

# METEOR: Baseline Evaluation Report

Report Number: M2.4/P

15 February 2019



## Authors:

C. Simon, A. Lyon, B. Regmi  
S. Zakaria & L. Petrarulo



Oxford Policy Management

## Key Contributors:

C. Jordan, A. Winson, &  
S. Ghosh



**British  
Geological Survey**  
Expert | Impartial | Innovative



Oxford Policy Management



**NSET**  
Earthquake Safe Communities in Nepal




## METEOR Baseline Evaluation Report



### Document Verification

Project	METEOR: Modelling Exposure Through Earth Observation Routines
Report Title	METEOR Baseline Evaluation Report
Related Milestone	M2.4
Reference as	C. Simon, A. Lyon, B. Regmi, S. Zakaria & L. Petrarulo (2019) METEOR Baseline Evaluation Report. Report M2.4/P
Release Type	Public / <del>Confidential</del> / <del>Confidential with Embargo Period</del>

Prepared by: Contributors		
Name(s): C. Simon, L. Petrarulo, A. Lyon, B. Regmi & S. Zakaria	Signature(s): 	Date(s): 15 February 2019
Approved by: Project Manager		
Name: K. Smith	Signature:	Date: 15 February 2019
Approved by: UKSA IPP Project Officer		
Name:	Signature:	Date:

Date	Version	Alterations	Editor



## *METEOR Baseline Evaluation Report*



### About Oxford Policy Management

Oxford Policy Management is committed to helping low- and middle-income countries achieve growth and reduce poverty and disadvantage through public policy reform.

We seek to bring about lasting positive change using analytical and practical policy expertise. Through our global network of offices, we work in partnership with national decision makers to research, design, implement, and evaluate impactful public policy.

We work in all areas of social and economic policy and governance, including health, finance, education, climate change, and public sector management. We draw on our local and international sector experts to provide the very best evidence-based support.

### About this report

Oxford Policy Management have been contracted by British Geological Survey (BGS) to manage the Monitoring and Evaluation components of the METEOR project. This report has been written to document the process, results and analysis of the baseline evaluation, which was conducted between September and December 2018.

The intended audience consists of BGS, the METEOR project partners, the UK Space Agency and Caribou Digital.

### Acknowledgements

The METEOR baseline evaluation could not have been conducted without the support of numerous organisations and individuals. OPM would like to acknowledge the support of all the METEOR project partners (BGS, DMD, NSET, ImageCat, HOT, GEM, and Fathom) in helping to assemble and review the baseline data and report. A special thanks to Shubharoop Ghosh of ImageCat who was instrumental in collecting information from global stakeholders. We are also indebted to the support of our local partners, NSET in Nepal and DMD in Tanzania, for helping arrange and organise our baseline visits. Thanks also to Caribou for providing guidance and oversight of the M&E process. Finally, we thank the numerous stakeholders we spoke to from various government agencies, development partners, civil society, and academic institutions. Your patience and time are greatly appreciated. The information you provided is invaluable for our understanding of the contexts in which the METEOR project will unfold and will be very useful as we move forward.



## METEOR Baseline Evaluation Report



### Executive Summary

This **report** was written by Oxford Policy Management (OPM) to compile the data gathered in a baseline evaluation in the last quarter of 2018 for the project entitled Modelling Exposure Through Earth Observation Routines ([METEOR](#)) led by the British Geological Survey (BGS).

The **project** started in February 2018 and is planned to last 3 years, delivering rigorous and open protocols and standards to allow for the quantitative assessment of exposure in a multi-hazard setting, with explicit uncertainties. These protocols and standards will be developed for broad application in the Least Developed Countries (LDCs) and will be tested and validated in Nepal and Tanzania. The long-term goal is to reduce the human and financial cost of disasters such as earthquakes, landslides and floods. Governments' ability to practice Disaster Risk Reduction (DRR) and Disaster Risk Management (DRM) (herein DRRM) will be strengthened, as well as the ability of civil society and the private sector more broadly.

The **methodology** for this report is based on the Theory of Change of the project and consists of two country case studies (based on a desk review of relevant documents, interviews with key informants and an in-country workshop) and one global study which focuses on interviews with international stakeholders such as international Non-Governmental Organisations (NGOs), the United Nations (UN) and the World Bank, as well as insurance companies, testing relevance and sustainability.

**Key themes**<sup>1</sup> emerging from the **global study** include:

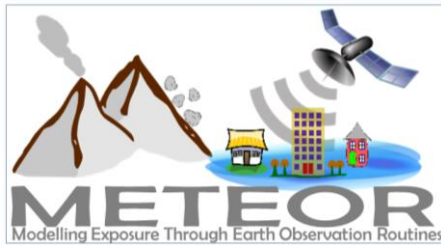
- There is a general lack of knowledge among decision-makers in LDC Official Development Assistance (ODA) countries about risk data and how it might be used for DRRM
- LDCs generally lack the resources/capacity to effectively use data
- In LDCs there are often constraints to sharing data. There are many examples where LDC governments want to own and control the dissemination of data or the opposite, where governments are hesitant to use data produced by others
- Exposure, hazard, and vulnerability datasets in LDCs are often inaccurate or incomplete leading to high uncertainty levels, making them difficult to use for practical purposes in DRRM.

**Key themes** emerging from the **Nepal** country case study include:

- There is a recognition that hazard and exposure data are seldom used in planning for DRRM and, as a result, an increasing demand for evidence (data) in decision-making
- Nepal struggles with coordination around DRRM. There is deficient coordination across all spheres – public, private, humanitarian actors, and civil society
- While good technical people exist in different departments of government, there is an overall lack of technical capacity, in particular among decision-makers.
- Existing hazard/exposure data sets are of poor quality, not uniform or not shared
- There are many uncertainties around the pace of federalisation of government, leading to a lack of clarity on the responsibilities of different levels of government around DRRM
- *Ad hoc* building, lack of enforcement, poverty and climate change all heighten risk of disaster

---

<sup>1</sup> Key themes for the global and country case studies in the executive summary are very high-level summaries and do not reflect the full picture of specific situations. Please refer to the relevant sections in the report for more details.



## *METEOR Baseline Evaluation Report*



- Gender mainstreaming in the sciences related to DRRM is still limited but there are encouraging signs of improvements
- Different understandings of DRRM terminology further complicate effective disaster management.

**Key themes** emerging from the **Tanzania** country case study include:

- There is interest in METEOR products, reflected by having DMD as a consortium partner
- Stakeholder felt that there were conflicting government priorities when it came to DRRM, where the approach has been generally reactive and response-focused
- There is limited capacity and resources within government to effectively use METEOR datasets
- Existing hazard/exposure data sets are of poor quality, not uniform or not shared
- There is an overall lack of public awareness of DRRM issues
- There are some weaknesses in government coordination
- Different understandings of DRRM terminology further complicate effective disaster management.

The **conclusions** from this analysis illustrate the importance of government involvement and ownership to ensure success and sustainability. Open source repositories owned and managed by government will be an important mechanism in engendering ownership. The project will also carefully consider how to communicate clearly complex issues, using consistent language. Finally, as both countries are struggling with decentralisation issues and ensuring appropriate capacity to mitigate and manage risks, being able to engage at the sub-national level will be important, but challenging, for METEOR.

**Recommendations** emerging from the baseline for the METEOR consortium to consider include:

- **Focus on engaging government and promoting government ownership of METEOR outputs.** METEOR must quickly identify and select the key government departments with whom they will have an active and on-going engagement. They should also actively disseminate updates, information, and communications to other government involved in DRRM, to ensure METEOR products and services are familiar across broader government Ministries.
- **Focus on delivering METEOR datasets onto a broad variety of government and other platforms.** While establishing central government open-source repositories of exposure, hazard and vulnerability data is outside METEOR's scope, the METEOR team should focus on getting METEOR datasets onto multiple government platforms so that these data are accepted and thus can be used by a broader set of stakeholders who are required to use 'government' data in official reports. METEOR should also try to link with other key data platforms both locally and globally to ensure broad dissemination of the outputs.
- **Focus on communication of project goals.** To ensure widespread buy-in of METEOR, the team should think carefully through how to pitch the project to different sets of stakeholders. The focus should be on communicating how project outputs are useful to the different end-users and how it can improve the way they work. This will entail tailoring communication products to different users. To ensure sustainability, METEOR should look to developing communications through a



## *METEOR Baseline Evaluation Report*



consultative process with public, private and civil society. The team should also ensure key documents are translated into the local language.

- **Focus on the capacity** to ensure people are: (i) aware of the datasets; (ii) know how they are constructed and what they can be used for; and (iii) demonstrate with tangible examples how to use. This capacity-building effort should be in partnership with both government and non-government actors who can serve as a bridge in the transfer of knowledge and skills.
- **Develop ‘research into use’ case studies.** Related to capacity building, it will be useful to highlight examples of how the project can contribute to meet some of Nepal’s and Tanzania’s challenges. These will help local stakeholders see in practice how the METEOR data can help them.
- **Explore how to engage the local/provincial level.** With larger federalisation/devolution processes on-going in both Nepal and Tanzania, there is a need to engage and build the capacity of local policy decision-makers. While not within the scope of the project, METEOR should think about ways, perhaps in the future, to engage with sub-national governments.

In terms of **next steps**, the findings of this report will be considered at a learning event to discuss the recommendations, baseline indicators, and targets for mid-line and end-line evaluations. The consortium is currently discussing the place and date for the learning workshop.



# METEOR Baseline Evaluation Report



## Contents

<b>DOCUMENT VERIFICATION .....</b>	<b>I</b>
<b>ABOUT OXFORD POLICY MANAGEMENT.....</b>	<b>II</b>
<b>ABOUT THIS REPORT.....</b>	<b>II</b>
<b>ACKNOWLEDGEMENTS .....</b>	<b>II</b>
<b>EXECUTIVE SUMMARY .....</b>	<b>III</b>
<b>ABBREVIATIONS .....</b>	<b>IX</b>
<b>1. INTRODUCTION .....</b>	<b>1</b>
1.1. PROJECT SUMMARY.....	1
1.2. METEOR PROJECT OVERVIEW.....	1
1.3. PROBLEM STATEMENT .....	2
1.4. OVERVIEW OF THE PROJECT.....	2
1.5. PURPOSE AND STRUCTURE OF THIS REPORT.....	3
<b>2. METHODS.....</b>	<b>4</b>
2.1. DESCRIPTION OF BASELINE METHODS AND SAMPLE SIZES .....	4
2.1.1. Country case studies.....	4
2.1.2. Global study.....	6
2.1.3. Limitations of the methodology .....	7
<b>3. LOGFRAME KPIS .....</b>	<b>7</b>
<b>4. BASELINE FINDINGS.....</b>	<b>10</b>
4.1. GLOBAL STUDY FINDINGS .....	10
4.1.1. The wider global context .....	10
4.1.2. Definitions .....	11
4.1.3. Global stakeholders.....	12
4.1.4. Key global themes .....	17
4.1.5. Value and sustainability of METEOR .....	18
4.1.6. Data Sources/Platforms.....	19
4.2. NEPAL FINDINGS .....	23
4.2.1. The wider country context.....	23
4.2.2. Key stakeholders in DRM.....	27
4.2.3. Key themes from Nepal interviews.....	38
4.2.4. Value of METEOR.....	46
4.2.5. Data sources.....	47



# METEOR Baseline Evaluation Report



4.3.	TANZANIA FINDINGS .....	52
4.3.1.	<i>The wider country context</i> .....	52
4.3.2.	<i>Key stakeholders in DRM</i> .....	57
4.3.3.	<i>Key themes from Tanzania interviews</i> .....	67
4.3.4.	<i>Data sources</i> .....	74
5.	<b>CONCLUSIONS</b> .....	<b>76</b>
5.1.	SUMMARY OF KEY FINDINGS .....	76
5.2.	SUSTAINABILITY AND PROJECT DESIGN RISKS .....	77
5.3.	RECOMMENDATIONS FOR PROJECT IMPLEMENTATION .....	78
5.4.	LEARNING FROM THE BASELINE EVALUATION .....	79
ANNEX 1.	<b>INTERVIEW GUIDES</b> .....	<b>80</b>
ANNEX 2.	<b>IN-COUNTRY WORKSHOP MATERIALS</b> .....	<b>91</b>
ANNEX 3.	<b>LOGFRAME PROGRESS</b> .....	<b>93</b>
ANNEX 4.	<b>ANNOTATED BIBLIOGRAPHIES</b> .....	<b>99</b>

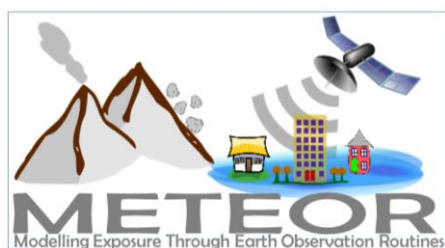
## Figures

Figure 1: METEOR Theory of Change .....	3
Figure 2: Stakeholder workshop exercise .....	6
Figure 3: National and sub-national DRRM administrative structures (simplified) .....	27
Figure 4: National government stakeholders .....	28
Figure 5: National and sub-national DRM administrative structures (simplified) .....	55
Figure 6: Tanzania stakeholders .....	58

## Tables

Table 1: Case study desk review sample .....	4
Table 2: Case study key informant interviews .....	5
Table 3: Global study key informant interviews .....	7
Table 4: Key performance indicator baseline figures .....	8
Table 5: Definitions .....	11
Table 6: Key global stakeholders .....	13

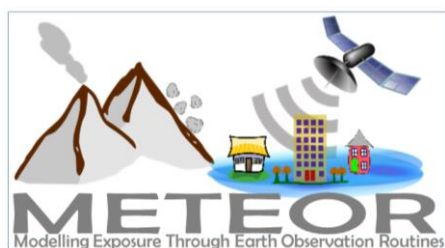




## *METEOR Baseline Evaluation Report*



Table 7: Global study DRRM themes .....	17
Table 8: Suggestions for METEOR sustainability .....	19
Table 9: Global data sources for DRRM data .....	20
Table 10: Key policies governing DRRM .....	25
Table 11: Key Government stakeholders .....	29
Table 12: Other key stakeholders .....	33
Table 13: Key Nepalese DRRM themes .....	38
Table 14: Terminology .....	40
Table 15: Nepal DRRM data sources .....	48
Table 16: Key policies governing DRRM in Tanzania .....	53
Table 17: Key Government stakeholders .....	59
Table 18: Other key stakeholders in DRM .....	65
Table 19: Key Tanzania DRRM themes .....	67
Table 20: Tanzania terminology definitions .....	68
Table 21: Tanzania DRRM data sources .....	74

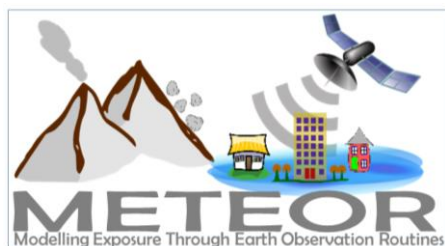


## *METEOR Baseline Evaluation Report*



### Abbreviations

ADB	Asian Development Bank
BBB	Build Back Better
BGS	British Geological Survey
BMIS	Building Management Information System (Nepal)
CAPRA	Partnership between the CEPREDENAC, UNISDR, IADB and the World Bank
CAT	Catastrophe
CBO	Community Based Organisation
CBS	Central Bureau of Statistics (Nepal)
CCA	Climate Change Adaptation
CCRIF	Caribbean Catastrophe Risk Insurance Facility (CCRIF)
CDS	Centre for Disaster Studies, Tribhuvan University
CDES	Central Department of Environmental Science (Nepal)
CEA	Cost Effectiveness Analysis
CEPREDENAC	Center for Coordination of Natural Disaster Prevention in Central America
CSO	Civil Society Organisation
CSSR	Collapsed Structure Search and Rescue
DarMAERT	Dar es Salaam Multi-Agency Emergency Response Team (Tanzania)
DC	District Commissioner (Tanzania)
DED	District Executive Directors (Tanzania)
DfID	Department for International Development (UK)
DG	Director General
DHM	Department of Hydrology and Meteorology (Nepal)
DIMS	Disaster Information Management System
DM	Disaster Management
DMA	Disaster Management Agency (Tanzania)
DMC	Disaster Management Committee
DMD	Disaster Management Department of the Prime Minister's Office (Tanzania)
DMG	Department of Mines and Geology (Nepal)
DMTC	Disaster Management Training Centre, Ardhi University (Tanzania)
DoE	Division of Environment



## *METEOR Baseline Evaluation Report*



DoI	Department of Irrigation (Nepal)
DoS	Department of Survey (Nepal)
DPNet	Disaster Preparedness Network (Nepal)
DRI	Data Risk Information
DRM	Disaster Risk Management
DRM Act	Disaster Risk Management Act (Tanzania)
DRR	Disaster Risk Reduction
DRRM	Disaster Risk Reduction and Management
DRRM Act	Disaster Risk Reduction and Management Act (Nepal)
DSM	Digital Surface Model
DUDBC	Department of Urban Development and Building Construction (Nepal)
DWRI	Department of Water-Resource and Irrigation (Nepal)
ECHO	EC Directorate General for Humanitarian Operations
EIA	Environmental Impact Assessment
EO	Earth Observation data
EOCC	Emergency Operations and Communications Centre (Tanzania)
EWS	Early Warning System
GC	Guy Carpenter
GDP	Gross Domestic Product
GFDRR	Global Facility for Disaster Reduction and Recovery (GFDRR)
GIS	Geographic Information Systems
GLOF	Glacial Lake Outburst Flood
GoN	Government of Nepal
GOST	Geospatial Operational Support Team
GoT	Government of Tanzania
GRAF	Global Risk Assessment Framework
GST	Geological Survey of Tanzania
HCT	Humanitarian Country Team
HEPRS	Health Emergence Preparedness and Response Section (Tanzania).
HFA	Hyogo Framework for Action
HOT	Humanitarian OpenStreetMap Team



## *METEOR Baseline Evaluation Report*



IADB	Inter-American Development Bank
IASC	InterAgency Standing Committee
ICIMOD	International Centre for Integrated Mountain Development
ICT	Information and Communication Technology
IDF	International Development Forum
INSARAG	International Search and Rescue Advisory Group
IOM	International Organization for Migration
IOST-TU	Institute of Science and Technology, Tribhuvan University
JICA	Japanese International Cooperation Agency
KIIs	Key Informant Interviews
KLL	Kathmandu Living Labs
KP	Knowledge Product
KPIs	Key Performance Indicators
KVDA	Kathmandu Valley Development Authority
LDC	Least developed country
LGA	Local Government Authority
LGOA	Local Government Operations Act (Nepal)
M&E	Monitoring and Evaluation
METEOR	Modelling Exposure Through Earth Observation Routines
MFR	Medical First Responder
MICS	Multiple Indicator Cluster Survey
MoD	Ministry of Defence
MoEWRI	Ministry of Energy, Water Resources and Irrigation (Nepal)
MoFAGA	Ministry of Federal Affairs and General Administration (Nepal)
MoH&SW	Ministry of Health and Social Welfare (Tanzania)
MoHA	Ministry of Home Affairs (Nepal)
MoL	Ministry of Lands (Tanzania)
MoLM	Ministry of Land Management, Cooperatives and Poverty Alleviation (Nepal)
MoU	Memorandum of Understanding
MoUD	Ministry of Urban Development (Nepal)
NBS	National Bureau of Statistics (Tanzania)



## METEOR Baseline Evaluation Report



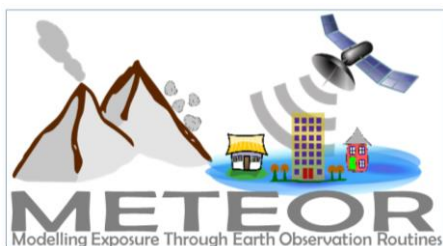
NDMP	National Disaster Management Platform (Tanzania)
NDR	National Position Paper on Disaster Risk Reduction and Management in Nepal of 2017
NDRRMA	National Disaster Risk Reduction and Management Authority (Nepal)
NEMC	National Environmental Management Council (Tanzania)
NEOC	National Emergency Operations Centre (NEOC),
NGO	Non-Governmental Organisation
NIWA	National Institute of Water & Atmospheric Research (NIWA)
NPC	National Planning Commission (Nepal)
NPDRR	National Platform of Disaster Risk Reduction (Nepal)
NRA	National Reconstruction Authority (Nepal)
NSDRM	National Strategy for Disaster Risk Management
NSET	National Society for Earthquake Technology-Nepal.
NUDS	National Urban Development Strategy (Nepal)
ODA	Official Development Assistance
OFDA	US Foreign Disaster Assistance (OFDA)
OPM	Oxford Policy Management
OSM	OpenStreetMap
PCRAFI	Pacific Catastrophe Risk Assessment and Financing Initiative
PDRF	Post-Disaster Recovery Framework
PFRNA	Post Flood Recovery Needs Assessment
PICs	Pacific Island Countries
PMO	Prime Minister's Office
PS	Permanent Secretary
RAS	Regional Administrative Secretary
RC	Regional Commissioner (Tanzania)
RS	Remote Sensing
SAWTEE	South Asia Watch on Trade, Economics and Environment
SDGs	Sustainable Development Goals
SEEA	System of Environment Economic Accounting
SFDRR	Sendai Framework for Disaster Risk Reduction
SPC	Secretariat of the Pacific Community



## *METEOR Baseline Evaluation Report*



SPF	Strategic Partnership Framework
SRTM	Shuttle Radar Topography Mission
TANDREC	Tanzania Disaster Relief Committee
TBC	To Be Confirmed
TCRA	Tanzania Communications Regulatory Authority (Tanzania)
TDMC	Tanzania Disaster Management Council
TIRA	Tanzania Insurance Regulatory Authority
TMA	Tanzania Meteorological Agency
ToR	Terms of Reference
TRCS	Tanzania Red Cross Society
TSBCIN	Technical Support for Building Code Implementation in Nepal
TU	Tribhuvan University, Nepal
TURP	Tanzanian Urban Resilience Programme
UN	United Nations
UNDAC	United Nations Disaster Assessment and Coordination
UNDP	United Nations Development Programme
UNHCR	United Nations High Commissioner on Refugees
UNICEF	United Nations Children's Fund
UNISDR	United Nations International Strategy for Disaster Reduction
UN OCHA	United Nations
USD	United States Dollar (currency)
USAID	United States Agency for International Development
UTM	Universal Transverse Mercator
VEO	Village Executive Officer
VPO	Vice President's Office
WB	World Bank
WEO	Ward Executive Officer
WFP	World Food Programme
WHO	World Health Organisation
WRRDC	Water Resource Research and Development Centre (Nepal)



## METEOR Baseline Evaluation Report



## 1. Introduction

### 1.1. Project Summary

Project Title	Modelling Exposure Through Earth Observation Routines (METEOR): EO-based Exposure, Nepal and Tanzania
Starting Date	08/02/2018
Duration	36 months
Partners	UK Partners: The British Geological Survey (BGS) (Lead), Oxford Policy Management Limited (OPM), Fathom  International Partners: The Disaster Management Department, Office of the Prime Minister – Tanzania, The Global Earthquake Model (GEM) Foundation, The Humanitarian OpenStreetMap Team (HOT), ImageCat, National Society for Earthquake Technology (NSET) – Nepal
Target Countries	Nepal and Tanzania for “level 2” results and all 47 Least Developed ODA countries for “level 1” data
IPP Project	IPPC2_07_BGS_METEOR

### 1.2. METEOR Project Overview

At present, there is a poor understanding of population exposure to natural disasters in many ODA countries, which causes major challenges when making Disaster Risk Reduction (DRR) and Disaster Risk Management (DRM) (herein DRRM) decisions. METEOR (Modelling Exposure Through Earth Observation Routines) takes a step-change in the application of earth observation exposure data by developing and delivering more accurate levels of population exposure to natural hazards. Providing new consistent data to governments, town planners and insurance providers will promote welfare and economic development in these countries and better enable them to respond to the hazards when they do occur<sup>2</sup>.

METEOR is funded through the second iterations of the UK Space Agency’s International Partnership Programme, which uses space expertise to deliver innovative solutions to real world problems across the globe. The funding helps to build sustainable development while building effective partnerships that can lead to growth opportunities for British companies.

---

<sup>2</sup> BGS (2017). Modelling Exposure Through Earth Observation Routines (METEOR): EO-based Exposure, Nepal and Tanzania, IPP Bid. Confidential and unpublished. Note, sections 1.3 and 1.4 are largely extracted from the proposal document.



## *METEOR Baseline Evaluation Report*



### 1.3. Problem Statement

Despite recent scientific advancements in the characterisation of the built environment and the development of hazard models, economic and human losses due to natural disasters continue to increase. The escalating impacts of natural hazards are caused mostly by increasing exposure of populations and assets<sup>3</sup>. A major challenge when making DRRM decisions in ODA countries is poor understanding of the distribution and character of exposure. To bolster resilience to climate change and natural hazards, exposure needs to be mapped, monitored and modelled by Governments, NGOs, affected communities and businesses. Mapping requires robust quantitative methods to justify resilience and risk mitigation decisions. Past projects have aimed to map exposure with Earth Observation (EO) using a range of approaches, though the application of these in DRRM has been greatly limited by the fact that many efforts have been poorly calibrated, for instance, by being based solely upon readily available data; or being designed only for a specific setting.

To date there has been no formal discipline to arise around the development of exposure, and this has resulted in a “patchwork” data fusion approach where GIS analysts simply aggregate “the best available data<sup>4</sup>.” This ad hoc process skews risk drastically towards known and inventoried assets, underrepresenting those that are most vulnerable. In ODA countries, the impact is much more pronounced since populations and assets are not well recorded. This situation is inadequate for prioritising mitigation and the regional distribution of resources for natural disasters.

### 1.4. Overview of the project

METEOR takes a step-change in the application of EO exposure data by developing and delivering rigorous and open routines (protocols) and standards to allow quantitative assessment of exposure, with explicit uncertainties. These protocols and standards are being developed for broad application to ODA countries and will be tested and validated in two contexts - Nepal and Tanzania - to assure they are fit-for-purpose. EO-based geohazard footprints (earthquake, flooding, landslides and volcanic eruptions) will also be co-developed for those two countries. The process of building capacity and co-delivering new consistent data will promote welfare and economic development in these countries and demonstrate the applicability of the techniques elsewhere. METEOR will deliver country-wide openly-available exposure data for the 47 least developed ODA countries. Better-informed DRRM decisions that meet the demands of international drivers (e.g. SDGs, Sendai Framework) will be underpinned by our national-scale data.

METEOR’s Theory of Change is pictured in Figure 1. The project ultimately seeks to contribute to a reduction in the cost, in human and financial terms, of disasters such as earthquakes, landslides and floods by ensuring that policies, plans, and practice are better informed by DRRM data, particularly disaster loss estimation systems, across public and private sectors, and civil society. In the medium term the project will contribute to three objectives. First, working in Tanzania and Nepal specifically, the project will strengthen the ability of government to demonstrate good practice in DRRM. This will strengthen pre-positioning, emergency response, and ability to prioritise mitigation activities such as land use planning, land acquisition programmes, and building codes. Both countries will act as

---

<sup>3</sup> *ibid.*

<sup>4</sup> *ibid.*





## METEOR Baseline Evaluation Report



'lighthouses' of good practice, sharing their experience and lessons with other nations in their respective regions, using international networks and collaborations. The second objective is also specific to those two countries and involves the wider community of organisations involved in DRRM, particularly the private sector and civil society, so that they are also demonstrating good practice, based on good quality data. The third objective is a wider one that recognises that the datasets, protocols and learning experience around their use can influence practice across the globe. The project will contribute to the third objective by providing access to open source exposure data on all 47 Least Developed Countries (LDCs), together with communications materials designed to improve policies, plans and practice in DRRM.

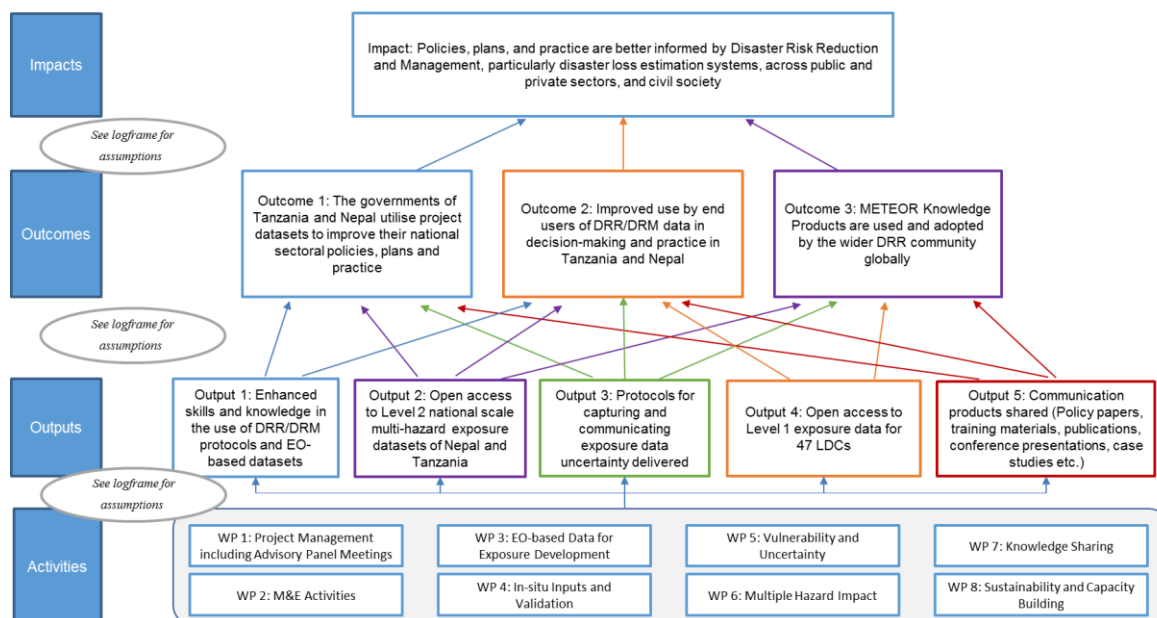


Figure 1: METEOR Theory of Change  
Source: Authors

### 1.5. Purpose and structure of this report

The purpose of this document is to report on the method, process, results, and analysis of the baseline evaluation of the METEOR project. This report grounds the study in a clear picture of the social, political, and economic context in which this project lives. This includes (i) clearly describing the institutional framework which governs the use of exposure data in disaster risk management policy and planning in Nepal and Tanzania, (ii) identifying public and private stakeholders at both the national and international level who have clear interests and influences on project objectives and goals, and (iii) to establish clear qualitative measures of longer-term success.

In the following sections, we first outline the project context and the methodology employed to collect the baseline data. Next, we elaborate on the findings from the baseline evaluation by workload (Nepal, Tanzania, and Global) we conclude with project risks and recommendations for next steps.



## METEOR Baseline Evaluation Report



## 2. Methods

The METEOR project is guided by a theory of change (see Figure 1 in section 1.4) and thus uses a theory-based approach to evaluate impact. Within this context, we have developed an evaluation design using a variety of qualitative methods and tools to assess programme impact. These are discussed in the following sections.

### 2.1. Description of baseline methods and sample sizes

This baseline study involves two workstreams: (i) country case studies for the two pilot countries of Nepal and Tanzania and (ii) global study which focuses on international stakeholders with a vested interest in METEOR outputs. The interview guides used for these workstreams can be found in ANNEX 1.

#### 2.1.1. Country case studies

The baseline case studies serve to fully describe the institutional framework that governs DRRM within Nepal and Tanzania, exploring relationships between and among various stakeholders. Here we establish baseline levels of awareness, and understanding around topics and data related to exposure, risk, vulnerability, and disaster planning and response.

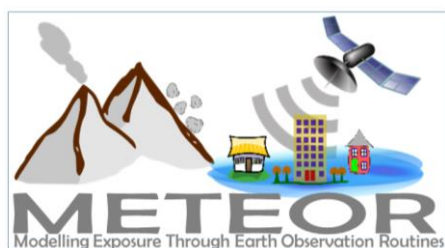
The country case studies involved data collection using three different tools. The first was a **desk review** of critical documents related to in-country disaster risk management and response, including key policies and strategies that govern DRRM policies and practices. These documents were initially identified by our local partners, NSET in Nepal and DMD in Tanzania, as well as Monitoring and Evaluation (M&E) officers from Oxford Policy Management (OPM) who live and work from OPM offices in the two countries. Additional documents were added to the review based on interviews with key stakeholders. Each document was reviewed by a team member and briefly summarized in an annotated bibliography, highlighting the relevant points related to this project (see ANNEX 4).

Table 1: Case study desk review sample

Country	No. of documents reviewed	Key document titles
Nepal	10	<ul style="list-style-type: none"> <li>GoN, Ministry of Home Affairs (2017). Government of Nepal Disaster Risk Reduction and Management (DRR&amp;M) Act</li> <li>GoN, Ministry of Home Affairs (2017). National Position Paper on Disaster Risk Reduction and Management Nepal</li> <li>GoN, Ministry of Home Affairs (2017). Disaster Risk Reduction National Strategic Action Plan (2018-2030)</li> </ul>
Tanzania	12	<ul style="list-style-type: none"> <li>United Republic of Tanzania. (2015). Disaster Management Act</li> <li>United Republic of Tanzania. (2004). National Disaster Management Policy</li> <li>United Republic of Tanzania. (2014). National Operational Guidelines for Disaster Risk Management</li> </ul>

Source: Authors

The primary tool for baseline data collection involved **key informant interviews (KIIs)** with in-country government, academic, civil society, donor, and private sector actors working in the field of DRRM, in



## METEOR Baseline Evaluation Report



particular those with an interest in exposure, hazard, and vulnerability data. For these interviews the team used a standard questionnaire (see ANNEX 1) that included questions on the following themes:

- What the interviewee does related to DRRM
- Key challenges they face (as an organisation and as a country) when supporting better disaster planning and preparedness
- What types of data do they use in their work and how they access and use these data
- How they interact with other stakeholders operating in the space
- Whether their organisation is gender-balanced and what the opportunities and challenges for women in the field are <sup>5</sup>
- How they define and consider different terminology related to DRRM, exposure and response
- What is needed to improve DRRM in the future.

Overall the team conducted a total of 42 key informant interviews, 28 in Nepal and 14 in Tanzania<sup>6</sup>. The number of interviews conducted by type in each country are described in Table 2.

Table 2: Case study key informant interviews

Country	Government	Academic	Donor/ Humanitarian agencies	NGOs	Private sector	TOTAL
Nepal	13	3	6	4	2	28
Tanzania	7	2	5	-	-	14
Total	20	5	11	4	2	42

Source: Authors

The final data collection tool involved **in-country workshops** with key stakeholders to gain further insight into the main needs and expectations they have towards METEOR and its outputs. Since many of the logframe indicators are qualitative in nature, there is a need to be able to map progress toward project impacts and goals. To this effect, the workshop took key stakeholders in government, civil society, and the humanitarian community through a series of scenarios to help each group articulate what constitutes the steps to indicate progression towards successful implementation and the achievement of programme impacts. This effort involved identifying the key stakeholders in DRRM and describing in detail the in-country situation today with regards to DRRM practices, behaviours, and policies/regulations. Next, the facilitator took the group through what a 'best case' and 'better case' scenarios would look like, to try to track the evolution of practices and behaviours that would constitute forward progress (Figure 2 and ANNEX 2 for more details). These 'steps' will be used to help note progress to inform our qualitative indicators. It should be noted that in both countries, the team struggled to get the right mix of people in the room to discuss these issues. Our intention is to

<sup>5</sup> Due to a miscommunication the gender questions were only asked in Nepal

<sup>6</sup> In total the team interviewed over 40 people Nepal and 30 in Tanzania. In several of the interviews there were multiple participants.



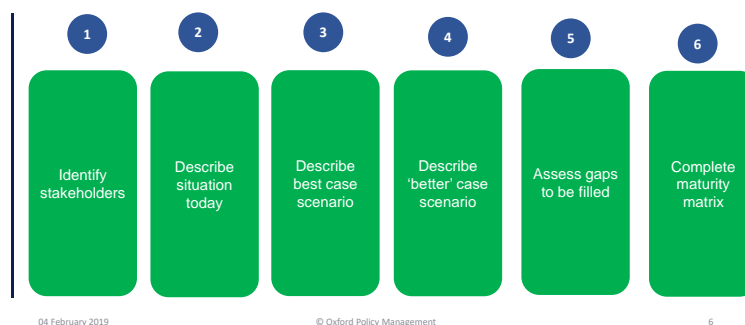
## METEOR Baseline Evaluation Report



use the annual learning workshops, to repeat this exercise to obtain more in-depth indicators of progress.

- **Nepal Workshop:** Friday, September 21, 2018. Eight participants from NSET, ICIMOD, HOT. Note: This workshop did not involve government actors due to being held on a public holiday.
- **Tanzania Workshop:** Wednesday, November 7, 2018. Six participants from DMD, National Bureau of Statistics and the Geological Survey of Tanzania.

### Steps



### Step 2: Describe the situation today



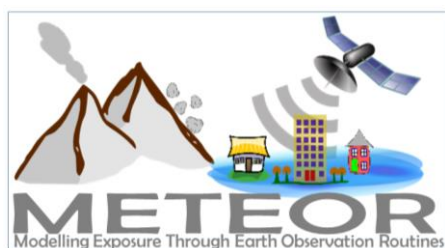
Practices/data	Behaviors	Policies/regulations
<ul style="list-style-type: none"> <li>Describe how DRR/DRM happens in your country</li> <li>Discuss and outline how data (e.g. around exposure, vulnerability, hazards) are used (or not used) in these activities;</li> <li>Discuss how this evidence used in practice to influence policy decisions.</li> </ul>	<ul style="list-style-type: none"> <li>What behaviors work well or add quality to the process? (i.e. coordination/ collaboration across ministries, following existing policies and plans, use of evidence in decision-making)</li> <li>What behaviors impede the process?</li> </ul>	<ul style="list-style-type: none"> <li>Make a list of the known policies, regulations, standard used to plan/prepare for and respond to disaster.</li> </ul>
Think of differences between government, civil society and private sector actors!		

04 February 2019 © Oxford Policy Management 8

Figure 2: Stakeholder workshop exercise  
Source: Authors

#### 2.1.2. Global study

The Global Study focused on international stakeholders with a vested interest in METEOR outputs. These included organisations such as UNICEF and the World Bank who are involved in humanitarian response, various international NGOs and insurance companies. Interviews with this stakeholder set



## METEOR Baseline Evaluation Report



reveals key information about project relevance and sustainability. Over time, we will trace growing awareness, interest, and uptake of METEOR outputs outside the pilot countries.

Table 3: Global study key informant interviews

Organisation type	# of interviews
Humanitarian/development organisation	7
Private sector/consulting	2
Insurance	3
NGO/civil society	2
Academic	1
<b>Total</b>	<b>15</b>

Source: Authors

### 2.1.3. Limitations of the methodology

The methodology for this theory-based evaluation is comprehensive and has included interviews with a diverse set of stakeholders, yielding coded evidence on themes and issues that we will track over the course of the evaluations. We do however want to point to a few limitations. First, due to the complexity of the subject matter and the number of interviews with sector specialists in both Tanzania and Nepal, a representative from BGS accompanied OPM on the interviews. Given that this baseline was primarily to collect broad-based views of stakeholders around DRRM, we feel that there is no risk of bias in evidence collected. The METEOR products are not yet complete and therefore stakeholders did not express more than various levels of interest in the eventual outputs of the project.

A second limitation specifically in Nepal was that due to time constraints, the baseline interviews were combined with the inception mission. Ideally, an inception mission would have happened first with BGS to introduce the project to various stakeholders and the baseline would have happened at a later date where OPM would have conducted the data collection. Overall, we feel that the process went smoothly and we were able to achieve both objectives in the combined mission.

A final limitation, specifically in Tanzania was that questions around gender were not specifically explored. The error was due to a versioning issue with the data collection instruments. OPM will make a concerted effort to (i) raise this issue and how to rectify it in the learning workshop; (ii) ensure that these questions are fully explored in the mid-line and end-line evaluations.

## 3. Logframe KPIs

Table 4 shows baseline values for the METEOR project's key performance indicators (KPIs). For a full look at METEOR's logframe, see ANNEX 3. For the qualitative indicators we have extracted key findings from the baseline report. We intend to discuss the target values for mid-line and end-line with key stakeholders and consortium members at the annual learning workshop for 2019.

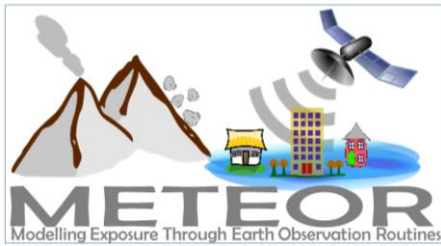


## METEOR Baseline Evaluation Report



Table 4: Key performance indicator baseline figures

KPI #	Indicator	Baseline Value	Mid -line Target	End Line Target
1	Feedback from relevant Ministry (or decision-maker) of the usefulness of the datasets for improving their national DRR/DRM	<p>In both countries, government officials expressed general interest in the METEOR project and products.</p> <p><b>Nepal</b> findings suggest:</p> <ul style="list-style-type: none"> <li>• Recognition that hazard and exposure data are seldom used in planning for DRR, even when robust data may exist;</li> <li>• There is an increasing demand for these types of products for decision-making;</li> <li>• Existing hazard/exposure data is of poor quality/uniformity or not shared;</li> </ul> <p><b>Tanzania</b> findings suggest:</p> <ul style="list-style-type: none"> <li>• Clear interest in METEOR as DMD is a METEOR consortium partner</li> <li>• Need for better mitigation strategies to deal with populations located in geo-hazard areas – METEOR will be able to highlight the areas of highest vulnerability</li> <li>• The quality and consistency of hazard and vulnerability data across Tanzania varies depending on who has collected it and how it has been archived - Fragmented datasets, no central repository.</li> </ul>	<ul style="list-style-type: none"> <li>• The level of engagement of Tanzanian and Nepalese governments with METEOR is sustained and maintained positive.</li> </ul>	<p><b>Nepal:</b></p> <ul style="list-style-type: none"> <li>• 3 concrete examples of how government stakeholders are using METEOR products in their work</li> <li>• Adoption of METEOR's exposure and hazard maps/data by the MoHA's procedures for allocating rescue and operations resources in the aftermath of a disaster</li> <li>• Adoption of METEOR's exposure and hazard maps/data by the DWRI in the next due update of their water-induced plans and hazard maps.</li> </ul>
2a	Percentage of Nepalese and Tanzanian territory covered by Level 2 multi-hazard exposure data (aligned with SFDRR Global Target g and Priority Area 1)	Zero (0) percent	TBC (based on work plan)	100 percent



## METEOR Baseline Evaluation Report



KPI #	Indicator	Baseline Value	Mid -line Target	End Line Target
2b	Number of Level-1 datasets for LDCs uploaded on online platforms (aligned with SFDRR Global Target g and Priority Area 1)	Zero (0) LDCs	TBC (based on work plan)	47 LDCs
3	Percentage of end users reporting improved capacity to use DRR/DRM protocols and open source datasets (disaggregating males and females)	Zero (0) percent	TBC (Subject of Annual Learning Event 2019)	70 percent
4	Qualitative indicator: Feedback from UNICEF, UNISDR partners and insurance companies in respect of usefulness of datasets and protocols	Baseline findings suggest: <ul style="list-style-type: none"> <li>• That global stakeholders believe that METEORs effort to establish standards and a system for the consistent development of robust multi-hazard and exposure data would be helpful to the LDC DRRM landscape;</li> <li>• There was general understanding that the accuracy and acceptance of METEOR datasets will depend on what the data is being used for - that the scale and detail of the exposure data in a given place would determine its fit for use.</li> </ul>	<ul style="list-style-type: none"> <li>• See progression in awareness of the METEOR project within our pilot countries and in international circles</li> <li>• More people within a given agency become interested in learning more about the products;</li> <li>• METEOR project members are asked to give demos or talks about products and protocols</li> <li>• Agencies request (or download) datasets and engage with METEOR members on how to use these data for prepositioning, planning, or in products and services</li> </ul>	<ul style="list-style-type: none"> <li>• Agencies begin testing/using METEOR data/protocols in their work</li> </ul>

Source: Authors





## METEOR Baseline Evaluation Report



### 4. Baseline findings

This section discusses the baseline findings for the two workstreams: Global Study and the Country Case Studies of Nepal and Tanzania.

#### 4.1. Global study findings

##### 4.1.1. The wider global context

Each year natural disasters negatively impact hundreds of thousands of lives and lead to economic losses averaging USD 250-300 billion per annum<sup>7</sup>. These losses are often disproportionately high in developing countries that experience high-rates of poverty and rapid urbanisation, which pushes the most vulnerable onto increasingly hazard-prone areas. Furthermore, LDCs are challenged by a lack of resources to effectively understand risk, implement mitigation measures, and respond to disasters.

The international humanitarian system for responding to natural disasters, as currently structured, is not as timely or effective as it could be<sup>8</sup>. Funding is secured on a largely *ad hoc* basis after a disaster strikes and often comes too late to effectively help households. Furthermore, there is an ongoing and growing shortfall in humanitarian funding, as climate-related disasters are on the rise. For example, in 2015, the total sum of global UN appeals (a proxy for humanitarian need) stood at USD 20 billion of which only about half was funded<sup>9</sup>.

The Sendai Framework for Disaster Risk Reduction 2015 – 2030 makes a critical shift from simply managing disasters to address root causes to look at reducing risk. The framework focuses on four priorities for action: (i) understanding disaster risk, (ii) strengthening disaster risk governance, (iii) investing in DRR for resilience, and (iv) enhancing disaster preparedness for effective response so as to build back better<sup>10</sup>. The METEOR project is primarily focused on priority one. Based in an understanding of disaster risk in relation to vulnerability, capacity, exposure of persons and assets, hazard characteristics and the environment, the METEOR project will provide guidelines, data and information that are essential to credible risk assessment as a fundamental underpinning to inform DRRM.

Globally, the DRRM field and the insurance industry has experienced a rapid evolution in the development of risk models, platforms and data. This growth is due, in large part, to advances in: technology, data storage and computing as well as improvements in innovative data sources such as remote sensing and crowdsourcing. Additionally, in the past several years, in Europe, there has been an increase in attention to regulatory standards around insurance that require companies to better understand their exposure to catastrophe risk<sup>11</sup>.

The insurance and financial industries mostly use proprietary or commercial risk models offered by large catastrophe (CAT) modelling companies. These companies offer numerous risk models for

---

<sup>7</sup> UNISDR Strategic Framework 2016-2021

<sup>8</sup> Clarke, D. and Dercon, S. (2016). *Dull Disasters: how planning ahead will make a difference*. Oxford University Press. Oxford.

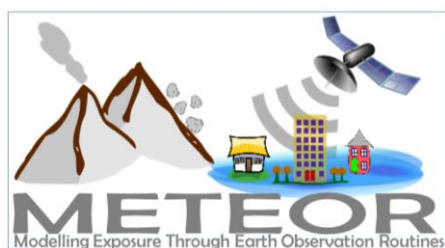
<sup>9</sup> *ibid*.

<sup>10</sup> UNISDR Strategic Framework 2016-2021

<sup>11</sup> The Solvency 2 regulation of the European Union has a pillar on Governance and Supervision that requires insurers to understand their exposure to catastrophic risk. See

[http://ec.europa.eu/finance/insurance/solvency/solvency2/index\\_en.htm](http://ec.europa.eu/finance/insurance/solvency/solvency2/index_en.htm)





## METEOR Baseline Evaluation Report



different hazards and regions. However, since the commercial insurance industry is driven by market interest, the developing world, where insurance markets are underdeveloped, is often left out. To make an existing CAT model work for a developing country involves customisation and the additional collection of data that may be incomplete or not exist.

Within this context, there has been a rise in open source, free tools available for modelling. The proliferation of these tools is largely due to reductions in the price of data processing and data storage. Open source and free or low-cost models will certainly benefit developing countries; however as one World Bank report notes:

*'... the existence of a "free" model is not full solution. A potential user must be aware of the model's existence, have access to the internet, and know how to download the object code, or know how to compile source code. In addition, most models still require location-specific data such as exposure information or a digital elevation model. Also, varying levels of expertise are required to install, run, and interpret the model results. Finally, the computational hardware required to run the model and to store and analyse model results must also be available<sup>12</sup>.'*

There are very real barriers to uptake of disaster risk modelling and exposure data in developing countries that need to be addressed in addition to simply providing the data.

### 4.1.2. Definitions

In early meetings of the METEOR consortium, it became clear that members had different personal definitions for the various terms related to DRRM and exposure<sup>13</sup>. For example, for some, the term vulnerability immediately conjured thoughts on the vulnerability of people while for others the vulnerability of buildings. To reconcile these differences, the consortium created a glossary of definitions for the METEOR project reflecting the official definitions from the United Nations International Strategy for Disaster Risk Reduction (UNISDR)<sup>14</sup> (see Table 5) to ensure that all members were talking the same language. Both pilot countries of Nepal and Tanzania have adopted the official definitions for their national DRRM systems and, therefore, with which METEOR will work.

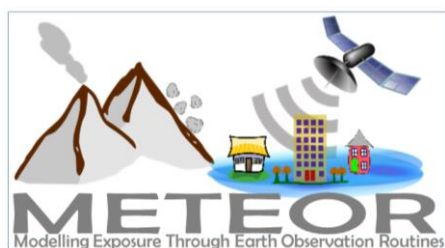
Table 5: Definitions

Term	Definition
(Geological) Hazard	<p>A process, phenomenon or human activity that may cause loss of life, injury or other health impacts, property damage, social and economic disruption or environmental degradation.</p> <p><b>Geological or geophysical hazards</b> originate from internal earth processes. Examples are earthquakes, volcanic activity and emissions, and related geophysical processes such as mass movements, landslides, rockslides, surface collapses and debris or mud flows.</p> <p>Hydrometeorological factors are important contributors to some of these processes. Tsunamis are difficult to categorize: although they are triggered by undersea earthquakes and other geological events, they essentially become an oceanic process that is manifested as a coastal water-related hazard. <b>Hydrometeorological hazards</b> are of atmospheric, hydrological or oceanographic origin. Examples are tropical cyclones (also known as typhoons and hurricanes); floods, including flash floods; drought; heatwaves and cold spells; and coastal storm surges.</p>

<sup>12</sup> World Bank (2016). Solving the Puzzle: Innovating to Reduce Risk. Washington, DC. pg. 10

<sup>13</sup> To be noted that in 2015 the MOHA has translated DRR terminologies from the Sendai Framework in Nepali language and context to make common and proper understanding among all DRR stakeholders.

<sup>14</sup> See: <https://www.unisdr.org/we/inform/terminology>, last accessed Feb. 4, 2019



## METEOR Baseline Evaluation Report



Term	Definition
	Hydrometeorological conditions may also be a factor in other hazards such as landslides, wildland fires, locust plagues, epidemics and in the transport and dispersal of toxic substances and volcanic eruption material.
Exposure	The situation of people, infrastructure, housing, production capacities and other tangible human assets located in hazard-prone areas. Measures of exposure can include the number of people or types of assets in an area. These can be combined with the specific vulnerability and capacity of the exposed elements to any particular hazard to estimate the quantitative risks associated with that hazard in the area of interest.
Vulnerability	The conditions determined by physical, social, economic and environmental factors or processes which increase the susceptibility of an individual, a community, assets or systems to the impacts of hazards.
(Disaster) Risk	The potential loss of life, injury, or destroyed or damaged assets which could occur to a system, society or a community in a specific period of time, determined probabilistically as a function of hazard, exposure, vulnerability and capacity. The definition of disaster risk reflects the concept of hazardous events and disasters as the outcome of continuously present conditions of risk. Disaster risk comprises different types of potential losses which are often difficult to quantify. Nevertheless, with knowledge of the prevailing hazards and the patterns of population and socioeconomic development, disaster risks can be assessed and mapped, in broad terms at least. It is important to consider the social and economic contexts in which disaster risks occur and that people do not necessarily share the same perceptions of risk and their underlying risk factors.
Catastrophe risk models (CAT models) <sup>15</sup>	Catastrophe modeling allows insurers and reinsurers, financial institutions, corporations, and public agencies to evaluate and manage catastrophe risk from perils ranging from earthquakes and hurricanes to terrorism and pandemics. A combination of science, technology, engineering knowledge, and statistical data is used to simulate the impacts of natural and manmade perils in terms of damage and loss. Through catastrophe modeling, RMS uses computing power to fill the gaps left in historical experience. Models operate in two ways: probabilistically, to estimate the range of potential catastrophes and their corresponding losses, and deterministically, to estimate the losses from a single hypothetical or historical catastrophe.

Source: UNISDR (2009). *UNISDR Terminology on Disaster Risk Reduction*. Geneva.

Given this disparity among its own consortium members, the METEOR evaluation team thought it would be interesting, during the baseline activities, to ask various stakeholders for their personal definitions/perceptions of different terms related to DRRM, risk modelling and exposure. This was done primarily to get some insights on the general familiarity with and any context-specific connotation of key DRRM terminology at baseline. The responses varied widely, often dependent on the sector of experience. Key findings of this exercise are provided in sections 4.2.3 and 4.3.3.

### 4.1.3. Global stakeholders

There are several sets of stakeholders crossing academic, public and private sector organisations that may have an interest in METEOR (see Table 6). These international stakeholders include insurance and re-insurance companies that may be able to use METEOR products or protocols in the design of their models. While these stakeholders are summarised here, the METEOR Sustainability plan goes into more detail on how METEOR might engage with these global actors in the future as products are developed and disseminated<sup>16</sup>. As an action step for the Midline – the evaluation team will revisit this list with consortium members, cross-referencing the METEOR Sustainability plan to ensure all members agree on critical stakeholders.

<sup>15</sup> See: <https://www.rms.com/blog/2015/06/22/what-is-catastrophe-modeling/>

<sup>16</sup> The METEOR Sustainability plan is currently underdevelopment and will be discussed as part of the learning workshop.



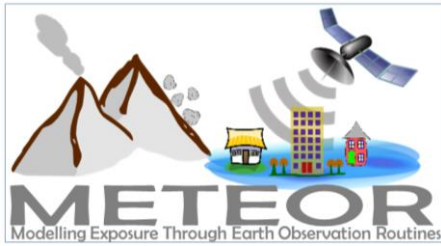
## METEOR Baseline Evaluation Report



Table 6: Key global stakeholders

Type	Organisation	Role	Relevance/Action for METEOR
<b>Research/ Academic</b>	<b>POPGRID Data Collaborative</b>	Consortium of data producers, data users, donors, and other stakeholders that seeks to: (i) facilitate collaboration among data producers; (ii) inform users so that they can choose the data most suited to their needs; (iii) work with users and donors to identify and prioritise data needs; and (iv) promote collaboration on data validation, documentation, and access initiatives <sup>17</sup> . Data access is maintained by Columbia university	This is relevant to METEOR as a mechanism to inform users and possibly to promote access to METEOR exposure data. ImageCat is a member of the POPGRID consortium and will be the primary link for METEOR outputs
<b>Humanitarian/ NGO</b>	<b>United Nations Office for Disaster Risk Reduction (UNISDR)</b>	Focal point in the United Nations system for the coordination of disaster reduction. Responsible for ensuring synergies among the disaster reduction activities of the United Nations system and regional organisations and activities working in socio-economic and humanitarian fields.	There is a UNISDR representative on our advisory board  A potential user / conduit for METEOR outputs. UNISDR often request BGS to provide support after a disaster so we might use METEOR outputs to help UNISDR and the in-country responders.
	<b>United Nations Disaster Assessment and Coordination (UNDAC)</b>	Part of the international emergency response system for sudden-onset emergencies. It is designed to help the United Nations and governments of disaster-affected countries during the first phase of a sudden-onset emergency. UNDAC is a system used by United Nations Office for the Coordination of Humanitarian Affairs (UN OCHA) to deploy a team to conduct assessment, coordination and information management	We haven't had direct contact with UNDAC, this might be via UN OCHA.
	<b>World Bank</b>	Provides technical assistance to developing countries as well as support through policy advice, research and analysis. Works with internal personnel and external partners on disaster risk management (DRM), including technical and development agencies of national governments, leading universities, the insurance sector, the risk modelling industry, civil society organisations, and foundations, as well as other multilateral agencies.  <b>Geospatial Operational Support Team (GOST):</b> works on projects to predict rural roads, count rooftops, estimate poverty, and detect land cover change in special economic zones, and explores the relationship between vehicle density and pollution levels.	We have a WB representative on our advisory board.  Relevant as an organisation that operates in DRM and funds work in this field. Note the Tanzanian Urban Resilience Programme (TURP) (joint with DfID) project in Dar es Salaam. Probably best links with WB GFDRR.

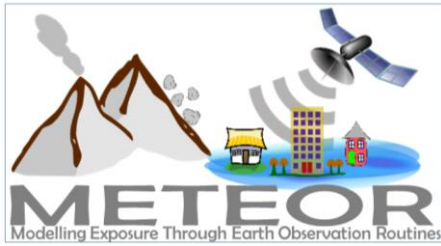
<sup>17</sup> <https://www.popgrid.org/about>, last accessed Jan. 7, 2019



## METEOR Baseline Evaluation Report



Type	Organisation	Role	Relevance/Action for METEOR
		<b>Global Facility for Disaster Reduction and Recovery (GFDRR):</b> is a global partnership that helps developing countries better understand and reduce their vulnerability to natural hazards and climate change. GFDRR is a grant-funding mechanism, managed by the World Bank, that supports disaster risk management projects worldwide.	
	<b>International Development Forum (IDF)</b>	A public/private partnership led by the insurance industry and supported by international organisations. IDF works with country governments and National Government Insurance Trust Funds, Disaster Management Authorities, Insurance regulators Multi-lateral organisations and Think Tanks.	Represented on our advisory panel  IDF is a potential route to gauge interest in our outputs and promote them when they're delivered
	<b>UNICEF Innovation Office</b>	UNICEF supports national government(s) in their preparedness plan(s) for issues that may affect children.	Could be a user of our results. They work at national and international scales.
	<b>World Vision</b>	Aid organisation involved in international development, aid and advocacy, working to improve the lives of the world's poorest children. World Vision leverages its long-term planning focus as an organisation (sometimes ~15 years' timeline in a country) and global development footprint to "imbed individual and community resilience, early warning, disaster preparedness and mitigation programming into community development models." Response strategies incorporate research, evidence-based programming, advocacy and humanitarian policy supported by in field support and enabling technologies to ensure the effectiveness of the interventions.	Could potentially be a user of METEOR data outputs to assist with their pre-positioning of DRM assets. Could also be a future partner disseminating and training on METEOR products and services in other countries.
<b>Private sector</b>	<b>Guy Carpenter (GC)</b>	Reinsurance Broker and Risk Intermediary. Uses data and risk models to price and place insurance covers for its reinsurance and corporate clients. Guy Carpenter works with reinsurers, insurers, and large corporations globally that provide insurance protection for a variety of property risks, i.e. building, infrastructure, etc. GC also works with government partners to provide specialised risk transfer products (i.e. catastrophe bonds) to cope with natural disasters. GC provides data, tools, and advisory services for catastrophe risk management. GC risk modellers and analysts have extensive experience with data sets that provide a picture of the hazard and exposure in countries. GC has a deep capacity for using exposure data for cat modelling and risk underwriting purposes.	There are various ways to work with the (re)insurance sector (see METEOR Sustainability plan). METEOR will create an Industry Advisory Group to help direct cohesive communication and activity with the private sector.



## METEOR Baseline Evaluation Report



Type	Organisation	Role	Relevance/Action for METEOR
	<b>TransRe</b>	Transatlantic Holdings, Inc. is a leading international reinsurance organisation that offers reinsurance capacity on both a treaty and facultative basis structuring programs for a full range of property and casualty products <sup>18</sup> .	Same as above
	<b>SCOR</b>	SCOR, the 5th largest reinsurer in the world, provides insurance companies with a diversified and innovative range of solutions and services to control and manage risk. Using its experience and expertise ("The Art & Science of Risk"), SCOR provides cutting-edge financial solutions, analytics tools and services in all areas related to risk – in Life & Health insurance (longevity, mortality, LTC, etc.) as well as in P&C insurance (natural catastrophes, agriculture, industry, transport, engineering, etc.) <sup>19</sup> .	Same as above
	<b>Canopius</b>	Canopius is a global specialty lines (re)insurer. As one of the top 10 insurers in the Lloyd's insurance market, they wrote over \$1.2 billion premium across the group in 2017 <sup>20</sup> .	Same as above
	<b>KatRisk</b>	KatRisk is a catastrophe modelling company focused on flood and wind risk. Use high performance GPU computing hardware to develop state of the art high-resolution yet cost-effective views of risk. They build and test solutions in collaboration with clients and provide and transparency into the underlying data, methodologies and choices made in the process of creating their products <sup>21</sup> .	Same as above
	<b>Risk Frontiers</b>	Providers of risk management and catastrophe modelling and solutions.	Same as above
	<b>Sage on Earth</b>	Consultancy providing expertise on the use of disaster and climate risk information to build resilience <sup>22</sup> .	Same as above

<sup>18</sup> <https://www.transre.com/about-us/>, last accessed Jan. 7, 2019

<sup>19</sup> <https://www.scor.com/en/about-scor/>, last accessed Jan. 7<sup>th</sup>, 2019

<sup>20</sup> <https://www.canopius.com/about-canopius/>, last accessed Jan. 7<sup>th</sup>, 2019

<sup>21</sup> [www.katrisk.com/](http://www.katrisk.com/), last accessed Jan. 7<sup>th</sup>, 2019

<sup>22</sup> <https://www.sageonearth.ca/>, last accessed Jan. 7<sup>th</sup>, 2019



## METEOR Baseline Evaluation Report

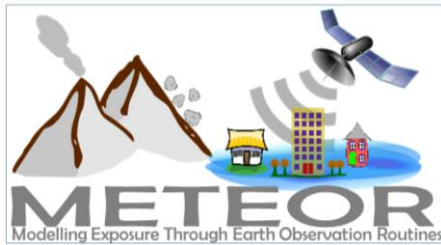


Type	Organisation	Role	Relevance/Action for METEOR
	<b>Blue Marble</b>	Blue Marble Microinsurance is a consortium of nine of the world's leading insurance companies. The consortium develops and implements microinsurance solutions in order to encourage economic growth in emerging countries. It has projects in Africa, Latin America, and Asia Pacific.	Same as above
	<b>Kinetic Analysis Corporation</b>	Kinetic Analysis Corporation uses scientifically proven techniques integrated into a ground-breaking multi-model analysis platform to draw a coherent, quantified picture of hazards and losses, for active events in real-time and for long-term risk assessment <sup>23</sup> .	Same as above
	<b>MiCRO</b>	A specialty reinsurer that offers risk transfer solutions in Central America and Haiti against natural disasters in order to protect the most vulnerable population who do not have access to insurance. Works with aggregators who provide key services to the low-income population. MiCRO works with local partners to design and implement index-insurance based products that are complemented with the offering of value -added services that are essential to increase resilience of the low-income population <sup>24</sup> .	Same as above

Source: Authors

<sup>23</sup> [www.kinanco.com](http://www.kinanco.com), last accessed Jan. 7<sup>th</sup>, 2019

<sup>24</sup> [www.microrisk.org](http://www.microrisk.org), last accessed Jan. 7<sup>th</sup> 2019



## METEOR Baseline Evaluation Report



### 4.1.4. Key global themes

The themes expressed by global stakeholders are summarised in Table 7 and explained in more detail in the remainder of this section.

Table 7: Global study DRRM themes

Theme	Summary of main points	Relevance/Lessons for METEOR
<b>Lack of understanding by LDC policy makers of risk data and its application for DRRM</b>	<ul style="list-style-type: none"> <li>There is a general lack of knowledge among decision-makers in LDC ODA countries about risk data and how it might be used for DRR/DRM;</li> <li>There is a lack of awareness about the need for DRRM – governments tend to be reactive (focus on response) rather than proactive;</li> <li>There is limited technical understanding of hazard, exposure, and risk information</li> </ul>	<ul style="list-style-type: none"> <li>METEOR should ensure the clear communication of its products and services, tailored to different types of stakeholders (e.g. policy makers vs. scientists)</li> </ul>
<b>Lack of resources/capacity to effectively use exposure data</b>	<ul style="list-style-type: none"> <li>LDCs do not have the resources/capacity to effectively use data (e.g. do not have the technology);</li> <li>Lack of capacity to train and use risk data;</li> <li>Systemic issues, including problems of corruption and underfunded programs;</li> <li>Uptake and adoption of data and risk products is slow and may be difficult due to differing knowledge of risk and limited capacity.</li> </ul>	<ul style="list-style-type: none"> <li>While METEOR will not solve this issue, the team should think clearly about how they invest and use capacity-building resources to ensure maximum productivity.</li> </ul>
<b>Constraints to sharing data</b>	<ul style="list-style-type: none"> <li>Lack of data sharing culture in many LDCs where governments want to own and control the dissemination of data;</li> <li>Governments are hesitant to use data produced by others.</li> </ul>	<ul style="list-style-type: none"> <li>METEOR must (i) engage government where appropriate and promote government ownership of the products and services produced to ensure that their products are used and endorsed by government<sup>25</sup>; and (ii) engage organizations such as our local partners (e.g. NSET) who advise government.</li> </ul>
<b>Lack of the right kind of data/inaccurate data/incomplete data</b>	<ul style="list-style-type: none"> <li>In LDCs there are frequently incomplete exposure and hazard data sets and high levels of uncertainty associated with them;</li> <li>Baseline datasets are not available to assess damaged areas in post-disaster situations;</li> <li>Limited data and sophisticated tools/models result in lack of insurance cover or high premium rates for insurance products in LDCs, making them inaccessible to most people.</li> </ul>	<ul style="list-style-type: none"> <li>METEOR's standards and protocols speak directly to this issue.</li> </ul>

Source: Authors

<sup>25</sup> In case for Tanzania it is suggested you register the study through [http://www.costech.or.tz/?page\\_id=1625](http://www.costech.or.tz/?page_id=1625)





## METEOR Baseline Evaluation Report



The themes expressed by global stakeholders overlapped many of those expressed by in-country stakeholders in Nepal and Tanzania (see sections 4.2 and 4.3). Not surprisingly, a recurrent theme emerging from discussions with global stakeholders is the perception that many LDC governments, in particular political decision-makers, lack the knowledge and understanding to use risk data effectively for DRRM. Several stakeholders indicated that while there are competent technical people within LDC governments, there are few with both the technical capacity and the policy-making authority. One stakeholder had a slightly different take on this idea, focusing more on how people value such data: *“within certain ministries (transport, urban development, emergency management) there is capacity for using EO-data, but it is not prioritised.”* Other stakeholders argued that the knowledge is there, but it is more a resourcing and capacity issue. For example, one person noted *“there is sufficient understanding of what EO-based products could do; but ‘limited’ to ‘no capacity’ of processing and how to apply.”*

Nearly all of those interviewed at some point discussed the challenges around the availability and reliability of comprehensive data sets for LDC countries that provide information on hazards, exposure and vulnerability. We received many comments such as *‘infrastructure data is not included’* or *‘there are few multi-hazard datasets.’* A few also noted that publicly available crowdsourced data such as OpenStreetMap have many limitations around detail and accuracy.

Several stakeholders expressed concern that the lack of availability of data seriously hinders response efforts in LDCs. For instance, one stakeholder commented that the *“lack of valid data on impacted facilities and assets as well as information on the extent and severity of a disaster’s impact hinders response activities and distribution of much needed aid.”* Those in the insurance world acknowledged that lack of data and data inaccuracies make market entry problematic, limiting the availability of insurance product; or, where insurance exists, premium rates for insurance products are high and thus inaccessible to most people in LDCs.

Another theme revolved around sensitivities to sharing data. Some stakeholders discussed the reluctance of governments to share official data, suggesting that in LDCs there was a *‘lack of data-sharing culture.’* Others pointed out the opposite problem, where governments were hesitant to use data produced by others. For example, one stakeholder noted, *“for numerous reasons, it’s often a very sensitive issue when large entities give data to countries. Some governments have gone through the effort to create some of their own data and are reluctant to adopt new datasets.”*

### 4.1.5. Value and sustainability of METEOR

Overall, the response of global stakeholders to the METEOR project was positive. There was agreement that creating a set of standards and establishing a system for the consistent development of robust multi-hazard and exposure data would be helpful. As one stakeholder noted, *“standards of data will be a key driver for future data sets to be helpful and fit for purpose.”* There was also an understanding that the accuracy and acceptance of METEOR datasets will depend on what the data is being used for - that the scale and detail of the exposure data in a given place would determine its fit for use. There were also some out-of-scope suggestions such as *“it would be useful to develop exposure at different scales based on country size (population and GDP)”* and *“data needs to cover property and agriculture assets.”* These types of comments speak to the important role of clear communication of exactly what METEOR intends to deliver and how it can be used (or not used).





## METEOR Baseline Evaluation Report



Those interviewed also came with several suggestions on how to ensure the sustainability of METEOR projects (see Table 8). These ideas ranged from building government capacity and ownership of the METEOR data to carefully crafting communications and using peer-to-peer methods of sharing knowledge.

Table 8: Suggestions for METEOR sustainability

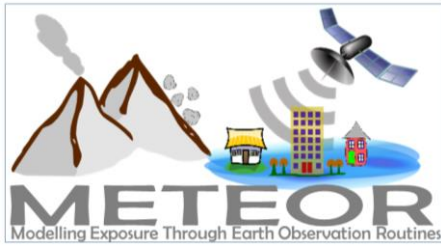
Suggestion	Description
<b>Government capacity-building and ownership</b>	<ul style="list-style-type: none"> <li>• Need to include an on-going training and capacity-building programme</li> <li>• Work with government focal points in charge of implementing activities that support the Sendai Framework</li> <li>• Governments need to have ownership of the methods and the ability to create data themselves</li> <li>• Involvement of government personnel in the process of data generation (can be as advisors or team member of technical committees)</li> <li>• Dissemination of results should come through government sources.</li> </ul>
<b>Communication</b>	<ul style="list-style-type: none"> <li>• METEOR should carefully craft communication to address a country's level of understanding and capacity. Some countries will need more detailed explanations to ensure that policy-makers understand how to use the results.</li> </ul>
<b>Peer-to-Peer sharing</b>	<ul style="list-style-type: none"> <li>• Have countries that take up the METEOR project assist others in the region that may not have the same level of capacity and knowledge.</li> </ul>
<b>Share data on other relevant sites</b>	<ul style="list-style-type: none"> <li>• Combine and use METEOR datasets within the Magic Box platform<sup>26</sup> for DRRM decision-making.</li> </ul>
<b>Do not link funding to DRRM to insurance</b>	<ul style="list-style-type: none"> <li>• Bank loans and financing tied to DRRM activities should not be directly tied to insurance coverage offerings as insurance is often viewed negatively in LDCs;</li> <li>• Collaborative approach with industry players working together and outside the competitive space.</li> </ul>

Source: Authors

### 4.1.6. Data Sources/Platforms

Within the conversations with global stakeholders and as part of the overall document review, several tools/platforms/datasets emerged that may be of interest to METEOR.

<sup>26</sup> Magic Box is a software platform that uses real-time data to inform life-saving humanitarian responses to emergency situations. This open-source platform ingests data from both public sources and from private sector partners, and generates insights based on methodologies and algorithms provided by their data science team. These insights are made available to the development and humanitarian partners through an API and user interfaces.

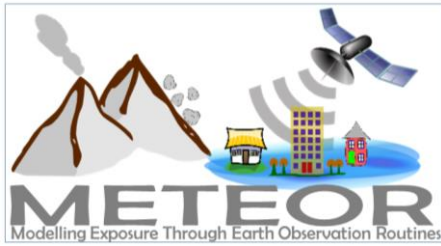


## METEOR Baseline Evaluation Report



Table 9: Global data sources for DRRM data

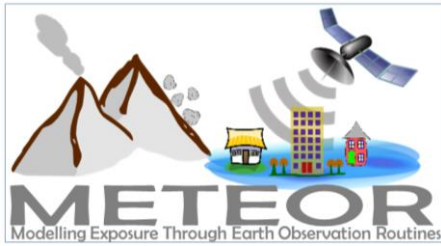
Tool/Platform	Sponsor Organisation	How it is used
<b>Global Risk Assessment Framework (GRAF)</b>	<b>UNISDR</b>	<ul style="list-style-type: none"> <li>Provides framework for the use of data products for DRRM decision-making.</li> <li>Houses the following products/tools/info for technical work: <ul style="list-style-type: none"> <li>National DRR platform info</li> <li>Loss data collected after disasters</li> <li>Policy design strategies and framework</li> <li>Risk based monitoring</li> <li>DRR measures</li> <li>Showcase of best practices.</li> </ul> </li> <li>Uses of exposure data in (i) monitoring, currently loss-based but risk-based monitoring is being considered in many cases; (ii) post-disaster losses (iii) defining risk management measures; (iv) policies for public, (v) tracking how risk is changing the implementation of Sendai Framework of DRRM</li> </ul>
<b>Pacific Catastrophe Risk Assessment and Financing Initiative (PCRAFI)</b>	<b>Geoscience Division Secretariat of the Pacific Community (SPC) World Bank Asian Development Bank</b>	Aims to provide the Pacific Island Countries (PICs) with disaster risk modelling and assessment tools. It also aims to engage in a dialogue with the PICs on integrated financial solutions for the reduction of their financial vulnerability to natural disasters and to climate change. The initiative is part of the broader agenda on disaster risk management and climate change adaptation in the Pacific region. The Pacific Disaster Risk Assessment project provides 15 countries with disaster risk assessment tools to help them better understand, model, and assess their exposure to natural disasters.
<b>Global Facility for Disaster Reduction and Recovery (GFDRR)</b>	<b>World Bank</b>	A global partnership that helps developing countries better understand and reduce their vulnerability to natural hazards and climate change. Helps countries integrate disaster risk management and climate change adaptation into development strategies and investment programs and recover from disasters quickly and effectively.
<b>InaSAFE</b>	<b>Developed jointly by Indonesia (BNPB), Australia (Australian Government) and the World Bank (GFDRR)</b>	Free software that produces realistic natural hazard impact scenarios for better planning, preparedness and response activities. It provides a simple, but rigorous way to combine data from scientists, local governments and communities to provide insights into the likely impacts of future disaster events.
<b>AIR Worldwide</b>		AIR pioneered the catastrophe modelling industry, creating the tools that changed how people think about risk management. More than 400 organisations rely on AIR's models, software, and services to manage their risk from natural catastrophes, terrorism, cyber-attacks, and pandemics. AIR is part of the Verisk Analytics family of companies, a leading data analytics provider.



## METEOR Baseline Evaluation Report



Tool/Platform	Sponsor Organisation	How it is used
<b>RiskScape</b>	<b>New Zealand's initiative as a collaboration between GNS Science and the National Institute of Water &amp; Atmospheric Research (NIWA)</b>	Software is designed to assist organisations and researchers with estimating asset impacts and losses from natural hazards. The software is modular; taking a set of four inputs for the calculations. Each simulation uses one asset, hazard, aggregation and vulnerability layer. Impacts and losses can be estimated for many different natural hazard and asset combinations. RiskScape is easily adapted for use anywhere in the world.
<b>CAPRA</b>	<b>Partnership between the Center for Coordination of Natural Disaster Prevention in Central America (CEPREDENAC), UNISDR, the Inter-American Development Bank (IADB) and the World Bank</b>	CAPRA (Probabilistic Risk Assessment) Platform is an initiative that aims to strengthen the institutional capacity for assessing, understanding and communicating disaster risk, with the ultimate goal of integrating disaster risk information into development policies and programs. Under the CAPRA Programme, government, institutions, private companies and other agencies address specific development challenges and meet disaster risk information needs through specialised software applications, extensive documentation, consultancy and advisory services, hands-on practical training and other complementary services.
<b>Caribbean Catastrophe Risk Insurance Facility (CCRIF)</b>		The first multi-country risk pool in the world and was the first insurance instrument to successfully develop parametric policies backed by both traditional and capital markets. It was designed as a regional catastrophe fund for Caribbean governments to limit the financial impact of devastating hurricanes and earthquakes by quickly providing financial liquidity when a policy is triggered. CCRIF offers earthquake, tropical cyclone and excess rainfall policies to Caribbean and Central American governments.
<b>GeoDash</b>	<b>Government of Bangladesh</b>	GeoDASH is geo-spatial data storing and sharing initiative by the Bangladesh Government. It is a web-based platform for compiling, updating and sharing geospatial databases that will allow facilitating the use, management, exchange and quality control of geospatial data sets in a collaborative manner.
<b>Oasis Loss Modelling Framework</b>		The Oasis Loss Modelling Framework provides an open source platform for developing, deploying and executing catastrophe models. It uses a full simulation engine and makes no restrictions on the modelling approach. Models are packaged in a standard format and the components can be from any source, such as model vendors, academic and research groups. The platform provides: (i) a platform for running catastrophe models, including a web-based user interface and an API for integration with other systems (Oasis Loss Modelling Framework); (ii) core components for executing catastrophe models at scale and standard data formats for hazard and vulnerability (Oasis ktools); (iii) a toolkit for developing, testing and deploying catastrophe models (Oasis Model Development Toolkit)
<b>Mapillary</b>		A service for sharing crowdsourced geotagged photos, developed by Mapillary AB, located in Malmö, Sweden.

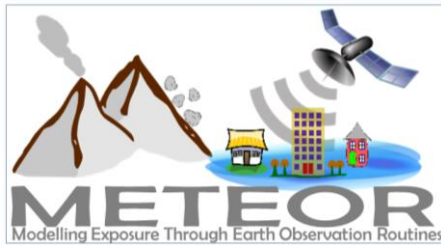


## METEOR Baseline Evaluation Report



Tool/Platform	Sponsor Organisation	How it is used
<b>InfoRM</b>	<b>InterAgency Standing Committee (IASC) and the European Commission</b>	A global, open-source risk assessment for humanitarian crises and disasters. It can support decisions about prevention, preparedness and response
<b>ACAPS</b>	<b>Consortium of Norwegian Refugee Council and Save the Children</b>	ACAPS was established in 2009 as a non-profit, non-governmental project with the aim of providing independent, ground-breaking humanitarian analysis to help humanitarian workers, influencers, fundraisers, and donors make better decisions. ACAPS supports the humanitarian community by providing up-to-date information on more than 40 key crises around the globe.

Sources: Authors



## METEOR Baseline Evaluation Report



### 4.2. Nepal findings

#### 4.2.1. The wider country context

##### Disaster risks and vulnerabilities

Nepal is a mountainous, land-locked country that sits in a seismically active zone and experiences frequent extreme events due to a variety of natural and man-made hazards such as intense rainfall and rapid, unplanned urbanization, and lack of awareness at different levels. The country is exposed to a broad range of natural hazards, including many of those of interest to METEOR - earthquakes, landslides, and floods. Furthermore, the frequency and intensity of hydrometeorological hazards in Nepal are rising<sup>27</sup>.

Natural disasters negatively impact livelihoods and the built environment increasing the vulnerability of the local population. The negative impacts of natural disasters contribute to and intensify other factors such as urbanisation, deforestation, encroachment of the flood plains, and poor planning and building practices.

As one of the least developed countries in the world, over 80% of the Nepalese population lives in rural areas and 25% lives below the poverty line<sup>28</sup>. Reports estimate that 80% of Nepal's population is at risk from natural and climate-induced hazards<sup>29</sup>. The social and economic impacts of disasters in Nepal are high. A recent study suggests that from 1980-2017, disasters in Nepal have caused 21,000 deaths and impacted the livelihoods of upwards of 13 million people, resulting in close to USD 5.9 billion in physical losses<sup>30</sup>. Government estimates indicate that disasters cost the government of Nepal about 6% of its annual development expenditures<sup>31</sup>. Women and girls are often differently and disproportionately affected by crises. Existing gender inequalities increase the vulnerability of women and girls, so when a crisis takes place, they are often more exposed to increased loss of livelihoods, security, and even lives, both during and in the aftermath of the event<sup>32</sup>.

Recent disasters include the 2015 Gorkha earthquake of 7.6 magnitude, which resulted in 8790 fatalities, over 22,300 injuries, and an estimated USD 7 billion in damages and losses<sup>33</sup>. In 2017, monsoonal rainfall triggered large-scale flooding and landslides in southern Nepal, affecting agricultural land and infrastructure, where an estimated 11.5 million people were affected<sup>34</sup>.

<sup>27</sup> ADB. 2014. *Assessing the Costs of Climate Change and Adaptation in South Asia*. Manila.

<sup>28</sup> Central Bureau of Statistics (2018). *Statistical Yearbook of Nepal: 2017*, 16<sup>th</sup> edition. National Planning Commission, Kathmandu, Nepal

<sup>29</sup> Ministry of Home Affairs. (2018). *Nepal Disaster Report, 2017: The Road to Sendai*, Kathmandu: Government of Nepal.

<sup>30</sup> D. Guha-Sapir, R. Below, Ph. Hoyois – EM-DAT: The CRED/OFDA International Disaster Database – [www.emdat.be](http://www.emdat.be) – Universite' Catholique de Louvain – Brussels – Belgium, cited in ADB 2018.

<sup>31</sup> Ministry of Home Affairs (2017). *National Position Paper on Disaster Risk Reduction and Management Nepal*. Government of Nepal.

<sup>32</sup> CARE International (2017) *Suffering in silence: The 10 Most Under-Reported Humanitarian Crises of 2016*

<sup>33</sup> NPC. (2015b). *Nepal Earthquake 2015: Post Disaster Needs Assessment: Key Findings. Vol. A*. Kathmandu: National Planning Commission, Government of Nepal.

<sup>34</sup> Asian Development Bank (2018). *The Enabling Environment for Disaster Risk Financing in Nepal: Country Diagnostic Assessment*. Unpublished draft



## METEOR Baseline Evaluation Report



### Governance of disaster risk management

In the last several years, from a legal and regulatory framework, the governance around DRRM in Nepal has made great progress with the adoption of several important laws and policies. However, there also remains some confusion as parts of different policies in some cases appear to contradict one another and many of these laws have yet to be fully operationalised. These challenges are discussed in the sections below. The key policies governing DRRM are identified in Table 10. For more detailed information and a fuller list of documents, see the annotated bibliography (ANNEX 4).

In 2015, Nepal adopted a new Constitution<sup>35</sup>. As the fundamental law and policy framework for managing government, the Constitution of Nepal introduced a federal system of government with shared sovereignty and exercise of state power at the federal, provincial, and local levels. Within this framework, disaster management responsibility is entrusted to all levels of government.

Another key legal document is the 2017 *Disaster Risk Reduction and Management Act (DRRM Act)*. The DRRM Act broadens the scope from disaster response and recovery to also include disaster risk reduction and preparedness. It outlines a multi-tier institutional structure of DRRM for the federal, provincial, district and local governments. It is more comprehensive than the earlier iteration, and it tries to address different risks and hazards with a multi-sectoral, community-based, multi-scale approach to DRRM, through the adoption of different structural arrangements such as councils, executive committees and designated authorities. This Act also calls for the creation of the National Disaster Risk Reduction and Management Authority and provides for the establishment of a Disaster Risk Reduction and Management National Council. Both these regulatory bodies are viewed as critical to the oversight and management of a national DRRM policy.

In addition, the government of Nepal recently endorsed the *National Disaster Risk Reduction Policy* and the *National Strategic Action Plan for Disaster Risk Reduction 2017-2030*. The National Disaster Risk Reduction Policy describes how Nepal contributes to sustainable development through developing a safe, adaptive and climate resilient nation. The National Strategic Action Plan focuses on improving disaster risk financing arrangements for post-disaster response. The plan includes four priority areas: (i) understanding disaster risk; (ii) strengthening disaster risk governance to manage disaster risk for each development sector and at national, provincial and municipal levels; (iii) reducing disaster and climate change risks through investments for resilience; and (iv) enhancing disaster preparedness for effective response and to 'build back better' in recovery, rehabilitation and reconstruction.

Other key laws and policies include the 2017 *Local Government Operations Act (LGOA)* which elaborates on the functions and jurisdiction of local governments carried forth from the 2015 constitution and the *National Urban Development Strategy* which addresses the development of safer settlements, land use regulations and building codes, and awareness building and preparedness to address disaster risk and vulnerabilities<sup>36</sup>. The LGOA has clearly mentioned the responsibility of local governments (municipalities) for disaster risk management, including development and implementation of policy, guidelines and plans.

---

<sup>35</sup> See ANNEX 4 for more details are parts that related to DRRM

<sup>36</sup> See ANNEX 4 for more details are parts that related to DRRM





## METEOR Baseline Evaluation Report



Table 10: Key policies governing DRRM

Policy	Description
<b>2017 Disaster Risk Reduction and Management Act (DRRM Act)</b>	<ul style="list-style-type: none"> <li>Passed in 2017, the DRRM Act broadens the scope from disaster response and recovery to also include disaster risk reduction and preparedness. It is more comprehensive than the earlier iteration, and it tries to address different risks and hazards with a multi-sectoral, community-based, multi-scale approach to DRRM through the adoption of different structural arrangements such as councils, executive committees and designated authorities.</li> <li>Mandates for the development of the Disaster Risk Reduction and Management Authority (NDRRMA). It provides for a national Disaster Risk Reduction and Management National Council to be chaired by the Prime Minister.</li> <li>Outlines a multi-tier institutional structure of disaster risk reduction and management for the federal, provincial, district and local- government, creating provincial and local Disaster Risk Reduction and Management Committees chaired by the Chief Minister of provinces and municipalities' mayors. The regulations associated with the Act are still under development.</li> </ul> <p><b>NOTE:</b> Parts of the 2017 DRRM Act appear to conflict with the constitution, namely (i) the act defines a centralised approach where local, district, and provincial committees report up to or are subordinate to the federal authority; (ii) the substantial role of districts which do not feature in the federal structure outlined by the constitution. As such, the actual institutional framework at the provincial and local levels is still being considered and clarified. Specifically, it is an ongoing process to unbundle the powers on sub-national security, which has implications for post-disaster rescue work. It is therefore important to analyse and keep track of what these subnational government bodies are doing in terms of DRRM.</p>
<b>National Disaster Risk Reduction Policy</b>	<ul style="list-style-type: none"> <li>Envisions contributing to sustainable development through developing a safe, adaptive and climate resilient nation.</li> <li>Increase the awareness and capacity among various stakeholders and governments on the importance of dealing with disaster risk management. The focus is to: a) improve the disaster risk reduction and management governance; b) integrate climate change and disaster risk management; c) increase the public and private sector investments on disaster risk reduction; and d) improve early warning systems.</li> </ul>
<b>National Strategic Action Plan for Disaster Risk Reduction: 2017 – 2030</b>	<ul style="list-style-type: none"> <li>Focused on enhancing disaster risk financing arrangements for post-disaster response. The plan includes four priority areas: (i) understanding disaster risk; (ii) strengthening disaster risk governance to manage disaster risk for each development sector and at national, provincial and municipal levels; (iii) reducing disaster and climate change risks through investments for resilience; and (iv) enhancing disaster preparedness for effective response and to 'build back better' in recovery, rehabilitation and reconstruction.</li> <li>Priority area (iv) includes a discussion on disaster risk insurance and financing including: (a) the development of a National Risk Financing and Insurance Strategy; (b) a review of existing practices of risk transfer on agriculture and livestock insurance products; (c) and the development of regulations for risk transfer mechanisms (e.g. micro-insurance, contingency fund, low-interest credit scheme etc.).</li> </ul>

Source: Authors

Despite all the forward progress in the passage of relevant legislation, there remains some confusion over roles and responsibilities. Under the new constitution, for instance, the exact role each level of government plays in DRRM is not entirely clear. For example, responsibilities for 'disaster



## METEOR Baseline Evaluation Report



*management*’ in various forms fall under the jurisdiction of all three levels of government<sup>37</sup>. Similarly, *‘early preparedness for rescue, relief and rehabilitation from natural and man-made calamities’* is assigned to both federal and state jurisdictions<sup>38</sup>.

To complicate matters, parts of the DRRM Act appear to contradict the new Constitution. The DRRM Act of 2017 has some contesting clauses, which violate with norms and values of federal democratic constitution. Though the act was enacted after promulgation of 2015 constitution, it consolidates Disaster Risk Reduction (DRR) functions under the domain of federal government. Three layers of committees are provisioned in province, district and local governments which are more or less like administrative units and subunits under the federal government’s chain of command. More specifically, the functions of the Ministry of Home Affairs (MoHA), the focal line ministry of DRRM in the earlier regime, remain untouched.

Finally, the DRRM Act calls for the establishment of the National Disaster Risk Reduction and Management Authority (NDRRMA) to oversee disaster management countrywide, however, this agency has yet to be defined and operationalised, leaving outstanding questions on where different responsibilities will reside.

Figure 3 presents a simplified picture of how the proposed national and sub-national administrative structures around DRRM relate to one another. The boxes and arrows in a lighter colour represent uncertainties in how the final structure will operate once the inconsistencies between different legislation are sorted out. On the National side, there is a *National Disaster Risk Reduction and Management Council* that is chaired by the Prime Minister and whose members include all the relevant line ministries in DRRM. Reporting to this head council is the *Executive Committee* which is chaired by the Minister of Home Affairs and whose members include line ministry secretaries (civil servants as opposed to elected officials), development partners, NGOs, Community Based Organisations (CBOs) and other organisations that work in DRRM. The new NDRRMA is envisioned to sit underneath these two structures to coordinate DRRM activities across Nepal. What remains unclear is how many and what type of divisions will sit underneath the NDRRMA. For example, the existing National Emergency Operations Centre (NEOC), currently under the MoHA, will in the future likely sit under the NDRRMA (see Table 11 for more details). Other proposed divisions include policy and planning, research and capacity building, recovery, rehabilitation and reconstruction and so forth.

Another outstanding question is the development of the Terms of Reference (ToR) for the new NDRRMA agency. The MoHA has historically had a strong focus on disaster response and it is critical that the ToR of NDRRMA adequately focuses on all aspects of disaster, not just response. It will also be important to see what type of authority the Chief Executive of this new organisation will hold.

On the sub-national side, there remains a challenge implementing the DRRM Act in terms of the exercise of sole rights and shared rights, as per the Constitution. There is the potential for contradiction within this Act and with future laws that the local governments may formulate, as per the self-rule jurisdiction under the Constitution<sup>39</sup>.

<sup>37</sup> Oxford Policy Management (2018). Policy and Institutions Facility: Political economy issues related to climate change and disaster resilience in Nepal. Unpublished draft.

<sup>38</sup> *ibid.*

<sup>39</sup> The DRRM structure is asymmetric [Thapa and Gautam, 2018] as federal, provincial and local government committees are chaired by prime minister, chief minister and local government heads who are all elected representatives. On the other





## METEOR Baseline Evaluation Report

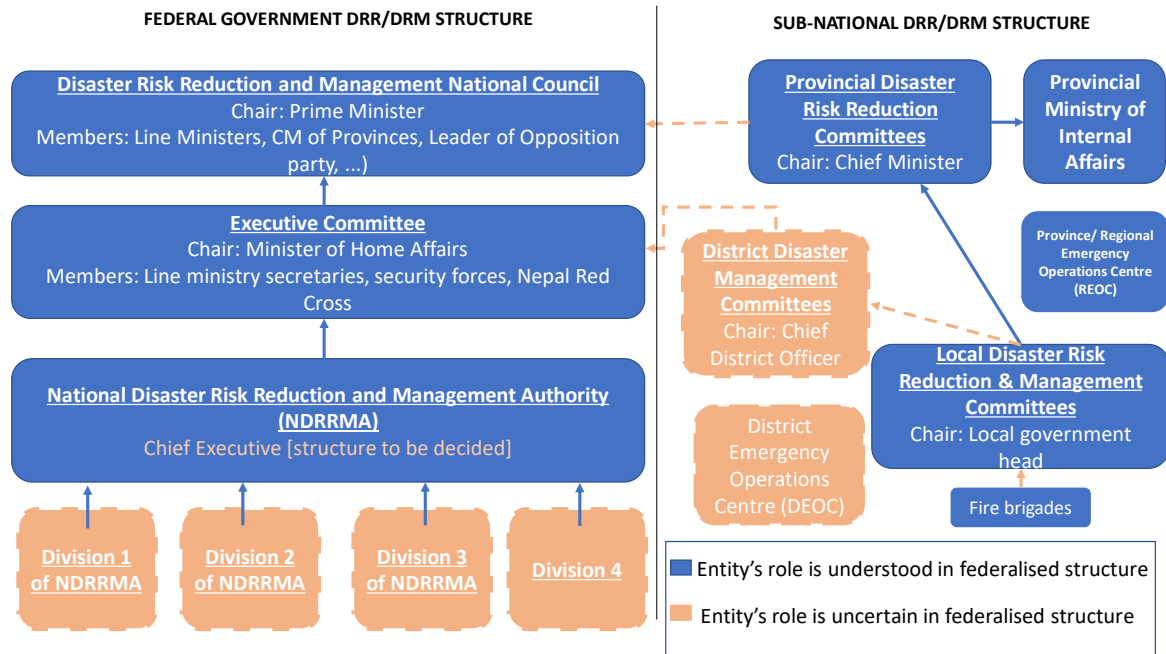


Figure 3: National and sub-national DRRM administrative structures (simplified)

### 4.2.2. Key stakeholders in DRM

Within the context of the uncertainties outlined above related to the current and future governance of DRRM in Nepal, there are multiple stakeholders playing an important role in DRRM. In this section we take a closer look at these key stakeholders, their roles and responsibilities and their relevance to the METEOR project.

The section begins with national government stakeholders, visually depicted in Figure 4, the primary stakeholders of which are further described in Table 11.

Currently, the Ministry of Home Affairs is considered the focal ministry for disaster risk management in Nepal, playing the lead role in post-disaster response, particularly in the management of rescue and relief operations through mobilisation of security forces and other humanitarian actors. MoHA also operates the NEOC and is expected to oversee the efforts of the yet-to-be established NDRRMA.

Under the Ministry of Energy, Water Resources and Irrigation (MoEWRI) there are two departments of key relevance to METEOR. First, the Department of Water Resources and Irrigation (DWRI) collects data at the river basin level and prepares water-induced disaster management plans, hazard and risk maps, and applies environment-friendly mitigation measures in the downstream areas to help minimise human casualties and damage of infrastructure. Second, the newly created Water Resource

hand, district DRRM committees, which are the middle tier between province and local levels, are chaired by a Chief District Officer who is a civil servant (bureaucratic staff) under MOHA. This structure does not follow the protocol being standardized between civil servants and elected political representatives. In fact, since one of the stipulations of Nepal's state administration is that the elected political representatives are never obliged to civil servants, the current structure would have local (elected) DRRM committees to be preminent respect to provincial (non-elected) ones, which would imply some serious governance/implementation constraints.



## METEOR Baseline Evaluation Report



Research and Development Centre (WRRDC) is a research-based centre that conducts both research and training on water-based issues.

The Ministry of Urban Development's (MUD), Department of Urban Development and Building Construction (DUDBC) are responsible for making settlements more resilient to natural and human-made disaster risks. Key priorities are the implementation of risk sensitive land use planning and enforcement of building code for resilient construction in Nepal in the context of diverse ecological setting, which is prone to disasters of various kinds.

The primary responsibility of the National Reconstruction Authority (NRA) is to oversee and coordinate recovery and reconstruction work in affected districts of the 2015 earthquake. They have a database on the status of all buildings reconstructed. The National Planning Commission (NPC) plays a lead role in mainstreaming DRRM into national policies and plans and ensures conformity of DRR policies with other national and sectoral policies. Within the NPC is the **Central Bureau of Statistics (CBS)** which is responsible for collection, consolidation, processing, analysis, publication and dissemination of socio-economic statistics and other information of the entire country based on census data and surveys. The remaining stakeholders all tangentially play a role in DRRM and are not discussed in detail here.

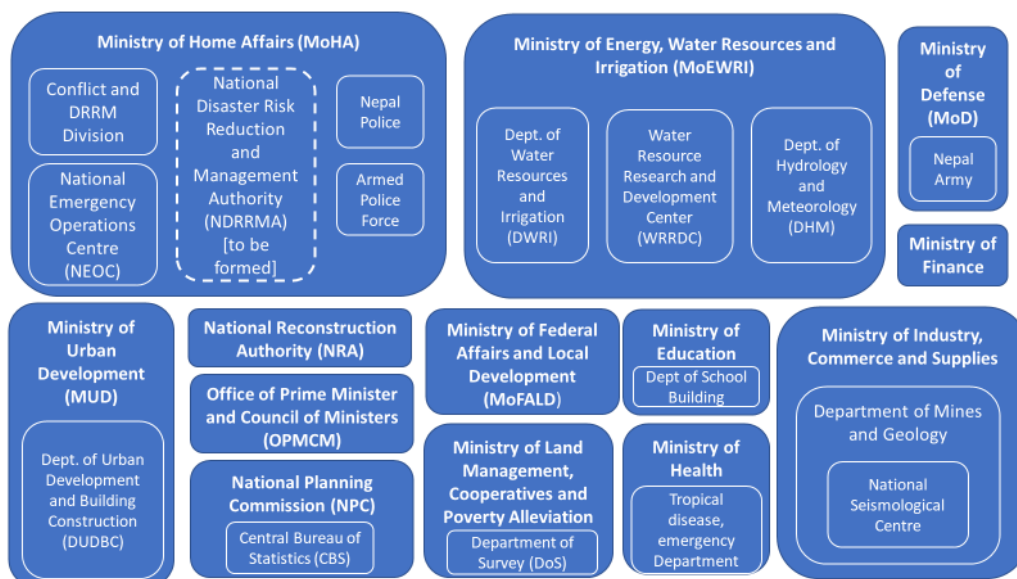


Figure 4: National government stakeholders



## METEOR Baseline Evaluation Report



Table 11: Key Government stakeholders

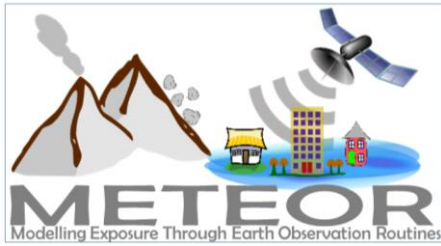
Organisation	Description	Relevance/Action for METEOR
<b>Ministry of Home Affairs (MoHA)</b>	<ul style="list-style-type: none"> <li>Focal ministry for disaster risk management in Nepal. Traditionally plays a lead role in post disaster response, particularly managing rescue and relief operations, through mobilisation of security forces and other humanitarian actors, coordinated by Disaster Relief Committees at central, regional, district and local levels.</li> <li>Also maintains an official data repository of DRM administrative data collected from the districts that also includes census information.</li> <li><b>National Emergency Operations Centre (NEOC).</b> Sits under the Ministry of Home Affairs. The objectives of the NEOC are to work as a coordination and communication point for disaster information across the country, including government agencies and other response and recovery stakeholders such as Nepal Red Cross Society, UN agencies, INGOS and NGOs.</li> <li><b>Nepal Police and Armed Police Force are under MoHA,</b> who have trained emergency responders on Collapsed Structure Search and Rescue (CSSR), Medical First Responder (MFR) and Swift Water Rescue, Fire Response, etc.</li> </ul>	<b>Primary stakeholder.</b> METEOR should work with MoHA to get data sets and products approved and accessible through the MoHA portal
<b>National Disaster Risk Reduction and Management Authority (NDRRMA)</b>	<ul style="list-style-type: none"> <li>Mandated by the NDRRM Act, this authority is responsible for all disaster risk reduction and management functions. It's structure and It is currently unclear whether this Authority will be an autonomous agency or sit under the Ministry of Home Affairs</li> </ul>	<b>Primary stakeholder.</b> METEOR should keep up-to-date with structural development and work to train/build-capacity of future staff members.
<b>Ministry of Energy, Water Resources and Irrigation (MoEWRI)</b>	<ul style="list-style-type: none"> <li>This ministry was newly formed in 2018. It has the mandate for renewable energy promotion and includes the following departments and centres relevant to METEOR:</li> <li>The <b>Department of Water Resources and Irrigation (DWRI):</b> The DWRI is a government organization, with a mandate to plan, develop, maintain, operate, manage and monitor different modes of environmentally sustainable and socially acceptable irrigation and drainage systems from small to larger scale surface systems and from individual to community groundwater schemes.</li> <li>The <b>Water Resource Research and Development Centre (WRRDC)</b> is a research-based centre that is responsible for the provision of trainings to the employees under MoEWRI related to their job and to carry out study and research programme as well as to provide laboratory facilities.</li> <li><b>Department of Hydrology and Meteorology (DHM).</b> Government agency responsible for the collection and analysis meteorological and hydrology data. DHM disseminates information on water discharge, weather forecasts and early warnings. Information is used by sectoral ministries to plan and management water resources. DHM has developed an operational flood forecasting and early warning system for major flood-prone rivers of Nepal.</li> </ul>	<b>Primary stakeholder.</b> METEOR should look to build co-development capacities with key technical staff, focusing on the DWRI and WRRDC



## METEOR Baseline Evaluation Report



Organisation	Description	Relevance/Action for METEOR
<b>Ministry of Federal Affairs and General Administration (MoFAGA)</b>	<ul style="list-style-type: none"> <li>MoFAGA is the ministry that links national and sub-national levels of government. Plays a critical role in enhancing technical and functional capacities of the local bodies who are responsible for mainstreaming disaster risk reduction into local development plans.</li> <li>Developed several Guidelines and Manuals to support the local bodies to prepare harmonised DRM plan in consistence with the 14-step Planning Guidelines. It has also played a key role in post-disaster response and recovery as a member of District Disaster Relief Committee.</li> </ul>	<b>Secondary stakeholder.</b> METEOR should engage and inform to ensure they are involved when/if we reach out to sub-national levels.
<b>National Reconstruction Authority (NRA)</b>	<ul style="list-style-type: none"> <li>Mandate is to manage, oversee and coordinate recovery and reconstruction work in affected districts of the 2015 earthquake. The organisation identifies priorities for reconstruction, allocating resources from the National Reconstruction Fund to various ministries. Priorities are identified based on damage assessments.</li> <li>Have a database on the status of all buildings reconstructed. Used tablets to geospatially register the locations. Photographs of the destroyed buildings – what kind of buildings create what type of damages.</li> </ul>	<b>Primary Stakeholder.</b> The NRA could be a key user of METEOR outputs and their database of reconstructed buildings could help inform our work.
<b>Ministry of Urban Development (MoUD)</b>	<ul style="list-style-type: none"> <li>The primary stakeholder in DRM under this ministry is the <b>Department of Urban Development and Building Construction (DUDBC)</b> whose mandate is to make settlements more resilient to natural and human-made disaster risks. MoUD has been putting considerable efforts into implementation of integrated policies and plans towards inclusion, resource efficiency, mitigation and resilience to disasters while planning settlements and cities. The ministry's key priorities are the implementation of risk sensitive land use planning and enforcement of building code for resilient construction in Nepal in the context of diverse ecological setting, which is prone to disasters of various kinds.</li> </ul>	<b>Primary stakeholder.</b> The outcomes of METEOR will be useful for DUDBC for implementing its activities safer construction and resilient settlements. Secondary stakeholder
<b>National Planning Commission (NPC)</b>	<ul style="list-style-type: none"> <li>Plays a lead role in mainstreaming climate change adaptation (CCA) and DRR into national policies and plans (periodic and annual plans) and ensures conformity of DRR policies with other national and sectoral policies. It also guides the sectoral ministries in preparing risk-resilient development plans and has recently drafted a mainstreaming guideline for them. Post-earthquake, it was instrumental in finalising a post disaster needs assessment, developing policies for resilient recovery and reconstruction, mobilising resources and setting up the National Reconstruction Authority (NRA).</li> <li><b>Central Bureau of Statistics (CBS).</b> Sits under National Planning Commission and is responsible for collection, consolidation, processing, analysis, publication and dissemination of socio-economic statistics and other information of the entire country based on census data and surveys. It compiles and archives data on population, agriculture, forest, environment, poverty, labour and others on regular intervals, which are useful for comparison and analysis to help understand the trends and changes over time.</li> </ul>	<b>Secondary stakeholder.</b> The information from METEOR will be used by NPC in decision making in terms of shaping country's periodic plans.



## METEOR Baseline Evaluation Report



Organisation	Description	Relevance/Action for METEOR
<b>Ministry of Industry, Commerce and Supplies</b>	<ul style="list-style-type: none"> <li>The primary stakeholder in DRM under this ministry is the <b>Department of Mines and Geology (DMG)</b>, which operates the <b>National Seismological Centre</b>, which collects seismological data throughout the country through a network of 21 seismic stations and 7 accelerometers. It uses micro-seismic monitoring tool that allows seismic surveillance to support post-earthquake rescue operation.</li> </ul>	<b>Primary stakeholder.</b> DMG is the major and authentic source regarding the seismic hazard mapping. DMG has generated geological maps (though not very accurate) and project reports, can be useful for METEOR. METEOR should keep them apprised of our progress and demo our products to see how they might be useful to their initiatives.
<b>Ministry of Land Management, Cooperatives and Poverty Alleviation</b>	<ul style="list-style-type: none"> <li>The primary stakeholder in DRM under this ministry is the <b>Department of Survey (DoS)</b> Agency responsible for performing geodetic, gravity and other surveys throughout the country. It produces topographic base maps and carries out cadastral survey, maintains multi-resolution geo database and produces information on land use pattern and land-use maps.</li> </ul>	<b>Secondary stakeholder:</b> Likely an end-user. METEOR should keep them apprised of our progress and demo our products to see how they might be useful to their initiatives.
<b>Ministry of Defence (MoD)</b>	<ul style="list-style-type: none"> <li>The MoD (particularly the Nepali Army) is involved mostly in rescue operations. They are often called upon during emergencies as they have the training and the equipment needed to conduct rescues in flooding, landslide, and earthquake scenarios. The Nepali Army have newly established a disaster management training school, under which they have been producing professional responders on Collapsed Structure Search and Rescue (CSSR), Medical First Responder (MFR) and Swift Water Rescue, Fire Response, etc.</li> </ul>	<b>Secondary stakeholder:</b> Likely an end-user. METEOR should keep them apprised of our progress and demo our products to see how they might be useful to their initiatives.

Source: Authors



## *METEOR Baseline Evaluation Report*

In addition to government stakeholders there are numerous development partners, NGOs, academic institutions and private sector organisations operating in Nepal that are focused on disaster risk management and reduction issues (see Table 12). Of these, there are several that METEOR should consider as primary stakeholders given their work aligns well with this project. Among the development partners identified working in this area, DfID, UNHCR, and USAID are of key interest to METEOR. These organisations have expressed a high interest either in working to closely support our work (DfID, USAID) or in becoming primary users of our outputs (UNHCR).

In addition to NSET, a METEOR partner, there are several key stakeholders from civil society that METEOR should engage with. Firstly, the International Centre for Integrated Mountain Development (ICIMOD) was actively engaging in work around landslides and are important key actors for database management. Secondly, Practical Action is an international NGO focused on scaling up community-based early warning systems for flood and landslides. They work extensively with local and national government to incorporate DRRM into development planning. Similarly, DPNet is an umbrella organisation of national and international agencies that coordinate and advocate for DRRM within countries. Both agencies are well positioned to lead in (i) disseminating METEOR learnings to sub-national levels of government and (ii) sharing METEOR messages and products regionally.



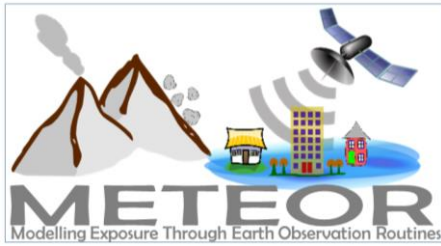
## METEOR Baseline Evaluation Report



Table 12: Other key stakeholders

Type	Organisation	Description	Relevance/Action for METEOR
Development partners	Asian Development Bank (ADB)	<ul style="list-style-type: none"> <li>Looking at (i) how to create the right enabling environment for risk financing; (ii) promoting social protection through work on disaster risk management, skills development, and knowledge partnerships; (iii) support in retrofitting damaged schools as part of the GoN's school sector programme.</li> </ul>	<b>Secondary stakeholder.</b> METEOR should keep them apprised of our work and results so that efforts are not duplicated
	DfID	<ul style="list-style-type: none"> <li>Providing up to £46m over 2016/17-2021/22 to strengthen resilience to disasters in Nepal at both a national and sub-national level, particularly in relation to earthquakes. The programme includes (i) £11m emergency contingency fund to respond to humanitarian crisis over the life of the programme; (ii) support interventions to reduce disaster risk and prepare for emergencies working with disaster prone urban centres to build and plan more safely; support the strengthening of critical public infrastructure to earthquakes; work to strengthen national capacity to respond to natural disasters and ensure that the international community is also prepared for large-scale emergencies.</li> </ul>	<b>Priority Stakeholder.</b> High relevance
	Japanese International Cooperation Agency (JICA)	<ul style="list-style-type: none"> <li>JICA's development assistance policy for Nepal includes four priority areas of which one speaks to DRM and calls for 'recovery works and disaster resilient nation-building in both structural and non-structural aspects'. Focus on 2015 earthquake rehabilitation and recovery and on DRR environment and climate change programming. Future DRM programming will focus on urban resilience of buildings and other physical infrastructure.</li> <li>Working with MoUD, MoHA, and MoFAGA, JICA supported the Project for Assessment of Earthquake Disaster Risk for the Kathmandu Valley, producing a <b>seismic hazard assessment of risk</b> for the Kathmandu valley that can be used for scenario planning.</li> </ul>	<b>Secondary stakeholder.</b> METEOR should keep them apprised of our work and results so that efforts are not duplicated – in particular, related to work in the Kathmandu Valley
	WFP	<ul style="list-style-type: none"> <li>Working with DFID on emergency preparedness to establish humanitarian staging area and establish logistics hubs in provinces. They are helping to <b>develop national capacities to manage disaster risk</b> through finance and risk-transfer tools, such as weather risk insurance.</li> </ul>	<b>Secondary Stakeholder.</b> METEOR should keep them apprised of our work and results so that efforts are not duplicated. <u>Note:</u> we did not meet with them during the baseline
	UNICEF	<ul style="list-style-type: none"> <li>Works with different clusters to support risk reduction. They <b>help communities develop the risk reduction plans</b> and provide support on the soft components such as what do if there is a landslide. Do little on support towards mitigation.</li> <li>Work with communities to develop risk profiles; but the tools are not technical. One issue they have is that community methods of identifying risk are not supported by empirical evidence. UNICEF would like to have validation of these decisions using scientific data. To prioritise provinces for work with UNICEF, they are working</li> </ul>	<b>Secondary stakeholder.</b> They have a keen interest in METEOR products and could serve as a good test case for broader dissemination

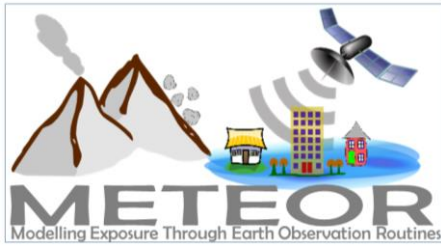




## METEOR Baseline Evaluation Report



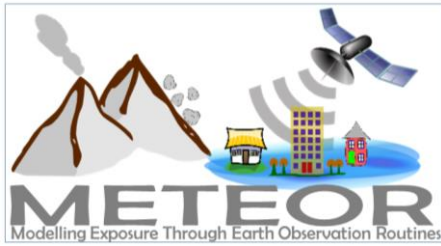
Type	Organisation	Description	Relevance/Action for METEOR
		to overlay population and social data with hazard information. Plan to conduct new Nepal Multiple Indicator Cluster Survey (MICS) household survey in 2019 want to use same methodology as the WB, so data can be linked. Also have geo-referenced school and wash point data.	
	<b>United Nations Development Programme (UNDP)</b>	<ul style="list-style-type: none"> <li>UNDP has been implementing the Comprehensive Disaster Risk Management Programme (CDRMP) since 2011 as part of the Strategic Partnership Framework (SPF), signed between the Geneva-based Bureau for Crisis Prevention and Recovery (UNDP/BCPR) and UNDP Nepal and in accordance with the Nepal Risk Reduction Consortium. The programme aims to strengthen the institutional and legislative aspects of disaster risk management (DRM) in Nepal by building the capacities of MoHA, MoFAGA, NPC, other partner ministries, departments and local governments.</li> </ul>	<b>Secondary stakeholder.</b> METEOR should keep them apprised of our work and results so that efforts are not duplicated – possible user of METEOR outputs
	<b>United Nations High Commissioner on Refugees (UNHCR)</b>	<ul style="list-style-type: none"> <li>Working with different areas to better understand how people get their information (e.g. via radio, mobile, etc.) so that they can have better warning systems in place during an emergency.</li> <li>Working with landslide and flood data to better understand risk and to provide evidence based decision-making and planning on where to place preparedness investments. Want to be able to tell donors – this is the risk, this is what we cover, this is the gap in funding</li> </ul>	<b>Primary stakeholder.</b> They have a keen interest in METEOR products and are trying to do similar things using overlapping datasets. Could serve as a good test case for broader dissemination
	<b>United States Agency for International Development (USAID)</b>	<ul style="list-style-type: none"> <li>Process of developing a USD 25 million disaster risk management programme where NPC will be the government focal point. Also, funding a programme called '<b>Technical Support for Building Code Implementation in Nepal</b> (TSBCIN)' operating from 2017-2019 being implemented by NSET. Focus is on improving the building permitting system, enhancing the capacities of masons, contractors, engineers, etc. on safer construction, raising awareness in communities on safer construction. Very interested in the data METEOR will provide - looking to do more evidence-based risk planning. Have offered space/coordination of upcoming meetings, etc.</li> </ul>	<b>Primary stakeholder.</b> They have a keen interest in METEOR products and are trying to do similar things using overlapping datasets. Could serve as a good test case for broader dissemination
<b>NGOs</b>	<b>Practical Action</b>	<ul style="list-style-type: none"> <li>An International NGO focused on leveraging technology for poverty alleviation. In <b>Nepal their DRR programme focuses on scaling up community-based early warning systems for flood and landslides and building resilience for the earthquake vulnerable communities.</b> Work with both local governments and national stakeholders to incorporate DRRM into development planning and its institutional sustainability. Looking at DRR technology to build resilience with a focus on hydro and meteorological hazards. For example, working with the MET – upgrade the technology in the hydro stations. Trying to automate and bring into the communication systems.</li> <li>Also work with Digital Surface Models (DSMs) to monitor actual rainfall in the watershed then you know how long it will take to provide advance information. Forecast of rainfall – time-based information to feed into flood model</li> </ul>	<b>Primary stakeholder.</b> They could be a high priority to help publicise the results in other countries. They could also be instrumental in bringing the work we do down to the community level.



## METEOR Baseline Evaluation Report



Type	Organisation	Description	Relevance/Action for METEOR
		<ul style="list-style-type: none"> <li>Work with District Emergency Information Centres and National Emergency Information Centres – also work with Telcom, b/c mainly info passes via phone/mobile.</li> </ul>	
	<b>International Centre for Integrated Mountain Development (ICIMOD)</b>	<ul style="list-style-type: none"> <li>A regional intergovernmental learning and knowledge sharing hub whose objective is to develop an economically and environmentally sound mountain ecosystem to improve the living standards of mountain populations and to sustain vital ecosystem services for the billions of people living downstream, now and for the future.</li> <li>ICIMOD's engagement and interest in disaster risk management lies in promoting use and mainstreaming of information in decision making through piloting information system, mapping and assessment of hazard, vulnerability and risk at multi-levels, and rapid response mapping support.</li> <li>Special focus is given to how to integrate space technology with IT and telecommunication infrastructure to deliver disaster information at the community level and enable two-way communication between communities and disaster managers for effective response.</li> </ul>	<b>Primary stakeholder.</b> Have set up a partnership to co-develop the landslide model. They could be a high priority to help publicise the results in other countries
	<b>Disaster Preparedness Network-Nepal (DPNet-Nepal)</b>	<ul style="list-style-type: none"> <li>National umbrella organisation of 97 national and international agencies with an objective of coordination, collaboration, learning and sharing of the experiences and to avoid duplication in emergency response in the country. Its areas of focus are (i) knowledge management, (ii) capacity building policy advocacy and coordination and (iii) networking with government agencies and relevant stakeholders.</li> <li><b>Close relationship with MoHA</b> to bridge the gap between governmental and non-governmental agencies in the field of disaster management. DPNet played a significant advocacy role in bringing forward new legislation on DRRM and is extending its secretariat to all provinces, in light of the new federal system of government.</li> <li><b>DPNET is the Secretariat for the National Platform of Disaster Risk Reduction (NPDRR)</b></li> </ul>	<b>Secondary Stakeholder:</b> could serve as an effective co-collaborator for engaging MoHA and with their role as Secretariat for the NPDRR.
	<b>NSET</b>	<ul style="list-style-type: none"> <li>NSET has ongoing programs in 30 municipalities focused on DRM and safer construction. Supporting NRA for Build Back Better (BBB) in 3 earthquake affected districts, working closely with MoHA, MoFAGA, MoUD and MoD. It has been maintaining DesInventar database, which covers the disaster database (detail inventory of historical disasters) since 1971. It has been working for capacity enhancement responders in Nepali Army, Nepal Police and Armed Police Force, and other community stakeholders. It has worked/has been working with different sectors such as schools, hospitals, private sectors, industries etc. Has worked for developing and implementing multi-hazard risk assessment methodologies at different levels.</li> </ul>	<b>Primary stakeholder</b>
<b>Academic institutions</b>	<b>Centre for Disaster Studies (CDS),</b>	<ul style="list-style-type: none"> <li>Established in 2003 under the Institute of Engineering to conduct research on emerging issues of DRM and climate change. They work to enhance disaster resilience in Nepali communities through the creation and dissemination of knowledge on DRR. <b>Connect students and faculty</b> in areas of interest around different types of hazards with a</li> </ul>	<b>Secondary Stakeholder.</b>



## METEOR Baseline Evaluation Report



Type	Organisation	Description	Relevance/Action for METEOR
	<b>Tribhuvan University</b>	focus on the impact on engineering. Provide both post graduate and under-graduate courses. Often, they are represented on the MoHA planning committee	
	<b>Central Department of Environmental Science (CDES), TU</b>	<ul style="list-style-type: none"> <li>CDES operates under the Institute of Science and Technology, Tribhuvan University (IOST-TU) and offers Master and PhD programs in Environmental Science. Since its inception in 2001, the department collaborates with national and international development partners, research institutions and universities to exchange of knowledge, skill and experience in the field of Environmental Science and Technology. Engage frequently with local government, working on watershed approaches that cross administrative boundaries</li> <li><b>DATA:</b> CDES has mapped 22 districts of the Chure region, creating susceptibility maps and cost estimates of different mitigation strategies<sup>40</sup>. Also have a database of 5003 landslides from pre-2015 earthquake</li> </ul>	<b>Secondary stakeholder</b>
	<b>Geography department, TU</b>	<ul style="list-style-type: none"> <li>Runs academic course on GIS and RS. Involved with post-disaster management. Part of NPC in writing section of development plan on disaster management, in particular on Glacial Lake Outburst Floods (GLOFs). Carryout consultancies with NGOs and private sector clients. Involved in JICA Gorkha landslide hazard assessment; Involved in ICIMOD GLOF risk assessment. It also Conducts academic researches on DRM.</li> </ul>	<b>Secondary Stakeholder</b>
	<b>Nepal GIS Society</b>	<ul style="list-style-type: none"> <li>Involved in research activities and generating spatial information</li> </ul>	<b>Secondary Stakeholder</b>
	<b>Central Department of Geology</b>	<ul style="list-style-type: none"> <li>Closely works with DMG and Nepal Geological Society, conducts national and international events, conducts academic researches for Geo-hazards.</li> </ul>	<b>Secondary Stakeholder</b>
	<b>Nepal Geological Society</b>	<ul style="list-style-type: none"> <li>One of the active professional societies involved for DRM activities. Has close link with academicians, researchers and universities.</li> </ul>	<b>Secondary Stakeholder</b>
<b>Private Sector</b>	<b>Plan 8 and Risk Consulting</b>	<ul style="list-style-type: none"> <li>Consultancy that combines the latest scientific and policy evidence with risk analysis approaches to provide policy makers and business with timely, understandable and relevant risks and opportunities information. Expertise in</li> </ul>	<b>Secondary Stakeholder</b>

<sup>40</sup> See: PCTMCDB & CDES-TU (2017) Landslide atlas of Chure Region 2017 with characterization and mitigation design, Part II

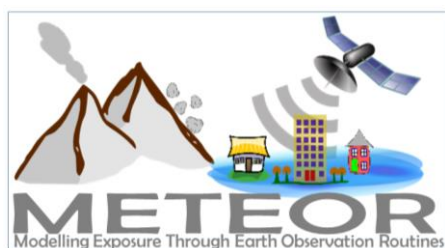


## METEOR Baseline Evaluation Report



Type	Organisation	Description	Relevance/Action for METEOR
		multiple areas including, multi-hazard and sector risk management with a focus on weather climate and natural hazards and national and subnational resilience planning and decision support.	
	<b>Genesis Consultancy</b>	<ul style="list-style-type: none"> <li>A leading Geo-Information and Earth Observation services consulting and research organisation in Nepal, specialised in providing spatial solution services for wide range of fields including disaster risk reduction. Provides customised GIS solutions, system development, GIS data management, spatial analysis, value added imagery products, satellite imagery processing/analysis, digital photogrammetry, mapping, Web GIS development/deployment services.</li> <li>Client base includes government – currently working with municipalities on land-use planning, which includes data collection of imagery and capacity-building. Also works with humanitarian organisations such as UNDP using data for modelling hazards. <b>DATA:</b> has lots of bespoke datasets; but they are proprietary.</li> </ul>	<b>Secondary Stakeholder</b>

Source: Authors



## METEOR Baseline Evaluation Report



### 4.2.3. Key themes from Nepal interviews

The numerous in-country interviews with government and other stakeholders in DRRM revealed a rich and textured tapestry of challenges, issues, strengths and weaknesses on how DRRM currently operates in Nepal. This section explores the major recurring themes emerging from these in-depth interviews. These ideas are summarised in Table 13 below and described in more detail in the following sections.

Table 13: Key Nepalese DRRM themes

Theme	Summary of main points	Relevance/Lessons for METEOR
<b>Words matter: programme terminology is complex</b>	<ul style="list-style-type: none"> <li>The METEOR project involves complex concepts and terminology that can have multiple meanings in different disciplines. Not everyone understands the key terms in the same way.</li> </ul>	<ul style="list-style-type: none"> <li>Ensure terminology and definitions are part of any conference, workshop, or training event undertaken as part of the project.</li> </ul>
<b>Increasing demand for evidence (data) in decision-making</b>	<ul style="list-style-type: none"> <li>Recognition that hazard and exposure data are seldom used in planning for DRR, even when robust data may exist.</li> <li>Decision-makers both inside and outside of government still struggle to use these data. One reason is that the concepts are complex and hard to understand or translate in a practical way. There is a need for better communication and awareness on how these type of data products can be used for planning purposes</li> <li>Within the context of a decentralised government, there is a need to push evidence capture and decision-making down to the local-level. Barriers in resource and capacity exist here as well as more practical issues such as important reports are not translated into the local language.</li> </ul>	<ul style="list-style-type: none"> <li>Need for METEOR to create practical case studies that show in a tangible way how evidenced-based decision-making can work.</li> <li>Need to focus on innovated ways to communicate complex concepts in ways that are meaningful to decision-makers.</li> <li>Focus on co-building and co-learning – ideally, Nepali partners would generate the ideas for a good case study and help present it to others.</li> <li>Researcher exchanges<sup>41</sup>.</li> </ul>
<b>Lack of coordination and sharing of data</b>	<ul style="list-style-type: none"> <li>Demand-based coordination when an issue is raised or where there is outside funding (e.g. development partner)</li> <li>Lack of coordination across all spheres – public, private, humanitarian actors, and civil society.</li> <li>Coordination is expected to improve with the establishment of the NDRRMA.</li> <li>Lack of data compatibility: especially spatial data generated by different agencies do not overlay each other.</li> </ul>	METEOR cannot solve this issue; but must be aware of the problem and our products/results can be used to empower stakeholder groups and provide open data that can be shared.
<b>Lack of government capacity and resources</b>	<ul style="list-style-type: none"> <li>Good technical people exist within individual departments of government; but overall the government struggles with capacity and resourcing.</li> <li>Difficult to institutionalise knowledge within government due to (i) frequent staff rotation; (ii)</li> </ul>	METEOR will not solve this issue; but should provide clear communications and training materials (in both English and Nepali) to ensure project

<sup>41</sup> BGS invited researchers from ICIMOD to come to the UK; they would prefer us to go there so that more people can be involved in Nepal. Tentatively scheduled for June 2019.

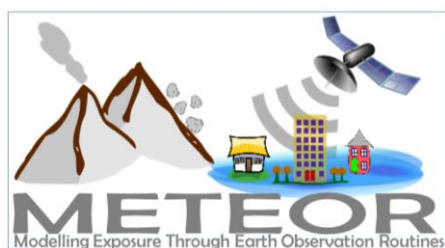


## METEOR Baseline Evaluation Report



Theme	Summary of main points	Relevance/Lessons for METEOR
	training ends with project funding – no on-going training within government departments.	outcomes are broadly disseminated and understood. METEOR should also conduct some relevant trainings to generate and/or handle produced information.
<b>Existing hazard/exposure data are of poor quality/uniformity or not shared</b>	<ul style="list-style-type: none"> <li>• Lots of data but of poor quality or lacking in uniformity. These issues pose challenges to comparing different datasets and coming to a consensus on which one is 'right' or on merging different datasets to have a more comprehensive model.</li> <li>• There is no standard methodology in data modelling and clear definitions of parameters.</li> <li>• Challenges to the quality of the data available on the MoHA data portal – the official government portal for DRM data.</li> <li>• Limited sharing of data - frequently find duplication of efforts and data (e.g. same river basin mapped by many different stakeholders). The reasons for siloed data: (i) no centralised mechanism or platform for sharing data; (ii) data is not standardised, so it is difficult to share; (iii) data is out of date and therefore not useful; (iv) there are inconsistencies in the data that render it less than useful for sharing; (v) access is limited due to the high fees charged for certain datasets; (vi) there is no open data sharing policy and no clear guidelines on how this type of DRRM data might be shared beyond for academic use.</li> </ul>	<p>The METEOR project speaks directly to this issue by providing protocols and standards for assessing the 'fit-for-purpose' of different datasets.</p> <p>The METEOR data are also provided without restriction, which should help them to be shared. Need to collaborate with MoHA and other agencies who are doing the similar initiatives.</p> <p>In addition, there is lack of a regular data updating mechanism, and METEOR could support in recommending one.</p>
<b>Uncertainties around the pace of federalisation of government</b>	<ul style="list-style-type: none"> <li>• Federalisation of government has led to a lack of clarity on responsibilities of DRRM.</li> <li>• There remain inconsistencies between the constitution and DRRM Act as well as uncertainties around how the NDRRMA will be operationalised.</li> <li>• Uncertainties around operationalisation of federalism. How quickly the federalism works and delivers?</li> </ul>	METEOR cannot solve this issue; but must be vigilant to ensure we are directing their products and services to the right group of people.
<b>Ad hoc building, lack of enforcement, poverty and climate change all heighten risk of disaster</b>	<ul style="list-style-type: none"> <li>• Government good at disaster response, but poor at land-use planning.</li> <li>• Lack of enforcement of laws and regulations around where and how to build infrastructure.</li> <li>• Ad hoc land development by people who lack awareness on proper construction practices; this is exacerbated by entrenched poverty that pushes people to build where they would not have in the past; or with limited funds, people choose less expensive building materials rendering their houses less safe.</li> </ul>	METEOR cannot solve this issue; but we can help to empower partners such as NSET that operate in this context. There is also opportunity for METEOR to conduct training for stakeholders at different levels on: risk sensitive land use planning, hazard and risk assessment process etc.; and sharing good practices from similar contexts





## METEOR Baseline Evaluation Report



Theme	Summary of main points	Relevance/Lessons for METEOR
	<ul style="list-style-type: none"> <li>Climate change exacerbates these issues and creates new types of hazards and issues (e.g. increased intensity and impact of landslide, flooding, glacier lake outburst flood)</li> </ul>	around the world for stakeholders at different levels.
<b>Gender mainstreaming in the sciences related to DRRM is still limited, but there are encouraging signs of improvements.</b>	<ul style="list-style-type: none"> <li>While the numbers of females in positions of authority in the DRRM field are limited in both the government and civil society, but are improving.</li> <li>At Tribhuvan University, women scientist make up near 50% of all students in the Geography and Central Department of Environmental Science</li> </ul>	METEOR cannot solve this issue; but we can make sure that we monitor the number of female beneficiaries of METEOR's capacity building and awareness activities.

Source: Authors

### Words matter: DRRM definitions

As explained in section 4.1.2, Nepal DRRM system is using the official UNISDR's definitions as developed within the Sendai Framework (Table 5). To be noted that in 2015, the MOHA has translated DRR terminologies from the Sendai Framework in Nepali language and context to make common and proper understanding among all DRR stakeholders.

Here we give account of the exercise undertaken by the METEOR evaluation team of assessing how different stakeholders in each country *personally* defined various key terms. The responses from Nepali interviewees were varied and dynamic, underscoring the challenges METEOR faces when trying to clearly explain the project. As one interviewee described: *"People understand these definitions in different ways. [it is] very important all understand the same work – from the same point of view."*

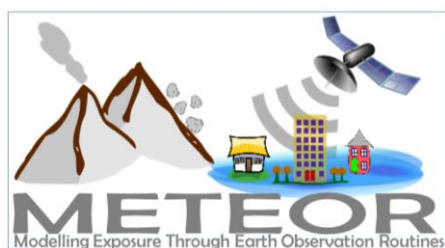
The process also exposed the sensitivity around the topic of terminology. While technical staff were comfortable providing definitions, many government officials were not. Indeed, in one case those interviewed asked that we send via email the words and they would subsequently send along the definitions. Given this sensitivity, in several cases, when interviewing senior government policy makers, the team chose not to ask for definitions as it was deemed culturally not appropriate by local partners.

The varied definitions found in Table 14 underscore the need for METEOR consortium members to ensure terminology and definitions are part of any conference, workshop, or training event undertaken as part of the project.

Table 14: Terminology

Term	Examples of definitions provided
<b>Vulnerability</b>	<ul style="list-style-type: none"> <li>Inability to tackle the situation</li> <li>Close to danger of the situation</li> <li>Is a exposure sensitive and adaptive capacity (divided by)</li> <li>Social economic capacity of the people living in some area of the risk in the area.</li> <li>Context we use – multi-dimension in terms of human health and lives and of properties – people are more exposed to hazards are more vulnerable. Related to capacity to cope – both physical assets, knowledge skills, social networks.</li> <li>Tendency to get natural hazard in the future</li> <li>The qualitative aspects of these exposure elements – types of houses – materials they are made of – cement pillars, mud brick houses, mud plaster – qualitative issues. If they are</li> </ul>





## METEOR Baseline Evaluation Report



Term	Examples of definitions provided
	<i>more vulnerable. Ultimately disaster affects people – so vulnerability looks at elderly, vulnerable, children, women. – gives the qualitative perspective.</i>
<b>Exposure</b>	<ul style="list-style-type: none"> <li>– Experiencing the event or getting thought about things</li> <li>– How we place the dangerousness</li> <li>– How topography/land is susceptible</li> <li>– They are exposed to hazard.</li> <li>– When the system exposed to hazards directly or indirectly – if a building is directly in the path of flood it is exposed.</li> <li>– Similar to vulnerability but the weakness of people</li> <li>– Is the elements that are exposed to disaster – physical dimension – size and number – houses, people, bridges, roads</li> </ul>
<b>Hazard</b>	<ul style="list-style-type: none"> <li>– Extreme events – risk of the event happening</li> <li>– Situation of risk</li> <li>– Type of risks</li> <li>– probability of an event that can cause catastrophic damage measured in time and in loss</li> <li>– geographically related – are the disasters where people and assets are exposed.</li> <li>– potential dangers to area or people.</li> <li>– the event that affects negatively to these exposure element</li> </ul>
<b>Risk</b>	<ul style="list-style-type: none"> <li>– The degree of intensity of exposure</li> <li>– probability or consequence of the danger</li> <li>– something vulnerable – people and property loss and damage</li> <li>– it is an estimate of loss for a probable catastrophic event</li> <li>– when you quantify the impacts of hazards in terms of social aspects human lives, properties and assets valued, livelihoods destroyed.</li> <li>– potential damage by hazards.</li> <li>– when the exposed elements which are more vulnerable – likelihood to be affected - if its happened it is impact.</li> </ul>
<b>Loss estimation</b>	<ul style="list-style-type: none"> <li>– damages estimation – what are the physical / life losses in any event or any disaster.</li> <li>– when something happens loss of life and property – predication of</li> <li>– all quantity losses tangible and intangible losses – a lot of things.</li> <li>– if you understand the risks – different for different hazards. Simple example there is a different building loss estimation for different structure types and we know the building response curve – mathematical model for the damage collapse of building – if we know how many people are in at different time of day – we can estimate in terms of loss</li> <li>– model which can produce figures showing human casualties and economic loss.</li> </ul>
<b>Uncertainty</b>	<ul style="list-style-type: none"> <li>– Not in our knowledge – no data to support the analysis or prediction</li> <li>– Something not sure</li> <li>– Something we cannot say for sure</li> </ul>

Source: Authors

### Increasing demand for evidence (data) in decision-making

A common theme among stakeholders interviewed in Nepal was the limited use of evidence in decision-making around DRRM. As one stakeholder described: *'everyone talks about data after a disaster – but [we] need planning to make decisions before disaster - evidence-based decisions.'*

While many pointed to the lack of the use of data by government, this issue was more widespread, and was raised by others as a challenge in their own organizations (see Box 1). For example, one development partner described their evolution in the use of data to determine flood preparedness investments. In the past, this organisation determined investments by first identifying the districts prone to flooding and then generically assigning a standard percentage of the population assumed to be at risk or vulnerable in each district (e.g. 25% of the population in each district). This flat-rate



## METEOR Baseline Evaluation Report



calculation provided a budget for planning purposes, but it did not consider historical evidence of the actual risk in any given district or place. This type of detailed hazard information overlaid with vulnerability data can provide much more precise budgetary estimates and better pre-positioning of relief supplies. Today, the organisation uses a flood model that better takes into consideration these historical patterns. The organisation is also in the process to do something similar for landslides.

Around this idea of use of evidence, several sub-themes emerged. First, there is **the challenge around getting stakeholders to use available data in planning for risk reduction**. Having more consistent hazard data is only the first step; a second important step is getting agencies to accept and use these data for planning purposes. Several stakeholders, both inside and outside government, indicated that they struggled to find ways to get policy makers effectively using these data in practice. For example, Nepal has a building code informed by data, but it is not adequately enforced in some urban areas. The question then becomes: how do we make the evidence compelling enough to convince people to change behaviour? One stakeholder argued that behavioural change *“results cannot be seen tomorrow”*. He suggested that we need to demonstrate mitigation efforts in a small catchment area to show people that it works and then replicate and scale from there.

### **Box 1: Quotes on lack of use of evidence in planning**

*“[In Nepal] the translation of information/data into tools for policy is frustrating.”*

*“[There are] one-off reports; but no sustainable flow of data to be used for planning”*

*“[There is] no systematic use of data in Nepal. When some problem occurs, they call everyone, and it is a ‘rush to the airport’.”*

*“They say they have contingency planning – but it is for the peacetime, not war time”*

*“[Evidence needs to] speak to the language of local decision-makers.”*

Another common theme is that **within the context of the new federal system of government, there is a need to push evidence capture and decision-making down to the local-level**. With federalism, it is important to bring evidence and data into the hands of local policy makers. However, there are real barriers to this to happen. First, there remains confusion on roles and responsibilities around DRRM within the new system, as it is currently evolving. Second, there is a lack of technical capacity at the local level to collect, store and use DRRM data. Third, several stakeholders raised the point that key reports are written in English and that data is seldom available in Nepali and other local languages for practical use at the local level.

A final theme is around **the need for better communication around concepts related to DRRM**. There is a certain level of complexity in understanding concepts like vulnerability, exposure and risk that often prevent people from using these data. Understandably people do not want to make decisions on something they do not fully comprehend. As one stakeholder indicated: *“In Nepal DRR is not driven by an understanding of risk.”* There is a need to be able to communicate these concepts in a way that speaks to decision-makers, otherwise there is a risk that nothing will get done.

### **Lack of coordination**

Nearly all stakeholders noted that Nepal faces challenges when it comes to coordination around DRRM activities. As one NGO stated: *“So many things are happening in parallel, there is no one to keep track on these happenings.”* However, the issue is greater than just not knowing what is going on. In fact, there can also be duplication of efforts. For example, one stakeholder noted an incidence where they identified 7-8 agencies that were modelling the same river catchment area.



## METEOR Baseline Evaluation Report



Some argued that **collaboration is primarily 'demand-based'**, e.g. that people work together only when something is needed for a donor project. Others mentioned **gaps in communication** between (i) the humanitarian sector and the government, (ii) academics and policy-makers, and (iii) the private sector and the government. As one private stakeholder stated: *"the private sector is left out of the loop. [While] involved in the information generation, when it comes to integrating into policy, the private sector is left out."* This person went on to say that the fault is not only with the government, as the private sector often fails to follow-up because there is no additional funding and thus no incentive. This issue raises a question on how to establish a continuity of resources.

The reasons given for this lack of collaboration by the government include that: (i) the government is pulled in too many directions, which takes it away from key work; (ii) insularity within government results in challenges in communication across silos. For example, one department indicated it provides information/data, but do not know how others use it; (iii) there is still confusion over the exact ToR for the NDRRMA. This last issue will hopefully be resolved with the operationalisation of the NDRRMA.

### Lack of government capacity and resources

While stakeholders tend to agree that there are good technical people in individual departments of government, overall the Nepalese government struggles with capacity and resourcing. The challenges Nepal faces are similar to those in many developing countries. First, **there is rarely enough funding to focus on building long-term capacity**, limiting the government's ability to institutionalise DRRM practices. As one stakeholder noted, *"due to level of the economy [the government] doesn't have the money to push mitigation [efforts]."*

This issue is compounded by the **frequent rotation of staff**. NGO, humanitarian, and private sector actors all mentioned the struggle to create an institutional memory within government and are frustrated by having to retrain government staff on a regular basis as people transfer jobs. The lack of institutional relationships means that **once project funding ends, there is a lack of incentive to continue to work with the data**. For example, one NGO indicated they have tried to handover responsibility and management of their data to the government, but with no uptake.

There is also a feeling that **policy-makers struggle to understand the technical language of DRRM**, making it even more difficult to institutionalise change. Several stakeholders noted the **need to develop better ways to communicate complex ideas** such as risk and exposure to government.

### Existing data is of unknown authenticity or not shared

There is a general feeling among stakeholders that there is **a lot of data out there, but that it is of poor quality or lacks uniformity**. As one stakeholder put it, *"a lot of data exists, [the] issue is in the details and the various scales of the data - scale, quality, granularity, uniformity of data is an issue."* To this point, some stakeholders raised questions on how to integrate new data into existing datasets. Others posed questions on how to compare datasets and, if different, how to determine which one is 'right'. They noted conceptual differences in how one thinks about disaster risk and pointed out that there is not any systematic inventory of data that is compiled using a scientific method. Along these lines, several stakeholders, mostly in academic circles and the private sector, expressed the **need for a standard methodology in data modelling and clear definitions of parameters**.



## METEOR Baseline Evaluation Report



Several stakeholders questioned the quality of the data available on the MoHA data portal – the official government portal for DRM data. As one noted, *“we must rely on government data, but often the methodology is not specified and not peer-reviewed.”* Another said, *“MoHA – those data are too coarse for us – we use that as a reference.”*

A second issue related to data is around **limited sharing of datasets**. While stakeholders talked about different sets of data (e.g. flood, building construction, landslide, etc.), the main challenge was consistently that institutions are not sharing data. The reasons expressed for the silo-like attitude were many and included that: (i) there is no centralised mechanism or platform for sharing data<sup>42</sup>; (ii) data is not standardised, so it is difficult to share; (iii) data is out of date and therefore not useful; (iv) there are inconsistencies in the data that render it less than useful for sharing; (v) access is limited due to the high fees charged for certain datasets; (vi) there is no open data sharing policy and no clear guidelines on how this type of DRRM data might be shared beyond for academic use. As one stakeholder aptly put it: *“[The] big issue is that we don’t have a mechanism for sharing [DRRM data] that should be everyone’s property.”*

**Uncertainties around federalism.** Many stakeholders raised the issue that the federalisation of government has led to a lack of clarity on responsibilities for DRRM. These comments reflect the confusion around inconsistencies in the constitution and the DRRM Act as well as remaining uncertainties around how the NDRRMA will be operationalised. Within this context the team heard a lot of comments like the following, *“[it is] unclear how the new government is going to be restructured. Before the MoHA handled response during a disaster, the Ministry of Local Development handled pre-disaster mitigation efforts and, afterwards, recovery [was handled] by sectoral ministries.”* or, *“[there is] still a lot that is unclear in the new government organisation. [It is] unclear how the cluster system will work at the province and local level.”*

### Box 2: Quotes on the need to engage at the local level

*“We encourage you to validate by going to other areas of the country”*

*“It is important to understand how products will be used and at which level – they look at their local perspective – can it be used at their level?”*

*“[We are] very interested to prepare the multi-hazard map at the local government level. Local government will be interested in more details – houses are scattered – they want to know exactly which house is vulnerable.”*

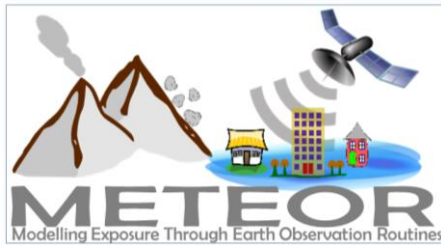
*“What is clear is that Local governments will be more powerful in assessing and administering response”*

*“[You] must go to the provincial level. Each province – will have their own planning commission.”*

One NGO was a bit more optimistic indicating that while Nepal is still going through the government decentralisation process, *“this can also be seen as an opportunity to influence and define DRM at the provincial and municipality levels.”*

One element that emerged from these discussions was the **need for METEOR to engage at the local level** (see Box 2). This finding poses a challenge for METEOR in that the project will only last three years and only envisioned to engage at the national level. There is no scope for in-depth local engagement. However, without this, the usage of data and relevance of use will be questioned.

<sup>42</sup> We do however note that there are portals such as the DHM portal, the ICIMOD portal, and the NSET portal. Therefore, it may be more a question of confusion on which agency should lead the data consolidation and sharing.



## METEOR Baseline Evaluation Report



### **Ad hoc building and lack of enforcement of building codes heighten disaster**

There was a general feeling among stakeholders that in the past the government has been quite good at disaster response, but that it performed poorly around land-use planning and the planning of infrastructure development. Compounding this issue is a **lack of enforcement of laws and regulations around where and how to build**. As one stakeholder eloquently put it, - “[they] *do by their heart, not their head.*”

Those interviewed struggled on how to use information learned from data to plan safer communities. There is so much *ad hoc* development that it is making people more vulnerable to hazards. As one stakeholder noted: “[people] *don’t realise the consequences of their building.*”

Regulations may tell people not to build in flood plains or to follow certain construction practices but without enforcement these practices continue to happen. For example, one stakeholder noted that road construction in rural areas is of poor quality due to where and how the roads are built. He indicated that local people are following instructions from the local contractor, but they do not know whether these are right.

### **Persistent poverty and climate change heighten risk of disaster**

Another thread running through these conversations was how **persistent conditions of poverty exacerbate existing issues**. For example, entrenched poverty pushes people to build where they would not have in the past; or with limited funds, people choose less expensive building materials rendering their houses less safe. As one stakeholder noted, poverty and disasters are part of a vicious circle, as “*people’s lives are already difficult, so impacts of disasters are felt even more.*” Finally, one other stakeholder noted there are huge psychological impacts on people during a disaster and these issues are rarely addressed.

A related theme was around how, in turn, **climate change contributes to challenges and threats of disaster**. For example, one academic shared that in some areas of Nepal, what in the past was mountain snow is now changing to mountain rain. Rainfall creates different types of hazards, changing how natural hazards operate and necessitating different solutions. He went on to say that there is very little data on these new hazards. Another government official spoke about glacier melt and the formation of new lakes which pose a different set of problems for locals as they may cause flooding and damage.

### **Gender in the sciences is still limited but there are encouraging signs of improvements**

In Nepal, government encourages 33 percent of staff to be made up of women. In the sciences, achieving this figure remains a challenge, but it is slowly improving, in particular at universities. For example, the Central Department of Environmental Science at TU indicated that about one third of the faculty are women, but that 42 out of 48 students are women. In addition, the head of this department is a woman. Similarly, the geography department indicated that, while there are only 2 women out of 12 faculty members, about 46 percent of students are women.

ICIMOD, one of key DRRM NGOs, has over 50 percent female employees, with three women working as programme coordinators in disaster managements. To encourage women in the sciences, ICIMOD created a gender team to do capacity-development for Nepalese women in geo-spatial training. NSET indicated that they have an M&E Manager and Research training director who are female and that many women who work in the field as social mobilisers are women.





## METEOR Baseline Evaluation Report



In government, figures are still low, but slowly changing. One department indicated they now have 20 percent women, however only 10 percent were in technical positions such as engineers, while the rest remained in clerical ones. These figures are an improvement from the past, when one person interviewed told that “10 years ago, they didn’t even have toilets for women!”

As a general observation, like other countries, it takes time to see substantial gender change in scientific education and professions. Figures from academia are encouraging, showing that women are slowly being incorporated into more technical fields, which hopefully will see them in more senior positions in government and civil society in the future.

### 4.2.4. Value of METEOR

**There was broad-based consensus across stakeholders that what METEOR proposes to do will be useful and of value in support of DRRM in Nepal** (see Box 3). One government official noted that METEOR was timely and could provide data that would help inform their planning. He indicated that the government was in the process of creating a priority plan with a section on disaster risk, looking at how to mainstream investments in disaster risk reduction across ministries.

A humanitarian organisation thought METEOR was useful to have objective/verifiable data, as they think about how to overlay different sources on social vulnerability data with hazard data. A second organisation indicated that they were in the process of designing a new, large disaster risk management programme and that *“all of this information is going to be very important information for us.”*

**The proposition also came with a flurry of advice for the METEOR team.** Such as *“don’t focus on the whole country – focus on settlements only – if a hazard it will effect a settlement.”* Or, as noted earlier, *“focus on getting data to sub-national policy makers.”* There were also expressions of concern that the data would only be useful if it could be broadly shared, *“[the] big question is how it can be shared and accessed.”*

**Stakeholders also expressed some healthy scepticism about the ability of METEOR to achieve its goals.** Some of this scepticism was due to a lack of understanding on how METEOR exposure data would be derived. For example, one person expressed doubt about getting building data for the whole country – not understanding that the building types would be defined and derived. This issue underscores once again that clear communication of the project goals is important to set and meet stakeholder expectations. In another example one stakeholder expressed concern over the reliability of the data, if based on existing sources, which he did not trust. Again, the process of data definition and verification/triangulation was not clearly understood.

#### Box 3: Quotes on value of METEOR products and services

*“What METEOR is doing could be very useful for this department for collecting and disseminating knowledge”*

*This is a “dream project for Nepal” – to have national datasets to help inform decision-making.*

*“Very useful – layer can be used or added to my topographical data to help inform risk”*

*“[This] is exactly the type of data I would like to have”*

*“This project is super timely’ and is the ‘dream*



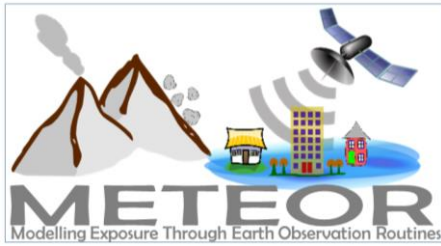
## *METEOR Baseline Evaluation Report*



### 4.2.5. Data sources

During the baseline interviews, a number of datasets that may be of interest to METEOR for the calibration of its products were mentioned. Table 15 lists those datasets identified as part of the baseline effort.



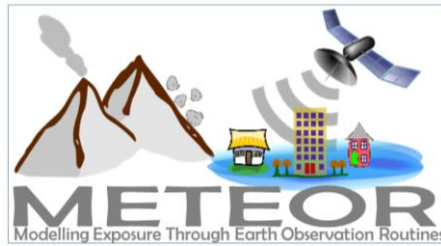


## METEOR Baseline Evaluation Report



Table 15: Nepal DRRM data sources

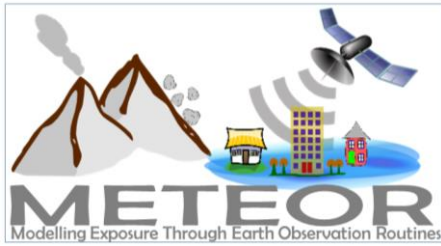
Name	Description
<b>University of Durham Seismic risk model</b>	<ul style="list-style-type: none"> <li>University of Durham grant from the Economic and Social Research Council to map the nature of landslides and specify landslide risk in Nepal. The model is both probabilistic and deterministic – want to know how many people are vulnerable in a given area at a given date and time to take into consideration the nature of Nepali life. Not simply deterministic like USGS models. Idea is to provide a tool for the humanitarian country team (HCT) to provide evidenced based decision-making and planning on where to place preparedness investments (drive CP investments for next year) want to be able to tell donors – this is the risk, this is what we cover, this is the gap in funding</li> </ul>
<b>MoHA data portal database</b>	<ul style="list-style-type: none"> <li>Collected from the district administration offices and are used to distribute relief. Includes CBS census information</li> </ul>
<b>Risk Atlas</b>	<ul style="list-style-type: none"> <li>NSET has conducted seismic vulnerability assessments of the then 58 different municipalities using the RADIUS tool</li> </ul>
<b>NSET Hazard database</b>	<ul style="list-style-type: none"> <li>Database is more comprehensive than that found at the MoHA and the level of detail is different. 29 hazards identified that hit Nepal; the major five are Earthquakes, landslides, floods, fires, epidemics. To compile, review data from newspapers such as: lives, property, economy, ward/municipality, intensity/magnitude, # of casualties, # of major/minor injuries, crop damage, building damage, money lost. To date they have not used social media as a source</li> <li>Interested in developing the capacity to collect and maintain data at the local level – thus the opportunity with decentralization. So far, they have not been successful in this effort. The <b>database is on a global platform that is open-access online</b>. Also have local server storage capacity. Has a data verification process – for example, right now data from 2015-2018 is being verified. Also have a project working with 30 municipalities collecting building details. This is being done in-conjunction with Kathmandu Living Labs (KLL)</li> </ul>
<b>Detail Building Damage Assessment</b>	<ul style="list-style-type: none"> <li>NSET has detail building damage assessment data for 14 cities – more than 200,000 buildings (including 3 cities within Kathmandu Valley)</li> </ul>
<b>Open Space Atlas of Kathmandu</b>	<ul style="list-style-type: none"> <li>NSET has identified different level of open spaces in Kathmandu Valley. It has identified more than 800 open spaces in Kathmandu valley.</li> </ul>
<b>Seismic Vulnerability assessment of Major hospitals</b>	<ul style="list-style-type: none"> <li>NSET has conducted seismic Vulnerability assessment of major regional hospitals of Nepal.</li> </ul>
<b>Hazard and Risk Assessment (2008)</b>	<ul style="list-style-type: none"> <li>Funded by the World Bank who should have these data sets. Neither NSET nor MoHA have the datasets readily available. Some stakeholders noted issues with dataset: In the way the WB has defined the earthquake hazard</li> </ul>
<b>Municipality building data</b>	<ul style="list-style-type: none"> <li>Municipalities have data on what is being built – but not centralised and only some have it digitised.</li> </ul>
<b>Climate Trend and Scenarios Data</b>	<ul style="list-style-type: none"> <li>Climate Trend analysis (temperature, precipitation and extreme events) from 1974-2014</li> <li>Climate Scenarios analysis (temperature, precipitation and extreme events) using RCP 4.5. and RCP 8.5.</li> </ul>



## METEOR Baseline Evaluation Report



Name	Description
<b>Building Management Information System (BMIS)</b>	<ul style="list-style-type: none"> <li>For government buildings only. Data include: Types, location, age, made of (information held at DUDBC)</li> </ul>
<b>JICA Gorkha landslide hazard assessment</b>	<ul style="list-style-type: none"> <li>Risk-sensitivity analysis of Kathmandu valley</li> </ul>
<b>National Climate Change Impact Survey</b>	<ul style="list-style-type: none"> <li>Perception survey conducted by the central bureau of statistics on 2016 post-disaster survey on perceptions around knowledge and impact on respondents to climate-related disaster.</li> <li>Climate-related disaster database – landslide drought, 1040 households canvasses in this national-level survey - asked people which hazards affect them – what impact their livelihoods. This is the baseline survey. How they feel it's changing.</li> </ul>
<b>Census Data</b>	<ul style="list-style-type: none"> <li>Have population and housing census data from 2011. Next census is 2021 and planning to have a module on climate change specifically relating to agriculture</li> </ul>
<b>System of Environment Economic Accounting (SEEA)</b>	<ul style="list-style-type: none"> <li>Through support from UNESCAP, CBS in the process doing a SEEA on land accounts, water accounts, and energy - not collecting on monetary terms.</li> </ul>
<b>Landslide mapping database</b>	<ul style="list-style-type: none"> <li>CDES, TU: Before earthquake did landslide mapping of country, a very useful database of 5003 landslides – funding of UNDP after earthquake couldn't do all areas. Also conducted a study on where there is the possibility of landslides in the future. Focused on 22 districts out of 33 in the Chure district. Created 'susceptibility maps' – data owned by the Ministry of Forestry</li> </ul>
<b>GLOF Risk Assessment</b>	<ul style="list-style-type: none"> <li>ICIMOD and TU Department of Geography</li> </ul>
<b>Vulnerability assessment covering three major rivers</b>	<ul style="list-style-type: none"> <li>ICIMOD and TU Department of Geography, and University of China</li> </ul>
<b>Gorka Earthquake assessment in seven districts</b>	<ul style="list-style-type: none"> <li>TU Department of Geography involved</li> </ul>
<b>Meteorological data</b>	<ul style="list-style-type: none"> <li>Geography, TU: Have national-level meteorological data; but poorly distributed in mountain region and is of poor quality</li> </ul>
<b>DfID SHEAR Project</b>	<ul style="list-style-type: none"> <li>Called Landslip with a focus on reducing impacts of hydrologically triggered landslide and building resilience in vulnerable and hazard-prone areas Dr. Helen Reeves (BGS) Looking at sites in South and NE India</li> </ul>



## METEOR Baseline Evaluation Report



Name	Description
<b>Shuttle Radar Topography Mission (SRTM2) Data</b>	<ul style="list-style-type: none"> <li>Nepal has ADB (and DFID?) funding to do work with ICIMOD on SRTM2 data</li> </ul>
<b>INFORM project</b>	<ul style="list-style-type: none"> <li>SEE UNHCR and DFID</li> </ul>
<b>Drone mapping</b>	<ul style="list-style-type: none"> <li>DfID has contacts</li> </ul>
<b>Genesis consulting private sector data sets</b>	<ul style="list-style-type: none"> <li>Developed around 15-20 datasets – have building roof prints, detailed socio-economic data – building structures, very detailed parameters to model vulnerability and risk; this is all small scale, primary data collection.</li> <li>Have a modified Universal Transverse Mercator (UTM) 2deg central meridian, Everest 1937 spheroid</li> <li>Municipalities outside Kathmandu have good data.</li> </ul>
<b>Kathmandu Valley Development Authority (KVDA)</b>	<ul style="list-style-type: none"> <li>Kathmandu Valley Development Authority (KVDA) supported by UNDP as a comprehensive disaster risk management programme</li> </ul>
<b>ICIMOD database</b>	<ul style="list-style-type: none"> <li>On website</li> </ul>
<b>Asian Disaster Preparedness Centre – Nepal Hazard Risk Assessment</b>	<ul style="list-style-type: none"> <li>WRRDC: did 1k-sq grid – project under MoHA. Called in initial meeting – They produced maps – have beautiful pictures in MoHA, but they are not used.</li> </ul>
<b>DoS digital map</b>	<ul style="list-style-type: none"> <li>The department of survey has digital map of Nepal – scale is 1:25,000. They also have 1/5000 high resolution of Kathmandu valley</li> </ul>
<b>Survey department of Ministry of Land Management, Cooperatives and Poverty Alleviation (MoLM)</b>	<ul style="list-style-type: none"> <li>Have layer of built-up areas -building outline data - but 20 years old – in urban areas there is drastic expansion.</li> <li>Aerial photographs</li> <li>Working on topological mapping of entire country (9 layers including built land use, road, schools built up area, etc.) – southern region completed but mountain regions not complete and pose a challenge. To be noted that scales are also different.</li> </ul>
<b>NRA database of reconstructed buildings</b>	<ul style="list-style-type: none"> <li>Have a database of the buildings that were reconstructed that includes level of construction that is ongoing. Used tablets to geospatially register the locations. Photographs of the destroyed buildings – what kind of buildings create what type of damages.</li> <li>Plan 8: For these 14 districts impacted by Gorkha they have all the maps down to the household-level. These are stored with the NRA. Done by World Bank, so should also have it.</li> </ul>
<b>Urban Integrated Development plan</b>	<ul style="list-style-type: none"> <li>Plan 8 - Ministry of Urban Development and Building Reconstruction is in the process of creating – Urban Integrated Development Plan – for 293 urban municipalities in last stages of being prepared – high quality GIS maps. Doesn't have the attributes for the household level.</li> </ul>

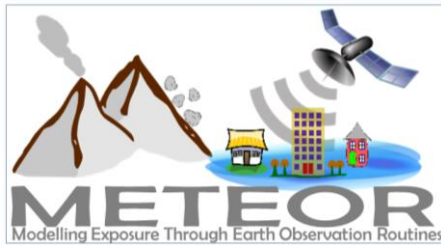


## METEOR Baseline Evaluation Report



Name	Description
<b>Open Data Risk Information</b>	<ul style="list-style-type: none"> <li>Open Data Risk Information (DRI) for Kathmandu Valley – using Open Street Map. He helped found KLL. Every school is mapped – came up with an 8-question questionnaire.</li> </ul>
<b>NSET DesInventar Database</b>	<ul style="list-style-type: none"> <li>It covers historical database of Disaster events including small, medium and large-scale events recorded since 1971. So far more than 25,000 reports have been recorded with more than 47000 deaths and missing.</li> </ul>
<b>Asian Development Bank flood modelling work</b>	<ul style="list-style-type: none"> <li>Plan 8 -ADB flood modelling work. To be confirmed.</li> </ul>
<b>Environmental Mapping of Municipalities -</b>	<ul style="list-style-type: none"> <li>NSET has conducted Environmental mapping of 5 municipalities within and outside of Kathmandu, includes urban infrastructures, (road, electricity, telecom, water supply, geology, etc.)</li> </ul>
<b>International Organization for Migration (IOM) municipal study around DRR (in 14 municipalities)</b>	<ul style="list-style-type: none"> <li>Plan8 has a contract with IOM for 14 municipalities. Phased approach. Rollout survey – all data collected by end of November 2018 – this data includes asking about data and information that exists at the municipal level around DRR. Second phase it to rollout a training programme –only contracted for first phase. US Foreign Disaster Assistance (OFDA) programme. There is also a smaller programme with EC DG Humanitarian Operations (ECHO) funding that looks at similar things – came up with 200 questions.</li> </ul>
<b>Earthquake Recovery Project</b>	<ul style="list-style-type: none"> <li>Plan 8 - Earthquake Recovery Project (challenge fund) – hired Mott McDonald to do a leave no -one behind – map initiative household vulnerability 5 districts – huge data set – about to reward it.</li> </ul>
<b>MICS Survey</b>	<ul style="list-style-type: none"> <li>Next one will happen in 2019. Hope to copy sampling parameters of Economic survey done by the World Bank so data can be linked. UNICEF also has geo-referenced school and wash points</li> </ul>
<b>NEKSAP</b>	<ul style="list-style-type: none"> <li>Look at NEKSAP website. Consortium conducts micro-surveys in disaster areas, mostly on nutrition monitoring</li> </ul>
<b>Population census 2021</b>	<ul style="list-style-type: none"> <li><u>Idea:</u> 2021 – population census – <b>can we get building taxonomy into the questionnaire?</b> Population census – to substantiate the building information – put the taxonomy into the census. Huge benefit- link with central bureau of statistic</li> </ul>

Source: Authors



## METEOR Baseline Evaluation Report



### 4.3. Tanzania findings

#### 4.3.1. The wider country context

Poverty in Tanzania has declined since 2007, with a fall from 28.2% in 2012 to 26.9% in 2016<sup>43</sup>. This decline has been accompanied by improvements in human development outcomes and living conditions. Improved health outcomes have driven this progress, along with robust gains in education and incomes, although the pace of improvement has slowed since 2010 and the absolute number of people living in poverty has remained static due to the high population growth rate<sup>44</sup>. The economy has been sustained by relatively high economic growth over the last decade, averaging 6–7% a year<sup>45</sup>.

Both the economic and the political context fundamentally influence the resources available for DRM, and the institutional strength and decision-making capability of those responsible for risk reduction, mitigation and management.

#### Disaster risks and vulnerabilities

Tanzania is an ecologically diverse country prone to a wide variety of climate-related disasters including drought, floods, epidemics, fire, tropical storms, earthquakes, pest infestation, and volcanic eruptions<sup>46</sup>. Tanzania lies on an active fault line stretching from the north of the country to the south and tremors occur from time to time. The last significant earthquake (magnitude 5.7) happened in September 2016 in the Kagera region of northwest Tanzania<sup>47</sup>. That earthquake killed at least 17 people, injured several hundred, and caused significant damage to local infrastructure.

In recent years, the country has experienced increasing frequency, intensity and magnitude of both natural and man-made hazards<sup>48</sup>. This has led to recurring small-scale emergencies, which are costly in terms of lives and livelihoods, leading to food insecurity and health problems. For example, in 2009/2010 flooding of the Mkonda River led to the displacement of around 24,000 people in the area of Kilosa town and another 19,000 in the Mpwapwa and Kongwa districts<sup>49</sup>. Similarly, in 2011 the flooding in the Kilombero valley destroyed 663 houses, submerged nearly 3000 more and left 9,000 people homeless. More recently, flooding has killed 9 people in 2018 and at least 19 in 2015 in Dar es Salaam alone. The risk varies nationally with drought and floods being widespread and earthquakes and landslides limited to the areas in the north and south of the country<sup>50</sup>.

The impacts of disasters not only affect individuals and their property, but also lead to costly damage of public infrastructure<sup>51</sup>. This damage in turn hampers the overall development process and undermines the national and international efforts geared towards poverty reduction<sup>52</sup>. Exacerbating

<sup>43</sup> <https://www.worldbank.org/en/country/tanzania/overview>

<sup>44</sup> *ibid.*

<sup>45</sup> <https://www.bbc.co.uk/news/world-africa-14095776>

<sup>46</sup> United Republic of Tanzania (2008). Disaster Risk and Capacity Needs Assessment for Tanzania Mainland.

<sup>47</sup> <https://www.gov.uk/foreign-travel-advice/tanzania/natural-disasters>

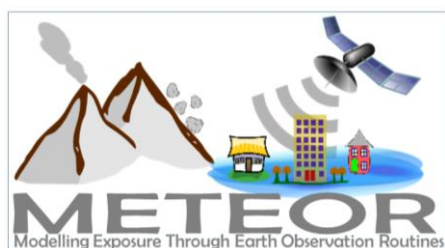
<sup>48</sup> Intergovernmental Panel on Climate Change (2014). Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. IPCC, Geneva, Switzerland.

<sup>49</sup> GoT (2012). National Climate Change Strategy.

<sup>50</sup> [https://www.ideo.columbia.edu/chrr/research/profiles/pdfs/tanzania\\_profile.pdf](https://www.ideo.columbia.edu/chrr/research/profiles/pdfs/tanzania_profile.pdf)

<sup>51</sup> United Republic of Tanzania (2014) National Operational Guidelines for Disaster Risk Management, 2014

<sup>52</sup> *Ibid.*



## METEOR Baseline Evaluation Report



these issues are rapid urbanisation and the large - and mostly unplanned - spatial expansion of urban areas. For example, it is estimated that 75% of the population in Dar es Salaam live in unplanned settlements and in Mwanza, over 80% of households reside in hazard-prone areas<sup>53</sup>. Dar es Salaam is Africa's fastest growing urban centre with the total population expected to expand by more than 85% by 2025<sup>54</sup>. It is likely to achieve 'megacity' status—10 million residents or more—by the early 2030s<sup>55</sup>. The UN's Global Report on Human Settlements is clear about the link between growth and disasters concluding that *"large and megacities concentrate and magnify risk"*<sup>56</sup>.

It is the most vulnerable who are most likely to live in hazard-prone areas in houses that are poorly constructed and unable to deal with hazards such as flooding, earthquakes and landslides. An analysis of the statistics shows that around the world, disasters lower the life expectancy of women more than men, and women and children are 14 times more likely to die than men during a disaster<sup>57</sup>.

### Governance of disaster risk management

The legal and policy framework guiding DRRM activities in Tanzania include several key pieces of legislation, described in further detail in Table 16. The **Disaster Management Act 2015** is of critical importance and replaces the Disaster Relief Coordination Act 1990. While the 2015 Disaster Management Act calls for new structures at both the national and sub-national levels, the current situation is still dynamic and some of these have yet to be fully operationalised.

There are also several other policies and regulations guiding specific sectors related to disaster management<sup>58</sup>. For example, the 2009 National Public Health Act and the 2004 National Environmental Management Act, address DRRM issues related to health and the environment. Similarly, the 2002 National Water Policy addresses the management of different disasters including floods, droughts and accidental water source pollution.

Table 16: Key policies governing DRRM in Tanzania

Policy	Description
<b>Disaster Management Act 2015</b>	<p>Provides the overarching legal framework for disaster preparedness and response in Tanzania. The key features of the Act include:</p> <ul style="list-style-type: none"> <li>• The <b>establishment of Disaster Management Agency (DMA)</b> to replace the Disaster Management Department (DMD) within the Prime Minister's Office. The new agency is meant to be the focal point for disaster reduction and management in the country. To date, the DMA has not yet been established and the Disaster Management Department is still operating as is, under the Prime Minister's Office.</li> <li>• The establishment of the <b>Tanzania Disaster Management Council (TDMC)</b> consisting of the Permanent Secretaries (PS) of a number of key Ministries and the Director General (DG) of the Tanzania Meteorological Agency. The chair of Council is the PS of the Ministry responsible for disaster management and the Director General of DMA is the Secretary to the Council. The TDMC is meant to oversee the management of the affairs of DMA.</li> </ul>

<sup>53</sup> Terms of Reference of Senior Disaster Risk Management Specialist for Dar es Salaam, UN Jobs website, <https://unjobs.org/vacancies/1460201006051>, last accessed on 15/02/2019.

<sup>54</sup> See <https://www.afdb.org/en/knowledge/publications/tracking-africa's-progress-in-figures/>

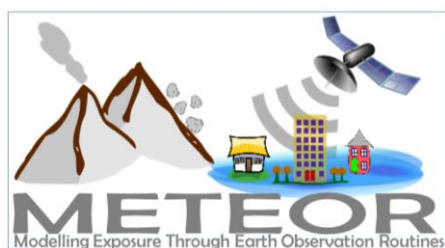
<sup>55</sup> <https://www.citylab.com/design/2015/02/the-bright-future-of-dar-es-salaam-an-unlikely-african-megacity/385801/>

<sup>56</sup> UN Habitat 'Global Report on Human Settlements' 2007

<sup>57</sup> 'Gender and Disasters', UNDP Bureau for Crisis Prevention and Recovery, October 2010

<sup>58</sup> See ANNEX 4 for broader descriptions of these documents





## METEOR Baseline Evaluation Report



Policy	Description
	<ul style="list-style-type: none"> <li>Regional, District, Ward, Village (Mtaa) level Disaster Management Committees to implement matters related to disaster risk management and humanitarian services at their respective levels.</li> </ul>
<b>Disaster Management Regulations 2017</b>	<ul style="list-style-type: none"> <li>Among other issues, it elaborates the <i>Emergency Operations and Communication Centre (EOCC)</i> procedure for disaster control and disaster management volunteers. The Regulations place the responsibility for the establishment and maintenance of the EOCC with the Director General (DG) of the DMA, in consultation with the Minister. One of the functions of the DMA as the national focal point for disaster management and risk reduction is to establish an EOCC. The regulations state the rules of engagement and procedures for disaster control for state and non-state actors including volunteers keen to assist. In addition, it includes the criteria for classification of a disaster as a local or district, regional or national disaster.</li> </ul>
<b>National Operational Guidelines for Disaster Risk Management, 2014</b>	<ul style="list-style-type: none"> <li>Provide an overall framework within which all stakeholders (state actors and non-state actors) in disaster management in Tanzania operate to prevent, prepare, mitigate and respond to emergencies and disaster situations in order to reduce disaster impact and safeguard the lives of Tanzanian citizens.</li> <li>Elaborate on the different legal and institutional frameworks in disaster management nationally, the responsibilities and functions of key players in disaster management and linkages between the different administrative levels.</li> </ul>
<b>National Disaster Management Policy 2004</b>	<ul style="list-style-type: none"> <li>Overarching document that provides for the development of preparedness and mitigation capacities for all kinds of disasters, establishment of collaborative institutional arrangements and promotion of knowledge on disaster management to the public.</li> </ul>

The current structure for disaster management is coordinated by the **Disaster Management Department (DMD)** in the Prime Minister's Office (PMO) (see Figure 5). The DMD is the central government body responsible for formulation of policies and plans related to disaster risk management in country, and for optimising collaborations between the Government of Tanzania (GoT) and international organisations supporting DRRM activities in the country (e.g. World Bank, UNDP, WHO, UNICEF, WFP), civil society and the private sector. DMD reports to the **Tanzania Disaster Management Council (TDMC)**, which is made up of the Permanent Secretaries (PS) of all key ministries and holds the ultimate responsibility for DRM.

The **2015 Disaster Management Act** calls for the establishment of an independent authority known as the **Disaster Management Agency (DMA)**, which will replace the existing DMD. The DMA will still be supervised by the TDMC. Tanzania is in a phase of transition as the Agency and TDMC are not yet fully operational. On the one hand, an independent authority would be likely to have more operational power in shaping the national DRRM system and resource allocation. On the other hand, the transition may imply a long period of inception that could bring the advancement of the DRRM agenda to a halt until the new management and priorities have been defined. This stasis could potentially be a risk to METEOR's ability to engage with the Government and influence DRRM-related policies.

The institutional structure for DRRM is further decentralised to the regions, districts, wards and village/sub-ward (Mtaa) administrative levels. According to the Disaster Management Act 2015, each administrative level will be represented by a **Disaster Management Committee (DMC)**, consisting of relevant officials and key persons and institution representatives. Some of the interviews revealed that a number of committees, especially at the ward/sub-ward levels, have been experiencing some





## METEOR Baseline Evaluation Report



operational challenges. The key functions of each disaster management committee are: (i) to oversee and coordinate disaster risk management activities and emergency operations; (ii) to mobilise resources for disaster management; (iii) to facilitate implementation of disaster management programs; and (iv) to respond in a coordinated manner during disasters<sup>59</sup>. The Disaster Management Committees at the regional and district levels are expected to be chaired by the Regional Administrative Secretary (RAS) and the District Executive Directors (DED) respectively, rather than the Regional and District Commissioners (RC and DC) as per the 1990 Act. This change will take the management out of the hands of elected officials and under the purview of technical bureaucrats.

As noted earlier, the Disaster Management Act (2015) is being gradually operationalised and the disaster management landscape in Tanzania remains in a state of transition. This institutional flux is expected to have an impact (positive or negative) on all matters related to disaster management at all levels of government.

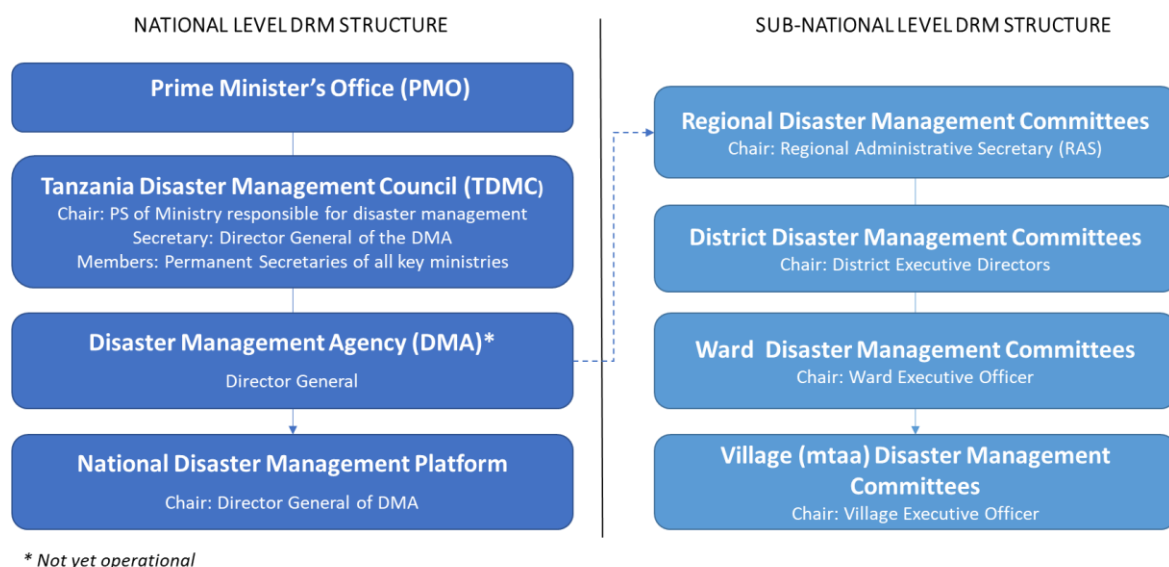


Figure 5: National and sub-national DRM administrative structures (simplified)  
Source: Authors

### How coordination currently works

Like in other countries, the DRRM focus in Tanzania so far has been mainly on preparedness for response to hazards. This is due to both the large amount of investments required and the complexity of the technical information and capacity (e.g. hazard understanding, risk forecasting) needed to develop the prevention and mitigation elements of a national DRRM system.

<sup>59</sup> Disaster Management Act, 2015.



## METEOR Baseline Evaluation Report



### Preparedness

Interviews showed that there are projects in various hazard-prone areas to help communities mitigate against disasters, but stakeholders feel that efforts are not consistent countrywide<sup>60</sup>. **Limitations in resources and institutional capability have an impact on national preparedness.** For example, one NGO manager indicated that Local Government Authorities (LGAs) are working very hard; but they have a lot of projects on their hands, which limits the extent to which they can get involved in disaster management. Indeed, DRRM is not always a direct investment and each LGA must conduct a detailed assessment on how to prioritise it in their planning and budgeting.

Various **implementing ministries** have different programmes in place to prepare for disasters. For example, the Ministry of Health stockpiles medicines for outbreaks and the Ministry of Livestock does something similar for animals. Civil society is similarly involved in disaster preparedness. For instance, the Red Cross is building warehouses in strategic locations with emergency goods in store. Currently the Red Cross is working on building a warehouse in Dodoma expected to be completed by August this year. They also manage numerous activities at the community level including compiling risk maps, community education programmes and preparing community leaders' plans.

**International donors** play an important role in supporting disaster preparedness. Examples of donor-funded programmes are the jointly funded World Bank-DfID's **Tanzanian Urban Resilience Programme (TURP)**. While the coordination system is defined under the DM Act of 2015, there is a general feeling that coordination between development partners and the GoT remains somewhat *ad hoc*. To this effect, UNHCR has indicated an interest in taking a more active coordination of donors to better align with GoT's priorities.

International donors also support groups centred on river basins (e.g. Wami/Ruvu Water Basin) working to improve the management of these natural resources. For example, nine **river basin groups** were established in line with the Water Resources Management Act of 2009 and they monitor water levels, liaise with grassroots water user groups and industry, issuing permits for usage as part of the water management work of government. These efforts around water are an interesting specificity of the disaster preparedness ecosystem in Tanzania.

### Response

Officially, response is guided by the **Tanzania Emergency Preparedness and Response Plan (TEPRP) of 2012**, Tanzania Disaster Communication Strategy (TDCS) of 2012, and the Disaster Management Regulations of 2017. In practice, there are some general processes followed for response activities, which are here reported. At the national level, the DMD receives regular weather alerts from the Tanzania Meteorological Agency (TMA). In an emergency, the DMD also receives information by many different means (including social media), but actions are implemented only if information is received through official channels. For small-scale disasters, the response is primarily at the district or regional level where the Disaster Response Committee coordinates activities. The local officials keep the DMD informed via regular assessment and situation reports. For large-scale disasters in one or multiple districts, the DMD is more actively involved. They move experts into the area, set up an Emergency Operations and Communications Centre (EOCC) and coordinate on the ground from there. The DMD

---

<sup>60</sup> DMD has noted correctly that since every area is unique and prone to its own hazards, conditions for vulnerability and exposure, the same measures in every district cannot be implemented.



## METEOR Baseline Evaluation Report



will also bring in experts from other sectors (e.g. health, water, etc.) as needed to support response efforts.

In Dar es Salaam specifically, there is a **Multi-Agency Emergency Response Team (DarMAERT)**. DarMAERT provides technical support to the Dar es Salaam Regional Disaster Management Committee and has a disaster plan in place for Dar es Salaam.

The Red Cross is a member of the DarMAERT and uses its network of volunteers to play a role in communication and warning by helping disseminate official warning notices to the public. It also plays a role in evacuation, health and medical functions (e.g. first aid), management of dead bodies and a primary role in post-disaster shelter and mass care. The Red Cross is arranging a Memorandum of Understanding (MoU) with DMD to improve coordination and the effectiveness of the response including access to resources.

In general, the private sector has been active within the response community, donating goods, providing transport, and making financial and logistical contributions.

**Tanzania faces many challenges when responding to a disaster.** While every sector is expected to take action on their mandate, there was a general feeling by stakeholders that with the exception of the police and army, **few other sectors had a clear understanding of their roles and responsibilities in an emergency.** As is common in disaster, **coordination and communication are challenges.** In addition, several stakeholders underscored that the **government is under-resourced when it comes to response efforts**, so the committee structures that are comprised of both government and civil society tend to lack the technical and financial resources needed to respond effectively.

### 4.3.2. Key stakeholders in DRM

The DRRM landscape in Tanzania involves many stakeholders from a wide range of government, donor partners, private sector, academia, and civil society actors. In addition to the institutions described in the previous section, key players in government (see Table 17) include METEOR's project partner, the Disaster Management Department (DMD). By coordinating the overall DRRM operations in Tanzania, DMD will be crucial ensuring METEOR's outputs are ratified for use by all other national stakeholders. The Geological Survey of Tanzania (GST) is another key stakeholder as the Government agency that holds all exposure and risk assessment data. The GST plays an important role in enhancing the monitoring of geo-hazards. There is potential for METEOR to engage more fully with GST as they have also expressed interest in the project. Other DRRM-relevant ministry departments include the Health Emergence Preparedness and Response Section (HEPRS) under the Ministry of Health (MoH&SW). Similar units exist in some Ministries e.g. Defence, Agriculture, Livestock, Education and Vocational Training.

Non-governmental stakeholders that have expressed interest, and will be formally engaged, include the University of Dar es Salaam, specifically its Geology Department. Ardhi University is also a good potential partner for METEOR. The project could explore working with academic institutions like Ardhi University in ensuring sustainable uptake of outputs of the project as it has a Disaster Management Training Centre. Development Partners such as the World Bank and DFID also have on-going initiatives in DRRM. METEOR at this stage will benefit from keeping an open line of communication to avoid overlaps, particularly in relation to TURP, and to increase efficiency and effectiveness. Humanitarian organisations such as HOT (a project partner) already have established teams on the ground collecting



## METEOR Baseline Evaluation Report



information and working on digitising parts of Dar es Salaam. METEOR could piggyback on already-existing activities and teams for some of its deliverables. With regards to disaster response, the Tanzania Red Cross teams tend to be amongst the first responders and are included within the structure of the Disaster Management Committees at the different sub-national levels as indicated in Figure 6 below.

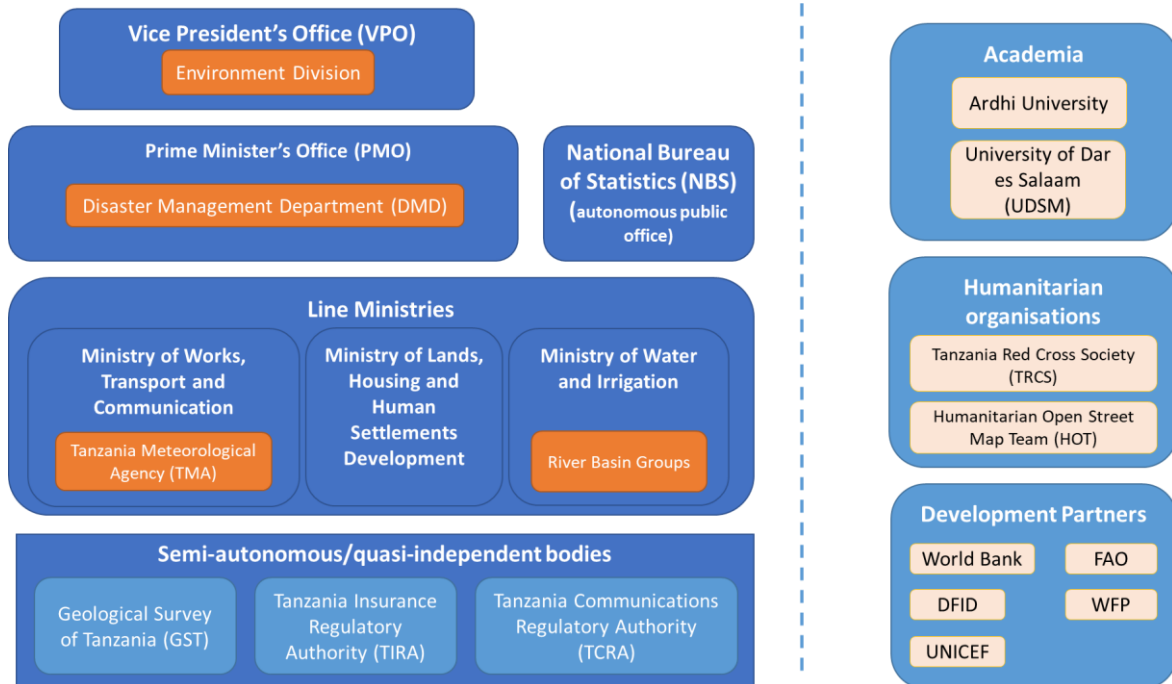


Figure 6: Tanzania stakeholders



## METEOR Baseline Evaluation Report



Table 17: Key Government stakeholders

Organization	Description	Relevance/Action for METEOR
<b>Prime Minister's Office (PMO), Disaster Management Department (DMD)</b> <sup>61</sup>	The office of the Prime Minister hosts the <b>Disaster Management Department (DMD)</b> , which is responsible for overall coordination of DRRM... The DMD will be replaced by the <b>Disaster Management Agency (DMA)</b> once the 2015 Disaster Management Act is fully operationalized.	<b>Project partner:</b> DMD is a partner in the METEOR project and the link across government, and in coordination. The role they play in building support and capacity for use of the datasets is crucial to the project success.
<b>Tanzania Disaster Management Council (TDMC)</b> <sup>62</sup>	The TDMC is a high- profile Council that will oversee the management of DMA, once established. According to the 2015 Act, TDMC will consist of the Permanent Secretaries (PS) of key Ministries and the Director General (DG) of the Tanzania Meteorological Agency. The chair of Council is the Permanent Secretary of the Ministry responsible for disaster management and the Director General of DMA is the Secretary to the Council.	<b>Primary stakeholder:</b> TDMC members should be fully briefed on the METEOR project as their Ministries are likely to be the primary users of the project outputs (e.g. data and training efforts).
<b>National Disaster Management Platform (NDMP)</b>	<ul style="list-style-type: none"> <li>Consists of different stakeholders and provides a stage for discussion of different issues related to DRRM. The Director General of DMA is the chair. Members include: (i) Head of departments responsible for disaster management within line ministries; (ii) Tanzania Communications Regulatory Authority (TCRA); (iii) Fire and Rescue Force; (iv) National Environmental Management Council (NEMC); (v) Geological Survey of Tanzania; (vi) Tanzania Meteorological Agency representative; (vii) other representatives from the civil society organizations, humanitarian organisations, media services, religious organisations, higher learning institutions, private sector etc.</li> </ul>	<b>Primary stakeholder:</b> The operationalisation of the NDMP is still underway. In future meetings it is hoped that the Council can become more involved in the work of METEOR, starting with, for example, a presentation of progress (preferably with a demonstration) and following up with commitments of involvement from key Ministries.

<sup>61</sup> The Disaster Management Agency (DMA) will be the national focal point for coordination of disaster risk reduction and management, once the 2015 Disaster Management Act is fully operationalised. The DMA will be a corporate entity headed by a Director General and sit outside of the PMO. The work of the DMA will be overseen by Tanzania Disaster Management Council (TDMC) (see below). As this new Agency is formed, it is anticipated that the DMA will become METEOR's partner.

<sup>62</sup> The Tanzania Disaster Relief Committee (TANDREC) was the key committee on emergency and disaster management at the national level and was chaired by the Permanent Secretary in the Prime Minister's Office (PMO), with Permanent Secretaries from key Government Ministries and heads of Early Warning Institutions as its members. It was set up for overseeing and coordinating overall disaster and relief operations at national level and was established by the Disaster Relief Coordination Act. No. 9 of 1990. This committee is in the **process of being replaced by the TDMC**.



## METEOR Baseline Evaluation Report



Organization	Description	Relevance/Action for METEOR
<b>Subnational Disaster Management Committees</b>	<ul style="list-style-type: none"> <li><b>Regional Committees</b> are meant to advise the Regional Commissioners on disaster management issues at regional level and oversee and mobilise resources for disaster management in the region. The Committees are chaired by the Regional Administrative Secretaries (RAS). The secretary of the committee is the Regional Disaster Management Coordinator. <b>District Committees</b> are meant to advise the District Commissioners on disaster related issues and oversee and mobilise needed resources for disaster management in the District. The Committees at District level are chaired by the District Executive Director (DED). The Secretary to the Committee is the District Disaster Management Coordinator. The lower-level disaster management structures are at the Wards. The chair is the Ward Executive Officer (WEO). The secretary of the committee can be any of the extension officers in the wards as appointed by the Council Director in consultation with the WEO. Its functions mirror those of higher-level committee but operating at ward level. The lowest level of disaster management structure is the sub-ward - Mtaa in urban areas and village in rural areas. The chair is the Mtaa or Village Executive Officer. Council Director may in consultation with the Mtaa or Village Executive Officer (VEO) designate any extension officer in village to be the secretary of the village/Mtaa committees.</li> </ul>	<b>Primary stakeholders:</b> These committees form the core of the institutional structure for DRR and DRM. METEOR will be able to engage with the committees through DMD (where they are operational).
<b>Tanzania Communication Regulatory Authority (TCRA)<sup>63</sup>.</b>	TCRA is quasi-independent Government body responsible for regulating the communications and broadcasting sectors in Tanzania. It plays a role in DRRM to ensure rapid and reliable communication of official information for effective disaster response operations. Official information to be issued relates to the causes, effects, potential hazards and actions to be taken.	<b>Secondary stakeholder:</b> METEOR needs to keep the TCRA informed of the progress of the project.
<b>Ministry of Works, Transport and Communication<sup>64</sup>.</b>	Ministry in charge of key critical infrastructure that has the potential of being impacted by disaster such as roads, bridges, ferry etc. The Ministry sets the compliance standards and has to monitor compliance. The Ministry also oversees the <i>National Information and Communication Technology Policy 2016</i> . One of the cross-cutting issues is the use of Information and Communication Technology (ICT) in disaster risk management. A specific objective of the Policy is to promote the use of ICT in reducing disaster risk and by strengthen cooperation with relevant regional and international organizations in promoting the use of ICT for disaster management and ensuring a conducive environment for effective use of ICT in disaster management.	<b>Secondary stakeholder:</b> METEOR needs to keep the Ministry informed of the progress of the project. Through the institutional structures coordinated by DMD (and the DMA when implemented), METEOR can support the widespread understanding (and therefore use) of the datasets. Collateral for METEOR could be the use of its outputs to inform the development of a geo-hazard resilient building code.

<sup>63</sup> TCRA Profile. Retrieved from <https://www.tcra.go.tz/index.php/about-tcra/tcra-profile>.

<sup>64</sup> About us. (2018). Retrieved from <http://www.mwct.go.tz/>.





## METEOR Baseline Evaluation Report



Organization	Description	Relevance/Action for METEOR
<b>Ministry of Lands, Housing and Human Settlements Development</b>	The Government Ministry mandated with administering all matters pertaining to land and human settlement. This includes ensuring that the relevant local authorities are complying with land-use policies and enforcement. It's role in the DRRM: of land use information and mapping. Roles to ensure that all relevant ministries, departments and agencies (they are the custodians) are complying with what needs to be done for good land use, including inspection.	<b>Secondary stakeholder:</b> METEOR needs to keep the Ministry informed of progress on the project. Through the institutional structures coordinated by DMD METEOR can support the widespread understanding (and therefore use) of the datasets.
<b>Geological Survey of Tanzania<sup>65</sup>.</b>	GST is a government agency that is mandated to <b>acquire and store geoscientific data and information</b> that is used in the sector. Its main activities include; geological mapping, mineral exploration and promotion of exploration and mining, evaluation, processing and research related to geohazards, geological processes and mineral systems. They <b>operate 9 seismic stations</b> in a national network – which are used to locate seismic sources. The GST has a role of enhancing monitoring and mitigation measures of geo-hazards as well as protection of the environment, life and property. They take an active role in (i) informing the public about hazards; (ii) providing geological mapping and research; (iii) proving technical assistance for earthquake risk reduction measures.	<b>Primary stakeholder:</b> The GST is an important stakeholder, particularly in mapping hazards, risks and vulnerabilities. The GST will be key users of METEOR products and are keen to cooperate on a regular basis. An MoU is being signed directly with the GST.
<b>Ministry of Water and Irrigation<sup>66</sup></b>	Mandated to ensure the sustainable use and development of water resources. The Ministry has four divisions; Water Resources Division; Urban Water Supply and Sanitation Division; Water Quality and Services Division; Rural Water Supply Division. Each of these visions then has its own Director. The implementation of the National Water Policy (2002) is under the Ministry of Water and Irrigation. The National Water Policy provides guidelines for flood mitigation plans, procedures for safety and ownership of dams and effective institutional framework for effective management of water resources.	<b>Secondary stakeholder:</b> METEOR needs to keep the Ministry informed of progress on the project. Through the institutional structures coordinated by DMD METEOR can support the widespread understanding (and therefore use) of the datasets.
<b>Tanzania Meteorological Agency (TMA)<sup>67</sup></b>	A government agency that provides meteorological services such as climate information and warnings, weather forecast and also play also provide advisory information for the country. Early warnings and weather and climate services such as forecasts are sent to different stakeholders in the DRM space allow for early preparation and decision making on response measures before an event occurs, this in turn enables the protection/safety of lives and property and the environment during disasters.	<b>Secondary stakeholder:</b> METEOR needs to keep the Agency informed of progress on the project. Through the institutional structures coordinated by DMD METEOR can support the widespread understanding (and therefore use) of the datasets.

<sup>65</sup> Canadian Mining Life. (2014). Geological Survey of Tanzania. Retrieved from [https://mininglifeonline.net/company\\_page\\_8377.html](https://mininglifeonline.net/company_page_8377.html)

<sup>66</sup> About the Ministry. (2018). Retrieved from <http://www.maji.go.tz/>

<sup>67</sup> (TMA). (2018). About Us. <http://www.meteo.go.tz/>.





## METEOR Baseline Evaluation Report

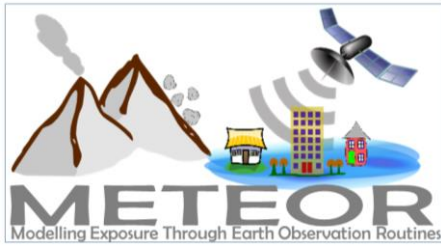


Organization	Description	Relevance/Action for METEOR
<b>Dar es Salaam Multi Agency Emergency Response Team (DarMAERT) Emergency<sup>68</sup></b>	DarMAERT is a tactical inter-agency body established with the aim of improving coordination emergency response and involves different stakeholders that play different roles in response to a disaster in Dar es Salaam. It provides technical support to the Dar es Salaam Regional Disaster Management Committee. It is the 'tactical branch' of the Regional Disaster Management Committee. DarMAERT has developed an Emergency Response Plan 2017 that stipulates roles and responsibilities of the different stakeholders.	<b>Secondary stakeholder:</b> METEOR needs to keep the Agency informed of progress on the project. Through the institutional structures coordinated by DMD METEOR can support the widespread understanding (and therefore use) of the datasets.
<b>Vice President's Office (VPO): Environment Division<sup>69</sup></b>	Disaster impact also entails environmental losses or destruction. The <b>Division of Environment (DoE)</b> within the VPO is responsible for development of environmental policies, laws, strategy and guidelines. The DoE in the VPO is divided into three sections under one Director; (i) Biodiversity Conservation; (ii) Environmental Management of Pollution; (iii) Environmental Assessment and Climate Change Management. Once operationalised, the DMA has plans to work closely with THE National Environment Management Council (NEMC) and the DoE within the VPO to integrate Disaster Management issues into the overall management of the environment. This includes alignment of DRM activities with the National Climate Change Strategy and to ensure DRR is part of Environmental and Social Impact Assessments for new development projects.	<b>Secondary stakeholder:</b> METEOR needs to keep the Division informed of progress on the project. Through the institutional structures coordinated by DMD METEOR can support the widespread understanding (and therefore use) of the datasets.
<b>National Environment Management Council (NEMC)</b>	Mandate to oversee to review, monitor and ensure all stakeholders comply with the Environmental Impact Assessment (EIA) requirements and to create awareness of the environment and the need to protect it to the general public. The final go-ahead of conducted Environment and Social Impact Assessments comes from the Vice President's Office as the final issuer of the EIA certificates. The Council reports to the Minister for Environment on implementation of the functions.	<b>Secondary stakeholder:</b> METEOR needs to keep the Council informed of progress on the project. Through the institutional structures coordinated by DMD METEOR can support the widespread understanding (and therefore use) of the datasets.
<b>National Bureau of Statistics (NBS)<sup>70</sup></b>	Autonomous public office responsible for providing official statistics to the Government, the public, and the community at large. It compiles and distributes National Census data. The NBS has four Directorates under the Director General. These include; Economic Statistics, Population Census and Social Statistics, Statistical Operations Finance, Administration and Marketing. Role in DRRM: the provision of information/data in relation to population distribution, size, composition etc.	<b>Primary stakeholder:</b> METEOR needs to coordinate with the NBS (probably through DMD) to ensure there is confidence in the datasets produced and that they can be easily accessed and used.

<sup>68</sup> PORALG. (2017). DarMAERT Emergency Response Plan October 2017. Retrieved from [file:///C:/Users/szakaria/Dropbox%20\(OPML\)/02%20-%20WB%20DRM%20and%20DRR%20Project/07%20-%20Library/DarMAERT%20Emergency%20Response%20Plan.pdf](file:///C:/Users/szakaria/Dropbox%20(OPML)/02%20-%20WB%20DRM%20and%20DRR%20Project/07%20-%20Library/DarMAERT%20Emergency%20Response%20Plan.pdf)

<sup>69</sup> The Vice President's Office. (2017). Environment Division. Retrieved from <http://vpo.go.tz/environment-division/>

<sup>70</sup> About NBS (2018). Retrieved from <http://www.nbs.go.tz/>.



## METEOR Baseline Evaluation Report



Organization	Description	Relevance/Action for METEOR
<b>Tanzania Insurance Regulatory Authority (TIRA)</b> <sup>71</sup>	Responsible for all matters related to insurance, including registration of different insurance companies, agents, brokers, insurance and loss surveyors. It is also responsible for inspection of all stakeholders providing insurance services and handling insurance complains from the public. TIRA has an overarching National Insurance Board that oversees the management of the six Directorates under the Commissioner of Insurance.	<b>Secondary stakeholder:</b> METEOR needs to keep the Authority informed of progress on the project.

Source: Authors

<sup>71</sup> About TIRA. (2016). Retrieved from <https://www.tira.go.tz/>.



## METEOR Baseline Evaluation Report

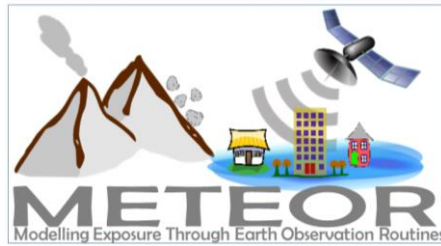


In addition to the GoT, there are several other key stakeholders in DRRM (see Table 18). As mentioned, a key programme for METEOR to coordinate with is the **Tanzania Urban Resilience Programme (TURP)**. The programme is specifically focused on DRRM in urban areas, principally Dar es Salaam, with the aim to increase Tanzanian resilience to climate and disaster risk. The programme operates through four pillars: (i) *Risk Identification* to strengthen the identification and understanding of climate risk and uncertainty in the local context, and enhance the linkages and coordination between risk management actors; (ii) *Risk Reduction* to strengthen cities' capacity to plan for and respond to climate risk, focussing on the reduction of the vulnerability of people, households and communities through structural and non-structural measures; (iii) *Disaster Preparedness & Emergency Management* to use scenarios of city risk to identify and prepare vulnerable groups with emergency response plans, design early warning systems, institute requirements for equipment, tools, infrastructure, simulations, and drills, and improve damage assessment capacities; (iv) *Resilience Academy* is a virtual programme tied to Tanzanian universities and training institutes that delivers an evolving digital curricula, practical experience, training placements and courses and equipment to support surveying, maintenance, risk monitoring and analysis activities. The goal of the last pillar is to ensure sustainability of tools and skills developed through the programme and develop partnerships between practitioners and academia that will enhance sustainability of datasets and risk management practices in the country. Leveraging the yearly placement in industry programme to provide university students with real world practical experience in collecting, analysing and applying risk data and transferring datasets and risk analysis tools to university programs are the two main activities of the Resilience Academy pillar<sup>72</sup>. As the datasets are being developed, further discussions will clarify data sharing and storage arrangements.

Other key stakeholders include Ardhi University's Disaster Management Training Centre (DMTC), which provides integrated teaching, research, and public services focused on DRRM. The DMTC is working with HOT on the **Ramani Huria** project (funded under the TURP programme) to create highly accurate maps of the most flood-prone areas of Dar es Salaam. A Memorandum of Understanding is in the final stages of agreement, and longer-term plans for collaboration are being developed.

---

<sup>72</sup> World Bank. (2018). Tanzania Urban Resilience Programme: Annual Report 2018. Retrieved from <http://documents.worldbank.org/curated/en/402541542394008047/Tanzania-Urban-Resilience-Programme-Annual-Report-2018>.



## METEOR Baseline Evaluation Report



Table 18: Other key stakeholders in DRM

Type	Name of the Organization	Description	Relevance/Action for METEOR
Academia	<b>Ardhi University and the Disaster Management Training Centre (DMTC)</b> <sup>73</sup>	A tertiary institution that has a Disaster Management Training Centre (DMTC). The DMTC serves as a centre of disaster management and risk reduction in Tanzania through the creation of relevant knowledge and its applications, including remote sensing and GIS. The DMTC provides integrated teaching, research and public services that are geared towards achieving sustainable social-economic development of Tanzania. Current projects include (i) flood modelling for Dar es Salaam for 3 different return periods; (ii) community-based mapping project called Ramani Huria funded under the DFID-WB TURP programme where students are helping HOT do the mapping to create highly accurate maps of the most flood prone areas of Dar es Salaam.	<b>Primary stakeholder:</b> The University has research capacity to further analyse the datasets and create tools for interrogation. METEOR will ensure the University is updated and active as fully as possible in the project.
	<b>University of Dar es Salaam</b>	A public university that offers tertiary education. Within the Department of Geology, several research projects have been undertaken in relation to geology broadly and geohazard monitoring which might be relevant to the project.	<b>Primary stakeholder:</b> METEOR will ensure the University is updated and active as fully as possible in the project.
	<b>Eastern and Southern Africa Seismic Working Group</b>	A network of seismic recording stations in nine countries that span the entirety of the East Africa Rift System, from Eritrea / Ethiopia in the north down to Mozambique / Zimbabwe in the south. The major objective at its inception in 1992 was to cooperate in earthquake monitoring and joint production of an earthquake bulletin with improved epicentre locations. The group conducts joint research and enhances skills. To date, ESARSWG has more than 52 seismic stations of which three fifths are up and running at any given time. ESARSWG will continue to strive to attain 100% station operation <sup>74</sup> .	<b>Secondary stakeholders:</b> Member of the Universities (above) are also members of this Group and communication will be maintained through those individuals.

<sup>73</sup> Ardhi University. (2018). Introduction. Retrieved from <http://www.aru.ac.tz/index.php/academic-units/menu/disaster-management-training-center-dmtc/2016-05-04-05-54-17..>

<sup>74</sup> [https://www.researchgate.net/publication/243972375\\_Challenges\\_and\\_accomplishments\\_of\\_the\\_Eastern\\_and\\_Southern\\_Africa\\_Regional\\_Seismological\\_Working\\_Group](https://www.researchgate.net/publication/243972375_Challenges_and_accomplishments_of_the_Eastern_and_Southern_Africa_Regional_Seismological_Working_Group)



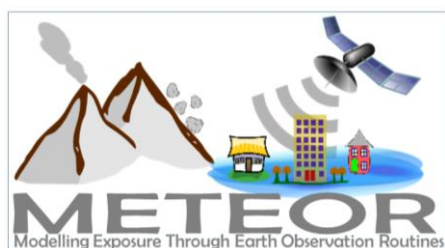
## METEOR Baseline Evaluation Report



Type	Name of the Organization	Description	Relevance/Action for METEOR
Humanitarian organisation	Tanzania Red Cross Society (TRCS) <sup>75</sup>	The TRCS is the Tanzania chapter of the global humanitarian organization that carries out relief operations to assist victims of disasters. In Tanzania, the Red Cross Society plays a role within the Disaster Management Committees that exist at Regional, District, Ward and Village level as stipulated in the Disaster Management Act 2015. According to the Act, a representative from TRCS forms part of the Disaster Management Committee at all levels and other humanitarian and voluntary organisations. In Dar es Salaam, TRCS also have a role specific as a member of DarMAERT. Using its network of volunteers TRCS is expected to play a secondary role in communication and warning by helping disseminate official warning notices to the public. It also plays a role in evacuation, health and medical functions (e.g. first aid), management of dead bodies and a primary role in shelter and mass care post-disaster.	<b>Primary stakeholder:</b> The Red Cross has excellent community connections and excellent experience in mitigating/ managing disasters. METEOR will ensure they are updated and active as fully as possible in the project.
Development partners	DfID	UK Department for International Development (DFID) is currently funding and engaged in DRM in Tanzania through a programme called the <b>Tanzania Urban Resilience Programme (TURP)</b> in collaboration with the World Bank and the Government of Tanzania.	<b>Primary stakeholder:</b> There is the opportunity to coordinate with DPs and their programmes for mutual benefit.
	World Bank	As a Development Partner the WB supports the Government of Tanzania on several developmental agenda's such as to increasing the resilience to climate and disaster risk, including the TURP programme in collaboration with DfID and GoT.	<b>Primary stakeholder:</b> There is the opportunity to coordinate with DPs and their programmes for mutual benefit.

Source: Authors

<sup>75</sup> PORALG. (2017). DarMAERT Emergency Response Plan October 2017. Retrieved from [file:///C:/Users/szakaria/Dropbox%20\(OPML\)/02%20-%20WB%20DRM%20and%20DRR%20Project/07%20-%20Library/DarMAERT%20Emergency%20Response%20Plan.pdf](file:///C:/Users/szakaria/Dropbox%20(OPML)/02%20-%20WB%20DRM%20and%20DRR%20Project/07%20-%20Library/DarMAERT%20Emergency%20Response%20Plan.pdf)



## METEOR Baseline Evaluation Report



### 4.3.3. Key themes from Tanzania interviews

A recent analysis of the context of DRRM in Tanzania<sup>76</sup> identified three major challenges: (i) the lack of data to give accurate assessments of exposure, sensitivity, and adaptive capacity of the population and assets; (ii) constrained institutional capacity in planning, including out-dated documents, unclear institutional responsibilities, and weak compliance; and (iii) a lack of appropriate storm water drainage and wastewater treatment, ineffective solid waste systems and flood management infrastructures, and inadequate systems for the effective operation and maintenance of infrastructure assets. These are in line with some of the key findings of our baseline activities in Tanzania, which are summarised in Table 19 and detailed further in the paragraphs below.

Table 19: Key Tanzania DRRM themes

Theme	Summary of main points	Relevance/Lessons for METEOR
Conflicting government priorities	<ul style="list-style-type: none"> <li>Reactive approach to disaster management</li> <li>Even when budgeted, allocated funding does not necessarily get spent on DRRM measures.</li> </ul>	<ul style="list-style-type: none"> <li>METEOR needs to put forward a good case for its outputs, i.e. the need to take measures before a disaster and how the project outputs will enable this</li> </ul>
Need for better mitigation measures	<ul style="list-style-type: none"> <li>Need for better mitigation strategies to deal with populations located in geo-hazard prone areas. Noted that government started in 2017 a process to update building codes.</li> </ul>	<ul style="list-style-type: none"> <li>METEOR will be able to highlight the areas of highest vulnerability and therefore the areas where the building codes need to be most conservative / strict.</li> </ul>
Limited capacity	<ul style="list-style-type: none"> <li>Technical capacity shortfalls</li> <li>Lack of sufficient funds</li> <li>Existence of maps does not guarantee their usage</li> <li>Need for more efficient communication of emergency messages to the people at risk</li> </ul>	<ul style="list-style-type: none"> <li>METEOR needs to engage stakeholders that are positioned to or have capacity to make use of the outputs or have access to resources to empower others enabling a wider reach of its outputs</li> </ul>
Issues with data quality, access, sharing and duplication	<ul style="list-style-type: none"> <li>Limited technical capacity to collect relevant, real-time data needed for early warning and DRM (e.g. seismic monitoring network is restricted by limited numbers of seismometers and manual data collection)</li> <li>The quality and consistency of hazard and vulnerability data across Tanzania varies depending on who has collected it and how it has been archived - Fragmented datasets, no central repository</li> <li>There are issues preventing the full sharing and access to DRRM data – the effort to create open-source data for use in modelling exposure is complicated by a new bill which include amendments prohibiting anyone/ institutions from publishing statistics without</li> </ul>	<ul style="list-style-type: none"> <li>METEOR needs to work to create appetite across government and other stakeholders to use the information.</li> <li>METEOR can help promote the use of robust and consistent data management practices</li> </ul>

<sup>76</sup> See the Business Case for TURP (DFID), unpublished.



## METEOR Baseline Evaluation Report



Theme	Summary of main points	Relevance/Lessons for METEOR
	authorization by the National Bureau of Statistics (NBS).	
Lack of public awareness of DRRM issues	<ul style="list-style-type: none"> <li>Many stakeholders raised the need for more public awareness on the threat of hazards, specifically on how land-use behaviours exacerbate these risks, and on how to take action in the event of a disaster.</li> </ul>	<ul style="list-style-type: none"> <li>METEOR does not have the scope nor budget to work at the community level. These types of efforts are being addressed by much larger projects such as TURP. METEOR data and products can help inform these project efforts.</li> </ul>
Human-generated issues such as urbanisation, population growth and land use	<ul style="list-style-type: none"> <li>Human-generated issues such as urbanisation, population growth and changing land use as major challenges in relation to planning for and responding to a disaster.</li> </ul>	<ul style="list-style-type: none"> <li>These issues are part of the context in which METEOR operates. METEOR's work can help inform other agencies and projects addressing these problems.</li> </ul>
Weaknesses in coordination	<ul style="list-style-type: none"> <li>The hierarchical structure of government makes it difficult to coordinate and react quickly in an emergency. The DRM Act addresses some of these issues (by forming an agency outside these hierarchical structures); but it is yet to be fully operationalised.</li> <li>Limited coordination across government, development partners, private sector actors, and civil society. This issue is exacerbated by the move of government from Dar es Salaam to Dodoma as most stakeholders outside of government are still headquartered in Dar es Salaam, posing challenges to regular meetings.</li> </ul>	<ul style="list-style-type: none"> <li>METEOR will not be able to solve coordination issues in DRRM. METEOR needs to be aware of the key stakeholders operating in DRRM and target its activities accordingly to get their buy-in.</li> <li>By working closely with and to empower DMD, the coordinating DRRM institution, METEOR will likely contribute to better allocation of resources, which is linked to better coordination.</li> </ul>

Source: Authors

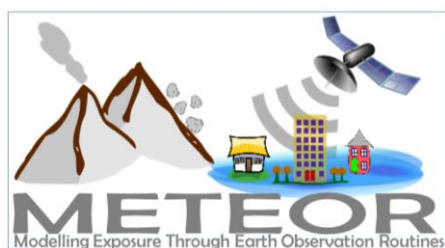
### Words matter: DRRM definitions

As explained in section 4.1.2, Tanzanian DRRM system is using the official UNISDR's definitions as developed within the Sendai Framework (Table 5). However, in Tanzania we performed the same exercise as in Nepal to ask stakeholders their *personal* perceptions and definitions of different terminology related to DRRM. Similarly, we received a diverse set of answers and a brief summary of them is provide in Table 20 below.

Table 20: Tanzania terminology definitions

Concept	Definitions
Disaster Risk Management (DRM)	<ul style="list-style-type: none"> <li>DRM is to eradicate the vulnerability of the disasters especially to people and property – reduce. Every day we are preparing land use strategic plans and topical maps and in there we are indicating those areas that are vulnerable to hazards. Also do inspection, public education (e.g. billboards).</li> </ul>
Disaster Risk Reduction (DRR)	<ul style="list-style-type: none"> <li>Same as DRM</li> <li>Processes and strategies that can be taken to reduce risk. Processes can be at both national and local level</li> </ul>





## METEOR Baseline Evaluation Report



	<ul style="list-style-type: none"> <li>Regarding catastrophic events, risk reduction is reducing the negative effect to society caused by geohazard</li> <li>Disruption from normal practice which have some impact</li> <li>Natural event, especially flood issues. Methodology used to reduce impact on people and property.</li> </ul>
<b>Vulnerability</b>	<ul style="list-style-type: none"> <li>Areas exposed to disaster and how we can resist them, especially natural hazards. Links to master plans, plans at local level.</li> <li>Being exposed to the risk of disaster</li> <li>Location related, people's exposure to certain geohazard</li> <li>Exposure to risk</li> <li>Extent the people are affected /are vulnerable. Understanding of their response mechanism. Degree of response is minimised if less vulnerable.</li> </ul>
<b>Hazard</b>	<ul style="list-style-type: none"> <li>Something that can bring damage to infrastructure and people</li> <li>Unexpected events which may affect people</li> </ul>
<b>Exposure</b>	<ul style="list-style-type: none"> <li>Same as vulnerability.</li> <li>Scenario: if earthquake is to happen here, then surroundings are subjected to some forces</li> <li>Based on flooding: temperature and precipitation parameters</li> </ul>
<b>Risk</b>	<ul style="list-style-type: none"> <li>Risk is a hazard</li> <li>Being in danger of facing something that can harm you</li> <li>Negative impacts. Something that can damage crops or something, if in an open area therefore no risk as no humans</li> <li>Adverse impacts of an activity</li> <li>Magnitude</li> </ul>
<b>Resilience</b>	<ul style="list-style-type: none"> <li>If you take measures against disaster.</li> <li>When somebody is affected, how they recover quickly, especially in urban area flooding. Take some protocols – there are laws that cover those areas and municipal authorities in implementation. Working to make harmony, people to live safely and securely without destruction of life and property.</li> <li>How society can cope/handle with the situation happening, in terms of infrastructure and knowledge to reduce the risk. How they can manage themselves without outside help</li> <li>Likelihood of surviving after an event</li> </ul>
<b>Remote sensing data</b>	<ul style="list-style-type: none"> <li>Normally procured through the websites. Some free but they may be less reliable. E.g. universities.</li> <li>Satellite images providing information on chemical, biological. In Tanzania there is very little – the application of remote sensing data. Have to pay others for the data – Tanzania has no satellite of its own.</li> </ul>
<b>Uncertainty</b>	<ul style="list-style-type: none"> <li>Unknown in assessing procedures or combating approaches, missing</li> <li>Things that one cannot really predict</li> </ul>

Source: Authors

### Perception from stakeholders about lack of government prioritisation around DRR

In the sample we interviewed, there was a general perception that the GoT did not prioritise DRRM within its budgets and actions<sup>77</sup>. Traditionally, when it comes to DRRM the government has focused on response rather than on planning. As one senior civil servant noted the government takes a “reactive approach to disasters not proactive.” This reactive approach is common where resources are limited, and government priorities are many. Indeed, several of those interviewed noted that trying

<sup>77</sup> DMD notes that the sample size of stakeholders interviewed was small and that actual prioritisation should be done by an economic analysis that looks at budgets. While such an exercise would be very useful, to conduct such an analysis is outside the scope of this programme. Furthermore, perceptions are very important to understand when it comes to engagement and uptake of project deliverables.



## METEOR Baseline Evaluation Report



to mainstream DRRM through budgeting is difficult and even when budgeted, allocated funding does not necessarily get spent on DRRM measures. An external stakeholder noted its opinion that *“Disaster risk reduction is not a priority for Government.”*

**Several stakeholders view the lack of action by government to prioritise disaster risk reduction efforts as politically motivated.** For example, one technical expert in the field pointed out that the Mtera dam in Dodoma has issues of sedimentation and that the water volume is decreasing due to upstream activities (e.g. irrigation). However, to date there has been no action by government to mitigate. His perception was that this was due to upcoming elections and the hesitation on behalf of politicians to confront upstream farmers. Similarly, another stakeholder pointed out examples where people are living and farming in areas previously noted as at risk due to hazards. In this case, the stakeholder indicated there was strong political pushback when relocation was attempted. This issue may also in part be due to local scepticism and a lack of trust in the hazard mapping process.

When asked what needs to be done to improve DRR measures, the suggestions centred around two areas. The first theme was the **need for better mitigation strategies to deal with populations located in geohazard areas**. As one NGO leader put it, *“[we] need to have mitigation measures to apply before and help society to become more resilient to hazards.”* This includes better regulations such as building codes. It should be noted that the government is in the process of producing building codes to help with DRR efforts. The process began in 2017 and a draft document was submitted to the PMO in 2018. To date, it is still unclear when these regulations will pass, to which law/act they will be tied, and which ministry will own the codes once finalised.

The second was around **building better early warning systems that include real-time data collection and use**. These efforts should include not just improved data collection and analysis; but more efficient communication of emergency messages to the people at risk.

In both these cases (the building code and the early warning systems), the contribution that the METEOR datasets could make to strengthening the information on which decisions are based, and therefore increasing effectiveness, is significant. However, such improvements are very dependent on the institutional capacity and the collective will to change practices, both of which are beyond the scope of METEOR.

### Capacity constraints and resource shortfalls at all levels of government

**Several of those interviewed noted that the government does not have the capability to respond effectively to disasters.** As one stakeholder put it, government *“can’t react fast enough.”* This is particularly the case at the local level. Currently the government does not have rapid response capability. One stakeholder brought up as an example the ferry disaster on Lake Victoria<sup>78</sup>, noting that the local people could have responded faster if they had had appropriate training. As such, stakeholders see a **need to build technical capacity at the local level** to help governments prepare on what to do if there is a disaster and how to recover.

**This lack of capacity is also related to funding shortages**, which prevent government at all levels from fully engaging in disaster planning and response. It was noted that while DMD has on occasion taken on the response functions, due to the limited funding and capacity, it reverted to the core function of coordination. Furthermore, one technical expert with experience in disaster management noted that

---

<sup>78</sup> See <https://www.bbc.co.uk/news/world-africa-45599042>



## METEOR Baseline Evaluation Report



the community has no culture of using maps to understand the environment – printing and placing maps in the Government offices does not necessarily mean they will use the maps.

### Issues with data quality, access, sharing and duplication

Interviews with stakeholders also revealed several challenges around the data needed and used for effective DRRM. These challenges focused on three themes: the technical capacity to collect data; data quality; and data sharing and access.

**Within key institutions, there is limited technical capacity to collect relevant, real-time data needed for early warning and DRM.** For example, the GST monitors nine seismic stations; but there is no automated system to send the data to a central repository. Rather, the data must be physically collected from the seismic stations which, due to resource constraints and operational challenges, only happens every 2-3 months<sup>79</sup>. As a result, seismic processing does not occur in real time, limiting its operational use during a crisis. The situation is different for some non-seismic hazards, whereby relevant hazard-related data (river gauges, rainfall etc.) are telemetered. However, the main issue is that there seem to be no clear early warning systems in place to issue alerts in real time.

**The quality and consistency of hazard and vulnerability data across Tanzania varies depending on who has collected it and how it has been archived.** As one stakeholder noted: *“Some [data] are out of date, other data have viruses [and so cannot be used], and others want money [to provide data].”* Efforts to centralise existing data sets appear to be on-going by the National Bureau of Statistics and in projects such as the one led by Ministry of Lands who are developing a database for mapping land use, but at this point in time these collections appear to be quite fragmented.

**There are issues preventing the full sharing and access to DRRM data.** There are challenges with sharing government data across ministries and among stakeholders. Although, disaster management data is largely accessible for free through the Sendai Framework Monitor<sup>80</sup>, each institution has its own data sharing policies. Data is often considered proprietary or confidential. Indeed, one stakeholder interviewed noted that leaders are reluctant to share data and *“sometimes you have to fight to get it.”* The effort to create open-source data for use in modelling exposure is complicated by a new bill<sup>81</sup> tabled in September 2018 and signed into law by the President shortly thereafter to make amendments to the Statistics Act No. 9 of 2015<sup>82</sup>. The amendments include prohibiting anyone/institutions from publishing statistics without authorisation by the National Bureau of Statistics (NBS). The amendments include extending the authority of the bureau to effectively “initiate, correct and even nullify official statistics collected through research or survey<sup>83</sup>.” It also makes changes to the definition of ‘official statistics’ to mean statistical information produced, validated, compiled and disseminated by or under authority of the bureau only, therefore excluding other government institutions and agencies. **This centralisation of power around official information is troubling and it is unclear how the passage of this law will affect METEOR and other similar projects.** For example, there is a risk that the HOT data on exposure will not be accepted by government. The government

<sup>79</sup> Currently using Landsat DEM - 90 m resolution – country wide. Limitations to real time seismic data – no telemetered data, no automated signal processing.

<sup>80</sup> <https://sendaimonitor.unisdr.org/>.

<sup>81</sup> The Written Laws Miscellaneous Amendments Act No. 3 of 2018.

<sup>82</sup> To suit the amendments in the Act, the process of making changes to the Statistics Regulations of 2017 has started.

<sup>83</sup> See Articles 18 and 19 of the bill.



## *METEOR Baseline Evaluation Report*



has not been extensively involved in the process of generating these data and so there is a certain level of mistrust. This lack of acceptance can also lead to costly duplication. For example, the government recently posted a tender to re-digitise all of Dar es Salaam as a pilot. These data would duplicate information that is already publicly available. Efforts are on the way from HOT to engage with government on a more regular basis to facilitate understanding and acceptance of the data.

**Other barriers to data sharing and access include an unstable Internet**, which prevents users from downloading large datasets. **A second barrier relates to data costs**. Data, in particular high resolution satellite data, are expensive and therefore hard for many government and civil society stakeholders to access.

### **Lack of public awareness of DRRM issues**

One theme that came out clearly across all types of stakeholders in DRRM was the **need to raise the awareness of the public on the threat of hazards**. Those interviewed stressed the need for public education on the risk hazards pose, how land-use behaviours exacerbate these risks, and how to take action in the event of a disaster.

### **Human-generated issues such as urbanisation, population growth and land use**

One stakeholder highlighted human-generated issues such as urbanisation, population growth and land use changes as major challenges in relation to planning for and responding to a disaster. Stakeholders interviewed point to **upstream agriculture related activities** such as irrigation resulting in sedimentation changes and ultimately increasing flooding events. Lack of coordination between different stakeholders results in inconsistencies as some institutions issue permits for activities along water bodies that ultimately undermine the function of water management authorities. This lack of process has the potential to lead to **building in unsuitable areas**. Some early initiatives to **develop integrated water resource development plans for water basins** are underway. The plans might address some of the existing inconsistency as the process brings together different stakeholders.

### **Weaknesses in coordination**

Similar to the challenges in Nepal, there is an issue of overall government coordination around DRRM. The 2015 DRM Act addresses these issues of coordination with the establishment of the **Disaster Management Authority (DMA) and related structures at the sub-national level**; however, these agencies are **not yet fully functional**. Government in Tanzania tends to operate in a hierarchical fashion with lines of authority within Ministries, and then across Ministries. To coordinate despite such ingrained habits, especially when under time pressure, takes effort and authority. This has been recognised in the Act, which forms an Agency to sit outside of the hierarchical Ministerial structures.

Furthermore, this relatively explicit vertical coordination to address DRM within the process of decentralisation does not address coordination across actors outside of government. **Coordination across government, development partners, private sector actors, and civil society appears to be limited** (e.g. to meetings of the National Platform for Disaster Management (NDMP) in DRR and to individual disasters in DRM). This issue is **exacerbated by the move of government from Dar es Salaam to Dodoma** as most stakeholders outside government are still headquartered in Dar es Salaam, posing challenges to regular meetings.



## *METEOR Baseline Evaluation Report*



**The NDMP, a convening body of such actors, is by law supposed to meet twice a year, but to date these meetings have not been regular<sup>84</sup>.** To convene so many stakeholders uses a lot of time and expense in preparation and, with the resource and capacity limitations in government, this may affect the regularity of the meetings.

For the government to be more effective, there needs to be more collaboration between all stakeholders at all levels (technical and non-technical) in dealing with geo-hazards. Indeed, one stakeholder noted that collaboration between the municipal departments and the PMO was key to the success of the resettlement in the previous flood events.

---

<sup>84</sup> The NPDM met in January and November 2018



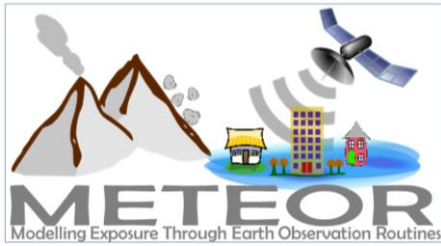
## METEOR Baseline Evaluation Report



### 4.3.4. Data sources

Table 21: Tanzania DRRM data sources

Name	Description
<b>Ministry of Lands (MoL)</b>	<ul style="list-style-type: none"> <li>Ministry of Lands is working on a database for mapping on land use – a tool and guidance for PMO and MoL to know what is happening. This has not yet been started</li> </ul>
<b>National Water Basin Boards</b>	<ul style="list-style-type: none"> <li>National Water Basin Boards (such as the Wami – Ruvu) have access to various technologies for monitoring river discharge and ground water resources. Wami – Ruvu have access to: river gauging stations, weather stations and piezometers. The data from the gauging stations and weather stations is telemetered; data from the borehole piezometers is collected every 3 months. Data from boreholes is used to plan water extraction for housing / industry, data from the gauging and weather stations is of use for flood assessment. Currently there is no EWS mechanism. Primary limitation of data availability is vandalism of equipment, which results in stations occasionally being offline.</li> </ul>
<b>Geological Survey of Tanzania</b>	<ul style="list-style-type: none"> <li>GST archive: so all data used for exposure and risk assessment is generated from GST</li> <li>Geological data – GST seismometers – have seismic data from 9 stations. The data from these has to be manually collected (every 3 months) and then signals must be manually picked. Seismic monitoring in real time would require: densifying the seismic network, developing the capacity to telemeter data to GST and signal processing software.</li> </ul>
<b>Open Source</b>	<ul style="list-style-type: none"> <li>Remote sensing (open source) – helps but the resolution is not high enough</li> </ul>
<b>Administrative boundaries data</b>	<ul style="list-style-type: none"> <li>Ministry of Lands and Local Government custodians</li> </ul>
<b>National Bureau of Statistics</b>	<ul style="list-style-type: none"> <li>Statistical information</li> </ul>
<b>University of Dar es Salaam</b>	<ul style="list-style-type: none"> <li>PhD student focusing on Msimbazi Valley (She is an employee of NEMC) – using remote sensing and climatic data to model floods from 1980s to now and to predict future events.</li> </ul>



## METEOR Baseline Evaluation Report



<b>HOT</b>	<ul style="list-style-type: none"> <li>• Since 2015 HOT has been doing work with the Ramani Huria<sup>85</sup> project. Ramani Huria (Swahili for “Open Map”) is a community-mapping project, with the aim to map Dar es Salaam with a particular focus on its flood vulnerable wards Phase 2(B). 44 wards out of 94 wards in DSM tracking buildings (material), roads (material), draining and flood extent data. Data from 26 wards in 2015. Phase 2: less manual mostly validation and cleaning</li> <li>• They also have rain data and flood extent for 27 wards. (Drainage data- drains, culverts and ditch).</li> <li>• HOT will be involved in the census 2022 with the NBS</li> <li>• Confirmed that Government has released a tender to digitise Dar Es Salaam. COWI and HOT and others have submitted proposals for the tender. They are hoping they will win this and be able build on already existing data at HOT.</li> </ul>
------------	--

Source: Authors

---

<sup>85</sup> Ramani Huria, led by HOT has trained over 300 university students and community members to map their own wards, creating highly accurate maps of a very large part of Dar es Salaam, with particular focus on the most flood-prone areas. The operating principle of the project is to engage local people using local devices and using open knowledge to build their own resilience. The project teaches communities on how to use open software using their own mobile phones to collect flood data in their own neighbourhoods. In addition, communities are also engaged to prepare their own Asset and Threat Inventory. This initiative feeds into pillar one of TURP (World Bank 2018).





## *METEOR Baseline Evaluation Report*



## 5. Conclusions

### 5.1. Summary of key findings

Based on the themes that emerged during the baseline interviews, the METEOR team has identified the following key themes most relevant to the project.

- **METEOR projects and datasets need government backing to ensure project impact and sustainability.** Many stakeholders expressed the importance of working closely with government to ensure the success and sustainability of the project. Government engagement is critical at both the technical level (training government scientists as key users and future trainers of the data) and at the policy level – to ensure there is government buy-in of METEOR products. There was a general feeling that the government needed to take the lead for the project to be successful in the longer-term. Furthermore, as both the country case studies and the global study revealed, there are challenges with government when it comes to the use and sharing of data. Therefore, government ownership of METEOR products will be critical for sustainability.
- **There is a need for more centralised and open source data repositories of exposure data.** Stakeholders in both countries stressed the need for more open-source central repositories of exposure, hazard, and vulnerability data. Ideally, these central repositories would be owned and managed by government. While establishing such repositories is outside METEOR's scope, the METEOR team should focus on getting METEOR datasets onto government platforms so that these data are accepted and thus can be used by a broader set of stakeholders who are required to use 'government' data in official reports.
- **DRRM data, including exposure data, are complex and, beyond technical circles, it is not widely understood how to use these data for effective policy-making.** Both the global study and country case study workstreams revealed that understanding how to use exposure and broader DRRM data to influence policy around risk mitigation and response is a challenge, in particular for non-scientist policy-makers within government. Therefore, how to communicate these complex ideas is of critical importance.
- **Both pilot countries have made recent progress in legislation around DRRM, however both are struggling to operationalise new policies in light of parallel processes of federalisation (in Nepal) and devolution (in Tanzania).** Both Nepal and Tanzania have recently enacted legislation around DRRM. These efforts demonstrate a strong interest in government to address climate change and DRRM challenges. At the same time, both countries are still in the process of operationalising these policies. In Nepal there are challenges of how the newly established National Disaster Risk Reduction and Management Authority will work within the context of the federalisation of government. Similarly, in Tanzania, the new Disaster Management Act calls for the establishment of a Disaster Management Agency that operates outside the traditional hierarchical structure of government; but it is still unclear how this agency will operate or link with sub-national levels.



## *METEOR Baseline Evaluation Report*



- **Explore how to engage the local/provincial level.** With the federalisation of government, many stakeholders expressed the need to engage and build the capacity of local policy decision-makers. While not within the scope of the project, METEOR should think about ways, perhaps in the future, to engage with sub-national governments. One possibility is to engage the Ministry of Federal Affairs in Nepal and the Ministry of Regional Administration and Local Government in Tanzania, since they engage at the subnational level.
- **Lack of the right kind of data/poor quality of data.** Stakeholders in both countries discussed the challenge of finding complete and accurate datasets around exposure, hazards and vulnerability. While data sets may exist, they are often incomplete or of unknown origin. These pose challenges for data use and comparability. The global study echoed these findings, concluding that incomplete exposure datasets lead to high levels of uncertainty associated with exposure data, limiting their use for pre-positioning of assets, response scenarios, and in the development of insurance products.
- **Coordination of DRRM remains a challenge.** In both countries, stakeholders raised challenges of coordination among DRRM stakeholders, extending across all spheres - public, private, humanitarian/development partners, and civil society. There are many important projects occurring; however, there is concern efforts will be duplicated without better coordination.

### 5.2. Sustainability and project design risks

The baseline reveals several sustainability and project risks that should be monitored as we move forward. These include:

- **Government engagement.** There is a risk that the project will fail to adequately engage key government stakeholders. The result would be that the project outputs would not be broadly taken up and therefore not used beyond project timelines. One solution is to build capacity and engagement with other agencies that work closely with government; but may have broader capacity and commitment to carry on the results.
- **Local government engagement.** As METEOR is currently set up to primarily engage with national stakeholders in Tanzania and Nepal, there is a clear risk to neglect the engagement with and capacitation of local authorities. This would be crucial to maximise METEOR's impact on reducing human and economic losses by natural disasters as sub-national government is often in charge of disaster response, but it is limited by low DRRM awareness and capacity. METEOR needs to work with the two national governments to find ways to adequately engage local authorities and disaster committees.
- **Capacity development.** There is very limited project budget towards capacity development. Given that sustainability is dependent on uptake, which is directly linked to capacity, the programme



## *METEOR Baseline Evaluation Report*



should consider ways to stretch this budget, particularly in the light of devolution and the importance of engaging sub-national actors.

- **Working and thinking politically.** As federalisation/devolution processes are rolled out in both countries, the political economy and governance contexts can change, even drastically. METEOR needs to regularly monitor this situation and work in an adaptive fashion to be able to address key changes in the in-country context efficiently and effectively. The stakeholder mapping exercise carried out during the baseline activities is relevant mitigation measure, which should be followed by the definition of tailored engagement approaches. The team should also work out specific interventions for changes that are likely to happen, such as the operationalisation of the Disaster Management Agency in Tanzania that will replace DMD, or the entering into force of the amendments of the Statistics Act in Tanzania.
- **Coordination with other initiatives.** METEOR is not acting in a void as numerous past and current DRRM initiatives have been identified in both countries. It is therefore very important to exchange knowledge and, where appropriate, coordinate with other initiatives to avoid duplication of efforts and add value to the general DRRM sector.

### 5.3. Recommendations for project implementation

The following recommendations have been distilled from the findings presented in this report.

- **Focus on engaging government and promoting government ownership of METEOR outputs.** METEOR must quickly identify and select the key government departments with whom it will have an active and on-going engagement. The modalities of such engagement (roles and responsibilities) also need to be clearly defined in collaboration with DMD and NSET. The team should also agree on the best ways to actively disseminate updates, information, and communications to other government involved in DRRM, to ensure METEOR products and services are familiar across broader government Ministries.
- **Focus on delivering METEOR datasets onto a broad variety of government and other platforms.** Establishing central government open-source repositories of exposure, hazard and vulnerability data is outside METEOR's scope. However, there ways for METEOR to maximise the access and usability of its data. For instance, METEOR team should focus on getting METEOR datasets onto multiple government platforms so that these data are accepted and thus can be used by a broader set of stakeholders who are required to use 'government' data in official reports. While doing so, the team should emphasise to government counterparts the benefits of centralised data management infrastructure in supporting evidence-based policies and producing substantial savings. Finally, METEOR should also try to link with other key data platforms both locally and globally to ensure broad dissemination of the outputs.
- **Focus on communication of project goals.** To ensure widespread buy-in of METEOR, the team should think carefully through how to pitch the project to different sets of stakeholders. The focus should be on communicating how project outputs are useful to the different end-users and how it can improve



## METEOR Baseline Evaluation Report



the way they work. This will entail tailoring communication products to different users. To ensure sustainability, METEOR should look to developing communications through a consultative process with public, private and civil society. The team should also ensure key documents get translated into the local language.

- **Focus on the capacity** to ensure people are: (i) aware of the datasets; (ii) know how they are constructed and what they can be used for; and (iii) demonstrate with tangible examples how to use. This capacity-building effort should be in partnership with both government and non-government actors who can serve as a bridge in the transfer of knowledge and skills.
- **Develop ‘research into use’ case studies.** Related to capacity building, it will be useful to highlight examples of how the project can contribute to meet some of Nepal’s and Tanzania’s challenges. These will help local stakeholders see in practice how the METEOR data can help them.
- **Explore how to engage the local/provincial level.** With larger federalisation/devolution processes on-going in both Nepal and Tanzania, there is a need to engage and build the capacity of local policy decision-makers. While not within the scope of the project, METEOR should think about ways, perhaps in the future, to engage with sub-national governments.

### 5.4. Learning from the baseline evaluation

It is important that the METEOR team has an opportunity to reflect on the results and findings of the baseline evaluation. The value of the information contained in this report is in it being incorporated into project design and strategy. To this end, OPM will support METEOR to hold a learning event. It is expected that all consortium members will attend this event. OPM will try to schedule the event in conjunction with one of the in-country quarterly in person meetings.

The details of this event are still in development; however, the key agenda items are likely to include the following:

- Synthesis of findings of baseline evaluation
- What was surprising?
- How to turn findings into action - implications for project design
- Break-out discussions on what to change about the project
- A review of the theory of change, to check this still makes sense
- Definition of logframe targets
- A review of our evaluation questions (for follow-up at midline and endline)
- Next steps for each partner to take

The team should also think about holding separate learning events in each country to bring a broad set of stakeholders together in planning next steps. In both countries, development partners have offered to host a gathering and METEOR should consider taking up this offer.



## METEOR Baseline Evaluation Report



### ANNEX 1. Interview Guides

#### METEOR KII FOR INTERVIEWS WITH: NATIONAL ACTORS

##### PREPARATION

<b>Country:</b>			
<b>Name of Interviewee</b>		<b>Title/Role:</b>	
<b>Name of Organization:</b>		<b>Date of interview:</b>	
<b>Name of interviewer</b>		<b>Name of Note-taker</b>	

##### INTRODUCTIONS

*Introduce yourself and inform the respondents about the background of the study and why you are there. Ensure you have **their consent** to proceed with the interview. Let them know that the interview **will take about 1-hour** and that their responses will be anonymous. They can stop anytime if not comfortable with a question. Here is some suggested text:*

*Good morning/afternoon/evening. My name is [.....] from Oxford Policy Management. OPM is working with a consortium of organizations led by the British Geological Society on a project called Modelling Exposure Through Earth Observation Routines or METEOR. METEOR is a three-year project funded by the UK Space Agency to develop new ways of using space-related technologies such as Earth Observation (EO) techniques - particularly satellites - to improve understanding of exposure. Exposure in this context means the location and key characteristics infrastructure such as housing, factories, hospitals, and roads in an area that could be impacted or destroyed by a hazard such as an earthquake or a flood. The primary objective of the project is to develop rigorous and open-source standards and protocols that allow for the quantitative assessment of exposure in a multi-hazard setting. The goal is to help improve the ownership and use of exposure data by national stakeholders who can apply this information for use in disaster risk management and response activities. The project will also work closely with the insurance industry to help support the development of better-informed disaster risk insurance products in ODA countries.*

*We got your name from our local partners [NSET or DMD] as a person who is actively engaged in this area. We would like to ask you a few questions about what you do and your activities around exposure, disaster risk management and response. The interview will take about one hour. The information you give us is confidential and will only be used for reporting purposes. Your name will not be revealed to anyone and your responses will be combined with others to show combined views and opinions. There are no right or wrong answers. It is your true opinion that is important to us.*



## METEOR Baseline Evaluation Report



### DISCUSSION TOPICS

I want to start by getting a better understanding of your organization and your role.

1. Can you talk a little about *[insert name of organisation]* and how it is structured? What is its primary mission/objectives? (*stakeholder mapping*)

2. What is your role in the organization?

3. Can you briefly describe the in-country procedures/processes/policies the government and other stakeholders undertake around **disaster preparedness and planning**? Is your organization involved? What other organizations are involved? *PROBE* here for working groups, regular meetings they have each year, programs or initiatives with supporting documents, regular documents that are produced or reviewed? How all of these efforts are financed? (*Impact 1.2 and outcomes 2.1 and 3.1*)

4. Can you talk about the most recent disaster *[insert name of disaster]* and describe the types of procedures/processes the government and other stakeholders undertook in the **response**? Is your organization involved? What other organizations are involved? *PROBE* here for task forces? Who has authority to determine disaster? How government, private sector and civil society work together? If they work together? Who are the various agencies involved and their respective roles? Probe to get the names of documents/laws/policies, etc. (*Impact 1.2 and outcomes 2.1 and 3.1*)





## METEOR Baseline Evaluation Report



5. Are you familiar with the process of assessing the risks of a disaster? If yes, can you describe in more detail what data or information is used to assess risk? What types of models are used? Where the information comes from? Who is involved?

6. In your opinion, what are the major challenges facing [Nepal/Tanzania] when it comes to planning for and responding to a disaster?

7. I am now going to ask you about a series of words/concepts related to planning and responding to a disaster. For each concept I will ask you to describe what the concept means to you and briefly discuss if or how you use this concept in your work. Review the rating scale before proceeding. (impact indicator 3, outcome indicators outcome 1.1 and 2.1)

Interview rate level of understanding 0 = Does not a clear idea of the concept 1 = familiar with the term; and can provide a definition 2= very familiar with the term and use it regularly in their work		1. What the terms means to the stakeholder 2. If/how the stakeholder uses this concept in their work
Concept	Rating	
Disaster Risk Reduction (DRR)		
Vulnerability		
Exposure (data)		
Hazard		
Risk		
Loss estimation models		
Uncertainty (in terms of disaster risk)		





## METEOR Baseline Evaluation Report



8. **ONLY FOR THOSE THAT DO RISK ASSESSMENT IN THEIR WORK:** What kind of data and information do you use to assess exposure and disaster risk in your work? How do you access these datasets? Where do they come from? What are the challenges in using these data sets? How can we improve these data sets to make better use of them in emergencies? What kind of additional skills training would you like to see within your organization around data? (Outcome 2.2)

9. **ONLY FOR NON-TECHNOCRATS THAT DON'T USE DATA SETS:** What type of data/information do you use in your work? How do you access this information? Where does it come from? What, if any, are the challenges of the information? (Outcome 2.2)

10. In your opinion, what is needed to improve the effectiveness DRM/DRR efforts within government, civil society and the private sector? **PROBE:** What would you use the finances for? *training/education, risk awareness and communication activities, etc. (outcome 1.2 and impact 3)*

**Thank the person you are interviewing for their time and ask whether the respondent has any questions for you.**

### FOR THE NOTETAKER AND INTERVIEWER

After the interview, in this area, please enter any other interesting information about the interview. For example, do you think the group was being open? Were they holding anything back?



## METEOR Baseline Evaluation Report



### METEOR KII FOR INTERVIEWS WITH: GLOBAL STUDY: HUMANITARIAN ORGANIZATIONS

#### PREPARATION

<b>Country:</b>			
<b>Name of Interviewee</b>		<b>Title/Role:</b>	
<b>Name of Organization:</b>		<b>Date of interview:</b>	
<b>Name of interviewer</b>		<b>Name of Note-taker</b>	

#### INTRODUCTIONS

Introduce yourself and inform the respondents about the background of the study and why you are there. Ensure you have **their consent** to proceed with the interview. Let them know that the interview **will take about 1-hour** and that their responses will be anonymous. They can stop anytime if not comfortable with a question. Here is some suggested text:

Good morning/afternoon/evening. My name is [.....] from Oxford Policy Management. OPM is working with a consortium of organizations led by the British Geological Society on a project called Modelling Exposure Through Earth Observation Routines or METEOR. METEOR is a three-year project funded by the UK Space Agency to develop new ways of using space-related technologies such as Earth Observation (EO) techniques - particularly satellites - to improve understanding of exposure. Exposure in this context means the location and key characteristics of people and infrastructure such as housing, factories, hospitals, and roads in an area that could be impacted or destroyed by a hazard such as an earthquake or a flood. The primary objective of the project is to develop rigorous and open-source standards and protocols that allow for the quantitative assessment of exposure in a multi-hazard setting. The goal is to help improve the ownership and use of exposure data by national stakeholders who can apply this information for use in disaster risk management and response activities. The project will also work closely with the insurance industry to help support the development of better-informed disaster risk insurance products in ODA countries.

We would like to ask you a few questions about what you do and your activities around exposure analysis and disaster risk management and response. The interview will take about one hour. The information you give us is confidential and will only be used for reporting purposes. Your name will not be revealed to anyone and your responses will be combined with others to show combined views and opinions. There are no right or wrong answers. It is your true opinion that is important to us.



## *METEOR Baseline Evaluation Report*



### DISCUSSION TOPICS

**I want to start by getting a better understanding of your organization and your role.**

- 1. Can you talk a little about [*insert name of organization*] and how it is structured?  
What is its primary mission/objectives?**

- 2. What is your role in the organization?**

- 3. In your opinion, what are the major challenges facing less developed countries  
when it comes to improving DRM/DRR and disaster response?**

- 4. Are you familiar about the process of assessing exposure and the risks of a  
disaster?**
  - If yes, can you describe in more detail what data or information is used to  
assess risk? What type of data sets/models does your organization use?  
Where the information comes from? How do you access this information?  
Who else is involved?**
  - If yes, what do you see as the major challenges with the data sets that  
underpin these types of risk assessments? In your opinion, how can we  
improve these data sets to make better use of them in emergencies?**



## METEOR Baseline Evaluation Report



- If no, what type of data/information do you use in your work? How do you access this information? Where does it come from? What, if any, are the challenges of the information?

5. Describe METEOR's work (protocols and data sets) and ask about their interest. PROBE: what would be most useful to them? How would they use these datasets/protocols to help improve their work?

6. In your opinion, what is needed to improve the effectiveness of DRM/DRR within less developed countries?

*Thank the person you are interviewing for their time and ask whether the respondent has any questions for you.*

### FOR THE NOTETAKER AND INTERVIEWER

After the interview, in this area, please enter any other interesting information about the interview. For example, do you think the group was being open? Were they holding anything back?



## METEOR Baseline Evaluation Report



### METEOR KII FOR INTERVIEWS WITH: GLOBAL STUDY: INSURANCE ORGANIZATIONS

#### PREPARATION

<b>Country:</b>			
<b>Name of Interviewee</b>		<b>Title/Role:</b>	
<b>Name of Organization:</b>		<b>Date of interview:</b>	
<b>Name of interviewer</b>		<b>Name of Note-taker</b>	

#### INTRODUCTIONS

*Introduce yourself and inform the respondents about the background of the study and why you are there. Ensure you have **their consent** to proceed with the interview. Let them know that the interview **will take about 1-hour** and that their responses will be anonymous. They can stop anytime if not comfortable with a question. Here is some suggested text:*

*Good morning/afternoon/evening. My name is [.....] from Oxford Policy Management. OPM is working with a consortium of organizations led by the British Geological Survey on a project called Modelling Exposure Through Earth Observation Routines or METEOR. METEOR is a three-year project funded by the UK Space Agency to develop new ways of using space-related technologies such as Earth Observation (EO) techniques - particularly satellites - to improve understanding of exposure. Exposure in this context means the location and key characteristics of people and infrastructure such as housing, factories, hospitals, and roads in an area that could be impacted or destroyed by a hazard such as an earthquake or a flood. The primary objective of the project is to develop rigorous and open-source standards and protocols that allow for the quantitative assessment of exposure in a multi-hazard setting. The goal is to help improve the ownership and use of exposure data by national stakeholders who can apply this information for use in disaster risk management and response activities. The project will also work closely with the insurance industry to help support the development of better-informed disaster risk insurance products in ODA countries.*

*We would like to ask you a few questions about what you do and your activities around the use of exposure data in the design and development of insurance products for ODA countries. The interview will take about one hour. The information you give us is confidential and will only be used for reporting purposes. Your name will not be revealed to anyone and your responses will be combined with others to show combined views and opinions. There are no right or wrong answers. It is your true opinion that is important to us.*



## *METEOR Baseline Evaluation Report*



### **DISCUSSION TOPICS**

**I want to start by getting a better understanding of your organization and your role.**

- 1. Can you talk a little about *[insert name of organization]* and how it is structured? What is its primary mission/objectives?**

- 2. What is your role in the organization?**

- 3. In your opinion, what are the major challenges facing less developed countries when it comes to improving DRM/DRR and disaster response?**

- 4. Can you talk to me a bit more about any insurance or financial products your organization is working on related to disaster risk management and focused on LDCs? Do you know of any insurance and or financial products that others are working on in this area?**





## *METEOR Baseline Evaluation Report*



5. What are the major challenges/issues you see when it comes to designing and selling insurance products or other financial products for disaster risk management, in less developed countries?

6. What do you see as the major challenges with the data sets that underpin these types of insurance products or other financial products? In your opinion, how can we improve these data sets to make better use of them in emergencies?

7. Describe METEOR's work (protocols and data sets) and ask about their interest. PROBE: what would be most useful to them? How would they use these datasets/protocols to help improve their work?

8. In your opinion, what is needed to improve the effectiveness of DRM/DRR within less developed countries?

***Thank the person you are interviewing for their time and ask whether the respondent has any questions for you.***



## *METEOR Baseline Evaluation Report*



### **FOR THE NOTETAKER AND INTERVIEWER**

**After the interview, in this area, please enter any other interesting information about the interview. For example, do you think the group was being open? Were they holding anything back?**



# METEOR Baseline Evaluation Report



## ANNEX 2. In-Country Workshop Materials

<



# METEOR Baseline Evaluation Report



## Step 3: Describe a 'best case scenario' for disaster planning and preparedness

Practices/data	Behaviors	Policies
<ul style="list-style-type: none"> <li>What would be the components of a 'best case' system of disaster preparation and planning for geohazards?</li> <li>What data would be available and how would it be used?</li> </ul>	<ul style="list-style-type: none"> <li>How would stakeholders behave in a 'best case' disaster planning and preparedness system?</li> <li>Think about: <ul style="list-style-type: none"> <li>Roles &amp; responsibilities</li> <li>Coordination</li> <li>LT vs. ST in planning</li> <li>Transparency &amp; accountability</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>What policies would be in place in this 'perfect' system?</li> <li>What policies would be removed?</li> <li>What would be the key components in these policies?</li> <li>How would they work at the national level? Local level?</li> </ul>

Think of differences between government, civil society and private sector actors!

04 February 2019

© Oxford Policy Management

9

## Step 4: Describe a 'better' case scenario for disaster planning and preparedness

Practices/data	Behaviors	Policies
<ul style="list-style-type: none"> <li>What are some small changes to practices would demonstrate that things are improving?</li> <li>What small steps would show data availability and use are improving?</li> </ul>	<ul style="list-style-type: none"> <li>What types of small changes in behaviors would indicate that things in the system are improving?</li> <li>What are small steps show data usage by policy makers is improving?</li> </ul>	<ul style="list-style-type: none"> <li>What are small changes to policies that would indicate improvements?</li> <li>What are steps along the way to the approval of a new policy/regulation to show that would show progress?</li> </ul>

Think of differences between government, civil society and private sector actors!

04 February 2019

© Oxford Policy Management

10

## 5. Assess the gaps to be filled

Practices/Data	Behaviors	Policies
<p>For each area, review the key DRM/DRR com that we listed under the situation today. Consider how we described the 'best case' and better case' scenarios and prioritize the list on the basis of what needs the most improvement using the rubric</p>		

Rubric
1. Most in need of improvement
2. Somewhere in between.....
3. Least in need of improvement

04 February 2019

© Oxford Policy Management

11

## 6. Summarize into a Maturity Matrix

	Practices/Data	Behaviors	Policies
Works very well			
Working better			
Not working well			

04 February 2019

© Oxford Policy Management

12

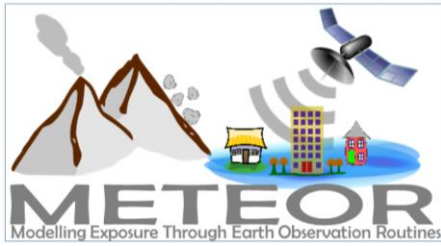
## Next steps in the evaluation

Nov 2018	Collect interview data in Tanzania
Dec 2018	Analyse data
Jan 2019	Get feedback on draft baseline report
Sep 2019	Hold similar workshop with key stakeholders to assess progress

04 February 2019

© Oxford Policy Management

13



## METEOR Baseline Evaluation Report



### ANNEX 3. Logframe Progress

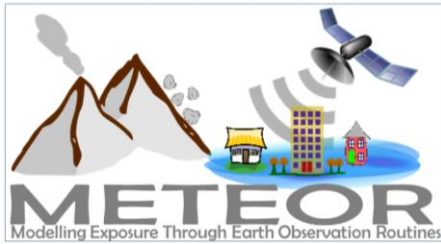
Level	#	Indicator	Baseline	Midline Target	Endline Target
Impact	01	Modelled reduction of deaths, missing persons and directly affected persons attributed to disasters (of similar magnitude and impact) per 100,000 population (disaggregating males and females) in Nepal and Tanzania <b>(aligned with SDG indicators 11.5.1 and 13.1.1)</b>	<ul style="list-style-type: none"> <li>TBC (Subject of the CEA)</li> </ul>	<ul style="list-style-type: none"> <li>TBC (Subject of the CEA)</li> </ul>	<ul style="list-style-type: none"> <li>TBC (Subject of the CEA)</li> </ul>
	02	Total modelled direct avoided economic loss attributed to disasters in Nepal and Tanzania (in GBP £)	<ul style="list-style-type: none"> <li>TBC (Subject of the CEA)</li> </ul>	<ul style="list-style-type: none"> <li>TBC (Subject of the CEA)</li> </ul>	<ul style="list-style-type: none"> <li>TBC (Subject of the CEA)</li> </ul>
	03	Qualitative indicator: progress towards mainstreaming the use of robust DRR data to systematically inform policy changes across public and private sector, and civil society	<p>Baseline findings in <b>Nepal</b> suggest:</p> <ul style="list-style-type: none"> <li>There are good technical people within departments of government; but overall the government struggles with capacity and resourcing.</li> <li>Overall there is a lack of understanding among decision-makers on how METEOR data can be used to help influence policy and practice.</li> </ul> <p>Baseline findings in <b>Tanzania</b> suggest:</p> <ul style="list-style-type: none"> <li>There are technical capacity shortfalls within government which may hinder the use of METEOR products.</li> <li>Existence of maps does not guarantee their usage</li> </ul>	<ul style="list-style-type: none"> <li>TBC (Subject of Annual Learning Event 2019)</li> </ul>	<ul style="list-style-type: none"> <li>Increasing # of examples of a diverse set of stakeholders using exposure, vulnerability, and hazard datasets, including METEOR products, in their work.</li> <li>Government policies and regulations reference DRR data</li> <li>The update and reliable storage of METEOR data/products is part of the mandate/responsibilities of national authorities/institutions/organisations</li> </ul>



## METEOR Baseline Evaluation Report



<b>Outcome</b>	<b>1.1</b>	Qualitative indicator: progress towards effective use of robust DRR data to inform integration of DRR good practice into government policy in Nepal and Tanzania	<p>Baseline findings in <b>Nepal</b> suggest:</p> <ul style="list-style-type: none"> <li>• There are good technical people within individual departments of government; but overall the government struggles with capacity and resourcing.</li> <li>• Overall there is a lack of understanding among decision-makers on how METEOR data can be used to help influence policy and practice.</li> </ul> <p>Baseline findings in <b>Tanzania</b> suggest:</p> <ul style="list-style-type: none"> <li>• There are technical capacity shortfalls within in government which may hinder the use of METEOR products.</li> <li>• Existence of maps does not guarantee their usage</li> </ul>	<ul style="list-style-type: none"> <li>• DRR data such as METEOR products are accepted and used by government actors. Particularly important where strict data use laws are in place (Tanzania).</li> <li>• We can see a proliferation of METEOR and other products <b>available</b> on web portals</li> <li>• See increasing use or reference to evidence-based datasets in discussion</li> </ul>	<ul style="list-style-type: none"> <li>• We can see a proliferation of METEOR and other products being <b>downloaded</b> from web portals</li> <li>• We can see the use of METEOR and other DRR datasets in prepositioning of supplies/materials by government programs.</li> </ul>
	<b>1.2</b>	Feedback from relevant Ministry (or decision-maker) of the usefulness of the datasets for improving their national DRR/DRM ( <b>KPI 1</b> )	<p>In both countries, government officials expressed general interest in the METEOR project and products.</p> <p><b>Nepal</b> findings suggest:</p> <ul style="list-style-type: none"> <li>• Recognition that hazard and exposure data are seldom used in planning for DRR, even when robust data may exist;</li> <li>• There is an increasing demand for these types of products for decision-making;</li> <li>• Existing hazard/exposure data is of poor quality/uniformity or not shared;</li> </ul> <p><b>Tanzania</b> findings suggest:</p>	<ul style="list-style-type: none"> <li>• The level of engagement of Tanzanian and Nepalese governments with METEOR is sustained and maintained positive.</li> </ul>	<p><b>Nepal:</b></p> <ul style="list-style-type: none"> <li>• 3 concrete examples of how government stakeholders are using METEOR products in their work</li> <li>• Adoption of METEOR's exposure and hazard maps/data by the MoHA's procedures for allocating rescue and operations resources in the aftermath of a disaster</li> <li>• Adoption of METEOR's exposure and hazard maps/data by the DWRI in the next due update of their water-induced plans and hazard maps.</li> </ul>

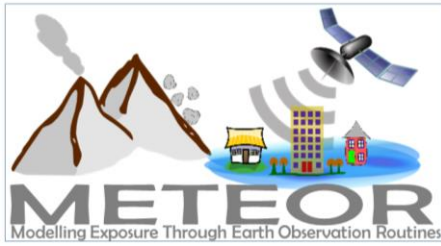


## METEOR Baseline Evaluation Report



		<ul style="list-style-type: none"><li>• Clear interest in METEOR as DMD is a METEOR consortium partner</li><li>• Need for better mitigation strategies to deal with populations located in geo-hazard areas – METEOR will be able to highlight the areas of highest vulnerability</li><li>• The quality and consistency of hazard and vulnerability data across Tanzania varies depending on who has collected it and how it has been archived - Fragmented datasets, no central repository.</li></ul>		
2.1	Qualitative indicator: progress towards effective use of robust DRR data to inform integration of DRR good practice into civil society's and private sector's practices	<p>Baseline findings in <b>Nepal</b> suggest:</p> <ul style="list-style-type: none"><li>• There are numerous NGOs and private organisations focused on DRRM.</li><li>• Some of these organisations are well positioned to (i) lead on disseminating METEOR learnings to sub-national levels of government and (ii) sharing METEOR messages and products regionally</li></ul> <p>Baseline findings in <b>Tanzania</b> suggest:</p> <ul style="list-style-type: none"><li>• The relevant NGO and private sector panorama for METEOR in Tanzania is limited. Universities and the Red Cross appear to be the main primary stakeholders for METEOR outside the public sector</li></ul>	<ul style="list-style-type: none"><li>• Academics and practitioners from NGOs and private sector are familiar with METEOR's objectives and products and can define their concrete uses in their disaster-related work.</li></ul>	<ul style="list-style-type: none"><li>• We can see a proliferation of METEOR and other products being <b>downloaded</b> from web portals</li><li>• Academics and practitioners from NGOs (e.g. NSET, ICIMOD, Red Cross) and the private sector are familiar with and willing to apply METEOR and other DRR datasets in their work.</li></ul>
2.2	Percentage of end users reporting improved capacity to use DRR/DRM protocols and open source datasets	<ul style="list-style-type: none"><li>• Zero (0) percent</li></ul>	<ul style="list-style-type: none"><li>• TBC (Subject of Annual Learning Event 2019)</li></ul>	<ul style="list-style-type: none"><li>• 70 percent</li></ul>

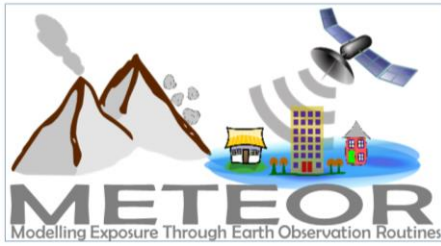




## METEOR Baseline Evaluation Report



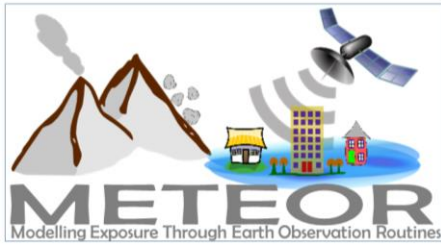
	(disaggregating males and females) <b>(KPI 3)</b>			
<b>3.1</b>	Qualitative indicator: Feedback from UNICEF, UNISDR partners and insurance companies in respect of usefulness of datasets and protocols <b>(KPI 4)</b>	<p>Baseline findings suggest:</p> <ul style="list-style-type: none"> <li>• That global stakeholders believe that METEORs effort to establish standards and a system for the consistent development of robust multi-hazard and exposure data would be helpful to the LDC DRRM landscape;</li> <li>• There was general understanding that the accuracy and acceptance of METEOR datasets will depend on what the data is being used for - that the scale and detail of the exposure data in a given place would determine its fit for use.</li> </ul>	<ul style="list-style-type: none"> <li>• See progression in awareness of the METEOR project within our pilot countries and in international circles</li> <li>• More people within a given agency become interested in learning more about the products;</li> <li>• METEOR project members are asked to give demos or talks about products and protocols</li> <li>• Agencies request (or download) datasets and engage with METEOR members on how to use these data for prepositioning, planning, or in products and services</li> </ul>	<ul style="list-style-type: none"> <li>• Agencies begin testing/using METEOR data/protocols in their work</li> </ul>
<b>3.2</b>	Qualitative indicator: Progress towards creating insurance products informed by METEOR data and/or protocols	<p>Baseline findings suggest:</p> <ul style="list-style-type: none"> <li>• That in LDCs there are limited data and sophisticated tools/models which increase uncertainty, resulting in: (i) lack of insurance cover or (ii) high premium rates for insurance products which makes them inaccessible to most people.</li> </ul>	<p>Indicators of movement towards goal:</p> <ul style="list-style-type: none"> <li>• Insurance companies express more active interest in METEOR products/data – wanting to review datasets and protocols;</li> </ul>	<ul style="list-style-type: none"> <li>• Insurance companies express their interest in using METEOR data and/or protocols to develop new insurance products</li> </ul>



## METEOR Baseline Evaluation Report



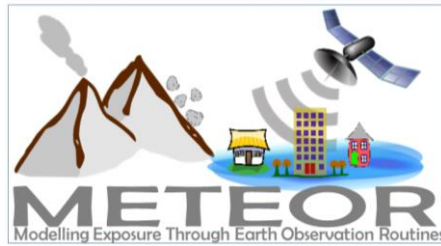
			<ul style="list-style-type: none"> <li>Many of the insurers we spoke with thus have limited or no products available in LDCs.</li> </ul>	<ul style="list-style-type: none"> <li>Insurance companies make requests for datasets for specific locations</li> </ul>	
	3.3	Number of dissemination nodes where METEOR Knowledge Products (KPs) and datasets are available to be accessed	<ul style="list-style-type: none"> <li>Zero (0)</li> </ul>	<ul style="list-style-type: none"> <li>TBC</li> </ul>	<ul style="list-style-type: none"> <li>TBC (Subject of Annual Learning Event 2019)</li> </ul>
Output	1.1	Percentage of professionals trained in Nepal and Tanzania reporting increased knowledge on the training topic (disaggregating males and females)	<ul style="list-style-type: none"> <li>Zero (0)</li> </ul>	<ul style="list-style-type: none"> <li>75 percent</li> </ul>	<ul style="list-style-type: none"> <li>75 percent</li> </ul>
	1.2	Number of professionals trained in Nepal and Tanzania (disaggregating males and females)	<ul style="list-style-type: none"> <li>Zero (0)</li> </ul>	<ul style="list-style-type: none"> <li>TBC</li> </ul>	<ul style="list-style-type: none"> <li>TBC (Subject of Annual Learning Event 2019)</li> </ul>
	1.3	Number of organisations that had representatives trained in Nepal and Tanzania	<ul style="list-style-type: none"> <li>Zero (0)</li> </ul>	<ul style="list-style-type: none"> <li>TBC</li> </ul>	<ul style="list-style-type: none"> <li>TBC (Subject of Annual Learning Event 2019)</li> </ul>
	1.4	Percentage of targeted institutions and organisations in Nepal and Tanzania that had at least two people trained	<ul style="list-style-type: none"> <li>Zero (0)</li> </ul>	<ul style="list-style-type: none"> <li>TBC</li> </ul>	<ul style="list-style-type: none"> <li>TBC (Subject of Annual Learning Event 2019)</li> </ul>
	2.1	Percentage of Nepalese and Tanzanian territory covered by Level 2 multi-hazard exposure data (aligned	<ul style="list-style-type: none"> <li>Zero (0) percent</li> </ul>	<ul style="list-style-type: none"> <li>TBC</li> </ul>	<ul style="list-style-type: none"> <li>100 percent</li> </ul>



## METEOR Baseline Evaluation Report



		with SFDRR Global Target g and Priority Area 1) ( <b>KPI 2a</b> )			
	<b>3.1</b>	Workplan on track to achieve completion within deadline	<ul style="list-style-type: none"> <li>• Yes</li> </ul>	<ul style="list-style-type: none"> <li>• Yes</li> </ul>	<ul style="list-style-type: none"> <li>• Yes</li> </ul>
	<b>3.2</b>	Percentage of approached users reporting satisfaction with METEOR protocols (disaggregating males and females)	<ul style="list-style-type: none"> <li>• Zero (0)</li> </ul>	<ul style="list-style-type: none"> <li>• 95 percent</li> </ul>	<ul style="list-style-type: none"> <li>• 95 percent</li> </ul>
	<b>4.1</b>	Number of Level-1 datasets for LDCs uploaded on online platforms (aligned with SFDRR Global Target g and Priority Area 1) ( <b>KPI 2b</b> )	<ul style="list-style-type: none"> <li>• Zero (0) LDCs</li> </ul>	<ul style="list-style-type: none"> <li>• TBC</li> </ul>	<ul style="list-style-type: none"> <li>• 47 LDCs</li> </ul>
	<b>5.1</b>	Policy paper on the use of national-scale exposure data for insurance and other risk-transfer mechanisms published and shared	<ul style="list-style-type: none"> <li>• Zero (0)</li> </ul>	<ul style="list-style-type: none"> <li>• 0</li> </ul>	<ul style="list-style-type: none"> <li>• 1</li> </ul>
	<b>5.2</b>	Number of communication products shared	<ul style="list-style-type: none"> <li>• Zero (0)</li> </ul>	<ul style="list-style-type: none"> <li>• TBC</li> </ul>	<ul style="list-style-type: none"> <li>• TBC (Communication plan under development)</li> </ul>
	<b>5.3</b>	Number of conferences or workshops hosted or attended by consortium members at which METEOR's findings are shared or discussed	<ul style="list-style-type: none"> <li>• Zero (0)</li> </ul>	<ul style="list-style-type: none"> <li>• 5</li> </ul>	<ul style="list-style-type: none"> <li>• 10</li> </ul>



## METEOR Baseline Evaluation Report



### ANNEX 4. Annotated Bibliographies

#### Tanzania Documents

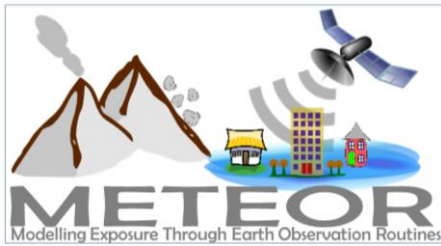
#	Document	Brief description of content and key points
01	<b>United Republic of Tanzania. (2004). National Disaster Management Policy 2004.</b>	<ul style="list-style-type: none"> <li>The policy is the overarching guiding document that provides for the development of a preparedness and mitigation capacities for all kinds of disasters, establishment of collaborative institutional arrangements and promotion of knowledge on disaster management to the public.</li> </ul>
02	<b>United Republic of Tanzania. (2015). Disaster Management Act 2015.</b>	<ul style="list-style-type: none"> <li>The Disaster Management Act of 2015 provides the overarching legal framework for disaster preparedness and response in Tanzania. The key feature of the Act include:</li> <li>The establishment of Disaster Management Agency (DMA) to replace the Disaster Management Department (DMD) within the Prime Minister's Office. The new agency is meant to be the focal point for disaster reduction and management in the country.</li> <li>Establishment of Tanzania Disaster Management Council (TDMC) consisting of Permanent Secretaries (PS) of a number of key Ministries and the Director General (DG) of the Tanzania Meteorological Agency. The chair of Council is the PS of the Ministry responsible for disaster management and the Director General of DMA the Secretary to the Council. The TDMC is meant to oversee the management of the affairs of DMA.</li> <li>Regional, District, Ward, Village (Mtaa) level Disaster Management Committees to support matters related to disaster preparedness and response. Related to this the Minister responsible for Disaster Management may provide guidelines to these committees that prescribe for preparation plans at different levels, mode of communication and dissemination of information relating to disaster risk reduction and management; dissemination of early warning information and running of affairs of the committee.</li> </ul>
03	<b>United Republic of Tanzania (2017). Disaster Management Regulations 2017.</b>	<ul style="list-style-type: none"> <li>These regulations mainly focus on: emergency operations and communication centre, procedure for disaster control and disaster management volunteers. The Regulations place the responsibility for the establishment and maintenance of Emergency Operations and Communication Centre with the Director General (DG), in consultation with the Minister.</li> <li>The DG is the coordinator of all emergency operations. Some of the expected basic equipment required for each operation room at the Centre include; daily weather forecasts reports, maps detailing topography, roads, railways of the disaster area, television screens to project satellite images of the disaster area, situation board for disaster statistics. The regulations proceed to state the rules of engagement and procedures for disaster control for state and non-state actors including volunteers keen to assist. In addition, it includes the criteria for classification of a disaster as a local or district, regional or national disaster.</li> </ul>



## METEOR Baseline Evaluation Report



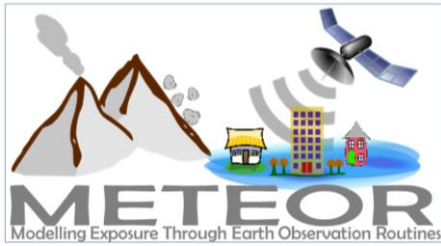
#	Document	Brief description of content and key points
04	<b>United Republic of Tanzania. (2014). National Operational Guidelines for Disaster Risk Management, 2014.</b>	<ul style="list-style-type: none"> <li>• These guidelines provide an overall framework within which all stakeholders (state actors and non-state actors) in disaster management in Tanzania will operate under to prevent, prepare, mitigate and respond to emergencies and disaster situations in order to reduce disaster impact and safeguard the lives of Tanzanian citizens.</li> <li>• The guidelines cover the response part of the disaster management and provides a framework for the development of further detailed sectoral operational plans by several Government agencies, NGOs, Civil Society Organisations (CSOs), international agencies and other stakeholders. It supplements the National Disaster Management Policy, National Disaster Management Act, Tanzania Emergency Preparedness and Response Plan and its associated Communication Strategy. The guidelines provide a code of conduct to guide stakeholder's behaviour as they operate in the entire disaster management cycle.</li> <li>• The guidelines elaborate on the different legal and institutional framework in disaster management nationally, the responsibilities and functions of key players in disaster management and linkages between the different administrative levels and how national legal and institutional framework link up with regional and international plans, strategies, policies. Climate change, gender and vulnerable groups are the two broad cross-cutting issues that the document provides a framework for integration and goes ahead to place the responsibility of ensuring integration of these two issues in disaster management at regional national, district and village levels with the Disaster Management Agency (DMA). The Centre will either be fully or partially activated based on the Tanzania Emergency Preparedness and Response Plan levels.</li> </ul>
05	<b>United Republic of Tanzania. (2017). DarMEART Emergency Response Plan</b>	<ul style="list-style-type: none"> <li>• DarMEART is a multi-agency response team formulated to improve coordination in emergency response and better support the Dar es Salaam/regional Disaster Management Committee. The objective of this new response plan were to strengthen the DarMAERT'S capacity to support emergency response by ensuring that all involved in tackling emergency or disaster know their role, are competent in performing the tasks assigned to them, work together as a partnership and have access to available resources and facilities.</li> <li>• In 2011 a first DarMAERT Emergency Response Plan was drafted but it was not completed, endorsed or implemented. The new plan developed through a consultative and collaborative process involving most DarMAERT members is structured along seven chapters and two annexes, and provides a framework of management, coordination and control within which a team of responders can go about their work during major emergencies caused by either natural or manmade /technological hazards.</li> <li>• Supported technically and financially by World Bank and DfID.</li> <li>• The DarMAERT Emergency Response Plan considers 15 key response functions based on the 2012 Tanzania Emergency Preparedness and Response Plan (TEPRP): Direction and control, Communication and warning, Evacuation, Firefighting, Law enforcement, Health and Medical Services, Search and Rescue, Shelter and mass care, Emergency and Public Information, Damage Assessment, Public works and engineering, Utilities, Resource Management and Supply, Transportation and Dead Bodies Management.</li> <li>• The plan assigns primary and secondary roles to main stakeholders (government departments and agencies and other organizations) and categorize them as primary and secondary/supportive stakeholders so as to ultimately bring order to response operations.</li> </ul>
06	<b>United Republic of Tanzania. (1990).</b>	<ul style="list-style-type: none"> <li>• The Act calls for the establishment of the Tanzania Disaster Relief Committee (TANDREC), which is an Inter-Ministerial Committee set up for overseeing and coordinating overall disaster and relief operations at national level. As per the new Disaster Management Act (2015), this</li> </ul>



## METEOR Baseline Evaluation Report



#	Document	Brief description of content and key points
	<b>Disaster Relief Coordination Act 1990.</b>	committee has been replaced with a high level known as the Tanzania Disaster Management Council (TDMC) which is made up of Permanency Secretaries of all key ministries.
<b>07</b>	<b>United Republic of Tanzania. (2012). Tanzania Emergency Preparedness and Response Plan (TEPRP) 2012.</b>	<ul style="list-style-type: none"> <li>This document sets out the guidelines and operational procedures to enable the Government to save lives, resources and retain a functional government in the event of both man-made/technological and natural hazards. It is based on the Disaster Relief Coordination Act, No. 9, of 1990 and the National Operational Guidelines for Disaster Management. It applies to all government agencies, departments and volunteer organizations who may be involved in a national level emergency or disaster.</li> </ul>
<b>08</b>	<b>United Republic of Tanzania. (2004). Environmental Management Act 2004.</b>	<ul style="list-style-type: none"> <li>The Act provides the institutional and legal framework for sustainable environmental management. It also states the principles for impact and risk assessment, prevention and control of pollution, waste management, environmental quality standards, public participation, compliance and enforcement. It also provides the framework for implementation of international instruments on environment and the National Environment Policy and the establishment of the National Environmental Fund and other related matters.</li> <li>The section on Environmental Emergency Preparedness, calls for the Minister responsible for matters related to the Environment, to prepare environmental emergencies management guidelines. In consultation with the disaster management institution or individual employer the Minister is to also prepare an emergency preparedness plan for the anticipated risk in any area of land or premises. Environmental emergencies range from natural disasters such as floods and droughts to oil spills, fires and other industrial accidents.</li> </ul>
<b>09</b>	<b>United Republic of Tanzania. (2002). National Water Policy 2002.</b>	<ul style="list-style-type: none"> <li>Section 4.8 of the policy on Disaster Management sets out objectives in relation to management of different disasters including floods, droughts, dam safety monitoring and ownership of dams, and accidental water source pollution. With regards to floods the policy sets an objective for the development of mitigation plans.</li> <li>Measures identified that can help mitigate impacts of floods include;</li> <li>Establishment of mechanism for emergency preparedness in collaboration with other sector department and agencies</li> <li>Establishment of early warning systems and flood monitoring stations to allow for timely dissemination of information to the public,</li> <li>Strengthening of existing hydrological stations, identification and mapping of flood prone areas and</li> <li>Discouraging people to settle in flood prone areas are some the measures identified to attain the objective</li> <li>Delineation of hazard prone areas and control of development by the water legislation</li> </ul>
<b>10</b>	<b>United Republic of Tanzania (2011). Urban Planning and Space</b>	<ul style="list-style-type: none"> <li>Provides the space and planning standards for residential areas, recommended minimum space and planning standards for health, education and recreational facilities, service trade and industries, public utility way leaves.</li> </ul>



## METEOR Baseline Evaluation Report



#	Document	Brief description of content and key points
	<b>Standards Regulations, 2011.</b>	
<b>11</b>	<b>United Republic of Tanzania (2007). Urban Planning Act, 2007.</b>	<ul style="list-style-type: none"> <li>The Act sets out the provisions for sustainable development of land in urban areas .It sets out provisions for the control of development of land and planning consent, land purchase, land acquisition and compensation, dispute settlement and other miscellaneous provisions.</li> <li>The Act gives every town council, township authority, city and municipal council the role of planning authority within their respective area of jurisdiction. The respective planning authorities within their areas of jurisdiction establish planning space standards, height, design, density of buildings on land, appearance and sitting of buildings and manner of access to both land and building in accordance with a set of national standards.</li> </ul>
<b>12</b>	<b>World Bank. (2017) . Tanzania Urban Resilience Program Annual Report 2017.</b>	<ul style="list-style-type: none"> <li>The report provides details of the different projects carried out under the programme aim at helping the Government of Tanzania increase disaster and climate risk resilience .The programme has four pillars; risk identification; risk reduction, disaster preparedness and emergency management and the resilience academy.</li> </ul>





## METEOR Baseline Evaluation Report



### Nepal Documents

#	Document	Brief description of content and key points
01	<b>Constitution of Nepal. 2015. Government of Nepal.</b>	<ul style="list-style-type: none"> <li>As the fundamental law and the framework policy for managing governance system, the Constitution of Nepal has introduced a federal system of governance with shared sovereignty and exercise of state power at federal, provincial and local level.</li> <li>The constitution also enshrines a series of rights to citizens that are relevant to the work of an NDRRMA. The constitution has guaranteed every citizen the right to live with dignity, right to inclusion and justice, right relating to property, right to information, right to clean and safe environment, rights relating to education and health, right to food and housing, rights of women and children, rights of dalit<sup>86</sup> and disabled persons, right to social security, rights of senior citizens along with state obligation to implement the rights with appropriate policy, legislative and institutional measures. The constitution is clear on the issues of human security, environmental protection, security and safety by all means.</li> <li>Disaster management responsibility has been entrusted clearly to the federal and local levels and not specifically mentioned for provincial level, but with the concurrent powers of managing disaster at all levels. This implies the need to build capacities at federal, provincial and local levels for effective management of disaster risk reduction in Nepal.</li> </ul>
02	<b>Disaster Risk Reduction National Strategic Action Plan (2018-2030). Ministry of Home Affairs. Government of Nepal.</b>	<ul style="list-style-type: none"> <li>Over the years, the Government of Nepal (GoN) has shifted its focus from a reactive to a proactive approach for disaster risk management (DRM) and has undertaken efforts in strengthening legal frameworks, policy and planning, organizational aspects, institutional capacities and partnerships for DRM. This include; moving from a disaster response oriented legal framework, National Strategy for Disaster Risk Management (NSDRM 2009), transformation from the National Calamity Relief Act 1982 toward DM Bill (currently in in-depth discussion for endorsement), coordinated work for the improvement of overall DRM capacity through Nepal Risk Reduction Consortium, established focal desk for DRM within line ministries, establishment of national multi-stakeholder platform for DRR, to name a few.</li> <li>Further, the Government of Nepal committed to the implementation of the new Sendai Framework for Disaster Risk Reduction 2015-2030 at the Third United Nations World Conference (March 2015) on Disaster Risk Reduction, to enhance efforts to strengthen disaster risk reduction to reduce losses of lives and assets from disasters, increase the capacity for understanding about the disaster risks, strengthen the global cooperation for DRR and establish multi-hazard risk information management / Early Warning Systems (EWS) system for potential disasters worldwide.</li> <li>Globally, 2015 was marked by various global agenda i.e. Sendai Framework for DRR, Financing for Development, SDGs and COP21. Priorities under each global agenda are mutually reinforcing and guide Nepal to further prioritise for the country's resilient and sustainable development.</li> <li>2015 Gorkha earthquake was a catastrophic event, which cost thousands of lives and economic losses to the country. Major disaster risks remain including the recurrence of similar types of flooding, landslides, droughts, GLOFs as well as earthquakes.</li> </ul>

<sup>86</sup> Dalit refers to an ethnic group



## METEOR Baseline Evaluation Report



#	Document	Brief description of content and key points
		<ul style="list-style-type: none"> <li>In this context, Ministry of Home Affairs (MoHA), Prime Minister's Office (PMO), NPC together with key line ministries have started preparation toward a new roadmap for post-2015 framework for Nepal to address priorities under Sendai Framework for DRR. Taking into account the experience gained through the implementation of Hyogo Framework for Action: 2005-2015/NSDRM, lessons from 2015 Gorkha earthquake, and other existing/emerging initiatives around Climate Change and Sustainable Development Goals, the Government of Nepal has initiated the process for formulation of "National Disaster Risk Reduction Policy and Strategic Action Plan".</li> </ul>
03	<b>Disaster Risk Reduction and Management Act, 2017. Ministry of Home Affairs. Government of Nepal.</b>	<ul style="list-style-type: none"> <li>The long-awaited law regarding DRRM was promulgated by the legislative parliament of Nepal in 2074. The DRRM Act 2074 is more comprehensive than the earlier Natural Calamities (Relief) Act 2039. The preamble of the Act recognises the need for addressing all aspect of disaster management in a coordinated and effective manner.<sup>87</sup> The Act, in defining disaster<sup>88</sup>, categorises disasters as natural and non-natural disasters.<sup>89</sup></li> <li>Whilst defining disaster, and stipulating categories of disasters, the Act does not identify climate-induced disaster in explicit terms. In defining natural disaster, the Act recognises disasters such as glacial lake outburst flood (GLOF), drought, flood, landslides, storms, heat and cold waves, among others, which are climate-induced, but it does not recognise climate-induced disaster as a concept. The non-recognition of climate-induced disaster precludes the planners from considering the 'additionality' concept during planning and implementation, respondents argue.</li> <li>The Act also defines disaster risk reduction, disaster response, recovery and management. While defining disaster management, the Act stipulates all cycles of disaster management that include DRR, disaster response and disaster recovery,<sup>90</sup> which may respond to the need of ensuring disaster resilience, during the implementation of the DRR component of the Act. The Act envisions a disaster search and rescue team (an expert group prepared for search and rescue operation which can be mobilised during disaster events).<sup>91</sup> In addition to Gaupalika, the rural municipality, the Act also recognises the district assembly as a local level.<sup>92</sup></li> <li>The analysis of the Act brings us to the conclusion that, unlike its predecessor the DRRM Act 2074 has shifted the way in which the country deals with disasters from mere response and recovery to risk reduction. The Act is more comprehensive than the earlier iteration, and it tries to address different risks and hazards with a multi-sectoral, community-based, multi-scale approach to DRRM through the adoption of different</li> </ul>

<sup>87</sup> Preamble of the Disaster Risk Reduction and Management Act 2074

<sup>88</sup> Section 2(l) of Disaster Risk Reduction and Management Act 2074

<sup>89</sup> Section 2(i) and 2(d) of Disaster Risk Reduction and Management Act 2074. While defining non-natural disaster, it provides 'snowfall, hailstone, avalanche, glacial lake outburst flood, extreme rainfall, flood, landslide and soil-erosion, inundation, drought, storm, cyclone, cold wave, heat wave, lightning, earthquake, volcanic eruption, forest fire or similar other disasters emanating from natural disasters.'

<sup>90</sup> Section 2(q) of Disaster Risk Reduction and Management Act 2074.

<sup>91</sup> Section 2(m) of Disaster Risk Reduction and Management Act 2074.

<sup>92</sup> Section 2(u) of Disaster Risk Reduction and Management Act 2074.



## METEOR Baseline Evaluation Report



#	Document	Brief description of content and key points
		<p>structural arrangements such as councils, executive committees and designated authorities. However, it must be noted that it categorically failed to specifically recognise and address climate-induced disaster.</p> <ul style="list-style-type: none"> <li>This federal 'umbrella law' designed to deal with disaster, at all its cycles and levels, provides an equal amount of opportunity and challenge. The major opportunities remain in providing an integrated, multi-sectoral approach in dealing with disaster. The provision of NDRRMA is an entry point into making disaster an issue that needs to be dealt with beyond the MoHA. Practitioners in disaster risk reduction reflected, however, that the challenge remains in how the MoHA exerts pressure and influence to form the NDRRMA, designating its Terms of Reference (ToR) in executing its functions. As the NDRRMA is under MoHA, which has historically had a strong focus on disaster response, it is critical that the ToR of NDRRMA adequately focuses on all aspects of disaster.</li> </ul>
04	<b>Local Government Operation Act, 2017. Government of Nepal.</b>	<ul style="list-style-type: none"> <li>In order to ensure legal recognition, and define rights, power and functions of local government, Nepal promulgated the Local Government Operation Act 2074 (LGOA). The Act, in elaborating the functions and jurisdiction of local government listed in schedule 8 and 9 of the Constitution, provides a comprehensive list of sole and shared functions of local government in the new federal structure of the country.</li> <li>The Act also details the roles and responsibilities of the local government; a separate heading on 'local market management, environment protection and biodiversity'<sup>93</sup> is provided to articulate relevant provisions that state local environment protection, biodiversity-related laws, standards, plan formulation and implementation, monitoring and regulation, local level environmental risk reduction provisions,<sup>94</sup> low carbon and environment friendly local development,<sup>95</sup> protection and promotion of green areas at the local level,<sup>96</sup> and determination and management of environment protection areas at the local level.<sup>97</sup> Similarly, it charts out the responsibilities of local governments in disaster management, renewable energy, local development and human settlement.</li> <li>The Act also explicitly provides for climate change adaptation—however, this is stipulated in the Transport Permit<sup>98</sup> section of the Act, which most of the respondents view as a mistake. Additionally, the LGOA recognises the need for considering disaster management and climate change adaptation while devising an annual and periodic plan, an entry point echoed by most of the respondents.</li> </ul>

<sup>93</sup> Section 11(2) (j) (12) of Local Government Operation Act 2074.

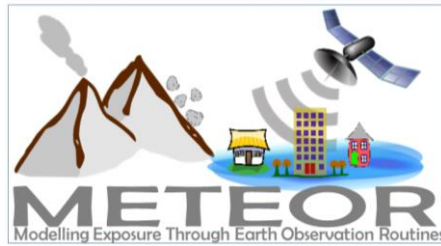
<sup>94</sup> Section 11(2) (j) (13) of Local Government Operation Act 2074

<sup>95</sup> Section 11(2) (j) (16) of Local Government Operation Act 2074

<sup>96</sup> Section 11(2) (j) (17) of Local Government Operation Act 2074

<sup>97</sup> Section 11(2) (j) (18) of Local Government Operation Act 2074

<sup>98</sup> Section 11(4) (k) (3) of Local Government Operation Act 2074



## METEOR Baseline Evaluation Report



#	Document	Brief description of content and key points
05	<b>National Urban Development Strategy (NUDS) 2017. Government of Nepal</b>	<ul style="list-style-type: none"> <li>The NUDS has adopted 'resilience' as one of its guiding principles. Relevant strategies in the NUDS include promotion of a multi-hazard approach to dealing with disasters and climate change; ensuring development of integrated safer settlements; internalisation of a resilience perspective in land use regulations and building codes and by-laws; and enhanced awareness and preparedness to deal with disaster risk and vulnerability at all the levels of government as well as local communities and civic bodies. At the same time, the NUDS makes two important observations: (1) the concept of resilience in Nepal is limited to natural disaster management frameworks and policies, and is yet to be integrated in the urban planning process; and, (2) the existing assessment and preparedness efforts have been mainly concentrated on earthquake, while other potential disasters like flooding, land subsidence and landslides, as well as the much broader issue of climate change remain side-lined. However, the NUDS is silent about an approach to addressing climate issues, for example, whether to view climate change concerns through the lens of disaster or as a stand-alone agenda.</li> <li>The NUDS fails to consider the implications of federal structure of the country on the planned urban systems. The urban systems have been envisioned on the basis of transportation (commuting) networks, trade flows, and the dynamics of existing settlement systems. Although new political demarcations might not significantly alter these equations anytime soon, the urban strategies to be adopted by provinces or municipalities may lead to entirely new urban growth paradigms.</li> <li>In the area of urban governance, the NUDS aims to create an efficient and effective governance infrastructure for urban management and service delivery. The stated strategies include focusing on the 'facilitating' role of the federal level, the 'coordinating' role of the provincial level, and the 'implementing' role of the local level. However, the NUDS is silent about the 'planning' role—exactly who, among the three government tiers, will be responsible for urban planning, and to what extent. Practitioners and academics in urban development stress that this omission provides scope for future power struggles between local and the federal government.</li> </ul>
06	<b>Fourteenth Development Plan. 2016. National Planning Commission Nepal. Government of Nepal.</b>	<ul style="list-style-type: none"> <li>The Fourteenth Plan (2016-19) has envisaged effective management of all forms of disasters to make Nepal a disaster-resilient nation. The Plan strategizes national disaster management capacity by mainstreaming and integration, policy and legal framework, institutional set-up, technical and managerial capacity, and collaboration and partnership building in course of effective disaster risk reduction and management. In institutional set-up, the Plan envisages an on competent national agency to lead, execute and implement DRR policy and programme from national level to local level.</li> </ul>
07	<b>Pokharel, Jagadish C. (2017). Nepal Post Disaster Reconstruction Experience: Current Status and Lessons Learned. A paper</b>	<ul style="list-style-type: none"> <li>The objectives are: a) Increase understanding of the wider economic and financial impacts of 2015 earthquake through analysis of the income, productive capacity, employment and investment; b) Analyse the macro sectors of the economy while providing cursory reflection of the implications on fiscal and trade balances; c) Assess fiscal &amp; monetary policies formulated post-earthquake; and d) Recommend measures and course correction mechanisms for the stakeholders for more credible post disaster economic management.</li> <li>The findings recommend that; a) The government and the central bank must ease terms and conditions for housing grant; b) There is a need to involve private consulting and housing construction companies for public sector housing, given the weak capacity of the Ministries responsible</li> </ul>



## METEOR Baseline Evaluation Report



#	Document	Brief description of content and key points
	<b>presented and discussed in South Asia Watch on Trade, Economics and Environment (SAWTEE) Dialogue on Post Disaster Reconstruction. Kathmandu</b>	for housing construction; c) The government should hold another external donor meeting to reassure pledges for necessary resources; and d) Need to make NRA a well-functioning and stable entity with the support of all stakeholders.
08	<b>Ministry of Home Affairs (2017). <i>National Position Paper on Disaster Risk Reduction and Management Nepal (NDR)</i>. Government of Nepal.</b>	<ul style="list-style-type: none"> <li>• The main purpose of NDR 2017 is to highlight Nepal's experiences in DRM over the last two years (2015 and 2016), documenting key lessons and challenges in the course of managing disaster risk and identifying future priority actions for effective disaster response, risk reduction and recovery.</li> <li>• Chapter 1 is introduction, containing the background, purpose and process of NDR 2017 and a summary of the methodology, key messages of the earlier NDRs and lessons learnt from the Hyogo Framework for Action (HFA). Chapter 2 is a review and analysis of disaster statistics from 2015 and 2016, a review of the DIMS and disaster management stakeholders, key hazards, issues of safeguarding development gains. Chapter 3 describes the 2015 mega-earthquake, documenting experiences on relief operation, recovery and reconstruction and volunteerism. Chapter 4 focuses on DRM regulatory frameworks such as the Constitution of Nepal (2015), DRRM Act (2017), and other policy frameworks. Chapter 5 describes how to achieve SFDRR based on HFA achievements, initiatives taken since Yokohama Strategy (1994) and other international commitments and efforts on mainstreaming Disaster Risk reduction (DRR) and Climate Change Adaptation (CCA) into development process. The last chapter, Chapter 6 focuses on how Nepal can achieve SFDRR targets within its stipulated time frame (together with SDGs), possible challenges while striving to achieve SFDRR and key priorities for the next few years.</li> <li>• The NDR 2017 identifies a number of priority action areas that could be considered for the next few years or so. They are: 1. creating an effective institutional set up as provisioned under the new Disaster Risk Reduction and Management Act, 2017. 2. Capacity building at all levels of the government for disaster risk reduction, preparedness, and response and recovery. 3. Instituting a practice of risk-informed development and mainstreaming DRR and CCA into sectoral development planning. 4. Ensuring allocation of adequate funding for DRR and CCA at all levels. 5. Empowering province and local governments for effective leadership role in disaster risk reduction and management. 6. Setting up an effective Disaster Information Management System (DIMS) at the central and province levels as a one-stop information hub. 7. Ensuring Gender Responsive Disaster Risk Reduction and Management. 8. Strengthening national capacity of SAR to the level of the International Search and Rescue Advisory Group (INSARAG) standards</li> </ul>



## METEOR Baseline Evaluation Report



#	Document	Brief description of content and key points
09	<b>Nepal Earthquake 2015 Post-Disaster Recovery Framework National Reconstruction Authority</b> <b>Government of Nepal Kathmandu, April 2016</b>	<ul style="list-style-type: none"> <li>The Post-Disaster Recovery Framework (PDRF) was prepared under the leadership of the NRA, in consultation with key stakeholders, to provide a systematic, structured and prioritized framework for implementing recovery and reconstruction. It is a common framework meant to serve all of government, as well as national and international partners and other recovery stakeholders, including the affected population.</li> <li>This Framework document encapsulates the vision and strategic objectives that guide recovery. In addition, it encapsulates the policy and institutional frameworks for recovery and reconstruction, as well as outlining implementation arrangements, projected financial requirements and immediate next steps necessary to ensure implementation of the Framework, of recovery and reconstruction activities.</li> <li>The PDRF lays out strategic recovery objectives and summarizes in an integrated manner the policy decisions, institutional arrangements, financing and financial management strategies, as well as implementation and monitoring systems that are being put in place to plan and manage recovery and reconstruction. It also sets out sector priorities that will contribute to the achievement of the strategic recovery objectives.</li> </ul>
10	<b>Nepal Flood 2017: Post Flood Recovery Needs Assessment November 2017</b>	<ul style="list-style-type: none"> <li>The Post Flood Recovery Needs Assessment (PFRNA) presents an objective basis for recovery planning as well as measures for reducing future risks. There are pockets of acute poverty and vulnerability in the Terai-Madhesh. The Recovery Strategy presents a roadmap through which the Government of Nepal aims to undertake the ambitious task of recovery in concert with the private sector, development partners and non-governmental alliances.</li> <li>The Assessment of disaster effects and recovery needs is led by the National Planning Commission (NPC) in close coordination with the Ministry of Home Affairs (MOHA) and other line ministries. The Assessment reflects the spirit of the recently enacted Disaster Risk Management Act, which provides an opportunity for all stakeholders to band together in pursuit of a more resilient Nepal through pre-disaster preparedness and post-disaster response. This is also a clear signal of our national commitment to the Sendai Framework, the global compact for disaster risk reduction.</li> <li>The chapter, in this report, presents a detailed analysis of disaster effects and recovery needs. This is followed by the Recovery Strategy to be implemented in the immediate, medium and long-term within a span of three years. Part II of this report proposes the resilience framework to address the underlying vulnerabilities and risks that exist in the Terai region.</li> </ul>