MAPPING
Bhutan's Risk Profile

A National Report based on WHO's Strategic Toolkit for Assessing Risks (STAR)

Health Emergencies Programme
Department of Public Health
Ministry of Health
Bhutan

January 2024

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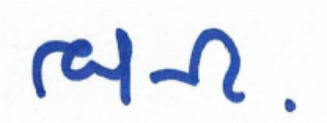
Foreword

It is with great pleasure and a sense of responsibility that I extend my sincere gratitude to all those who contributed to the successful convening of the All-hazard risk assessment through the STAR Workshop. This gathering brought together a diverse group of experts, professionals, and stakeholders dedicated to advancing the understanding and preparedness for the multifaceted risks that our health system may encounter. In today's rapidly evolving world, where health threats can emerge from various sources and in diverse forms, the importance of comprehensive risk assessment cannot be overstated. This workshop provided a crucial platform for the exchange of knowledge, experiences, and insights, fostering a collaborative environment to enhance our collective ability to identify, mitigate, and respond to health-related risks.

The invaluable contributions of experts and representatives from various agencies have enriched our understanding of the complex challenges we face. Through engaging discussions, case reviews, and practical exercises, participants had the opportunity to delve into the intricacies of health risks arising from natural disasters, health emergencies, chemical incidents, and other unforeseen events. As we navigate an era marked by unprecedented global challenges, the insights gathered from this workshop will undoubtedly play a pivotal role in strengthening our health system's resilience. By systematically evaluating the potential hazards, vulnerabilities, and capacities within our healthcare system and beyond, we can better equip ourselves to safeguard the health and well-being of our citizens.

I would like to express my deepest appreciation to WHO, organizers, facilitators, and participants for their commitment and dedication throughout the workshop. Your efforts have not only enriched the collective knowledge base but have also set the stage for ongoing collaboration and coordination in our ongoing pursuit of a resilient and responsive health system.

In conclusion, I encourage all stakeholders, both within the Ministry of Health and across relevant sectors, to actively engage with the findings and recommendations outlined in this All-hazard Risk Assessment Workshop Report. By working together, we can proactively address the challenges that lie ahead and ensure the health and safety of our communities.



(Pemba Wangchuk)
Acting Secretary

Short Overview

Country Risk Profile	Bhutan
Workshop Date	24-26 October 2023
Location	Paro
Methodology	Workshop
Facilitation Team	WHO Team 1. Dr Sandip Shinde 2. Dr Dipendra Gautam 3. Kencho Wangdi MoH Team (National Facilitators) 1. Deki Yangzom 2. Ugyen Tshering 3. Tandin Wangmo 4. Dechen Wangmo 5. Tenzin Dema
Sectors/ Ministries Represented	1. Department of Public Health, MoH 2. Royal Center for Disease Control 3. Department of Health Services, MoH 4. National Medical Services, MoH 5. Bhutan Food and Drug Authority, MoH 6. Department of Livestock, MoAL 7. Department of Agriculture, MoAL 8. Royal Bhutan Police 9. National Center for Hydrology and Meteorology 10. Ministry of Energy and Natural Resources 11. Department of Revenue and Customs 12. Ministry of Infrastructure and Transport 13. Department of Geology and Mines 14. Department of Local Governance and Disaster Management 15. Bhutan Red Cross Society 16. Khesar Gyalpo University of Medical Sciences of Bhutan 17. Department of Environment and Climate Change

Acknowledgments

The successful execution of the STAR Workshop would not have been possible without the generous support, guidance, and collaboration of various individuals and organizations. We express our deepest appreciation to the WHO Country Office Bhutan for their unwavering support, both technically and financially. Their commitment to advancing global health security has been instrumental in making this workshop a reality. Special thanks to the dedicated technical team from the WHO office whose expertise significantly enriched the content and structure of the workshop. Their contributions, spanning from the development of materials to active participation in discussions, have been invaluable.

We extend our gratitude to the national facilitators whose commitment and skills greatly contributed to the smooth conduct of the workshop. Their efforts in guiding participants through discussions, activities, and exercises have left a lasting impact on the overall success of the event. Our sincere thanks go out to all the agencies that actively took part in the workshop. Your representation and active engagement brought diverse perspectives to the discussions, fostering a rich environment for learning and collaboration.

Executive Summary

The Ministry of Health (MoH), Bhutan conducted its first strategic risk assessment workshop for all hazards from 24-26 October 2023. The workshop was conducted using the WHO's STAR (Strategic Toolkit for Assessing Risks) Toolkit. It was attended by participants from various non-health agencies and various departments and programmes under the Ministry of Health.

The workshop exercise focused on the identification of the common hazards in the country, assessment of likelihood, impacts, severity, and development of the seasonal calendar in relation to health emergencies. The risk assessment targeted hazards related to geophysical/hydro-meteorological, environmental, technological, and biological that have the potential to cause health emergencies in Bhutan. The main objective of the workshop was to develop a country context risk matrix of the priority hazards that will enable the country to make critical action plans for preparedness and mitigation.

The workshop identified 16 priority hazards, which were grouped under four categories:

- **Geo-physical/Hydro-meteorological**:
    1. Earthquake
    2. Glacial Lake Outburst Flood (GLOF)
    3. Flood
    4. Forest/Wildfire
    5. Landslide
- **Biological Hazard I**:
    6. Dengue
    7. Rabies
    8. Avian Influenza (HPAI),
    9. Emerging infectious disease (Disease X)
- **Biological hazard II**:
    10. Influenza,
    11. COVID-19,
    12. Acute Watery Diarrhea.
    13. MDR-TB
- **Biological & Technological hazards**:
    14. Food poisoning,
    15. AMR
    16. Chemical poisoning

The risk assessment of the hazards was carried out by taking into consideration the vulnerability of the population, the coping capacity of the hazard and the assessment of their impacts. The risk matrix has been summarized and profiled based on their likelihood and impacts as follows:

- **Very High**: Earthquake
- **High:** Glacial Lake Outburst, Avian Influenza, Tuberculosis, Flood, Forest/Wildfire, Landslide, Dengue, Seasonal Influenzas, COVID-19, Cholera/Acute Watery Diarrhea
- **Moderate:** Rabies, Disease X, Antimicrobial Resistance, Chemical Agent
- **Low:** Gastroenteritis/Foodborne Disease

The workshop also identified the strengths and weaknesses in terms of governance and resources, coping capacities of the health sector, non-health sector and community for each hazard. This information is translated into an evidence-based risk matrix, risk calendar, and specific action plans for each hazard.

Implications

The STAR workshop has the following implications:

- The findings of the STAR workshop will help the MoH, Department of Local Governance & Disaster Management (DLGDM) and other relevant stakeholders to prioritise their efforts to reduce the risk of and prepare for public health emergencies.
- The risk matrix, risk calendar, and action plans will provide a roadmap for developing and implementing effective interventions
- The workshop will enhance multi-sectoral collaboration and consensus building over the country context hazards
- The prioritisation of hazards and specific action plans will significantly help optimize limited resources for preparedness and mitigation efforts.

I. Introduction

Bhutan is highly vulnerable to health emergencies and disasters and emergency readiness forms an integral part of the health system in Bhutan. While there has been a lot of emphasis on strengthening health emergency preparedness and response in the country through an all-hazard approach, it is crucial that risk-based approaches are adopted to prioritize and optimally utilize the limited resources in the country. The recent health emergency from the COVID-19 pandemic has also underscored the need to strengthen health emergency preparedness and response capacity in the country. In this view, it was imperative that a strategic risk assessment of the multi-hazards be conducted using the WHO STAR toolkit that enables to quick development of a country risk profile which is essential for making key action plans.

The STAR Toolkit is an instrument developed by the WHO to help countries identify country context hazards and assess their level of risk that could trigger national response and cause potential disruption to the health care service. This process is intended to support the planning and prioritization of activities associated with all-hazard health emergencies.

The risk assessment using the STAR methodology is evidence-based and entails comprehensive exercise and consensus building among the experts and stakeholders to develop a technical report that is focused over a period of time and is in alignment with the International Health Regulation (IHR 2005). The risk profiling methodology adopted during the STAR workshop included the following key principles:

- All-hazards approach
- Multi-sectoral collaboration
- Whole-of-society engagement including CSOs
- Health system focus
- Compilation and review of the evidence and data on the risks/hazards
- Transparency and consensus-building

II. Objectives of STAR workshop

The following were the objectives of the STAR workshop:

- Identify and rank public health hazards in Bhutan based on the best available evidence and data
- Determine the likelihood, impacts and develop seasonal calendars of the hazards
- Review current coping capacities and identification of strengths and weaknesses

- Develop concrete action plans to address the gaps and strengthen resilience and readiness for health emergencies
- Sensitize/advocate the findings of the STAR to garner support from the stakeholders and leaders to foster ownership as well as effective implementation of the recommendations.
- Serve as the fundamental basis for the development of national health emergency contingency plans, national action plans for health security and joint external evaluations.

III. Risk profiling methodology

1. General overview of STAR methodology applied

The WHO-compliant risk profiling methodology was adopted by carefully defining the scope and objectives of the exercise. Multiple stakeholders, subject matter experts and CSOs were identified and included in the workshop. The national facilitators were identified, and orientations were provided by the STAR technical experts on the use of the STAR toolkit. The exercise began with the identification of the preliminary list of hazards that were extensively deliberated among the stakeholders and technical experts to prioritize hazards for in-depth analysis.

The process entailed stocktaking of the primary/secondary data, assessment reports, meteorological profile and other relevant country-specific data complemented by extensive review and discussion during the workshop. During the workshop, the participants were divided into groups based on hazard relevancy and their expertise to extract the best from the group exercise. The stakeholders were encouraged to actively participate and contribute to the group exercise that was facilitated by the national facilitators. After the assessment of the hazards, the participants engaged themselves in developing key action plans through extensive discussions and refinement of the finalized plans. The workshop exercises were meticulously carried out in a structured manner that resulted in effective profiling of the hazards and the development of a risk matrix.

2. Overview of the country workshop

The workshop was participated by representatives from multiple sectors relevant to the hazards. A total of 33 participants were involved in a 3-day STAR workshop that included subject matter experts, representatives from health and non-health sectors, departments and programs, policymakers, academia, national public health institutes, armed forces, Desuups and CSOs. Some of the key government agencies involved were the Department of Local Governance and Disaster Management, Department of Agriculture, Department of Livestock,

National Center for Hydrology and Meteorology, Department of Environment and Climate Change, Department of Geology and Mines, University of Medical Science of Bhutan (KGUMSB) and other relevant agencies.

The health leaders actively participated in the STAR workshop, sharing key lessons from the COVID-19 pandemic. They emphasised the importance of collaboration and unity in building a resilient system to withstand future disasters. In addition to the development of the risk matrix, the workshop also aimed to teach participants the use of the STAR toolkit to assess public health risks and prioritise preparedness and response actions. The participants were divided into four groups each group comprising 7-8 members based on their relevance to the category of the hazards. The sessions included informative presentations, in-depth group discussions and plenary sessions. The group exercise was guided by the local facilitators, with overall guidance from two international experts.

The workshop exercise started with an assessment of vulnerability, coping capacities, determining seasonal occurrences and the level of risks for each hazard. Finally, a clear action plan was developed that is expected to contribute to building a resilient health system to deal with any public health events in the country.

IV. Country Context

1. General Country Profile and Emergency Management System

Bhutan being a mountainous country is highly prone to multiple geophysical and hydro-meteorological hazards, including glacial lake outburst floods (GLOFs), flash floods, riverine floods, landslides, and windstorms. It ranks fourth highest in South Asia in terms of relative exposure to flood risks, with 1.7% of the total population at risk. With climate change, the frequency and intensity of extreme events are expected to increase. The country is also located in the seismic zone V of high earthquake occurrence.

The Constitution of the Kingdom of Bhutan provides for an overall framework for disaster risk reduction, risk management and provision for safety and security from all kinds of emergencies including natural calamities. The Disaster Management Act of Bhutan 2013 is the primary legislation that governs the emergency management system in the country and the National Disaster Management Authority (NDMA) is the highest decision-making body. The Disaster Management Act of Bhutan mandates the establishment of institutions, strategies, and coordination mechanisms to guide an effective disaster management process at the national and local levels. To this end, the Ministry of Health has developed the Health Emergency Disaster Contingency Plan, 2016 that elucidates coordination mechanisms within the health sector during health emergencies.

Between 1994 and 2016, some 87,000 people were affected and over 380 deaths occurred due to natural disasters in Bhutan— mostly arising from the impacts of floods, windstorms, earthquakes, and GLOFs. Floods and storms account for about 95 percent of total deaths related to natural disasters; the remaining 5 percent resulting from earthquakes.

2. Country Health Profile

The country's health system is based on the principle of Primary Health Care (PHC) with the goal of achieving Universal Health Coverage (UHC). The healthcare service is delivered through a 3-tier system of primary, secondary and tertiary care. The National Medical Services (NMS) provides stewardship for clinical services management in the country, while the MoH looks into policymaking, formulation of regulations, and guidelines and manages disease prevention and elimination through public health interventions in the country. Currently, the health service is entirely financed by the government and every individual in the country is provided with free healthcare services.

3. Health Emergency and Disaster Context

As mandated by the Disaster Management Act of Bhutan, 2013, the Health Emergency and Disaster Contingency Plan (HEDCP) was developed in 2016 with the key objective of ensuring the health sector's preparedness and response to emergencies in a timely, effective, and coordinated manner. The plan also entails the establishment of the Health Emergency Operation Center (HEOC) and the formation of the Health Emergency Management Committee (HEMC) which is the highest decision-making body for the health sector during emergencies. Further, the National Health Policy 2012 also mandates all health facilities to institute appropriate systems of care to deal with emergencies, disasters, epidemics, and outbreaks

As a signatory to the International Health Regulations 2005 (IHR), Bhutan has demonstrated its obligation and commitment to managing health risks that could negatively impact national and global health outcomes. During the COVID-19 pandemic, Bhutan has taken commendable response measures to prevent and respond to the global spread. Its efforts have been recognized internationally as a model for effective pandemic response. Despite new and varied challenges such as rising health expenditure and emerging health risks, Bhutan is set to make every effort to strengthen the country's preparedness and response to emergencies through various means such as reinforcing early warning systems, bolstering the One-Health approach and strengthening multi-sectoral coordination and collaboration.

V. Identified Hazards for Assessment

A total of 16 different hazards were unanimously prioritised by the participants from the preliminary list of 24 hazards during the workshop. The hazards were prioritised as per the country context, taking into account the previous occurrence, frequency, impacts, likelihood of occurrence in the future and possible impacts on health and socio-economic.

1. Geophysical and Meteorological Hazard

The following five hazards were chosen for in-depth assessment under the category of Geophysical and Meteorological Hazards. These hazards were assigned to Group A for further analysis.

1. Earthquake
2. Glacial Lake Outburst Floods (GLOFs)
3. Forest/WildFires
4. Flood
5. Landslide

2. Biological Hazard I (Zoonotic and Vector-borne)

The biological hazards were divided into two groups. The first category involved hazards related to Zoonotic and Vector-borne Diseases. A total of four hazards were prioritized under this category as follows and these groups of hazards were assigned to Group B for further assessment.

1. Dengue
2. Rabies
3. Emerging Infectious Disease (Disease X)
4. Avian Influenza

3. Biological Hazard II ((Airborne/Respiratory + Water-borne Diseases)

The next category of biological hazards belongs to the diseases occurring through airborne, respiratory and water-borne Diseases. A total of four diseases were chosen for further assessment and were assigned to group C.

1. Seasonal influenza
2. COVID-19
3. Cholera/ Acute diarrheal disease
4. MDR-TB

4. Food safety +AMR + Chemical + other human-induced hazards

The final category of the hazards group under food safety, AMR, Chemical and other human-induced hazards. The following three hazards were chosen and were assigned to group 4 for assessment.

1. Food Poisoning
2. AMR
3. Chemical poisoning

VI. Results of risk profile process

1. Risk Matrix

The risk matrix is generated through the stepwise process using the STAR methodology that considers previous experiences, study findings, assessment reports, data, and views of the experts. An in-depth group discussion was conducted while determining the data inputs. The risk matrix is broadly described under the likelihood and impact. The matrix also maps the key strengths, challenges, and gaps at the national, district, and community levels. The risk matrix below provides a simple visual overview of the results of the strategic risk assessment. It plots the impact and likelihood of risk on a graph, showing the priority risks that need to be addressed in preparedness and risk reduction activities.

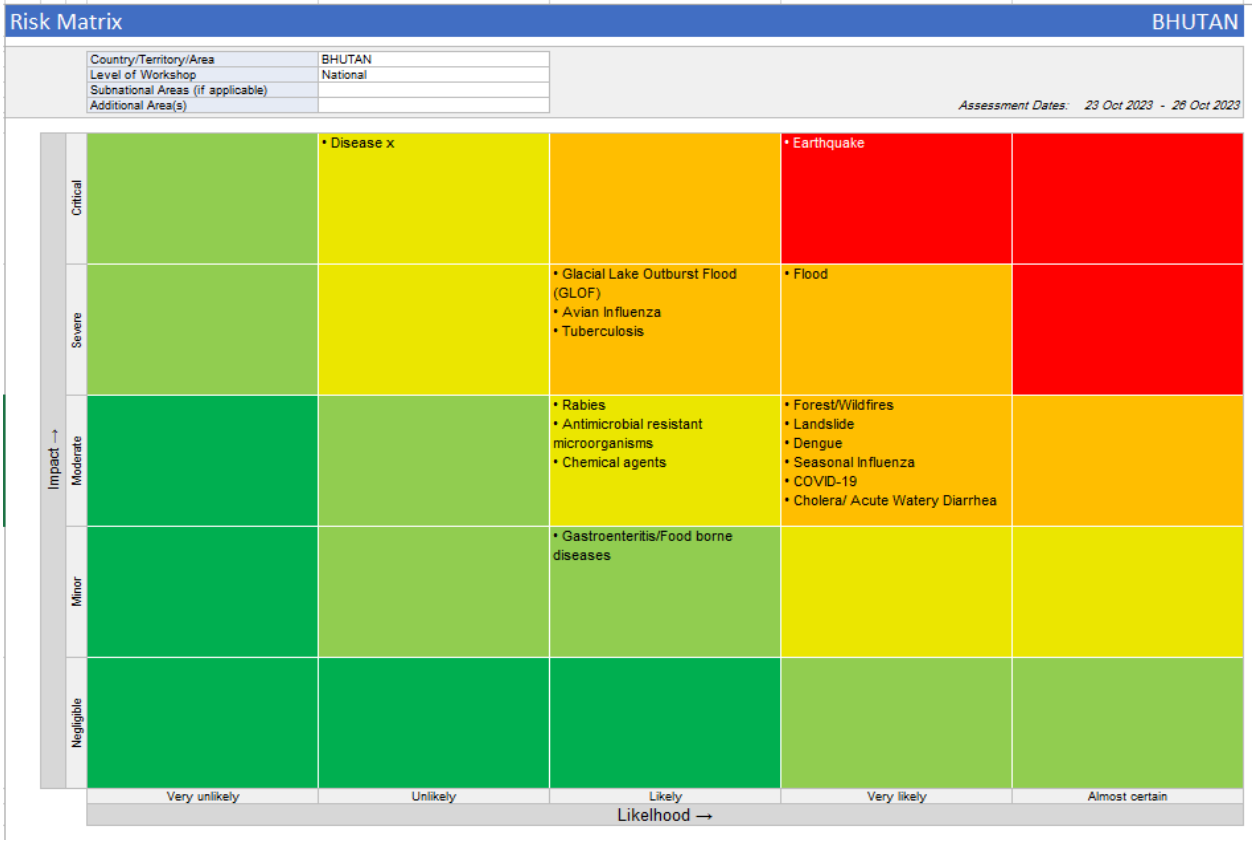


Figure 1 A Summary of Risk Matrix

Among the identified hazards, the likelihood of an earthquake is found to be very likely and will have critical impacts. The impact considers health consequences, geographical area, vulnerability, exposure, frequency and coping capacities in terms of governance, resources, health, and non-health sector capacities. While other hazards that include flood, fire outbreak, landslide, dengue, seasonal influenza, COVID-19 and acute watery diarrhea, GLOF, avian influenza and tuberculosis are likely or very likely to occur, they have been mapped to have moderate to severe impacts. Rabies, AMR, chemical events, and food-borne illness are likely to occur with minor to moderate impacts. The summary of the risk matrix has been presented in the figure above.

2. *Risk Calendar*

The risk calendar maps the seasonality of hazards based on the seasonal occurrence and helps in planning, prioritization and devising action plans to mitigate risk and scale up readiness capacity to be able to respond to the hazard. The information generated from the seasonal calendar will help and guide authorities to plan and prepare for upcoming hazards to reduce the risk of public health emergencies.

The seasonal occurrence of each hazard was carefully assessed using the past trends, available data, information, and unanimous agreement by the participants. The seasonality of the hazards is indicated by the colors from green to red against the month that is likely to occur. The seasonality of nine hazards has been mapped. For the rest of the hazards, the seasonality was not applicable as their likelihood of occurrence did not depend on the seasons. The green color indicated the lowest chance of occurrence while the red color indicated the highest probability of occurrence. The details of the seasonality of each hazard are depicted in the calendar below.

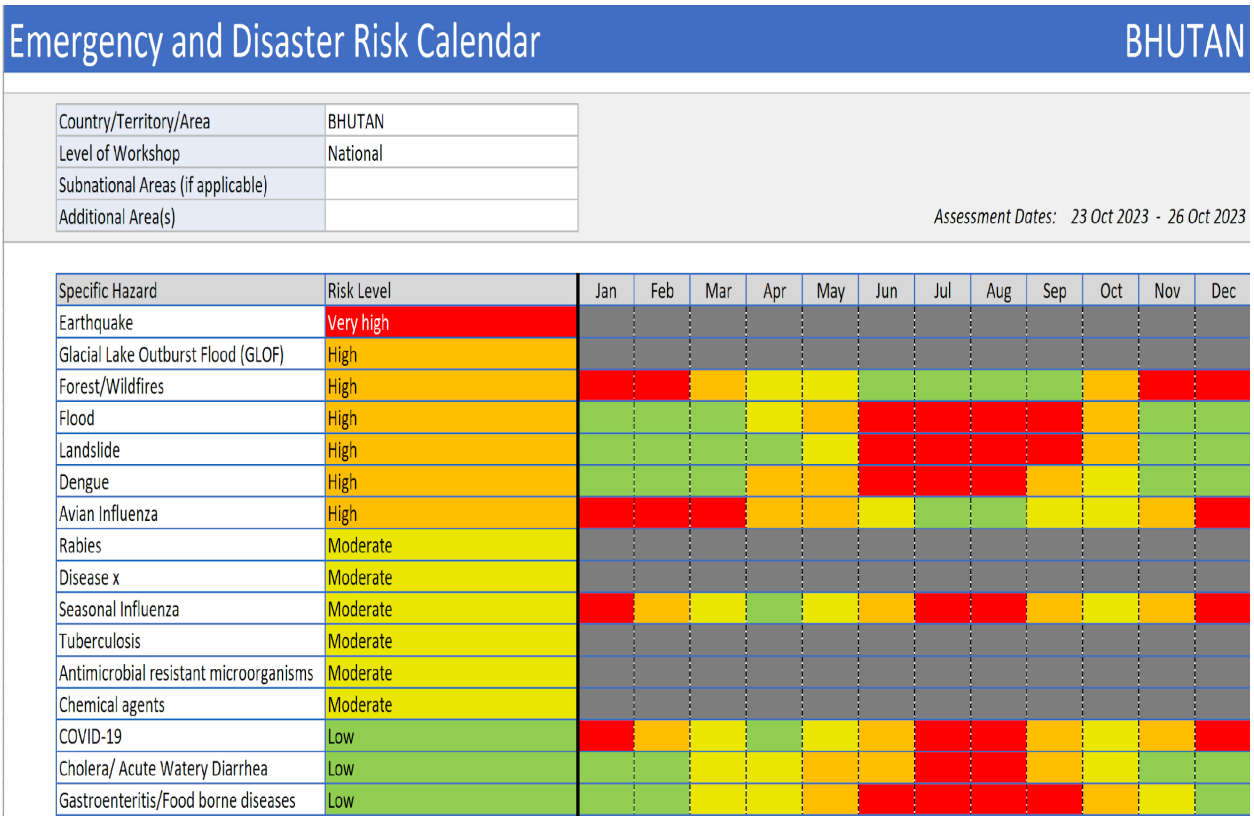


Figure 2 Seasonal Calendar of hazard

Green- Lowest, Yellow -Moderate, Orange – High, Red- Peak

VII. Recommended Actions

The following general recommendations have been drawn from the conduct of the STAR workshop. While efforts are underway to strengthen the health emergency preparedness and response in the country, the following specific recommendations have been highlighted.

The Ministry of Health shall:

- Continue to coordinate with the relevant stakeholders in its efforts to prevent, prepare and mitigate health emergencies.
- Advocate for strengthening of governance and prioritizing resources in order to build capacities of the health sector, non-health sector and community to be able to deal with emergencies and disasters to avoid adverse impacts on the health and wellbeing of the people.
- Prioritize the implementation of the action plans for each hazard generated from the STAR workshop with a focus on the high-risk hazards.
- Regularly review and update the risk matrix, risk calendar, and action plan to ensure that they are reflective of the latest information and evidence.

VIII. Conclusion and Next Steps

The findings from STAR, along with its recommendations, play a vital role in informing risk-based planning, which encompasses national emergency response plans, disaster management plans, National Action Plans for Health Security (NAPHS), and contingency plans. The STAR risk calendar, risk matrix, recommendations, and action plans tailored to each priority hazard are instrumental in enabling the country to prepare for a wide range of hazards. This knowledge and data also contribute to strengthening the country's healthcare system, fostering better coordination and collaboration among all pertinent sectors.

The findings of STAR will be disseminated to all the stakeholders at both national and district levels after the endorsement by the ministry. Additionally, the program will emphasize and work with the stakeholders in the implementation of the action plans.

IX. Annexes

a) List of Participants

1. Major Tshewang Thinley, Royal Bhutan Police
2. Yeshi Namgyel, Department of Local Governance & Disaster Management
3. Chhimi Dorji, Department of Local Governance & Disaster Management
4. Cheki Yangzom, Desuung office
5. Thinley Dorji, Desuung Office
6. Gyem Lham, Department of Air Transport
7. Nima Lhamo, Bhutan Construction and Transport Authority
8. Karma Namgay, Department of Geology and Mines
9. Phub Tshering, Bhutan Red Cross Society
10. Tshering Nima, National Centre for Hydrology and Meteorology
11. Sonam Tashi, Department of Environment and Climate Change
12. B.B Rai, Department of Agriculture
13. Dr Sangay Rinchen, Department of Livestock
14. Dr Chendu Dorji, Department of Livestock
15. Dorji, Punakha Hospital, National Medical Services
16. Yeshey Choden, Bumthang Hospital, National Medical Services
17. Sangay Dorji, CRRH, National Medical Services
18. Tshering Wangchuk, Health Desk, Paro Airport
19. Tshewang Penjor, Gidakom Hospital, National Medical Services
20. Pempa, Department of Health Services
21. Tashi Lhendup, Bhutan Food and Drug Regulatory Authority
22. Sonam Phuntsho, Policy and Planning Division, MoH
23. Dago Tshering, The Medical Education Centre for Research Innovation and Technology, KGUMSB
24. Pemba Yangchen, FoNPH, KGUMSB
25. Dr Kinley Penjor, FoNPH, KGUMSB
26. Karchung Tshering, Royal Center for Disease Control
27. Lila Maya Adhikari, Royal Center for Disease Control
28. Sonam Jamtsho, Royal Center for Disease Control
29. Laigden Dzed, Department of Public Health
30. Karma Wangdi, Department of Public Health
31. Tashi Dawa, Department of Public Health
32. Ugyen Zangpo, Department of Public Health
33. Tshewang Dorji, Department of Public Health

b) All-Hazard Risk Summary

All-Hazards Risk Summary — BHUTAN

Country/Territory/Area	BHUTAN
Level of Workshop	National
Subnational Areas (if applicable)	
Additional Area(s)	

Assessment Dates: 23 Oct 2023 - 26 Oct 2023

Risk	Risk Level	Geographical areas affected	Likelihood	Impact	Vulnerability	Coping Capacity	Level of Confidence
Earthquake	Very high	Whole country - 20 Districts	Very likely	Critical	Very High	Low	Good
Glacial Lake Outburst Flood (GLOF)	High	1. Mangdechhu basin 2. Chamkh	Likely	Severe	High	Partial	Satisfactory
Forest/Wildfires	High	Western (Haa, Paro, Thimphu, Pu	Very likely	Moderate	High	High	Good
Flood	High	Southern (Chukha, Samtse, Sarpa	Very likely	Severe	High	Partial	Satisfactory
Landslide	High	Southern (Chukha, Samtse, Sarpa	Very likely	Moderate	High	Partial	Satisfactory
Dengue	High	Chhukha, Sarpang, Samtse, Samo	Very likely	Moderate	High	Partial	Satisfactory
Avian Influenza	High	Samtse, Sarphang, Pema Gatsehl	Likely	Severe	High	Partial	Satisfactory
Rabies	Moderate	Haa, Chhukha, Dagana, Sarpang,	Likely	Moderate	High	Partial	Good
Disease x	Moderate	All districts	Unlikely	Critical	Very High	Low	Unsatisfactory
Seasonal Influenza	Moderate	Nation wide. However, most case	Very likely	Minor	Low	High	Satisfactory
Tuberculosis	Moderate	Nation Wide. (Most common in	Likely	Moderate	Low	High	Satisfactory
Antimicrobial resistant microorganis	Moderate	Whole Country	Likely	Moderate	Partial	Partial	Satisfactory
Chemical agents	Moderate	Thimphu, Chukha	Likely	Moderate	High	Partial	Satisfactory
COVID-19	Low	Nation Wide.	Likely	Minor	Low	High	Satisfactory
Cholera/ Acute Watery Diarrhea	Low	Cholera is not a Public Health cor	Likely	Minor	Low	High	Satisfactory
Gastroenteritis/Food borne diseases	Low	School, institute, Family gatherin	Likely	Minor	Partial	High	Satisfactory

c) Action Plan

i. Geophysical and Meteorological Hazard

Hazard	*Priority actions*	*Responsible*	*Stakeholders*	*Geographical area(s)*	*Justification/comments*
1. Earthquake	i. Amend Disaster Management Act of Bhutan 2013	DLGDM, MoHA	All ministries, technical agencies, private entities, CSOs/NGOs, Local Governments (LGs)	National	1. Due for amendment; 2. Inclusion of all hazards including biological and technological emergencies 3. Review of NDMA members
	ii. Review and update Health Emergency & Disaster Contingency Plan (HEDCP) 2016 (consider integrating NIPPP with HEDCP)	DoPH, MoH	All departments under MoH, DLGDM, MoF, MOAL, BRCS, KGUMSB, technical agencies, private entities, CSOs/NGOs, LGs	National	1. Due for revision; 2. Incorporate lessons learned from COVID-19 3. JEE recommendation
	iii. Enhance the national earthquake monitoring network	DGM, MOENR	Govtech, DLGDM, LGs, MoF	National	1. Difficult to keep it live and running all the time 2. Inadequate infrastructure at present
	iv. Develop SOP for coordination among Desks under NDRCC	DLGDM, MoHA	All relevant Desk under NDRCC	National	1. Weak coordination among stakeholders due to a lack of clear SOP
	v. Build additional USAR capacity and resources (USAR equipment) for	DLGDM	Armed forces, De-suung, Gyalsung	National	1. No INSARAG classified teams at present

	effective Response as per the INSARAG standard.				
	vi. Finalize the establishment of the Bhutan national Emergency Medical Team (EMT), in line with WHO EMT guidance	MoH	NMS, DLGDM, MoF, De-suung, BRCS	National	1. JEE (2017) Recommendations
2. GLOF	vii. Development of Disaster Information System (including loss and damage data)*[1]	DLGDM	All relevant agencies under NDRCC	National	1. No central dynamic database is available for long-term planning, as well as real-time decision-making.
	viii. Establish well-equipped National Emergency Operation Center (NEOC)	DLGDM	All relevant agencies including MoF	National	1. No NEOC at the national level for long-term planning, as well as real-time proper management of multi-sectoral response.
	i. Update and maintain automatic weather stations	NCHM	MoF	National	1. To use for long-term planning, as well as real-time decision-making.

	ii. Conduct regular awareness on GLOF risk and evacuation plan in catchment areas	NCHM	DLGDM, MoH, LGs	Sub-national	1. To enhance preparedness in the community level
	iii. Review and update District Disaster Management & Contingency Plan including evacuation plan	LGs (DDMC)	DLGDM, NCHM, MoH	Sub-national (relevant Districts)	1. To incorporate lessons learned as per evolving situation 2. To enhance effectiveness of coordination among responding agencies
	iv. Conduct regular Simulation exercise in the community	DLGDM	LGs, NCHM, MoH, De-suung, RBP, BRCS	Sub-national	1. To enhance preparedness in the community level
3. Forest/ wildfire	i. Establish better coordination mechanism among stakeholders (Inter-Agency Forest Fire Coordinating Group)	DoFPS	Armed forces, De-suung/Gyalsuung, LGs, DLGDM, Communities, BRCS	National	1.To enhance effectiveness of coordination among responding agencies
	ii. Reinforce advocacy and awareness programme	DoFPS	LGs, DLGDM, RBP, De-suung	National	1. Behavioral change
	iii. Procurement of PPE for firefighting	DoFPS	RBP, De-suung, DLGDM	National	1.Safety for responders

4. Flood	i. Conduct/Update Flood Risk Assessment and Hazard mapping	MOIT	NHCM, DLGDM, DGM	National	1. To minimise the loss and damage caused by floods
	ii. Develop clear mechanism for mobilising fund during emergencies/disasters	DLGDM	MoF	National	1. To ensure early disbursement of fund during response phase
	iii. Conduct Joint External Evaluation (IHR 2005 mandate)	MoH	DLGDM, WHO, MoAL, and other relevant agencies	National	1. Due for JEE (last one was conducted in 2017)
5. Landslide	i. Enforce slope grading (benching) while constructing roads	DECC	MOIT(DoST), DGM, LGs	National	1. To mitigate the adverse effects from landslide
	ii. Geological and stability study before the construction of any major infrastructures on the slope	DGM	MOIT	Sub-national	1. To ensure safety, mitigate risks, reduce costs, protect the environment, and comply with regulations

[1] **Action applicable to all geophysical hazards*

ii. Biological Hazard I (Zoonotic and Vector-borne)

Hazard	Priority Action	Responsible	Stakeholders	Geographic Area(s)	Justification/comments	Deadline
Dengue	1. Review, update and endorse Operational Plan for Preparedness and Response to Prevent and Control of Dengue in Bhutan 2020 (draft).	a. Vector-Borne Disease Control Program - Department of Public Health, Ministry of Health	a. Royal Center for Disease Control b. Local Government c. Local Community d. National Center for Hydrology and Meteorology e. Association of Bhutanese Industries f. MoESD (Ministry of Education and Skill Development) g. Desuung h. Khesar Gyalpo University of Medical Sciences of Bhutan (KGUMSB) i. National Medical Service j. Department of Law and Order	Dengue endemic areas and high-risk areas	a. No Formalized information sharing mechanism among relevant stakeholders b. Operational Plan for Preparedness and Response to Prevent and Control of Dengue in Bhutan 2020 in draft phase c. Inconsistent reporting from the field d.HR shortage for control and preventive activities	December 2024
	2. Develop and integrate Vector surveillance components in the existing web-based reporting system and sensitize.					November 2024
	3. Develop capacity in clinical case management of dengue.					May 2024
	4. Develop Risk Communication and Community Engagement Plan.					

Rabies	1. Review, update and endorse Joint Rabies Strategic plan for Dog-mediated human rabies elimination by 2030-Bhutan.	a. DoPH, Ministry of Health b. Ministry of Agriculture and Livestock (MoAL)	a. Royal Bhutan Police and Desuung b. Bhutan Food and Drug Authority c. DoFPS (Department of Forest and Park Services d. MoAL e. Local Government f. Institutions (KGUMSB and Royal University of Bhutan) g. National Medical Service h. Department of Law and Order	Rabies Endemic Districts	a. No joint operational plan in place for rabies (draft) b. Plans and guideline outdated /Not tested (Simex and Drill) c. No regular capacity building d. No committed budget for response e. Inconsistent reporting from the field f. Weak formal mechanism at national level to respond to zoonotic diseases	January 2024
	2. Review and Update One Health Strategic Plan.					January 2024
	3. Develop Capacity on rabies management in humans and conducting regular Simex to test and validate.					May 2024
	4. Establish diagnostic capacity for detection of rabies in human/animal at the Royal Center for Disease Control and 3 veterinary labs in endemic areas.					October 2024
Avian Influenza (HPAI)	1. Review,update and endorse National Influenza Pandemic Preparedness and Response Plan and National Influenza	a. DoPH, Ministry of Health	a. Royal Bhutan Police and Desuung b. Bhutan Food and Drug Authority	Past HPAI outbreak districts	a. National influenza pandemic preparedness plan in draft	January 2024

	Pandemic Preparedness Plan and SoPs.	b. Ministry of Agriculture and Livestock c. Department of Forest and Park Services	c. DoFPS (Department of Forest and Park Services) d. MoAL e. Local Government f. Institutions (KGUMSB and RUB) g. National Medical Service h. Department of Law and Order		b. Plans and guideline outdated /Not tested (Simex and Drill) c. No regular capacity building d. No committed budget for response e. Inconsistent reporting from the field f. No formal mechanism established to responds to zoonotic diseases g. Change of program focal at national level	
	2. Conduct capacity building exercises through Simex and FETP.					October 2024
	3. Enhance and establish molecular diagnostic capacity at National and Regional level for detection of HPAI.					September 2024
	4. High level advocacy for policy makers and relevant stakeholders to garner support in Implementation of NIPPP.					May 2024
Disease X	1. Develop Preparedness and Response Plan for Disease X and integrate with Health emergency and disaster contingency plan.	a. DoPH, Ministry of Health b. MoAL	a. Royal Bhutan Police and Desuung b. Bhutan Food and Drug Authority c. DoFPS (Department of Forest and Park Services) d. Local Government	Whole country with focus on high risk areas (Point of entries and commercial hubs)	a. Plans and guideline outdated /Not tested (Simex and Drill) b. No regular capacity building c. No committed budget response	February 2024
	2. Conduct outbreak simulation exercises.					October 2024

	3. Conduct Field Epidemiology Training Program for human and animal health.		e. Institutions (KGUMSB and RUB) f. National Medical Service g. Department of Law and Order		d. Inconsistent reporting from the field e. No formal mechanism established to responds to zoonotic diseases f. Frequent change of program focal at national and district levels.	
	4. Conduct regular risk assessment.					Continuous (regular desk review)

iii. Biological Hazard II ((Airborne/Respiratory + Water- borne Diseases)

Hazard	Plenary action	Responsible	stakeholder	Geographic Area	Justification
Influenza	1. Incorporation of influenza pandemic plans during policy development and revision of contingency and response plan for disease outbreak (eg. NIPPP) 2.Train Health Workers in testing, surveillance and response (strengthen rapid response teams) 3. Conduct Simulation Exercise and drills on outbreak and related emergency response. 4.Advocate for political buy-in for resource mobilization during outbreak/health emergency response. 5.Advocate implementation of public health and social measures during the mass gatherings in collaboration with non-health sectors to prevent and control the spread of the disease.	MoH DoPH DoPH DoPH DoPH	RCDC MoAL NMS DLGDM RBP Desuung CAG or Local Government or VHW	All Regions	There is poor coordination within stakeholders on Influenza disease prevention and control

COVID-19	1. Revise and implement NIPPP, 2020 (Draft). 2. Train Health Workers in testing, surveillance and response (strengthen rapid response teams) 3. Conduct Simulation Exercise and drills on outbreak and related emergency response. 4.Advocate for political buy-in for resource mobilization during outbreak/health emergency response. 5.Advocate implementation of public health and social measures during the mass gatherings in collaboration with non-health sectors to prevent and control the spread of the disease.	MoH MoH MoH DoPH	MoH MoAL NMS DLGDM RBP Desuung CAG or Local Government or VHW	All Regions	There is poor coordination within stakeholders on Influenza disease prevention and control

Acute Watery Diarrhea	1.Revise Outbreak investigation and response guideline on Diarrheal disease 2. Train rapid response team on outbreak and investigation manual 3. Improve access to safe drinking water through water treatment, regular monitoring and testing 4. Enhance program interventions (WASH) 5. Conduct awareness campaign on securing water sources to avoid contamination	RCDC MoH DoPH DoIT (Dept of infrastructure development) Local Government and VHW	NMS, Department of Water, Local Government and VHW, DoID	All Regions	• To update based on the new evidences • Poor coordination among the stakeholders • Improve access to safe drinking water

MDR-TB	1.Finalize and endorse NSP III(2024-2028) which covers community linkage for MDR-TB treatment monitoring / community DOT and advocacy. 2. Advocate for political buy-in for resource mobilization. 3.Establish isolation facilities for the TB patients at the identified TB reporting centers. 4. Develop capacity of clinicians on clinical management 5.Train focal staff on testing, surveillance and response 6.Establish formal mechanisms with the NCAH to share information on Zoonotic TB (Bovine TB).	MOH-NTCP MOH NMS MOH DoPH DoPH	MOH Local Government National Medical Service MOF, PPD	Nation wide	There is poor linkage/ involvement of the community and other non-health sectors. As of now, the Donor fund is covering most of the activities of MDR-TB. There is no proper established isolation ward for TB patients. There are pressing issues of HR in the relevant field. There is no reported case in human till date.

iv. Food safety +AMR + Chemical + other human-induced hazards

Hazard	Priority Action	Responsible	Stakeholders	Geographic Area(s)	Justification/Comments
Food Poisoning	1. Establish integrated and coordinated reporting systems between relevant sectors to improve existing reporting systems among the agencies/sectors.	BFDA	MoH(RCDC/DoPH) MoAL, DoFPS	National level (MoH/MoAL)	1. Lack of awareness of the existing reporting system among the agencies/sectors. 2. Action plan derived from the ***Bhutan Biosecurity and food safety Strategy.***
	2. Conduct risk analysis of food commodities	PPD (MoAL)	MoH/MoENR/DRC	National level (MoH/MoAL)	1. Requirement of further enhancement and systematic approach. 2. Action plan derived from the ***Bhutan Biosecurity and food safety Strategy.***
	3. Upgrade lab facilities and capacity of lab personnel to improve detection of food borne disease at point of entry.	MoH(BFDA)	RCDC MoIT MoAL MoF	Major entry points Major Urban hubs	1. Requirements of basic lab facilities in entry points are non-existent.
	4. Conduct awareness and advocacy campaigns (GAP/GMP/GHP)) to general population, agencies and to	MoAL/DoA	MoH (BFDA) MoF	National level	1. Lack of awareness on existing SoPs and guidelines among the agencies/sectors.

	decision makers				2. Action plan derived from the ***Bhutan Biosecurity and food safety Strategy.***
AMR	1.Expand the microbiology laboratories services for testing Antibiotic susceptibility	NMS	MoAL MoF BFDA MoH/DoPH/RCDC MoAL	National level	1. As per the existing data the reports were only inclusive of regional hospitals, no data from district hospitals due to lack of labs and tests. 2. Action plan is derived from the ***Draft 13 Five Year Plan***.
	2. Review antibiotic guidelines for prescribers (maintain antibiogram)	NMS, DHS	MoAL MoF BFDA	At all Districts	1. To instill good practices on the rational use of antibiotics for all prescribers including among the vets. 2. Implement antimicrobial stewardship programs for animal and human health to ensure rational use of antimicrobials based on the one health approach. 3. Action plan is derived from the ***Draft 13 Five Year Plan***.
	3. Build capacity in AMR data management in all relevant sectors and ensure data sharing to enable informed policies and interventions	MoH/DoPH/ NMS	MoAL MoF BFDA	At all Districts	1. To improve data systems and provide quality information for decision making. 2. Action plan is derived from the ***Draft 13 Five Year Plan***.

	4.Conduct awareness and advocacy campaigns at all levels - general population, relevant sectors and high level decision making on AMR.	MoH/DoPH/ NMS	MoAL MoF BFDA	At all Districts	1. To improve behaviors on the proper use of antibiotics among the general public while also ensuring that AMR remains an important agenda at the national level. 2. Action plan is derived from the ***Draft 13 Five Year Plan***.
	5.Strengthen the national AMR steering committee (IMCOH)	MoH/DoPH/ NMS	MoAL MoF BFDA	National level	1. To ensure that the AMR agenda is implemented across all relevant sectors and to provide a platform for information/data sharing to guide evidence informed decision making. 2. Provide multi sectoral engagement platform for all matters related to AMR through one health approach 3. Action plan is derived from the ***Draft 13 Five Year Plan***.
Chemical Poisoning	1. Update the monitoring strategies on chemical poisoning (industries, mines, hydropower projects and others) and sensitize the relevant stakeholders through: ● Training ● Adoption of newer technological approaches	DECC, MoENR	DoI/MoICE, DGM/MoENR, DoE/MoENR	Southern and urban centres (Chukha, Samtse, Gelephu,Samdrup Jongkhar, Thimphu)	The assessment, evaluation and monitoring of the Environment is not very efficient/effective although mandated by Environmental Assessment Act, 2000, Regulations on Environmental Clearance of Projects, 2016 and National Environmental Protection Act, 2007.
	2. Develop multi sectoral plans,	MoH,	MoICE, MoAL,	Nationwide	1. Chemical disaster management is a

	guidelines, SOPs, manuals related to the preparedness, response, alert, management, sampling and shipments of chemicals events and emergencies	DLGDM, MoENR	MoIT		multi-sectoral and multi-disciplinary responsibility. 2. No guiding document on incidents from hazardous chemicals.
	3. Improve detection, analysis and sampling of chemical and related events	RCDC	MoICE, MoENR, DLGDM,	Nationwide	3. No multilateral and bilateral agreements to deal with chemical events. 4. A health emergency and disaster contingency plan is in place but it does not cover the chemical incident management. 5. Currently Bhutan has no facilities or systems to take care of emergencies that may arise due to chemical contamination or related hazards 6. Mechanisms to ensure safe disposal/management of expired agro-chemicals. Based on the recommendations from ***JEE on IHR***. ***Draft National Chemical Profile 2016***
	4. Upgrade Poisoning Information Center a. Centralize reporting and information dissemination systems for chemical events.	MoH/RCDC	MoAL	RCDC, Thimphu	Based on the recommendations from ***JEE on IHR***.

	5. Create awareness on chemical hazards	DoPH/RCDC	DLGDM, NGOs, CSOs	Nation wide	The country's capacity to deal with chemical events /emergencies is limited.
	6. Develop capacity of the health professionals to respond to chemical event	DoPH/RCDC	DLGDM, NGOs, CSOs	Nation wide	The country's capacity to deal with chemical events /emergencies is limited.
	7. Carry out a study on prevalence and source of lead poisoning in children	MoH	KGUMSB, RCDC,	Nationwide	Based on the recommendations of the previous study

d) Agenda

Time	*Sessions*	*Modality*	*Lecturer/ Speaker*
Day 1			
8:45-09:00	**Registration**		All participants
09:00-09:30	**Inauguration Session** Introduction & Objective of the meeting Opening Remarks		Deki Yangzom, MoH Hon'ble Acting Secretary, MoH/ WR,DR AULAKH, Bhupinder Kaur
09:30-09:50	Presentation of country context of Disaster Management- National Disaster Response Coordination Mechanism	Presentation	Department of Local Governance & Disaster Management
09:50-10:10	Presentation on National Health Emergency Management System	Presentation	Ugyen Tshering, DoPH, MoH
10:10-10:45	Overview of STAR		Dr Sandip, WHO SEARO
10:45-11:00	**Group Photo followed by healthy break**		
Technical session			
11:00- 11:10	Introduction of Participants		Participants & Facilitators
11:10-11:45	Overview of strategic risk assessment using STAR	Presentation	Facilitation team
11:45-12:30	Questions & Answers		All participants
12:30-13:30	**Lunch**		
13:30-13:45	**Session 4:** Step 1: Identification of hazards that will trigger a nationally coordinated emergency response	Presentation	All facilitators + All Participants
13:45-14:15		Group work	
14:15-14:45		Plenary	
	Group Formation		Facilitation Team
14:45-15:00	Describe the health consequences, scale, and exposure	Presentation (Plenary)	Dr Dipendra/ Dr Sandip
15:00-15:15	**Healthy break**		
16:10-16:25	**Session 6 a** Describe the frequency, seasonality and likelihood of the hazard to occur based on available information	Presentation	Dr Dipendra/ Dr Sandip
16:25-17:00	**Session 6b** Frequency, seasonality and likelihood	Group work	Facilitators + Participants

Time	*Sessions*	*Modality*	*Lecturer/ Speaker*
Day 2			
9:00-9:15	Recap of Day 1		Designated notetaker
9:15-10:00	Session 6 c Frequency, seasonality and likelihood	Plenary	Facilitators
10:00-10:15	Session 7 Overview of severity	Presentation	Facilitators + Participants
10:15-10:30	Healthy Break		
10:30-11:15	Session 7 b Assessing severity	Group work	All facilitators + participants
11:15-11:45		Plenary	
11:45-12:00	Session 8 a Overview of describing the vulnerability	Presentation	Facilitators
12:00-12:45		Group work	
12:45-13:45	Lunch		
13:45-14:30	Session 8 b Describing vulnerability	Plenary	Facilitators + participants
14:30-15:00	Overview of coping capacities + confidence level	Presentation	Facilitators
15:00-15:15	Healthy Break		
15:15-16:30	Session 8 a Coping capacities mapping	Group work	Facilitators
16:30-17:30	Session 9 a Overview of coping capacities + confidence level	Plenary	All Facilitators + All participants
17:30-17:40	Wrap-up of Day 2		

Time	*Sessions*	*Modality*	*Lecturer/ Speaker*
Day 3			
9:00-9:15	Review of Day 2 and preview of Day 3		

9:15-10:00	Session 10 a Finalizing country risk profile and reviewing outputs (5x5, calendar, risk ranking)		All participants
10:00-10:30	Session 11 a Applying the country risk profile to inform key actions/next steps	Presentation	Facilitation team
10:30-10:45	Healthy Break		
10:45-12:00	Session 11 a Applying the country risk profile to inform key actions/next steps	Group work	Facilitation team
12:00-12:30	Session 11 b Review and adjustment of key actions	Plenary	All participants + facilitators
12:30-13:30	Lunch		
13:30-14:00	Session 11 b Review and adjustment of key actions	Plenary	All participants + facilitators
14:00-14:45	Session 12 Pathways for finalization risk profile results and utilization of results		All participants + facilitators
14:45-15:00	Closing Session		
15:00-15:30	Tea/Coffee Break		

e) Abbreviations

1. MoH: Ministry of Health
2. RCDC: Royal Center for Disease Control
3. DoPH: Department of Public Health
4. MoAL: Ministry of Agriculture and Livestock
5. DoFPS: Department of Forest and Park Services
6. MoENR: Ministry of Energy and Natural resources
7. DRC: Department of Revenue and Custom
8. MoIT: Ministry of Infrastructure and Transport
9. MoF: Ministry of Finance
10. BFDA: Bhutan Food and Drug Regulatory Authority
11. NMS: National Medical Services
12. DHS: Department of Health Services
13. DoI: Department of Immigration
14. MoICE: Ministry of Industry, Commerce and Employment
15. DGM: Department of Geology and Mines
16. DoE: Department of Energy
17. DLGDM: Department of Local Governance and Disaster Management
18. CSO: Civil Society Organization
19. NGOs: Non-governmental organization
20. KGUMSB: Khesar Gyalpo University of Medical Sciences of Bhutan
21. DECC- Department of Environment and Climate Change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