in the education sector.

Table 3 - Priority Areas

Priority Area I	Strengthening Earthquake Safety and Disaster Management Institutional and Policy Framework in the Education Sector
Priority Area II	Education and Awareness
Priority Area III	Risk Reduction and Mitigation
Priority Area IV	Preparedness, Response and Recovery
Priority Area V	Capacity Building

III. Priority Areas and Outcomes

a. Priority Area I - Strengthening earthquake safety and disaster management institutional and policy framework in the education sector

The objectives of this priority area are to formulate and implement various policies, guidelines, and ministerial directives to improve earthquake safety and disaster preparedness in schools; and to strengthen disaster management institutions within Bhutan's education sector.

Table 4 - Priority Area I

Priority Area I	Outcomes	Baseline	Recommended Interventions	Timeline*	Performance Indicators	Responsible Agencies
Strengthening earthquake safety and disaster management institutional and policy framework in Bhutan's education sector	1.1 Policies, guidelines, ministerial directives supporting earthquake safety and disaster management in schools are in place	<ul style="list-style-type: none"> - School Disaster Management Planning guidelines drafted and disseminated in 2008 - School Disaster Management plan part of school performance assessment since 2010 - Facilitators' guide for Workshop on Disaster Preparedness and Response for Safe School developed in 2011 - Information on earthquakes, other hazards and risk reduction incorporated into the non-formal education curriculum 	<ul style="list-style-type: none"> - Review and update School Disaster Management Planning Guidelines - Formulate guidelines to identify and abate hazards from building contents, equipment and furnishings - Adopt higher safety standards for design and construction of all schools/educational institutions (including tertiary/vocational institutes, special institutes and day care centers) - Issue Ministerial Directives for implementation of school plans, safety standards, disaster management policies and guidelines - Review school and college academic curricula for incorporation of earthquake science, information on other hazards and safety materials 	<ul style="list-style-type: none"> Short Short Medium Short Medium 	<ul style="list-style-type: none"> - School Disaster Management Planning guidelines reviewed and adopted; all schools have functional plans - Guidelines to identify and abate hazards from building contents, equipment and furnishings adopted and implemented in schools 	<p><u>Lead:</u> Department of School Education, Ministry of Education</p> <p><u>Supporting Agencies:</u></p> <ol style="list-style-type: none"> 1. Policy and Planning Division, Ministry of Education 2. Department of Research and Curriculum Development, Ministry of Education 3. Royal University of Bhutan 4. Department of Disaster Management, Ministry of Home and Cultural Affairs 5. Gross National Happiness Commission 6. Dzongkhag/Thromde Administrations
	1.2 Strengthen Disaster Management institutions within the education sector	<ul style="list-style-type: none"> - Disaster management unit mandated to be formed in the Ministry of Education - School disaster management committees and teams formed as per guidelines 	<ul style="list-style-type: none"> - Appoint/ Identify disaster management focal persons in all schools - Strengthen disaster management unit in the Ministry of Education - Monitor, review and support formation of disaster management committees and teams in schools - Encourage formation of disaster management clubs in schools 	<ul style="list-style-type: none"> Short Short & Medium Short Short 	<ul style="list-style-type: none"> - All schools with disaster management focal persons and functional disaster management unit in the Ministry of Education 	<p><u>Lead:</u> Department of School Education, Ministry of Education</p> <p><u>Supporting Agencies:</u></p> <ol style="list-style-type: none"> 1. Human Resources Division, Ministry of Education 2. School Principals 3. Department of Disaster Management, Ministry of Home and Cultural Affairs 4. Dzongkhag/Thromde Administrations

*Short (1-5 yrs.), Medium (5-10 yrs.), Long (More than 10 yrs.)

The Department of Disaster Management formed the School Disaster Management Planning Guideline in 2008. Based on this guideline, almost all schools in Bhutan have developed their own

School Disaster Management Plans. The Ministry of Education has reviewed the formulation of these plans as part of its performance assessment for schools since 2010.

In addition to these efforts, the Department of Disaster Management has worked with the Ministry of Education to incorporate information on earthquakes and other natural hazards and risk reduction materials in the non-formal education curriculum.

The action plan framework specifies two outcomes and eight key interventions to build upon these earlier actions and further strengthen disaster management institutions and policy framework in the education sector.

Outcome 1.1 - Policies, guidelines, ministerial directives supporting earthquake safety and disaster management in schools in place

a. Review and update school disaster management planning guidelines

Since the adoption of the School Disaster Management Planning guidelines in 2008, schools have gained a lot of experience in formulating and implementing their plans. The existing guideline should be reviewed to incorporate these experiences, to foster greater ownership by schools and the Ministry, and to ensure implementation and practice in all schools. The revised guideline should include procedures and guidance for budget requirements to implement the mitigation and preparedness measures in the plan and address tertiary/vocational institutes, special institutes, day care centres, extended classrooms and other such places of learning. The Ministry of Education, in collaboration with the Department of Disaster Management, should institute a procedure for monitoring the formulation and implementation of school disaster management plans.

b. Formulate guidelines to identify and abate hazards, from building contents, equipment and furnishings

Falling hazards cause most injuries and unsafe reactions during earthquakes. Falling objects could injure students and teachers inside and outside school buildings. These could also block doorways and exits. Equal importance should therefore be given to instituting and pursuing the fixing and mitigating falling hazards, and to addressing other hazards such as poor electrical wiring that could cause a fire, besides measures to strengthen buildings. To support this emphasis on falling hazards, standard guidelines should be formulated, adopted formally and implemented in all schools.

c. Adopt higher safety standards for the design and construction of all schools/educational institutions

Schools are densely populated places that function as community nodes during normal times and as evacuation areas following disastrous events. School buildings should be built to meet higher standards and levels of safety than other buildings. School buildings have not performed well in previous earthquakes for many reasons, which include poor workmanship, use of sub-standard

building materials, lack of construction quality control, monitoring and supervision, etc. It is therefore crucial that the Ministry of Education adopts and formulates higher safety standards and guidelines for school construction and plan to address capacity building needs for construction personnel, in order to enforce the new standards.

- d. Issue ministerial directives to implement disaster management plans, safety standards, policies and guidelines

The Ministry of Education should issue directives mandating the adoption and implementation of safety and disaster management related guidelines, standard and policies in all schools, day care centres, special institutes, tertiary/vocations institutes, etc. with fixed timelines.

Outcome 1.2 - Disaster management institutions within the education sector strengthened

- a. Appoint/ Identify disaster management focal persons

All schools have school disaster management plans and a disaster management focal person. However, focal persons keep changing, making it difficult for them to provide and sustain capacity development and facilitate disaster management activities in schools. Formally designating focal persons, for a fixed duration, would support facilitation and coordination of disaster management related activities in schools and help to ensure that capacity building activities are sustainable.

- b. Strengthen disaster management unit in the Ministry of Education

The School Liaison and Coordination Division holds responsibility for coordinating disaster management activities within the education sector. The division presently has one dedicated official working on disaster management. Considering the number of schools and the important role of the Ministry of Education, it would be advantageous to establish a small disaster management functional unit. The unit should work with a multi-sector disaster management committee and report to the Secretary, Ministry of Education to ensure that it is integrated and to facilitate mainstreaming of risk reduction measures into the Ministry's plans and programs.

- c. Form school disaster management committees and teams

As per the school disaster management planning guidelines, all schools are required to form school disaster management committees that are responsible for emergency planning for the school, as well as for developing and implementing preparedness, response and recovery measures for the school in coordination with local authorities. However, in most schools, institutional preparedness for disaster management exists only on paper, with most of the work being conducted by one focal person or the Principal. There is a need for schools to form the school committees with representation not only from teachers but also from parents and students. The committee members should be responsible for providing direction, decision-making and coordinating with the Dzongkhag, Ministry and other agencies. The committees should also direct formation of the various school teams, as required.

d. Encourage formation of disaster management clubs in schools

Schools have various clubs that help to increase awareness and capacities related to various subjects. Disaster Management Clubs should be formed in schools to increase awareness about risks from natural hazards, to promote student involvement in risk reduction activities, and to enhance the preparedness level of students and their families.

Table 5 - Priority I - Outcomes, Activities and Sub-activities

Outcome	Activity	Sub-Activity
1.1 Policy guidelines and ministerial directives supporting earthquake safety and disaster management in schools in place	a. Review planning guidelines, including budgetary and monetary mechanisms	1. Hold stakeholder meeting to compile and analyze lessons learned
		2. Review of guidelines and incorporation of lessons, financial mechanisms
		3. Set up of formal monitoring mechanisms
	b. Formulate guidelines to identify and abate hazards from building contents, equipment and furnishings	1. Assess falling hazards in pilot schools
		2. Formulate standard guidelines to identify and abate falling hazards
		3. Disseminate guidelines to all schools
	c. Adopt higher safety standards to be observed and maintained in the design and construction of all schools/educational institutions	1. Review of needs, gaps, current standards, etc.
		2. Consult with stakeholders
		3. Formulate, and agree on, safety standards
		4. Disseminate standards to all schools and educational facilities
	d. Issue ministerial directives for implementation of plans, standards, policies and guidelines	1. Review activities and requirements for formal directives
		2. Disseminate directives to all schools and education facilities
1.2 Disaster management institutions within the education sector strengthened	a. Appoint/identify disaster management focal person in all schools	1. Complete Terms of Reference
		2. Issue ministerial directives
	b. Strengthen the disaster management unit in the Ministry of Education	1. Assess human resource needs, detailing of responsibilities, etc.
		2. Discuss activities and submit them to Royal Civil Service Commission
	c. Form school disaster management committees	1. Issue Terms of Reference, per guidelines
		2. Issue ministerial directives
	d. Establishment of disaster management club in schools	1. Describe the need and rationale for disaster management club in schools
		2. Identify Club activities, materials, resources etc.
		3. Issue ministerial directives

Priority Area II- Education and Awareness

The objective of this priority area is to enhance knowledge and to share information related to earthquake safety and emergency preparedness in and among schools, and to increase awareness and education about earthquakes, other natural hazards and the importance of preparedness and risk reduction in schools and communities.

Table 6- Priority Area II

Priority Area II	Outcomes	Baseline	Recommended Interventions	Timeline	Performance Indicators	Responsible Agencies
Education and Awareness	2.1 Enhanced knowledge and information sharing management system created	- Knowledge and information shared through past and ongoing trainings programmes	- Form a knowledge sharing network among schools for earthquake science, engineering, risk reduction and safety - Share information with communities	Medium Short	- Mechanism for information sharing developed - No. of knowledge sharing activities - No. of community campaigns, etc.	<u>Lead:</u> Department of School Education, Ministry of Education <u>Supporting Agencies:</u> 1. Policy and Planning Division, Ministry of Education 2. Dzongkhag Education Officers 3. School Principals 4. Department of Disaster Management, Ministry of Home and Cultural Affairs
	2.2 Awareness and Education increased	- Workshop on disaster preparedness and response for safe schools conducted in 19 Dzongkhags - International Day for Disaster Reduction observed since 2008 - Existing information and education materials - School safety day observed in few schools since 2012	- Conduct awareness activities on a prioritized basis, including youth programs, awareness through media and media management - Observe International Day for Disaster Reduction (or commemoration of past earthquake events) and carry out an earthquake drill in all schools as a National event - Develop information and education materials (Risk Communication, dos and don'ts, hazard specific, family preparedness etc.) - Incorporate safety information on earthquakes and other hazards in school curricula and teacher training institute curricula - Carry out awareness on Family Preparedness for all school/ education staff	Ongoing Ongoing Ongoing Medium Short	- Increased awareness of disaster management among teachers and students - Development of a comprehensive awareness strategy for education sector - No. of awareness activities carried out at various levels - Information and education materials formulated and disseminated in all schools - Risk reduction materials incorporated in school and teacher training curricula - All school /education staff have family disaster management plans	<u>Lead:</u> Department of School Education, Ministry of Education <u>Supporting Agencies:</u> 1. Policy and Planning Division, Ministry of Education 2. Department of Research and Curriculum Development, Ministry of Education 3. Royal University of Bhutan 4. Dzongkhag Administrations 5. Dzongkhag Education officers 6. School Principals 7. Department of Disaster Management, Ministry of Home and Cultural Affairs

Outcome 2.1 - Enhanced knowledge and information sharing management

a. Establish knowledge sharing network among schools

Forming a network for disaster management focal persons and school disaster management committees would enable sharing of knowledge and experience, as well as joint implementation of activities and programs. A website would serve as a virtual platform for interested education personnel

to access related information, discuss common issues and challenges, and foster solidarity and motivation.

b. Share information with communities

Schools play an important role in informing and educating the public, and can spread awareness about natural hazards and the need for risk reduction and preparedness in their immediate communities and neighborhoods. Schools can undertake awareness campaigns, as well as preparedness and risk reduction programs, especially through school awareness teams and school disaster management clubs.

Outcome 2.2 - Increased awareness and education

a. Conduct awareness programs and activities

There is a need to conduct awareness activities and programs, including youth programs and awareness programs disseminated through local media channels, on a prioritized basis. Awareness programs and activities should be tailored to specific audiences, such as decision-makers, school disaster management committees, focal persons, teachers, and students. A key priority is to educate and raise awareness about earthquake safety and disaster preparedness for children with special needs and for day care centres.

b. Observe International Day for Disaster Reduction

Bhutan has observed the International Day for Disaster Reduction since 2008, with celebrations in different Dzongkhags, involving a few schools at a time. In addition to observing this day, Bhutan should also mark the anniversary of past earthquake events that have affected the country; these are significant days on which to share earthquake safety and risk reduction messages. Observing these days would allow schools to reflect on their safety and level of preparedness. In addition, all schools across Bhutan should conduct a national earthquake drill, or "shakeout" awareness-raising event, along with other awareness activities.

c. Develop information and education materials

Easy-to-use and understand educational materials should be developed for the disaster management committees, teams, focal persons, school disaster management clubs, teachers, special needs children, young children, and youth. These materials should provide basic information on various hazards, dos and don'ts, family preparedness, risk information including maps showing hazard zone areas (for glacial lake outburst floods, areas at high risk of flood inundation or landslides, etc.) and other relevant topics.

d. Incorporate safety information on earthquakes and other hazards in school curricula and teacher training institute curricula

Incorporating grade-appropriate material on earthquake science, information on other natural hazards and on disaster risk management issues into school and academic curricula will help to create a culture of preparedness and resilience. This represents a long-term investment in risk mitigation. The curricula of relevant vocational institutes like the College of Science and Technology and other higher tertiary institutes should also incorporate appropriate information on natural hazards and methods to mitigate risk and improve resilience.

e. Raise awareness on family preparedness

School management and teachers are responsible for ensuring the safety of their school's students. To fulfill this responsibility, both school personnel and their families need to be prepared for natural hazard events and emergencies. Schools must place a high priority on sensitizing staff on the need for family preparedness. Such programs help school personnel to fulfill their responsibilities to the school during emergencies, help to change attitudes, and help families to prepare their own emergency plans.

Table 7 - Priority II - Outcomes, Activities and Sub- activities

Outcome	Activity	Sub-Activity
2.1 Enhanced knowledge and information sharing management	a. Develop knowledge sharing network among schools	1. Develop suitable information technology platform and other coordination mechanisms
		2. Share knowledge and experience through activities (quiz, exhibitions, newsletters, etc.)
	b. Share information with communities	1. Conduct community based awareness activities in schools (dramas/ concerts, street plays, awareness materials, etc.)
		2. Conduct a "Families for disaster management" program
2.2 Increased awareness and education	a. Conduct awareness activities	3. Disseminate school plans
		1. Conduct a needs assessment and plan activities for target audiences
	b. Observe International Day for Disaster Reduction and past earthquake events	2. Implement planned activities
		1. Conduct a National Preparedness drill in all schools
	c. Incorporate safety materials on earthquake and other hazards in school and teacher training institute curricula	2. Remember past events and conduct other awareness activities
		1. Review existing curricula
		2. Formulate appropriate materials
		3. Increase knowledge among teachers on hazards and awareness
d. Raise awareness on family preparedness	4. Incorporate information on hazards and awareness into curricula	
	1. Formulate materials	
		2. Conduct sensitization programs

Priority Area III - Risk Reduction and Mitigation

The objectives of this priority area are to reduce loss of lives and property damage in the event of an earthquake or other natural hazard event. Specific risk reduction and mitigation measures differ, depending on the hazard. For earthquakes, risk reduction and mitigation involve ensuring that school buildings are structurally sound, located on stable ground and able to withstand the expected level of earthquake shaking, and that furnishing, decorative finishes and parts of the building are anchored or braced to prevent them from falling onto students. For glacial lake outburst floods, risk reduction measures might include shifting schools outside of high risk zones and lowering the water level in dangerous glacial lakes upriver from schools in low-lying areas. The table below focuses on risk reduction and mitigation measures for earthquakes, but similar measures can and should be delineated for the other hazards that Bhutan's schools face.

Table 8 - Priority Area III

Priority Area III	Outcomes	Baseline	Recommended Interventions	Timeline	Performance Indicators	Responsible Agencies
Risk Reduction and Mitigation	3.1 Structural measures implemented	<ul style="list-style-type: none"> - Vulnerability assessment checklist training conducted for more than 75 participants in 2012 - Existing School Planning and Building Division's designs include earthquake resilient features 	<p>New Construction:</p> <ul style="list-style-type: none"> - Prepare standard earthquake-resilient school designs - Review existing guidelines for school construction and incorporate risk reduction concerns, including identification of sites outside of hazard zones - Institute construction quality control and inspection mechanism for construction materials and adherence to standards and designs <p>Existing Buildings:</p> <ul style="list-style-type: none"> - Conduct vulnerability / safety assessment of existing school buildings - Carry out recommendations for replacement or repair/retrofit of existing buildings 	<ul style="list-style-type: none"> Short to Medium Short to Medium Short to Medium Short to Medium Medium to Long 	<ul style="list-style-type: none"> - All new schools constructed per earthquake resilient design - Schools constructed per guidelines outside of hazard zones - Quality and standards of all new constructions ensured - All schools assessed and strengthened accordingly 	<p><i>Lead:</i> School Planning and Building Division, Ministry of Education</p> <p><i>Supporting agencies:</i></p> <ol style="list-style-type: none"> 1. Department of School Education, Ministry of Education 2. School Principals 3. Dzongkhag Administrations 4. Dzongkhag Engineers 5. Department of Disaster Management, Ministry of Home and Cultural Affairs 6. Ministry of Works and Human Settlement

Priority Area III	Outcomes	Baseline	Recommended Interventions	Timeline	Performance Indicators	Responsible Agencies
	3.2 Falling hazards are abated	<ul style="list-style-type: none"> - All Dzongkhag Education Officers and selected principals trained on falling hazards and preparedness measures in 2010 - Facilitators' guide for Workshop on Disaster Preparedness and Response for Safe School includes component on fixing and bracing of falling hazards - Anchoring and bracing of falling hazards carried out in pilot schools 	- Carry out fixing, bracing and other non-structural measures in all schools (e.g. electrification, proper use of electrical appliances etc.)	Short to Medium	- Falling hazards in schools are identified and abated	<p><u>Lead:</u> Department of School Education, Ministry of Education</p> <p><u>Supporting Agencies:</u></p> <ol style="list-style-type: none"> 1. School Principals 2. Dzongkhag Education Officers 3. Department of Disaster Management 4. Ministry of Finance
	3.3 Risk Insurance in place for schools		- Explore and institute insurance coverage for school buildings	Medium to Long	- School buildings insured on a prioritized basis	<p><u>Lead:</u> Department of School Education, Ministry of Education</p> <p><u>Supporting Agencies:</u></p> <ol style="list-style-type: none"> 1. Royal Insurance Corporation and other insurance companies 2. Ministry of Finance

Outcome 3.1 - Structural Measures

For New Construction

a. Prepare standards for earthquake-resilient school designs

School buildings house children and teachers, serve as important community nodes and can function as safe emergency shelter during disasters. For all of these reasons, it is vital to prepare and maintain higher performance standards for school buildings, especially with regard to earthquake safety.

b. Review existing guidelines for school construction

Existing school construction guidelines and procedures should reflect the higher standards of construction that are now in place, and should ensure that potential natural hazards are considered at

all levels. Guidelines should specify how to identify safe sites for construction and should prohibit building in hazardous areas (e.g., glacial lake outburst flood red zone areas, flood zones or landslide prone areas).

c. Institute construction quality control and inspection mechanisms

Past assessments and experiences from previous earthquake events illustrate the importance of ensuring construction quality by testing materials, inspecting workmanship, and confirming that workers comply with design drawings during construction. It is therefore very important for the Ministry to institute independent quality control and inspection requirements for the construction of school buildings.

Existing Construction

d. Conduct Vulnerability/safety assessment of existing schools buildings

There are many old school buildings across Bhutan; in the 2009 and 2011 earthquakes, older and community-built buildings suffered more damage than did other buildings. It is therefore essential to assess the earthquake vulnerability of existing school buildings, to develop a clear understanding of the level of risk and the possibilities for strengthening or replacing structures in order to reduce and mitigate that risk. The vulnerability assessment should also indicate the school's exposure to floods, wildfires, landslides, rock falls and glacial lake outburst floods, to help identify cases in which the site itself is unsafe, and the school may need to be relocated.

e. Carry out recommended strengthening, replacement or relocation measures

Vulnerability and safety assessment recommendations for strengthening, replacing, or relocating old school buildings should be carried out in a prioritized and phased manner.

Outcome 3.2 - Falling hazards abated and insurance coverage in place

a. Carry out fixing, bracing and other non-structural measures in all schools

In most earthquakes, falling objects inside and immediately outside of buildings cause more injuries than structural damage does. Simple measures that keep objects from falling during earthquakes can prevent most of these injuries. The Ministry of Education should formulate guidelines for fixing and mitigating falling and other non-structural hazards (such as stairs, parapets, partitions, equipment, electrical systems and sources of fire hazards), train appropriate personnel and implement required measures.

Outcome 3.3 - Explore and institute risk insurance for school buildings

Insuring school buildings (on a prioritized/selective basis) can ensure funds are available for recovery and reconstruction activities, if required. Insurance can also be a way of ensuring and encouraging buildings to be constructed per design.

Table 9 - Priority III - Outcomes, Activities and Sub-activities

Outcome	Activity	Sub-Activity
3.1 Structural Measures Implemented	a. Prepare standards for earthquake-resilient school designs	1. Review existing designs and identify gaps
		2. Prepare standards for non-structural elements (fixtures, ceilings, partitions, equipment, stairs, electric systems, etc.)
		3. Formulate and disseminate enhanced standards and designs
	b. Review existing guidelines for school construction and incorporate risk reduction concerns	1. Review of existing construction guidelines
		2. Include seismic considerations, site assessment and other safety concerns in guidelines
		3. Update and disseminate guidelines
	c. Institute quality control and construction inspection mechanisms	1. Review existing construction inspection practices
		2. Formulate and mandate independent quality control and construction inspection
	d. Conduct vulnerability/safety assessment of old school buildings	1. Formulate vulnerability assessment checklists/ guidelines
		2. Train engineers/assessors
		3. Consolidate assessment reports and present conclusions to decision makers
	e. Implement recommended measures	1. Prioritize recommended measures
		2. Implement measures in phased manner
	3.2 Falling hazards abated	a. Carry out fixing, bracing and other non-structural measures in all schools
2. Disseminate guidelines and train maintenance and other staff		
3. Implement measures		
3.3 Insurance coverage in place	a. Insure school buildings	1. Explore insurance options
		2. Secure insurance

Priority Area IV - Preparedness, Response and Early Recovery

The objectives of this priority area are to strengthen preparedness planning and to enhance natural disaster response capacities.

Table 10 - Priority Area IV

Priority Area IV	Outcomes	Baseline	Recommended Interventions	Timeline	Performance Indicators	Responsible Agencies
Preparedness, Response and Early Recovery	4.1 Preparedness planning strengthened	<ul style="list-style-type: none"> - School disaster management plans in place for all schools - Awareness on preparedness planning and need to enhance preparedness initiated through past and ongoing training programs 	<ul style="list-style-type: none"> - Develop guidelines for disaster management and contingency plan for the education sector - Carry out table top/simulation exercises for the contingency requirements and arrangements - Develop education sector contingency plan - Sensitize all departments, divisions, agencies in the education sector and all education sector personnel at national and local level on plan and contingency arrangements 	<ul style="list-style-type: none"> Short Short Short to Medium Short to Medium 	<ul style="list-style-type: none"> - Functional education sector contingency plan in place - All schools, Dzongkhags, education sector agencies aware of the contingency plan 	<p><u>Lead:</u> Department of School Education, Ministry of Education</p> <p><u>Supporting Agencies:</u></p> <ol style="list-style-type: none"> 1. All Departments, Ministry of Education 2. Dzongkhag Education Officers 3. School Principals 4. Other agencies working in the education sector 5. Department of Disaster Management
	4.2 Response and immediate recovery capacities strengthened	<ul style="list-style-type: none"> - Basic disaster risk reduction and search & rescue training for 200 Scout masters conducted in 2012 - Education in emergency trainings conducted in 19 Dzongkhags - Distribution of standard safety materials to 128 pilot schools 	<ul style="list-style-type: none"> - Establish clear chain of command and communication flow - Maintain stockpile of materials required for emergency response and immediate recovery - Establish/institute pre-arrangements for emergency requirements - Standardize equipment/materials requirements at school, local government and national level - Continue delivery of workshop on disaster preparedness and response for safe schools and conduct refresher/additional courses and targeted courses as required 	<ul style="list-style-type: none"> Short Medium Short to Medium Short to Medium Ongoing Short 	<ul style="list-style-type: none"> - An effective communication and command system in place for emergencies - Stockpile of emergency materials and pre-arrangements in place and pre-positioned for effective response and recovery - Schools equipped with basic disaster management equipment and materials 	<p><u>Lead:</u> Department of School Education, Ministry of Education</p> <p><u>Supporting Agencies:</u></p> <ol style="list-style-type: none"> 1. School Principals 2. Dzongkhag Administrations 3. Dzongkhag Education Officers 4. Department of Disaster Management

Outcome 4.1 - Preparedness planning strengthened

a. Develop guidelines for disaster management contingency plan for education sector

As a very important sector, Education should develop a comprehensive emergency response and contingency plan that would specify emergency arrangements, emergency communication protocols, and responsibilities. This contingency plan would also provide the necessary guidance for school level emergency planning.

b. Conduct table top/simulation exercises for contingency requirements and arrangements.

A number of simulation/table top exercises should be conducted at various levels, to help formulate the education sector emergency response and contingency plan and to test the emergency arrangements being put into place.

c. Sensitize all departments, divisions, and agencies on the contingency arrangements

Once the emergency response and contingency plan is formulated and the emergency arrangements and procedures are put into place, all departments, divisions, agencies at various levels should be sensitized on the plan, arrangements, and their specific responsibilities.

Outcome 4.2 - Response and immediate recovery capacities strengthened

a. Establish clear chain of command and communication flow

Formulating and instituting a clear chain of command and information flow during emergencies will facilitate effective response. All levels within the education sector should establish a clear communication flow. To facilitate this, the Ministry of Education should prioritize procurement of emergency communication equipment that would function during emergencies and allow schools to self-report and ask for medical and search and rescue help.

b. Maintain stockpile of materials required emergency response and immediate recovery

Effective emergency preparedness and response require maintaining a stockpile of emergency materials at various levels. Schools should stockpile basic emergency response materials such as first aid kits, fire extinguishers, etc. Immediate recovery materials (CGI sheets, tarpaulin, education materials, etc.) should be stockpiled at Dzongkhag or regional levels, to ensure swift recovery and resumption of school function at the earliest possible time.

c. Establish/institute pre-arrangements for emergency requirements

Effective emergency management requires that the necessary arrangements be put into place well in advance. Per the education sector contingency plan, pre-arrangements and procedures (related to command and control, manpower, communications, and transportation, for response and immediate recovery among others) should be instituted and tested regularly.

d. Standardize equipment/materials requirements at all levels

Disaster response and immediate recovery equipment and materials for the education sector should be standardized at the school, Dzongkhag/region, and national levels.

e. Continue ongoing training programs and institute other emergency and response management trainings

The Safe School Initiative, Education in Emergency campaigns, and the workshop for disaster

preparedness and response for safe schools are a few of the ongoing training programs that the Department of Disaster Management and the Ministry of Education carry out, in collaboration with various agencies. So far, training programs have provided sensitization to District Education Officers and teachers on various natural hazards in Bhutan, underlying vulnerabilities and risks, and the need for the education sector to reduce risks and be prepared. The training programs also facilitated the formulation of school disaster management plans and conducted mock drills in pilot schools. Refresher training programs and programs tailored to target audiences such as principals, disaster management teams, focal persons and others could reinforce and expand existing training agendas.

Table 11 - Priority IV - Outcomes, Activities and Sub-activities

Outcome	Activity	Sub-Activity
4.1 Preparedness planning strengthened	a. Develop education sector guidelines for contingency disaster management planning	1. Form core group to identify scope and objectives, and outline guideline contents
		2. Discuss guidelines with officials at various levels and with various stakeholders
		3. Formulate guidelines
	b. Conduct table top/ simulation exercises and develop education sector contingency plan	1. Develop and design scenarios and exercises
		2. Conduct table top and simulation exercises at various levels.
		3. Formulate contingency plan
c. Sensitize all departments, agencies on contingency arrangements	1. Disseminate contingency plan and guidelines	
	2. Conduct sensitization among stakeholders at all levels	
4.2 Response and immediate recovery capacities strengthened	a. Establish clear chain of command and communication flow	1. Identify need and gaps
		2. Formulate standard communication procedures at various levels
	b. Maintain stockpile of materials required	1. Identify and standardize materials to be stockpiled for response and immediate recovery
		2. Stockpile materials on prioritized basis
	c. Establish/ institute pre-arrangements for emergency requirements	1. Identify gaps and requirements
		2. Discuss and formulate pre-arrangements to be put in place
3. Establish pre-arrangements as required		

Priority V - Capacity Building

The education sector must develop human and material capacities at various levels, in order to reduce risk and increase preparedness. Carrying out a capacity needs assessment and implementing capacity building programs to build technical, managerial and emergency skills on a prioritized basis, will help the sector to implement risk reduction and action plan priorities effectively.

Table 12 - Priority Area V

<i>Safe Schools – Action Plan (2013 – 2023)</i>						
<i>Priority Area V</i>	<i>Outcomes</i>	<i>Baseline</i>	<i>Recommended Interventions</i>	<i>Timeline</i>	<i>Performance Indicators</i>	<i>Responsible Agencies</i>
Capacity building	5.1 Capacity building for risk reduction	- Vulnerability assessment forms training conducted for more than 75 engineers in 2012	<ul style="list-style-type: none"> - Build capacity of engineers and maintenance staff to assess building for vulnerability and safety of school buildings - Build capacity of engineers and architects for retrofitting and seismic risk reduction techniques for buildings - Conduct comprehensive training on how to abate falling hazards - Raise awareness and capacity of policy and planning personnel and other relevant Ministry of Education personnel on mainstreaming earthquake safety and risk reduction concerns 	<ul style="list-style-type: none"> Short to Medium Medium to Long Short Short, Medium 	<ul style="list-style-type: none"> - Engineers/ technical personnel trained in the use of vulnerability assessment tools and procedures and equipped with capacity to retrofit/strengthen existing school buildings - School personnel, especially maintenance staff, trained in carrying out non-structural measures 	<p><i>Lead: School Planning and Building division, Ministry of Education</i></p> <p><i>Supporting Agencies:</i></p> <ol style="list-style-type: none"> 1. Department of School Education, Ministry of Education 2. School Principals 3. District engineers 4. Dzongkhag Administrations 5. Department of Disaster Management, Ministry of Home and Cultural Affairs 6. Ministry of Works and Human Settlement
	5.2 Capacity building for preparedness and response	<ul style="list-style-type: none"> - Workshop on Disaster Preparedness and Response for Safe Schools conducted in 16 Dzongkhags (includes Mock Drill, EIE, first aid and fire safety) - Basic disaster risk reduction and Search and Rescue training for Scout masters 	<ul style="list-style-type: none"> - Provide Emergency Management training for Education. Personnel (Disaster Management Unit, Dzongkhag Education personnel, Principals, School Disaster Management Committee, Focal persons) - Train School Disaster Management Teams, Principals, focal persons in conducting mock drills, Search and Rescue, First Aid, emergency logistics psycho-social/trauma care, fire safety and other capacity requirements - Develop and deliver comprehensive disaster management training developed for Scouts/ youth volunteer groups 	<ul style="list-style-type: none"> Short to Medium Ongoing Medium 	<ul style="list-style-type: none"> - Ministry and education personnel equipped with knowledge on emergency management - School disaster management teams and focal persons have enhanced capacity in carrying out their responsibilities - Scouts/ youth groups trained in disaster risk reduction and emergency skills and have ability to aid in immediate response 	<p><i>Lead: Department of School Education, Ministry of Education</i></p> <p><i>Supporting Agencies:</i></p> <ol style="list-style-type: none"> 1. School Principals 2. Department of Youth and Sports, Ministry of Education 3. Department of Disaster Management, Ministry of Home and Cultural Affairs

*Outcome 5.1 - Capacity building for risk reduction**a. Build capacity of engineers and maintenance staff to assess vulnerability/ safety of school buildings*

Bhutan has 553 schools today (not including day care centres, extended classrooms, and special institutes). It is especially important to assess the safety of the old and community-built schools, which proved to be more vulnerable than other schools in previous earthquake events. The Ministry of Education should invest to formulate tools to carry out vulnerability and safety assessments of school buildings and train engineers to use them.

b. Build capacity of engineers and architects for retrofitting and seismic risk reduction techniques

Engineers should receive training in retrofitting and seismic risk reduction techniques so that, after conducting vulnerability and safety assessments, they are able to provide recommendations on how to replace or strengthen school buildings.

c. Conduct comprehensive training on how to reduce hazards from falling objects

School maintenance staff or other relevant personnel should receive training on an urgent basis on how to fix or brace objects that can fall during earthquake shaking, and on other non-structural hazards, such as poor electric wiring that could lead to fires.

d. Raise awareness and capacity on mainstreaming earthquake safety and risk reduction concerns

Both the National Disaster Risk Management Framework and the Bill require Ministries and Agencies to mainstream disaster management risks and concerns into their plans and programs. The 11th Five Year Planning Guidelines identify "mainstreaming disaster resilience" as one of 16 National Key Result Areas and "disaster risk reduction" as a cross cutting theme. It would therefore be important to raise awareness and build capacity of policy, planning and other relevant personnel in the Ministry of Education, in order to enable them to carry out mainstreaming of risk reduction concerns into their plans and programs.

*Outcome 5.2 - Capacity building for preparedness and response**a. Emergency management training for education personnel*

Training in emergency management is required for principals, disaster management focal persons, district education officers and other key people in the Ministry of Education.

b. Training of committees, teams, focal persons

School disaster management committee members, the focal persons, and members of the various school teams should receive appropriate sensitization and skills development training. Trainings would include emergency first aid, search and rescue techniques, trauma management, and fire-fighting techniques.

c. *Comprehensive disaster management training for scouts and youth volunteers*

There are more than 18,000 scouts registered with the Bhutan Scouts Association, and thousands of youth are graduating from schools and colleges in Bhutan every year. It would be worthwhile to harness their potential and to provide them with a comprehensive disaster management and first responder training. Scouts and youth volunteers could help to spread the message of risk reduction and provide an immense support to communities during emergencies. They could also assist emergency agencies and first responders in delivering effective response and relief.

Table 13 - Priority V - Outcomes, Activities and Sub-activities

Outcome	Activity	Sub-Activity	
5.1 Capacity building for risk reduction	a. Build capacity of engineers and maintenance staff to assess building vulnerability and safety	1. Formulate tools and train engineers and assessors	
		2. Prepare plans and acquire resources needed for assessments	
		3. Provide training and mentoring to enhance skills and training assessors	
	b. Build capacity of engineers and architects in retrofitting and seismic risk reduction techniques	1. Conduct a gap assessment and identify capacity-building needs	
		2. Conduct training and mentoring programs	
		3. Conduct pilot projects to develop skills	
	c. Conduct comprehensive training on fixing and abating of falling hazards	1. Develop guidelines and a manual, and provide training	
		2. Conduct a pilot project to fix falling hazards in schools to demonstrate measures and develop skills	
	d. Raise awareness and capacity of policy and planning and other relevant personnel on mainstreaming risk reduction	1. Conduct awareness and sensitization activities	
		2. Integrate earthquake safety and risk reduction plans and policies into the Ministry of Education's plans and programs	
	5.2 Capacity building for preparedness and response	a. Provide emergency management training for education personnel	1. Conduct an assessment to determine capacity and training needs at various levels including the Disaster Management Unit, district education officers, principals, and school committee and teams
			2. Implement prioritized capacity building plan
b. Train committees, teams, principals, focal persons		1. Prioritize capacity requirements	
		2. Formulate a plan and strategy for school level capacity building	
		3. Implement the prioritized plan	
c. Provide comprehensive disaster management training for scouts and youth volunteer groups		1. Review existing scout programs	
		2. Assessment of need and opportunities for training scouts and youth volunteer groups in emergency and disaster management	
		3. Incorporate preparedness and response training into existing scout programs and develop youth volunteer training programs	

IV. Implementation, Review and Monitoring Arrangements

Mainstreaming disaster risk reduction is an important theme in the 11th Five Year Plan. As is true for other cross-cutting themes, the Gross National Happiness Commission and the Ministries and Agencies would be required to monitor their progress and achievements in mainstreaming these concerns.

Through the National Action Planning Process, the working groups have succeeded in incorporating their immediate priorities into the upcoming 11th Five Year Plan. However, the plan takes a long-term view (over more than 10 years) and has identified priorities and activities that would extend beyond the 11th Five Year Plan. In addition, as needs and priorities change over time, the plan requires continual review and monitoring.

The Department of School Education should ensure, as the key agency, that the national action plan is reviewed in conjunction with the annual and five yearly plan reviews. The Review Committee, which would be co-chaired by the Department of School Education and the Department of Disaster Management and involve the working group members, would carry out annual reviews of the action plan. The annual review meeting would evaluate the progress made in implementing the action plan, gaps, support and resource requirements and also plan for current priorities to be included in the upcoming annual and five yearly plans.

V. Annexure

Annexure I - School Earthquake Safety Working Group Members

Annexure II - Terms of Reference for the Working Group

Annexure III - Guidance Note on Development of Action Plan

Annexure IV - School Earthquake Safety Action Plan Matrix

Annexure I

School Earthquake Safety Working Group Members

	Name	Designation	Organisation
1	Chencho Dorji	Chief Liaison Officer	Department of School Education
2	Karma Sonam	Chief Engineer	School Planning and Building Division
3	Tshering Yangden	District Education Officer	Thimphu Dzongkhag
4	Lham Tshering	Thromde Education officer	Thimphu Thomde
5	Kamal Hingman	Vice Principal	Yangchenphug Higher Secondary School
6	Choki Dukpa	Principal	Jigme Losel Primary School
7	Yang Dorji (Coordinator)	Senior Program Officer	Department of School Education
8	Kaka Tshering	Deputy Chief Program Officer	Department of School Education
9	Lhagey Tshering	Principal	Babesa Primary School
10	Pelden Zangmo	Chief Program Officer	Department of Disaster Management
11	Lhachey Dema	Program Officer	Department of Disaster Management
12	Anne Erica Larsen	Program Analyst	United Nations Development Program, Bhutan
13	Sonam Pelden	Project Officer	Save the Children, Bhutan
14	Sonam Tshewang	Adm. Officer	Save the Children, Bhutan
15	Karma Doma Tshering	National Coordinator	GeoHazards International, Bhutan
16	Sonam Tenzin	Project Officer	GeoHazards International, Bhutan

Annexure II

Terms of Reference for School and Hospital Earthquake Safety Working Groups

The Department of Disaster Management (DDM) and GeoHazards International (GHI) will be collaborating in the area of disaster risk reduction and preparedness capacity in the country. Towards this end, the development of National Action Plans for School and Hospital Earthquake Safety in Bhutan is an important activity. The goal of the action planning process is to support the key Ministries - the Ministry of Health and the Ministry of Education to develop a comprehensive consensus plan on how to do away with the current situation of seismically unsafe schools and hospitals, to acceptable levels of seismic safety and preparedness.

Hospital and School Earthquake Safety Working Groups have been formed respectively, with representation from relevant Agencies and Departments, to come out with the draft National Action Plans for school and earthquake safety. This document describes the roles and activities of the Working Group and outlines the support and assistance to be provided by the DDM and the GHI in facilitating the planning process.

A. *Working Group Members*

Representative from key Ministries, Departments, the DDM and relevant UN and other Donor Agencies have been identified as members of the two Working Groups. The same Working Group members are expected to participate through out the action planning process for continuity and coordinated outcome of the process. In the absence of a designated Working Group member, a replacement from the same Agency/Department should represent with prior information to the DDM focal person.

B. *Working Group Activities*

The Working Group will conduct the following activities:

- Hold in-person meetings as per agreed schedule to carry out the action plan development process;
- Participate in a National Consultation Workshop to help advance the plan development process;
- Review and provide advice on the draft Action Plan Document, as needed;
- Provide information and data needed for the description of current conditions and gap analysis;
- Produce the draft National Action Plan as a consensus document, with support from DDM and GHI.

C. *Expected Outcomes*

Expected Outcomes of the Working Group meetings are:

- The development of a draft National Action Plan for Hospital Earthquake Safety and School Earthquake Safety;

- Increased awareness, understanding and urgency among members and stakeholders on the need for seismic safety and to reduce risks and enhance preparedness levels;
- The use of the Action Plan as a mainstreaming and prioritization tool for the Ministry of Health and the Ministry of Education in the 11th FYP.

D. Responsibilities of the Department of Disaster Management

As the National Coordinating Agency for disaster management, the DDM will be responsible for:

- Assigning a National focal person
- Providing the space for meetings
- Identifying and facilitating the participation of relevant stakeholders
- Facilitating technical experts/consultants, as required, during the process
- Ensuring awareness and advocacy on the formulation and implementation of the Plan
- Supporting the Ministry of Education and the Ministry of Health in taking ownership and in mainstreaming the Plan during the 11th FYP and consecutive FYP periods, as required.

E. Responsibilities of GeoHazards International

Support from GeoHazards International will consist of the following:

- GHI's Local Project Officer will organize and facilitate meetings of the Working Group, assist the Working Group members in obtaining background information and data and document for the Working Group meetings and decisions made;
- Develop drafts of the Plan document and compile and edit the draft Plan as per the comments and advice of the Working Group members.
- GHI will provide Mr. Thomas Tobin, who has many years of experience in mitigation planning, as a resource for the Working Groups. Mr. Tobin will co-chair the National Consultative Workshop for the Working Groups and other stakeholders.

Annexure III

Developing a National Action Plan (School Earthquake Safety and Hospital Earthquake Safety) - A Guidance for the Bhutan Working Groups

A. *Background*

In any earthquake disaster event, hospitals and schools have proven most vulnerable, be it in terms of loss of lives or damage to infrastructure. Bhutan lies in one of the most seismically active regions and even in the most recent earthquake events in Bhutan (21st September, 2009 Earthquake that impacted Eastern Bhutan and 18th September, 2010 that affected mostly Western Bhutan), both health and education sectors suffered heavy losses. More than 250 numbers of school infrastructure and over 100 hospital infrastructures were recorded as damaged in the two earthquake events. These figures alone call for schools and hospitals to enhance their seismic safety and preparedness.

In any community hospitals and schools are critical public service nodes and have a key role to play during all phases of disaster management. Above all, hospital and school management have the responsibility of ensuring a safe environment for children and the public.

Therefore, developing and implementing National Action Plans for Earthquake Safety for Schools and Hospitals is an initiative that needs to be urgently realized. This initiative also fits very well into the overall National Disaster Risk Management Framework, which calls for proactive risk reduction and mainstreaming of disaster concerns into national programs and policies and upcoming National Disaster Management Act, which requires each notified department/agency to prepare contingency/action plans for disaster management. The formulation of such actions plans could also be used as a disaster mainstreaming tool and help concerned sectors in prioritizing and incorporating important risk reduction and preparedness initiatives/actions into their own five year and annual plans.

B. *What is an Action Plan?*

An Action Plan is a written document that describes the tasks or actions to be performed to achieve a strategy or certain objectives/goals successfully. The purpose is to organize and develop solutions to address specific issues and challenge.

An action plan usually outlines - *strategy/objectives* (what is the strategy and what needs to be achieved), *issues* (challenges, problems, needs) *specific tasks* (what will be done and by whom), *a time line* (when will it be done), *resources* (available and required), *likely constraints* (existing or expected) and *outcomes* (expected changes that need to happen to move closer to the goal).

C. *Likely Components of an Action Plan for School and Hospital Earthquake Safety*

An action plan can be presented in many different ways - it can be a 50-page report, a five page list of key plan elements, or a simple one-page table. The working group should determine how best to present

the plan and the level of detail the plan should try to achieve. Too much detail may obscure the major elements of the plan.

Some of the main elements of an Action Plan would be:

1. *Background* - A brief description of *current conditions* physically (hazards, risks, vulnerabilities) and policy-wise (the NDRMF, Bill, relevant policies/guidelines). The plan document might also include a summary of the planning process and the work that was put in to come up with the Plan.
2. *Goals* - What are the *objectives* of the Action plan? - What does the Action Plan seek to achieve over a period of time? Goals and Objectives can be divided into short term, long term and intermediate or medium term goals. Clear and measurable Objectives would lead to identifying proper needs and interventions.
3. *Identified Gaps* - What are the issues to be tackled? A description of the shortcomings, gaps and needs which should be filled before the fundamental objectives can be met.
4. *Strategic Areas of Intervention* - What are the strategies that need to be adopted to overcome the identified gaps and meet the set goals and objectives? Areas of intervention may be identified in terms of - Awareness Raising, Mitigation/Risk Reduction, Response/Preparedness, Mainstreaming etc.
5. *Specific Activities* - The Plan then needs to specify priorities and actions under each identified strategy to fill the gaps and reach the objectives.
6. *Expected Outcomes* - What are the expected results/changes due to implementation of the strategy/ activities? - In quantitative as well as qualitative terms.
7. *Time Frame* - Timeline for actions should be realistic and could be aligned with the annual and five year planning process.
8. *Lead Agencies* - A listing of the organizations (and possibly individuals / positions) and agencies that would take the lead or be responsible for each action.
9. *Resources* - A summary of required and available resources, both fiscal (funding to implement elements of the action plan, cost estimates, sources of funding) and technical (technical documents, standards, training materials, manuals, etc.).
10. *Mechanisms/Additional Notes* - Implementation/ Coordination/ Reporting mechanisms and arrangements for carrying out activities and other requirements to be noted could also be included in the Plan.

An Action Plan Matrix to summarize all the key elements and for easy reference would be an important annexure to the Plan document.

D. Action Plan Development Process

For the development of an Action Plan, the working groups would adopt the following steps/process:

1. Set the Goals (Clarify objectives, scope, priority areas, etc.);
2. Based on the objectives, analyze needs and gaps;
3. Discuss steps or actions to be taken;
4. Identify - responsibilities and resources (both available and required), opportunities for cooperative implementation, barriers to implementation;
5. Discuss and estimate duration/ time required to carry out actions;
6. Establish priorities and a sequence or schedule for implementation.

Working group members shall meet once a month to review the plan drafting process until its finalization and adoption. An Action Plan is a work in progress. With time, as organizations grow and new developments take place, the Plan should be reviewed on a timely basis to reflect current realities and changing needs and priorities.

Annexure IV

Matrix for School Earthquake Safety – Action Plan (2013 – 2023 and beyond)						
Priority Area	Outcomes	Baseline	Interventions	Timeline Short (1-5 yrs.) Medium (5-10 yrs.) Long (More than 10 yrs.)	Performance Indicators	Responsible Agencies
1. Strengthening earthquake safety and disaster management institutional and policy framework in the Education Sector	1.1 Policies, guidelines, ministerial directives supporting earthquake safety and disaster management in schools in place	<ul style="list-style-type: none"> - School Disaster Management Planning guidelines drafted and disseminated in 2008 - School Disaster Management plan part of school performance assessment since 2010 - Facilitators guide for Workshop on Disaster Preparedness and Response for Safe School developed in 2011 - Information on earthquakes, other hazards and risk reduction incorporated in the non-formal education curriculum 	<ul style="list-style-type: none"> - Review of School Disaster Management Planning Guidelines, including budget and monitoring mechanisms - Formulate guidelines to identify and abate hazards from building contents, equipment and furnishings - Adopt higher safety standards for design and construction of all schools/educational institutions (including for tertiary/ vocational institutes, special institutes and day care centres) - Issue ministerial directives for implementation of school plan, safety standards, disaster management policies and guidelines 	<p>Short</p> <p>Short</p> <p>Medium</p> <p>Short</p>	<ul style="list-style-type: none"> - School Disaster Management Planning guidelines reviewed and adopted and all schools with functional plans - Guidelines to identify and abate hazards from building contents, equipment and furnishings adopted and implemented in schools 	<p><u>Lead:</u> Department of School Education, MoE</p> <p><u>Supporting Agencies:</u></p> <ol style="list-style-type: none"> 1. Policy and Planning Division, MoE 2. Department of Curriculum, MoE 3. Royal University of Bhutan 4. Department of Disaster Management, MoHCA 5. Gross National Happiness Commission 6. Dzongkhag/Thromde Administrations
	1.2 Strengthen disaster management institutions within the Education Sector	<ul style="list-style-type: none"> - Disaster management unit mandated to be formed in the Ministry of Education - School disaster management committees formed as per existing guidelines 	<ul style="list-style-type: none"> - Appoint/ identify disaster management focal persons in all schools - Strengthen disaster management unit in the Ministry of Education - Form school disaster management committees and teams - Encourage formation of disaster management clubs in schools 	<p>Short</p> <p>Short & Medium</p> <p>Short</p> <p>Short</p>	<ul style="list-style-type: none"> - All health facilities with disaster management focal persons and functional disaster management units - Health Help Centre fully functional and equipped to fulfill its mandates 	<p><u>Lead:</u> Department of School Education, MoE</p> <p><u>Supporting Agencies:</u></p> <ol style="list-style-type: none"> 1. Human Resources Division, MoE 2. School Principals 3. Department of Disaster Management, MoHCA 4. Dzongkhag/Thromde Administrations

2. Education and Awareness	2.1 Enhanced knowledge and information sharing management system created	<ul style="list-style-type: none"> - Knowledge and information shared through past and ongoing training programmes 	<ul style="list-style-type: none"> - Form a knowledge sharing network among schools - Share information with communities 	Medium Short	<ul style="list-style-type: none"> - Mechanism for information sharing developed - No. of knowledge sharing activities - No. of community campaigns, etc. 	<p><u>Lead:</u> Department of School Education, MoE</p> <p><u>Supporting Agencies:</u></p> <ol style="list-style-type: none"> 1. Human Resources Division, MoE 2. Dzongkhag Education Officers 3. School Principals 4. Department of Disaster Management, MoE
	2.2 Awareness and education increased	<ul style="list-style-type: none"> - Workshop on disaster preparedness and response for safe schools conducted in 19 dzongkhags - International Day for Disaster Reduction observed since 2008 - Existing information and education materials - School safety day observed in few schools since 2012 	<ul style="list-style-type: none"> - Conduct awareness activities and programs - Observe International Day for Disaster Reduction (or commemoration of past earthquake events) and carry out a preparedness drills in all schools as a National event - Develop information and education materials - Incorporate safety information on earthquakes and other hazards s in school and teacher training institutes curricula - Raise awareness on family preparedness 	Ongoing Ongoing Ongoing Medium Short	<ul style="list-style-type: none"> - Increased awareness on disaster management among teachers and students - Development of a comprehensive awareness strategy for education sector - No. of awareness activities carried out at various levels - Information and education materials formulated and disseminated in all schools - Disaster management related materials incorporated in school and teacher training curriculum - All school /education staff with family DM plans 	<p><u>Lead:</u> Department of School Education, MoE</p> <p><u>Supporting Agencies:</u></p> <ol style="list-style-type: none"> 1. School Principals 2. Department of Curriculum 3. Department of Disaster Management

<p>3. Risk Reduction and Mitigation</p>	<p>3.1 Structural measures implemented</p>	<p>Vulnerability Assessment checklist training conducted for more than 75 participants in 2012</p> <p>Existing School Planning and Building Division's designs include earthquake resilient features</p>	<p>New Constructions:</p> <ul style="list-style-type: none"> - Prepares standard earthquake-resilient school designs - Review existing guidelines for school construction - Institute construction quality control and inspection mechanism <p>Existing Buildings:</p> <ul style="list-style-type: none"> - Conduct vulnerability / safety assessment of existing school buildings - Carry out recommended strengthening, replacement or relocation measures 	<p>Short Medium</p> <p>Short Medium</p> <p>Short Medium</p> <p>Short Medium</p> <p>Medium Long</p>	<ul style="list-style-type: none"> - All new schools constructed as per earthquake resilient design - Schools constructed as per guidelines outside of hazard zones - Quality and standards of all new constructions ensured - All schools assessed and strengthened accordingly 	<p><u>Lead:</u> School Planning and Building Division, MoE</p> <p><u>Supporting agencies:</u></p> <ol style="list-style-type: none"> 1. Department of School Education, MoE 2. School Principals 3. Dzongkhag engineers 4. Dzongkhag Administrations 5. Department of Disaster Management, MoHCA 6. Ministry of Works and Human Settlement
	<p>3.2 Falling hazards are abated and insurance coverage in place</p>	<ul style="list-style-type: none"> - All Dzongkhag Education Officers and selected Principals were trained on falling hazards and preparedness measures in 2010 - Facilitators guide for Workshop on Disaster Preparedness and Response for Safe School includes component on fixing and bracing of falling hazards - Anchoring and bracing of falling hazards carried out in some schools 	<ul style="list-style-type: none"> - Carry out fixing, bracing and other non-structural measures in all schools - Explore and institute risk insurance for school buildings 	<p>Medium long</p> <p>Short , Medium</p>	<ul style="list-style-type: none"> - School buildings insured on a prioritized basis - Falling hazards in schools are identified and abated 	<p><u>Lead:</u> Department of School Education , MoE</p> <p><u>Supporting Agencies:</u></p> <ol style="list-style-type: none"> 1. Royal Insurance Corporation and other Insurance Companies 2. School Principals 3. Dzongkhag Education Officers 4. Department of Disaster Management 5. Ministry of Finance

4. Preparedness and Response	4.1 Preparedness planning strengthened	<ul style="list-style-type: none"> - School disaster Management Plans are in place for all schools - Awareness on preparedness planning and need to enhance preparedness initiated through past and ongoing training programs 	<ul style="list-style-type: none"> - Develop guidelines for disaster management and contingency plan for the Education Sector - Carry out Table top/simulation exercises for the contingency requirements and arrangements - Sensitize all departments, divisions, agencies in the Education Sector on the contingency arrangements 	Short Short Short, Medium	<ul style="list-style-type: none"> - Functional Education Sector contingency plan in place - All schools, dzongkhags, education sector agencies aware on the contingency plan 	<p><i>Lead: Department of School Education , MoE</i></p> <p><i>Supporting agencies:</i></p> <ol style="list-style-type: none"> 1. All Departments, MoE 2. Dzongkhag Education Officers 3. School Principals 4. Other agencies working in the Education Sector 5. Department of Disaster Management
	4.2 Response capacities strengthened	<ul style="list-style-type: none"> - Basic disaster risk reduction and search & rescue training for 200 scout masters conducted in 2012 - Education in Emergency Trainings conducted in 19 dzongkhags - Distribution of standard safety materials to 128 pilot schools 	<ul style="list-style-type: none"> - Establish clear chain of command and communication flow - Maintain stockpile of materials required for emergency response and immediate recovery - Establish/institute pre-arrangements for emergency requirements - Standardize equipment/ materials requirements at all levels - Continue delivery of workshop on disaster preparedness and response for safe schools and also conduct refresher/ additional courses and targeted courses as required 	Short Medium Short, Medium Short, Medium Ongoing	<ul style="list-style-type: none"> - An effective communication and command system in place for emergencies - Stockpile of emergency materials and pre-arrangements in place and pre-positioned for effective response and recovery - Schools equipped with basic DM equipment and materials 	<p><i>Lead: Department of School Education , MoE</i></p> <p><i>Supporting agencies:</i></p> <ol style="list-style-type: none"> 1. School Principals 2. Dzongkhag Education Officers 3. Dzongkhag Administrations 4. Department of Disaster Management

5. Capacity Building	5.1 Capacity building for Risk Reduction	<ul style="list-style-type: none"> - Vulnerability assessment forms training conducted for more than 75 engineers in 2012 	<ul style="list-style-type: none"> - Build capacity of engineers and maintenance staff to assess vulnerability/safety of school buildings - Build capacity of engineers and architects for retrofitting and seismic risk reduction techniques - Conduct comprehensive training on how to reduce hazards from falling objects - Raise awareness and capacity on mainstreaming earthquake safety and risk reduction concerns 	<p>Short, Medium</p> <p>Medium, Long</p> <p>Short</p> <p>Short, Medium</p>	<ul style="list-style-type: none"> - Engineers/ technical personnel trained in the use of vulnerability assessment tools and procedures and equipped with capacity to retrofit/strengthen existing school buildings - School personnel, especially maintenance staff trained in carrying out non-structural measures 	<p><u>Lead:</u> School Planning and Building division, MoE</p> <p><u>Supporting Agencies:</u></p> <ol style="list-style-type: none"> 1. Department of School Education, MoE 2. School Principals 3. District engineers 4. Dzongkhag administrations 5. Department of Disaster Management, MoHCA 6. Ministry of Works and Human Settlement
	5.2 Capacity Building for Preparedness and Response	<ul style="list-style-type: none"> - Workshop on Disaster Preparedness and Response for Safe Schools conducted in 16 Dzongkhags (includes Mock Drill, EIE, first aid and fire safety) - Basic DRR and Search and Rescue training for Scout masters 	<ul style="list-style-type: none"> - Provide Emergency Management training for Education. Personnel - Train committees, teams, focal persons - Comprehensive disaster management training developed for Scouts/ youth volunteer groups 	<p>Short, Medium</p> <p>Ongoing</p> <p>Medium</p>	<ul style="list-style-type: none"> - Ministry and education personnel equipped with knowledge on emergency management - School disaster management teams and focal persons have enhanced capacity in carrying out their responsibilities - Scouts/ youth groups trained in Disaster risk reduction and emergency skills and with the ability to aid in immediate response 	<p><u>Lead:</u> Department of School Education, MoE</p> <p><u>Supporting Agencies:</u></p> <ol style="list-style-type: none"> 1. School Principals 2. Department of Youth and Sports, MoE 3. Department of Disaster Management, MoHCA

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