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METEOR: MODELLING EXPOSURE THROUGH EARTH OBSERVATION ROUTINES

UK SPACE AGENCY

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British Geological Survey
Expert | Impartial | Innovative

FATHOM

GEM
GLOBAL EARTHQUAKE MODEL
working together to assess risk

Oxford Policy Management

HOT

ImageCat

NSET
Earthquake Safe Communities in Nepal

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Glossary

BGS	British Geological Survey: The UK national geoscience organisation focusing on public-good geoscience for government, and research to understand earth and environmental processes in the UK and internationally
BIPAD	Building Information Platform Against Disaster, Nepal
CAT	Catastrophe
CBO	Community Based Organisations
CBS	Central Bureau of Statistics, Nepal
CDO	Chief District Officer
CEA	Cost-Effectiveness Analysis
COSTECH	Commission for Science and Technology, Tanzania
CP	Communication Product
DDMC	District Disaster Management Committee
DFID	Department for International Development
DHM	Department of Hydrology and Metrology, Nepal
DMA	Disaster Management Agency, Tanzania
DMD	Disaster Management Department: Prime Minister's Office of Tanzania focused on disaster risk
DMG	Department of Mines and Geology, Nepal
DPNet	Disaster Preparedness Network - Nepal
DRM	Disaster Risk Management
DRR	Disaster Risk Reduction
DRRM	Disaster Risk Reduction and Management
DUDBC	Department of Urban Development and Building Construction, Nepal
EQ	Evaluation Question
FAO	Food and Agriculture Organization of the United Nations
Fathom	Provides innovative flood modelling and analytics, based on extensive flood risk research
FGD	Focus Group Discussion
GBP	Great British Pounds (£)
GDP	Gross Domestic Product
GEM	Global Earthquake Model: Non-profit organisation focused on the pursuit of earthquake resilience worldwide
GFDRR	Global Facility for Disaster Reduction and Recovery
GoN	Government of Nepal

GoT	Government of Tanzania
GST	Geological Survey of Tanzania
HOT	Humanitarian OpenStreetMap Team: A global non-profit organisation the uses collaborative technology to create OSM maps for areas affected by disasters
ICIMOD	International Centre for Integrated Mountain Development
IDF	Insurance Development Forum
IIAG	Insurance Industry Advisory Group
ImageCat	International risk management innovation company supporting the global risk and catastrophe management needs of the insurance industry, governments and NGOs
IPP	International Partnership Programme
KII	Key Informant Interview
KP	Knowledge Product
KPI	Key Performance Indicator
LDC	Least Developed Country
LDMC	Local Disaster Risk Reduction and Management Committee
M&E	Monitoring & Evaluation
METEOR	Modelling Exposure Through Earth Observation Routines
MEWRI	Ministry of Energy, Water Resources and Irrigation, Nepal
MoFAGA	Ministry of Federal Affairs and General Administration, Nepal
MoHA	Ministry of Home Affairs, Nepal
NAST	National Academy of Science and Technology, Nepal
NBS	National Bureau of Statistics, Tanzania
NCDRRM	National Council for Disaster Risk Reduction and Management, Nepal
NDRRMA	National Disaster Risk Reduction and Management Authority, Nepal
NEOC	National Emergency Operation Centre, Nepal
NGO	Non-Governmental Organisation
NPC	National Planning Commission, Nepal
NPR	Nepalese Rupee
NRA	National Reconstruction Authority, Nepal
NSET	National Society for Earthquake Technology: Non-governmental organisation working on reducing earthquake risk in Nepal and abroad
ODA	Official Development Aid
OPM	Oxford Policy Management Limited: Organisation focused on sustainable project design and implementation for reducing social and economic disadvantage in low-income countries

PDMC	Provincial Disaster Risk Reduction and Management Committee
PEA	Political Economic Analysis
PM	Project Manager
QA	Quality Assurance
QM	Quarterly Meeting
SDGs	Sustainable Development Goals
TADMAC	Tanzania Disaster Management Committee
TMA	Tanzania Meteorological Academy
ToC	Theory of Change
TRCS	Tanzania Red Cross Society
TU	Tribhuvan University, Nepal
TURP	Tanzania Urban Resilience Project
UDOM	University of Dodoma
UDSM	University of Dar es Salaam
UKSA	United Kingdom Space Agency
UN	United Nations
UNDP	United Nations Development Programme
UNHCR	United Nations Humanitarian High Commissioner for Refugees
UNICEF	United Nations Children's Emergency Fund
UNISDR	United Nations Office for Disaster Risk Reduction
USAID	United States Agency for International Development
WB	World Bank
WFP	World Food Programme
WHO	World Health Organisation
WP	Work Package (of the METEOR project)
WP2	Work Package 2 - M&E Activities
YILabs	Youth Innovation Labs, Nepal

Executive Summary

METEOR (Modelling Exposure Through Earth Observation Routines) is a project led by the British Geological Survey (BGS) with six consortium partners who bring a range of technical skills, experience and networks to contribute to the project impact of reduced human and economic tolls of geohazard in Nepal and Tanzania. National partners are the National Society for Earthquake Technology (NSET) in Nepal, and the Disaster Management Department (DMD) within the Office of the Prime Minister in Tanzania. The project will deliver detailed building exposure data to these two governments, together with national hazard footprints for specific geohazards, vulnerability data models that map the interaction of multiple hazards, and open protocols describing the steps used to produce the datasets. These products can be used by governments to inform policies, plans and practice relating to Disaster Risk Reduction and Management (DRRM). Less detailed exposure data will be made available for all other Official Development Aid (ODA) countries, often also referred to as Least Developed Countries (LDCs).

This document gives the results of data analysis carried out as part of the **midline evaluation** of the project carried out by Oxford Policy Management (OPM). It has been prepared with input from all consortium partners and support from Caribou Space (the provider of Monitoring and Evaluation (M&E) services to the funder, the UK Space Agency (UKSA) International Partnership Programme (IPP)).

The **objectives** of the midline are to test sustainability, relevance, efficiency and effectiveness. Insights are also sought into the co-development aspects of the data models.

The **methodology** combined a light-touch process evaluation which involved talking to key staff in most of the consortium partners, a formative evaluation using case studies for Tanzania and Nepal as well as a global case study. For the last study, Key Informant Interviews (KIIs) were carried out with representatives from the METEOR Advisory Board. The methodology was shaped by the unusual nature of the pace of delivery for the project when most key deliverables' due dates are towards the end of the project. An addendum will be produced in July 2020 once more stakeholders have seen project outputs.

In terms of the project meeting midline targets, the table below **summarises progress** using a Red, Amber, Green (RAG) codification. It should be noted that only those indicators with midline targets are included in the summary. The targets include some set by the M&E team to assess progress at this half-way stage. Also, OC denotes outcome targets and OP relate to outputs.

##	Indicator	Data source	Midline target	Achieved
OC 1.1	**Qualitative indicator: progress towards use of project outputs by the governments of Nepal and Tanzania to inform their DRR/DRM decision-making and practice**	KIIs in Nepal and Tanzania	Relevant government stakeholders in Tanzania and Nepal provide **unprompted**, **appropriate** and **realistic** use cases for METEOR outputs to support their DRR/DRM decision-making and practice	Nepal: Achieved / Tanzania: Partially achieved
OC 1.2	**Feedback from relevant Ministry (or decision-maker) on the usefulness of the project outputs for improving their national DRR/DRM (KPI 1)**	KIIs in Nepal and Tanzania	Relevant Ministries in Tanzania and Nepal offer to host METEOR datasets on official/government-led platforms.	Nepal: Achieved / Tanzania: Partially achieved

##	Indicator	Data source	Midline target	Achieved
OC 2.1	**Qualitative indicator: progress towards use of project outputs by "other end-users" (civil society, development partners, private sector, academia) in Nepal and Tanzania to inform their DRR/DRM decision-making and practice**	KIIs & FGD in Nepal only, Project monitoring data	"Other end-users" in Tanzania and Nepal provide **unprompted**, **appropriate** and **realistic** use cases for METEOR outputs to support their DRR/DRM decision-making and practice	Nepal: Achieved
				Tanzania: Partially achieved
OC 3.1	**Qualitative indicator: Feedback from the global community (e.g. UNICEF, UNISDR, WB, GFDRR) in respect of usefulness of project outputs (KPI 4)**	KIIs	Advisory Board members have confidence that METEOR outputs: 1. Can strengthen the discipline around the development of exposure and risk data 2. Will be put at use by their own organisations	Yes
OC 3.3	**Number of dissemination nodes where METEOR KPs and datasets are available to be accessed**	KIIs	0	1
OP 1.2	**Number of professionals trained in Nepal and Tanzania (disaggregating males and females)**	Monitoring data	0	0
OP 2.1a	**Percentage of Nepalese and Tanzanian territory covered by Level 2 exposure data**	Monitoring data	100%	Yes, 100%
OP 2.1b	**Percentage of Nepalese and Tanzanian territory covered by Level 2 multi-hazard data**	Monitoring data	50%	Yes, 50%
OP 3.1	**Workplan on track to achieve completion within deadline**	Monitoring data	No major delays are foreseen in delivering the protocols	Yes
OP 5.2	**Number of communication products shared**	Monitoring data	7 (14 cumulatively)	7 (14 cumulatively)
OP 5.3	**Number of conferences or workshops hosted or attended by consortium members**	Monitoring data	3 (5 cumulatively)	Yes, 6 (9 cumulatively)

While progress is on track in Nepal, there are some challenges specific to Tanzania that are hindering progress, further explored below.

In terms of the **findings**, the consortium members reported good cooperation, excellent coordination by the project manager and appreciation of the regular meetings, in particular those held in Tanzania and Nepal, in building relationships and effectiveness. The project works well at codeveloping outputs, building partnerships, engendering ownership: it benefits from consortium members having worked together before, and the dedicated M&E partner adds value. The project is on track to meet milestones. However, there is room for improvement in the areas of bringing together the workstreams to give a cohesive overview, having a shared understanding of the critical path of activities, and involving more/ different stakeholders. Ensuring capacity development remains a challenge that will be crucial to the success of the project. The project has already dedicated resources to strengthening links, attending key events and holding specific training sessions in Tanzania. Overall the **relevance and effectiveness** were assessed as high, with METEOR providing new levels of detail in classifying building attributes, and the high levels of transparency delivered through co-development and publishing data on open platforms - "global public goods" as one respondent termed it. This resonates well with the global trend towards open access and there are major funders interested in funding potential new, similar products.

A more detailed update of the context in **Nepal** concludes that disasters (including exceptional monsoon rains, floods, landslides and tornadoes) continue to be significant and challenging. The governance of the DRRM sector was updated by the 2019 revision to the DRRM Act but remains complex and multi-layered through the de-concentrated levels of government with a lack of clarity in resourcing and monitoring mechanisms. However, the visual demonstrations of some of the initial METEOR outputs clarified a lot of the complexity for stakeholders in November 2019, creating more confidence in project delivery to add value to DRRM in Nepal. A list was made of the potential users and uses of the data with other organisations offering to host the METEOR data on their portals - see below Country case study findings. Challenges in Nepal include coordinating multiple actors in this dynamic and complex environment, ensuring high quality involvement of local experts in technical aspects of the datasets and models, and ensuring local stakeholders are left with the capacity and confidence to use the data after the project is complete. A planned, local project Advisory Committee should go some way to addressing these issues.

In contrast, **Tanzania** is less focused on technical aspects of the project and more focused on ensuring policies are informed by high quality data and analyses. It shares Nepal's susceptibility to climate-related disasters and a complex, multi-layered legislative framework for Disaster Management, outlined in the 2015 Act which has not yet been fully implemented. The DMD coordinates, formulate policies and plans related to DRM, reporting to the Tanzania Disaster Management Committee (TADMAC), which is made up of the relevant Permanent Secretaries. There are also projects under implementation (e.g. Tanzania Urban Resilience Programme and *Ramani Huria* project) with clear logical links with the role of the DMD, and with the METEOR project. However, there are barriers in the payment system that inhibit smooth operation of the financial aspects of METEOR and therefore the full participation of DMD as a partner. For example, there has been no DMD representative at meetings outside of Tanzania. There is also confusion over the necessity of accreditation of the project with a local parastatal, the Tanzania Commission for Science and Technology. As a result, while there is appetite for METEOR outputs and DMD senior officials were satisfied with the project management and consortium makeup, there is also a desire to deepen the relationship to ensure sustainability. This includes increasing engagement with the National Disaster Management Platform. Despite the limitations, an initial list of uses of METEOR outputs was identified – see below Country case study findings.

In drawing **conclusions** from the midline, it is clear that the project is on track, well-managed and communications are strong and appropriate. The challenge of fostering ownership of METEOR outputs in Nepal and Tanzania has been facilitated by a physical presence in both countries, and the value of visualisation of the outputs through demonstrations with government and non-government stakeholders in Nepal has been proved. In both countries these gains need to be embedded with targeted capacity development. There is potential to improve co-development aspects in future technical development processes, even if it is to clarify expectations on both sides and allow for further feedback to be provided.

These conclusions lead to **six main recommendations for ensuring national stakeholders use METEOR products**: to prioritise the main users and uses to build sustainability; increasing engagement with influential local stakeholders ("champions") and policy-makers; if the need for accreditation is confirmed, obtain it; use training strategically; test products in specific DRRM activities; and use the endline to assess achievements, and a legacy evaluation to assess whether outcomes and impact have been achieved.

In terms of the outcome relating to the **wider global DRR community, the recommendations** are to increase enthusiasm by live demonstrations of the products with the Advisory Board and then more widely at international events. Targeting governments in other vulnerable ODA countries is also a

priority, using the advantage of established relationships to demonstrate the added value of METEOR products. However, strategies for engaging any kind of stakeholders, both in Tanzania and Nepal and globally, will need to be revised pending the restrictions in travel and social distancing due to the global pandemic of Covid-19.

1. Introduction

1.1. METEOR Project Summary

Table 1: METEOR Project Summary

Title	Modelling Exposure Through Earth Observation Routines (METEOR): EO-based Exposure, Nepal and Tanzania
Starting Date	08/02/2018
Duration	36 months
Partners	Consortium: The British Geological Survey (BGS) (Lead), ImageCat, The Humanitarian OpenStreetMap Team (HOT), Oxford Policy Management Limited (OPM), The Global Earthquake Model (GEM) Foundation, Fathom

International Partners: National Society for Earthquake Technology (NSET) - Nepal, The Disaster Management Department (DMD) – Tanzania |
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
Project Lead	British Geological Survey (BGS)
M&E Lead	Oxford Policy Management Limited (OPM)

1.2. Project Overview

At present, there is a poor understanding of population exposure in some Official Development Assistance (ODA) countries, which causes major challenges when making Disaster Risk Management 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. METEOR is delivering calibrated exposure data for Nepal and Tanzania, plus "Level-1" exposure for the remaining Least developed Countries (LDCs) ODA countries. Moreover, we are: (i) developing and delivering national hazard footprints for Nepal and Tanzania; (ii) producing new vulnerability data for the impacts of hazards on exposure; and (iii) characterising how multi-hazards interact impact upon exposure. The provision of METEOR's consistent data to governments, town planners and insurance providers will promote welfare and economic development and better enable them to respond to the hazards when they do occur.

METEOR is co-funded through the second iterations of the UK Space Agency's (UKSA) International Partnership Programme (IPP), 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.

1.3. Project Objectives

METEOR aims to formulate an innovative methodology of creating exposure data through the use of EO-based imagery to identify development patterns throughout a country. Stratified sampling technique harnessing traditional land use interpretation methods, modified to characterise building patterns, can be combined with EO and in-field building characteristics to capture the distribution of building types. The associated protocols and standards will be developed for broad application to ODA

countries and will be tested and validated for both Nepal and Tanzania to assure they are fit-for-purpose.

Detailed building data collected on the ground for the cities of Kathmandu (Nepal) and Dar es Salaam (Tanzania) will be used to compare and validate the EO generated exposure datasets. Objectives of the project look to: deliver exposure data for 47 of the least developed ODA countries, including Nepal and Tanzania; create hazard footprints for the specific countries; create open protocol; to develop critical exposure information from EO data; and capacity-building of local decision makers to apply data and assess hazard exposure. The eight work packages (WP) that make up the METEOR project are outlined below in section 1.4.

1.4. Work Packages

Outlined below are the eight work packages that make up the METEOR project (Table 2). These are led by various partners, with a brief description of what each of the work packages cover provided in Table 2. BGS is leading WP.6: Multiple Hazard impact, which focuses on the multiple hazard impacts on exposure and how they may be addressed in disaster risk management by a range of stakeholders.

Table 2: Overview of METEOR Work Packages

Work Package	Title	Lead	Overview
WP.1	Project Management	BGS	Project management, meetings with UKSA, quarterly reporting and the provision of feedback on project deliverables and direction across primary stakeholders.
WP.2	Monitoring and Evaluation	OPM	Monitoring and evaluation of the project and its impact, using a theory of change approach to assess whether the associated activities are leading to the desired outcome.
WP.3	EO Data for Exposure Development	ImageCat	EO-based data for exposure development, methods and protocols of segmenting/classifying building patterns for stratified sampling of building characteristics.
WP.4	Inputs and Validation	HOT	Collect exposure data in Kathmandu and Dar es Salaam to help validate and calibrate the data derived from the classification of building patterns from EO-based imagery.
WP.5	Vulnerability and Uncertainty	GEM	Investigate how assumptions, limitations, scale and accuracy of exposure data, as well as decisions in data development process lead to modelled uncertainty.
WP.6	Multiple Hazard Impact	BGS	Multiple hazard impacts on exposure and how they may be addressed in disaster risk management by a range of stakeholders.
WP.7	Knowledge Sharing	GEM	Disseminate to the wider space and development sectors through dedicated web-portals and use of the Challenge Fund open databases.
WP.8	Sustainability and Capacity-Building	ImageCat	Sustainability and capacity-building, with the launch of the databases for Nepal and Tanzania while working with in-country experts.

1.5. About this document

This report has been prepared by Oxford Policy Management as Lead Partner for the Monitoring and Evaluation (M&E) work package. It has been prepared following a process of data collection that took place between October 2019 and January 2020. The Midline report provides a formal assessment of interim progress towards targets. It assesses if the project is on track to achieve its outcomes and impacts. It informs implementation as it allows management to identify changes needed in the project delivery, or M&E approach, to achieve results. As it is a mid-point in the project delivery, it focuses on progress towards outputs and outcomes as impacts are not likely to have materialised yet. The report has been prepared with the collaboration and input from all the consortium partners, and with support from Caribou Space (UKSA IPP M&E provider). It builds on the work done on the baseline report and it follows the general provisions included in the M&E Plan.

1.6. Midline objectives

The main objectives of the midline evaluation are **assessing progress** towards intended results, and **providing operational insights,** focusing on:

- **Sustainability**, particularly with the global humanitarian community, the insurance industry, and the Governments of the other Least Developed Countries (LDCs)
- **Relevance** of METEOR products in Nepal, Tanzania and globally
- **Efficiency and effectiveness** of project activities and consortium management
- **Providing insights to improve the co-development aspects** of the METEOR project in the two target countries, acknowledging that the focus is different, i.e. more technical for NSET and more policy-oriented for DMD
- (Linked to the previous point) Better understanding the **political economy in Tanzania** to improve the engagement of local stakeholders in the project.

1.7. Structure of this document

The sections below are structured as follows: Section 2 describes the key components and methodology of the midline evaluation; Section 3 provides a summary of the progress to date against the project logical framework (also called logframe); Section 4 presents the key updates and findings identified by the midline evaluation; Section 5 draws some conclusions derived from the midline findings and discussed the key risks to the project sustainability; Section 6 summarises the key recommendations for both the project implementation and the M&E activities that will follow.

2. Methodology of the midline

2.1. Overview

In order to achieve the objectives of the midline evaluation, its key components include:

  i. **Light-touch process evaluation.** It is the general understanding of the consortium partners and the Client (UKSA) that the management and technical implementation of the project has been running smoothly with the right level of internal communication happening. Therefore, the process evaluation aspects of the midline are light-touch.
 ii. **Formative evaluation.** The project has an unusual timeline, with key outputs being completed towards the end of the project life. Moreover, there are aspects of engagement with the national project partners that require serious attention and improvement. Therefore, the focus of the midline is on questions around relevance and sustainability, and ensuring an up-to-date and thorough understanding of the institutional context and factors in the political economy underpinning the project success.
iii. **Secondary data on the number of outputs achieved**, compiled by BGS.

2.2. Light-touch Process Evaluation

The aim here was to understand how the consortium has been working together and how this can be improved efficiently. To do so, we had one conversation/interview via Skype with each consortium partner of about an hour. Below is a list of the people interviewed (Table 3) and the specific questions are included in appendix (Section 7).

Table 3: People interviewed for the midline process evaluation

#	Consortium Partner	Person(s)
1	BGS	Kay Smith, Colm Jordan, Annie Winson
2	GEM	Paul Henshaw, Vitor Silva
3	NSET	Sharad Wagle, Suman Pradhan
4	ImageCat	Charlie Huyck, Shubharoop Ghosh
5	DMD	Charles Msangi

2.3. Formative Evaluation

Following the same approach undertaken for the baseline evaluation, the formative aspects of the midline evaluation have been divided into **three case studies: a national case study for each of the two target countries of the project**, i.e. Nepal and Tanzania; and **a global case study** pertaining to METEOR's global ambitions to influence the DRRM strategies and practices of the international humanitarian community, the insurance industry and other LDC Governments.

2.3.1. Global Case Study

As there are no final METEOR products available yet to the broader public of global stakeholders, for the midline we carried out **Key Informant Interviews (KIIs) with some of the representatives of the METEOR Advisory Board**, who should have been kept up-to-date with the latest developments and draft output releases of the project. The key objective of the midline global case study is therefore to have a check-in of the relevance and sustainability of the METEOR products as they are currently planned for the global humanitarian community, in accordance with the project Theory of Change (see Outcome 3 in Figure 1).

Originally, we had planned to interview several members of the **Insurance Industry Advisory Group (IIAG)**, but it was decided that this would have been neither fair nor productive at this point, as we

understand they have not been able to see any draft output yet. Nevertheless, we have discussed internally, in coordination with the IIAG chair Stuart Fraser from the World Bank and the Global Facility for Disaster Reduction and Recovery (GFDRR), and decided for an orderly engagement of the insurance industry stakeholders through the IIAG. The idea was that at the next IIAG meeting, held in March 2020, the members were presented in detail the initial METEOR outputs, in order to raise interest in and receive their feedback on them. This will be followed by additional bilateral contacts. The M&E team will follow the subsequent engagement with the IIAG closely. *A brief synthesis addendum to this midline evaluation report will be then produced and separately discussed with the team to appropriately adapt according to its findings.*

An additional group of potential global users of METEOR products are LDC Governments other than Tanzania and Nepal. This is because the project will release exposure data, protocols and other outputs relevant to all LDCs. Therefore, the midline evaluation **gathers some primary data on the relevance and sustainability aspects of the METEOR outputs for LDC Governments**. After consulting with the other METEOR partners, the M&E team decided that the most efficient way to interview a sample of LDC Government representatives would be to attend the Understanding Risk Conference (18-22 May 2020, Singapore)[1]. As the conference will occur after the official deadline for the submission of the Midline Report (February 2020), *an addendum to the report with the findings and recommendations based on the interviews of the LDC officials will be submitted in June/July 2020.*

Table 4 provides a list of the people we have targeted for the midline global case study, although, as reported above, at this date we have not interviewed stakeholders from the IIAG and LDC governments.

Table 4: Stakeholders targeted for the midline global case study

#	Affiliation	Person
METEOR Advisory Board		
1	**UNDRR**	Adam Rowland Fysh
2	**World Bank & GFDRR**	Stuart Fraser
3	**DFID**	Ian Coady
METEOR Insurance Industry Advisory Group*		
4	**Hamilton Re**	Hanna Ali
5	**Lloyds**	Emma Watkins
6	**Aon/Impact Forecasting**	Sarka Cerna
7	**Scor**	Junaid Seria
8	**AIR Worldwide**	Luis Sousa
9	**CoreLogic**	William Forde
Least Developed Countries Governments*		
10-14/19	**LDC Government Representatives**	Representatives from 5-10 LDC Governments, to be identified.
*Not yet interviewed at the moment of writing the main midline evaluation report.		

2.3.2. Country Case Studies

The in-country activities for the midline evaluation were highly focused on investigating three crucial factors underpinning the impact of METEOR:

- Key aspects related to the relevance and sustainability of the METEOR outputs and outcomes, with a focus on the concrete uses of the METEOR products in DRRM policy and practice in Tanzania and Nepal

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[1] At the moment of writing, the world is undergoing an international health emergency for the spreading of the Covid-19 virus. Cases are presents in East and Southeast Asia, including Singapore, and some events have been cancelled or postponed globally. At this point, it is unclear whether the Understanding Risk Conference will take place. The M&E team will identify alternative ways of contacting relevant stakeholders in other LDCs. The METEOR consortium has a wide international network and we are confident that we will be able to rely on that to communicate with relevant LDC representatives.

- The current and likely future political economy context of DRRM in Tanzania and Nepal
- Concrete ways to involve key Tanzanian and Nepalese stakeholders in the co-development of the METEOR outputs (and influence the outcomes).

In order to investigate these key elements, we differentiated our approach in Nepal and Tanzania to take into account the known difference and current state of play of the project in each country. For instance, while the level of engagement and participation in the project had been so far higher in Nepal than in Tanzania, it was also true that the nature and interest of the two national project partners was different, i.e. more technical for NSET and more political and strategic for DMD.

Data gathered for the midline national case studies helped us assess the current status of the following qualitative logframe indicators: Outcome Indicators 1.1, 1.2 and 2.1 (see Section 3).

Below we explain our approach.

Nepal

A **Political Economy Analysis** (PEA) has already been carried out for Nepal at baseline. OPM Nepal **refreshed** this to ensure its continuing relevance. This involved an update on the national political, institutional and economic context related to DRRM (see Section 4.3.1).

In addition to the PEA update, the team worked closely with NSET and interviewed other key national DRRM stakeholders in Nepal to **assess the relevance, efficiency, and effectiveness of the co-development aspects of the METEOR project in Nepal.** This involved a 2-week mission to Kathmandu, as follows:

- Week 1 – Focus Group Discussion (FGD) with NSET and the International Centre for Integrated Mountain Development (ICIMOD) on the co-development of METEOR products; accompany BGS and adding relevant questions in meeting relevant government stakeholders (see list of meetings in Table 5).

- Week 2 – Attending Quarterly Meeting (QM) 6 of METEOR and facilitate plenary discussions at two stakeholder workshops organised by METEOR to present the project and its preliminary outputs to respectively DRRM-relevant policy/decision-makers and technical officials.

Table 5: Stakeholders interviewed for the midline Nepal case study

Organisation	Organisation Type	Interview type
National Society for Earthquake Technology (NSET)	NGO / project partner	KII and FGD
International Centre for Integrated Mountain Development (ICIMOD)	iNGO	KII and FGD
Central Bureau of Statistics (CBS)	Government	Extra questions added to BGS meeting
Department of Hydrology and Metrology (DHM)	Government	Ditto
National Planning Commission (NPC)	Government	Ditto
Department of Urban Development and Building Construction (DUDBC)	Government	Ditto
Nepal Academy of Science and Technology (NAST)	Academia	Ditto
Institute of Engineering, Tribhuvan University (TU)	Academia	Ditto
Ministry of Home Affairs (MoHA)	Government	Ditto
Ministry of Federal Affairs and General Administration (MoFAGA)	Government	Ditto
Department of Mines and Geology (DMG)	Government	Ditto

Understanding the politics of DRRM, and the ways in which the macro-level factors play out in influencing incentives and barriers to change is vital to the success of the project. The technical products of datasets and protocols, knowledge and skills, will be filtered through institutional and individual motivations and behaviours that can ensure success or failure in achieving impact. The best quality technical products are not sufficient to deliver change: there needs to be an environment where there is appetite for the products and willingness to change behaviour such that better information and analyses translate through into better policies and decisions that make a difference in lives of citizens.

At the midline point, there had been **concerning signs of relatively poor engagement of DMD and other Tanzanian DRRM stakeholders in the project**. For example, this lack of engagement manifested through the absence of any DMD representative from every QM occurred so far, with the exception of the QM4 held in Dar es Salaam; or the difficulty in getting inputs and statistics for project activities (e.g. on national direct economic loss figures from past relevant hazards).

Stronger participation in, and ownership of, the project by Tanzanian stakeholders had been seen by the consortium partners as a major concern for the impact and sustainability of METEOR. Therefore, a **PEA of DRRM in Tanzania, with particular attention to METEOR in-country partner, DMD** was carried out**.** For this, OPM Tanzania was involved to conduct a highly targeted study of the concrete barriers that have objectively slowed down the involvement of DMD in the co-development aspects of the project, and come out with possible entry points for overcoming them.

The study was conducted primarily through qualitative interviews starting with a FGD with the three senior disaster coordinators at the DMD to discuss barriers and ways of improving the engagement of DMD with METEOR. Further KIIs were conducted with other government stakeholders and the donor community. Table 6 provides the list of stakeholders interviewed and consulted during the midline evaluation.

Table 6: Stakeholders interviewed for the midline Tanzania case study

Institution/Organisation	Organisation Type	Interview type
DMD	Government / project partner	KIIs and FGD
Vice-President's Office (VPO)	Government	KII
Geological Survey of Tanzania (GST)	Government	KII
Department for International Development (DFID)	Donor	KII
Tanzania Meteorological Agency (TMA)	Government	KII
National Bureau of Statistics (NBS)	Autonomous public office	Brief consultation on the registration requirements for NBS and whether METEOR needs to be registered.

The key questions during the FGD with DMD were structured along the following themes (see Section 7.2 for the specific questions):

- Project partner engagement with other consortium partners
- Engagement of METEOR with stakeholders in Tanzania
- Sustainability and relevance of METEOR outputs
- Updates on policies and other DRM actives in-country

For the KIIs with other government stakeholders, the team prepared some guiding questions informed by previous interviews with the stakeholders conducted during the baseline evaluation. The questionnaire for the different KIIs had the following common themes with a focus on relevance and sustainability:

- What the interviewee does related to DRRM
- Overlaps between their role and DMD and nature of engagement with DMD
- Understanding the structure of the organisation and the in-house capacity and with whom METEOR might be able to engage
- What the main interests in and uses for METEOR outputs are
- How to best ensure uptake of METEOR outputs

An enquiry was also made at the National Bureau of Statistics (NBS) offices in Dodoma to determine if METEOR needs to be registered with NBS.

A key challenge during the interviews was finding the continuity between baseline and midline interviews because of staff turnover as in some of the institutions (such as the VPO and the GST) staff interviewed and engaged during the baseline activities no longer worked in these institutions. As a result, some of the interviews had to introduce METEOR again before getting the key focus of the midline evaluation.

3. Progress against logframe indicators

To give an indication of progress in the project implementation along its Theory of Change (ToC) (see Figure 1), this section provides an update at midline on those logframe indicators that have a 2020 (i.e. midline) target.

Figure 1. Theory of Change of the METEOR project
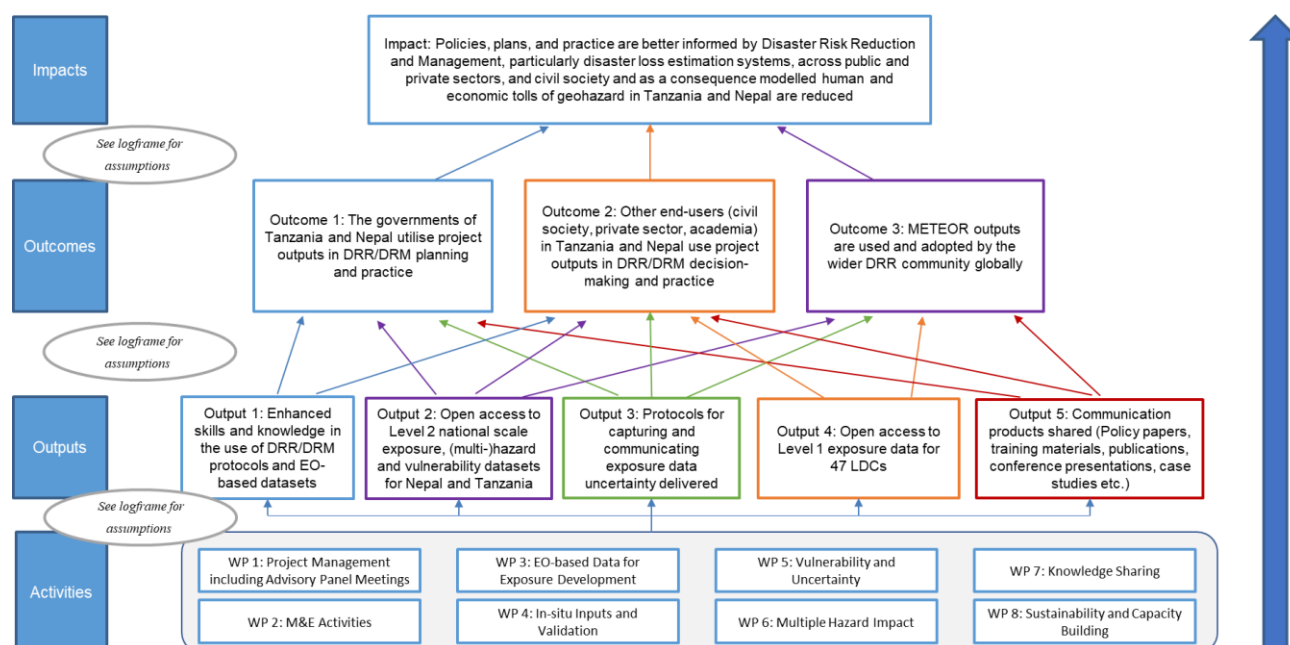
Table 7 provides a quick assessment of the progress against the midline targets of the logframe indicators. Below we then provide further details on the results achieved by the METEOR project to date against each midline target. Please notice that reasonable midline targets for the numerous qualitative indicators have been established by the M&E Team in preparing this report, as they had not been clearly defined before.

Table 7: Summary of progress against midline targets of logframe indicators

##	Indicator	Data source	Midline target	Achieved (Yes/No/Partially)
IM 1	**Modelled reduction of deaths, missing persons and directly affected persons attributed to disasters**	Internal model	N/A	-
IM 2	**Total modelled direct avoided economic loss attributed to disasters in Nepal and Tanzania (in GBP £)**	Internal model		-
IM 3	**Mainstreaming use of robust DRR data to systematically inform policy changes**	KIIs and FGDs		-
OC 1.1	**Qualitative indicator: progress towards use of project outputs by the**	KIIs in Nepal and Tanzania	Relevant government stakeholders in Tanzania and Nepal provide **unprompted**,	Nepal: Achieved

##	Indicator	Data source	Midline target	Achieved (Yes/No/Partially)
	governments of Nepal and Tanzania to inform their DRR/DRM decision-making and practice		**appropriate** and **realistic** use cases for METEOR outputs to support their DRR/DRM decision-making and practice	Tanzania: Partially achieved
OC 1.2	**Feedback from relevant Ministry (or decision-maker) on the usefulness of the project outputs for improving their national DRR/DRM (KPI 1)**	KIIs in Nepal and Tanzania	Relevant Ministries in Tanzania and Nepal offer to host METEOR datasets on official/government-led platforms.	Nepal: Achieved
				Tanzania: Partially achieved
OC 2.1	**Qualitative indicator: progress towards use of project outputs by "other end-users" (civil society, development partners, private sector, academia) in Nepal and Tanzania to inform their DRR/DRM decision-making and practice**	KIIs & FGD in Nepal only, Project monitoring data	"Other end-users" in Tanzania and Nepal provide **unprompted**, **appropriate** and **realistic** use cases for METEOR outputs to support their DRR/DRM decision-making and practice	Nepal: Achieved
				Tanzania: Partially achieved
OC 3.1	**Qualitative indicator: Feedback from the global community (e.g. UNICEF, UNISDR, WB, GFDRR) in respect of usefulness of project outputs (KPI 4)**	KIIs	Advisory Board members have confidence that METEOR outputs: 1. Can strengthen the discipline around the development of exposure and risk data 2. Will be put at use by their own organisations	Yes
OC 3.2	**Qualitative indicator: Progress towards creating insurance products informed by METEOR data and/or protocols**	KIIs	The Insurance Industry Advisory Group members have confidence that METEOR outputs can be useful to create new insurance products in developing countries	N/A
OC 3.3	**Number of dissemination nodes where METEOR KPs and datasets are available to be accessed**	KIIs	0	1
OP 1.1	**Percentage of professionals trained reporting increased knowledge on the training topic**	Monitoring data	N/A	-
OP 1.2	**Number of professionals trained in Nepal and Tanzania (disaggregating males and females)**	Monitoring data	0	0
OP 1.3	**Number of organisations that had representatives trained in Nepal and Tanzania**	Monitoring data	0	0
OP 1.4	**Percentage of targeted organisations that had at least two people trained**	Monitoring data	N/A	-
OP 2.1a	**Percentage of Nepalese and Tanzanian territory covered by Level 2 exposure data**	Monitoring data	100%	Yes, 100%
OP 2.1b	**Percentage of Nepalese and Tanzanian territory covered by Level 2 multi-hazard data**	Monitoring data	50%	Yes, 50%
OP 3.1	**Workplan on track to achieve completion within deadline**	Monitoring data	No major delays are foreseen in delivering the protocols	Yes

##	Indicator	Data source	Midline target	Achieved (Yes/No/Partially)
OP 3.2	Percentage of approached users reporting satisfaction with METEOR protocols (disaggregating males and females)	KIIs	N/A	-
OP 4.1	Number of Level-1 datasets for LDCs uploaded on online platforms	Monitoring data	0	0
OP 5.1	Policy paper on the use of national-scale exposure data for insurance and others	Monitoring data	0	0
OP 5.2	Number of communication products shared	Monitoring data	7 (14 cumulatively)	7 (14 cumulatively)
OP 5.3	Number of conferences or workshops hosted or attended by consortium members	Monitoring data	3 (5 cumulatively)	Yes, 6 (9 cumulatively)

3.1. Output Indicators

The output indicators which have midline targets are related to:

- Output 2 (Open access to Level 2 national scale multi-hazard exposure datasets of Nepal and Tanzania)

- Output 3 (Protocols for capturing and communicating exposure data uncertainty delivered)

- Output 5 (Communication products shared (CPs - Policy papers, training materials, publications, conference presentations, case studies etc.))

Output 1, which relates to training, and Output 4, which refers to the delivery of Level 1 exposure data for all LDC countries, are due to be delivered during the last year of the project and therefore they have no midline targets.

3.1.1. Output 2

The delivery of the Level 2 national scale multi-hazard exposure datasets in Nepal and Tanzania has proceeded as planned. Initial exposure datasets have been completed for both Tanzania and Nepal (Output Indicator 2.1a and KPI 2a.1). In terms of multi-hazard data, initial versions of all hazard footprints covered by the project have been produced, i.e. flood, earthquake, and landslide hazard footprints in Nepal and flood, earthquake, and volcanic eruptions in Tanzania. Moreover, an initial multi-hazard model, combining all single hazard footprints produced, have been prepared for Tanzania. In Nepal, the multi-hazard model has not been completed yet, as local experts are reviewing a second version of the landslide hazard footprint. As Output Indicator 2.1b (KPI 2a.2) speaks about "percentage of territory covered by Level 2 multi-hazard data", we can consider 100% of territory for Tanzania and 0% of territory for Nepal, bringing the result achieved to 50% of the final target, which is where the workplan forecasted the project would be at midline. Additionally, it is to be noted that, since the presence of volcanoes on the Tanzanian territory is patchy, the coverage of territory for volcanic hazard will only be provided for the relevant portions of territory that are actually subject to volcanic hazard.

3.1.2. Output 3

While speaking with ImageCat, which is the METEOR partner responsible for exposure data and protocols, they mentioned there are not major delays in the delivery of their work. Therefore, **we**

assume the protocols for capturing and communicating exposure data uncertainty will be delivered as scheduled. This achieves the midline target of Output Indicator 3.1. The next steps will be to work towards the endline targets for the Output 3 indications, i.e.:

- Knowledge of the protocols has been transferred to the right stakeholders in Tanzania and Nepal (Output Indicator 3.1)
- 75% of approached users report satisfaction with the METEOR protocols (Output Indicator 3.2).

3.1.3. Output 5

Of the three indicators of Output 5, only Indicators 5.2 and 5.3 were due to produce some results by midline. **Output Indicator 5.2** looked at the number of communication products (e.g. policy papers, training materials, publications, conference presentations, case studies etc.) produced and shared. By the end of the project year 2 (7th February 2020), **14 communication products have been shared** – listed below by type of document and date:

1. BLOG (28 November 2018): Turning UK aid into sustainable space projects (https://www.devex.com/news/sponsored/turning-uk-aid-into-sustainable-space-projects-93895)

2. BLOG (3 April 2019): An approach to field data collection in Kathmandu (https://www.hotosm.org/updates/an-approach-to-field-data-collection-in-kathmandu/)

3. BLOG (27 June 2019): Collecting building data sets for exposure data in Tanzania (https://www.hotosm.org/updates/collecting-building-data-sets-for-exposure-data-in-tanzania/)

4. DOCUMENT (31 August 2018): Import Existing Data into OSM Report Number: WP4.1/P (https://meteor-project.org/documents/METEOR_M4.1P_Import_Existing_Data_into_OSM.pdf)

5. CONFERENCE PRESENTATION (3-6 September 2018): METEOR: Modelling Exposure through Earth Observation Routines. Proceedings of the National EO Conference, Birmingham.

6. DOCUMENT (1 December 2018): Mapping of Exposure Report Number: WP4.2/P (https://meteor-project.org/documents/METEOR_M4.2P_EO_Mapping_of_Exposure.pdf)

7. CONFERENCE PRESNTATION (10-14 December 2018): Addressing the disaster risk reduction needs of end users in emerging countries using Earth Observation (EO) data and innovative risk products as part of the "Modelling Exposure through Earth Observation Routines (METEOR)" project. AGU Fall Meeting. San Francisco. (https://agu.confex.com/agu/fm19/meetingapp.cgi/Paper/608342)

8. CONFERENCE PRESENTATION (10-14 December 2018): Modelling Exposure Through Earth Observation Routines (METEOR) for Developing Countries: Increasing availability and access to more robust risk information. AGU Fall Meeting. Abstract #NH52B-03.

9. DOCUMENT (6 February 2019): Exposure Data Classification, Metadata Population and Confidence Assessment Report Number: M3.2/P (https://meteor-project.org/documents/METEOR_M3.2P_Exposure_Data_Classification_Metadata_Population_and_Confidence_Assessment.pdf)

10. DOCUMENT (11 February 2019): Protocols for Crowd-Sourcing Regional Exposure Data Report Number: M4.3/P (https://meteor-project.org/documents/METEOR_M4.3P_Protocols_for_Crowd-Sourcing_Regional_Exposure_Data.pdf)

11. CONFERENCE PRESENTATION (April 2019): METEOR: Modelling Exposure through Earth Observation Routines to aid sustainable development. Geophysical Research Abstract, Vol 21, EGU 2019-17990

12. DOCUMENT (1 August 2019): Ground Data Collection Using Protocols Kathmandu, Nepal Report Number: 4.4/P (https://meteor-project.org/documents/METEOR_M4.4P_Ground_Data_Collection_Using_Protocols_I_Kathmandu.pdf)

13. DOCUMENT (31 May 2019): Monitoring & Evaluation Plan Report Number: M2.2/P (https://meteor-project.org/documents/METEOR_M2.2P_Monitoring_Evaluation_Plan.pdf)

14. CONFERENCE PRESENTATION (9-13 December): METEOR: Constructing methodologies for multi-hazard impacts on exposure in developing nations. AGU Fall Meeting. San Francisco. https://agu.confex.com/agu/fm19/meetingapp.cgi/Paper/583006

The logframe targets for Output 5.2 had not been set at the moment of writing this report. As the production of communication products appears to be satisfactory, we have retrospectively assigned the targets for 2019 and 2020 as the same number of communication products actually produced, i.e. 7 each year. After discussing with the consortium partners, we have decided to set the endline target for Output 5.2 to 5 communication products. The target is lower than previous years because of the global pandemic of Covid-19 that has broken out in early 2020. Because of that, many of the international conferences and events planned until the summer of 2020 have been already cancelled or postponed. Furthermore, there is high uncertainty on whether a second wave of infections might break out in the Fall of 2020 too; a risk that needs to be considered. This is highly likely to affect the ability of the team to present at conferences. Therefore, we believe that a target of 5 communication products is both ambitious and realistic.

According to the target of **Output Indicator 5.3**, the consortium members had to have hosted or attended 5 conferences or workshops by the midline deadline (7th February 2020). **The target have been exceeded as the conferences or workshops hosted or attended (presenting) have been 9**:

1. EVENT (December 2019): American Geophysical Union 2019 (https://meteor-project.org/documents/AGU_iPosterSessions.pdf)

2. WORKSHOP (November 2019): Stakeholder workshop for technical officials in Nepal

3. WORKSHOP (November 2019): Stakeholder workshop for policy-makers in Nepal

4. EVENT (19-23 September 2019): HOT Summit and State of the Map 2019 (https://meteor-project.org/documents/2019-09%20_%20HOT%20Summit%20%20__%20METEOR%20Project.pdf)

5. EVENT (12-17 May 2019): ESA Living Planet Symposium 2019 (https://meteor-project.org/documents/METEOR_poster_LPS_May_2019.pdf)

6. EVENT (7-12 April 2019): EGU General Assembly 2019 (https://meteor-project.org/documents/METEOR_EGU19_ColmJordan.pdf)

7. EVENT (10-14 December 2018): American Geophysical Union 2018 (https://meteor-project.org/documents/AGU_METEOR_GHOSH_121218.pdf)

8. EVENT (5 December 2018): GEM2018 Global Earthquake Model: Working together to assess risk (https://meteor-project.org/documents/METEOR_poster_Pavia_November_2018.pdf and https://meteor-project.org/documents/poster_GEM_meeting_v7.pdf)

9. EVENT (4-7 September 2018): UK National Earth Observation Conference 2018 (https://meteor-project.org/documents/METEOR_poster_UKNEOC_2018.pdf)

Similarly to what considered for Output Indicator 5.2, due to the likely reduction of conferences and events held in 2020 and 2021 because of the consequences of the outbreak of Covid-19, after internal deliberation within the METEOR consortium, we have decided to set the target for 2021 of Output Indicator 5.3 at 5 conferences or workshops where METEOR's findings are presented. Indeed, under "normal" conditions, a substantial increase in the dissemination efforts in the last year of the project would have been expected, but the possible strong limitations in personal contacts at the global level for the remainder duration of the project implementation makes a slight increase to be more realistic.

3.2. Outcome Indicators

The delivery of the final METEOR products and the capacity building / knowledge transfer activities are planned to happen towards the end of the project. Therefore the Outcomes at the midline point were not expected to have been achieved. Nevertheless, through the evaluation activities, we were able to test the achievement of some intermediate outcomes, which give an indication on whether the project is on the right path to achieve the final outcomes. Table 8 illustrates the intermediate and final outcome targets we have developed. It has to be noted that the endline targets have not yet been discussed with the rest of the consortium and will be the subject of discussion at the next Annual Learning Event.

Table 8: Midline and endline targets of METEOR's Outcome Indicators

##	Indicator	Midline target	Endline target
OC 1.1	**Qualitative indicator: progress towards use of project outputs by the governments of Nepal and Tanzania to inform their DRR/DRM decision-making and practice**	Relevant government stakeholders in Tanzania and Nepal provide unprompted, appropriate and realistic use cases for METEOR outputs to support their DRR/DRM decision-making and practice	1. Relevant government stakeholders in Tanzania and Nepal confirm their intention to use METEOR outputs to support specific DRR/DRM assessments, technical studies, policies or strategies. 2. Between Outcome Indicator 1.1 and Outcome Indicator 2.1, end-users in Tanzania and Nepal have used the METEOR outputs in at least 1 DRRM activity per country.
OC 1.2	**Feedback from relevant Ministry (or decision-maker) on the usefulness of the project outputs for improving their national DRR/DRM (KPI 1)**	Relevant Ministries in Tanzania and Nepal offer to host METEOR datasets on official/government-led platforms.	METEOR datasets are hosted on official/government-led platforms in Tanzania and Nepal.
OC 2.1	**Qualitative indicator: progress towards use of project outputs by "other end-users" (civil society, development partners, private sector, academia) in Nepal and Tanzania to inform their DRR/DRM decision-making and practice**	"Other end-users" in Tanzania and Nepal provide unprompted, appropriate and realistic use cases for METEOR outputs to support their DRR/DRM decision-making and practice	1. "Other end-users" in Tanzania and Nepal confirm their intention to use METEOR outputs to support specific DRR/DRM assessments, technical and/or scientific studies, strategies or inform their support to the government's DRR/DRM efforts. 2. Between Outcome Indicator 1.1 and Outcome Indicator 2.1, end-users in Tanzania and Nepal have used the METEOR outputs in at least 1 DRRM activity per country.

##	Indicator	Midline target	Endline target
OC 3.1	**Qualitative indicator: Feedback from the global community (e.g. UNICEF, UNISDR, WB, GFDRR) in respect of usefulness of project outputs (KPI 4)**	Advisory Board members have confidence that METEOR outputs: 1. Can strengthen the discipline around the development of exposure and risk data 2. Will be put at use by their own organisations	There is evidence that the organisations on the METEOR Advisory Board are going to use the METEOR outputs in supporting DRRM activities in developing countries
OC 3.2	**Qualitative indicator: Progress towards creating insurance products informed by METEOR data and/or protocols**	The Insurance Industry Advisory Group members have confidence that METEOR outputs can be useful to create new insurance products in developing countries	Insurance companies are engaged in creating new insurance products
OC 3.3	**Number of dissemination nodes where METEOR KPs and datasets are available to be accessed**	0	6 nodes in total of which 1 global, 1 Tanzanian and 1 Nepalese

3.2.1. Outcomes 1 and 2

The only difference between Outcomes 1 and 2 are end-users they target: Outcome 1 aims for the METEOR outputs to be put into use to inform DRRM activities and decision-making in Tanzania and Nepal by the government, while Outcome 2 targets "other end-users" that are not part of the government - defined as the civil society, development partners, private sector, and academia.

In order to be considered to be on a likely path to achieve those outcomes, the project at midline should have demonstrated two main elements:

1. Relevant stakeholders (governmental and non) in both Nepal and Tanzania should have provided **unprompted, appropriate** and **realistic** use cases for METEOR outputs to inform their decision-making and practice
2. Relevant Ministries in both Tanzania and Nepal should have offered to host METEOR datasets on those official or government-led platforms that they use to get the data and evidence to make their DRRM decisions.

The evidence that we have collected shows how the project has objectively met the midline outcome targets for Nepal, but it is struggling to meet those same targets in Tanzania.

In Nepal, following activities in country to show the initial data to and get feedback from local stakeholders (governmental and non), the project was indeed able to receive some clear indications of specific DRRM activities that could be supported by METEOR outputs, and relevant Ministries (e.g. MoHA, CBS) have offered to host METEOR datasets on their portals. More details on the achievements and the likely reasons for them are given in the following sections.

In Tanzania, for a series of reasons that are explained in the following sections, the indications of potential uses for the METEOR outputs have remained at the level of "possibilities" and, at this point, besides the options of hosting METEOR datasets on global platforms, there is no clear idea of which Tanzanian platform can be used to make the METEOR data accessible for use in official DRRM decision-making. In fact, there is even some uncertainty on whether Tanzanian government and scientific institutions will be <u>allowed</u> to reference METEOR data without a formal accreditation of the project by the Tanzania Commission for Science and Technology (COSTECH).

3.2.2. Outcome 3

The Outcome 3 looks at the use of the METEOR outputs by global DRRM actors outside Tanzania and Nepal. As explained in Section 2.3.1, in the preparation of this report we have only interviewed members of the METEOR Advisory Board as a proxy of organisations of the global humanitarian and

DRRM community. The insurance industry and other LDC governments will be the subject of further addenda.

The midline target that we have set for the Outcome Indicator 3.1 that covers the global humanitarian community foresees that Advisory Board members have confidence that METEOR outputs:

1. Can strengthen the discipline around the development of exposure and risk data
2. Will be put to use by their own organisations.

The evidence collected through interviews of some Advisory Board members confirms that the project has achieved the midline target. In fact, the interviews confirmed that they have confidence in the robustness of the METEOR data and there are very high chances that their organisations will utilise them to support their DRRM activities in developing countries. More details are provided in Section 4.2.

Furthermore, Outcome Indicator 3.3 looks at the accessibility of METEOR outputs by counting the "number of dissemination nodes where METEOR KPs [Knowledge Products] and datasets are available to be accessed". Due to the project delivery plan, the indicator has only an endline target, which is having METEOR outputs on 6 nodes/ platforms in total of which 1 global, 1 Tanzanian and 1 Nepalese. Despite that, **the project has already uploaded some of its initial outputs for Nepal[2] on the Building Information Platform Against Disaster (BIPAD) (http://bipad.gov.np/) (see example in Figure 2), which is used by the federal government. This is a remarkable achievement which goes beyond what the Outcome Indicator 3.3 target for the project midline.**

Figure 2. Screenshot of visualization of METEOR Seismic Hazard data for Nepal on BIPAD

Source: https://bipad.gov.np/risk-info/#/hazard

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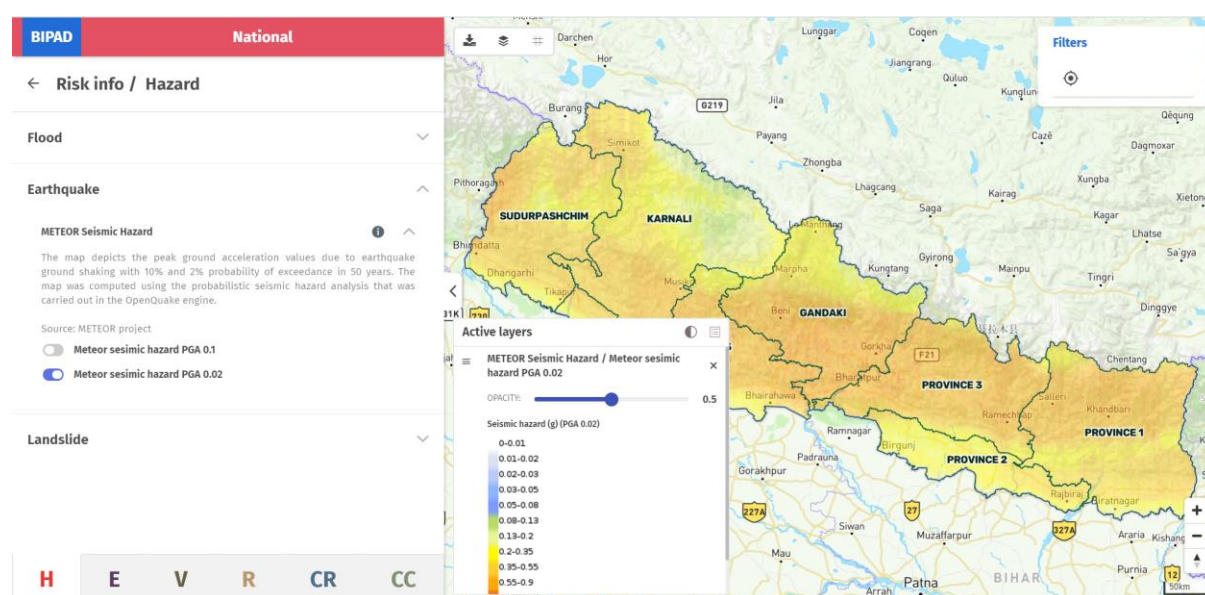
[2] At the moment of writing, on the BIPAD the following METEOR datasets for Nepal are available online: METEOR Seismic Hazard PGA 0.1 and PGA 0.02, and METEOR Flood Hazard between 5 and 1000 years occurrences.

4. Midline Findings

4.1. Process evaluation

The data for the light-touch midline process evaluation were collected through online interviews of ten people from five partners of the METEOR consortium (see Table 3). All interviews followed the same questions which focused on three main aspects of METEOR's implementation:

- The internal consortium management, communication, and functioning
- The efforts to foster government's ownership of METEOR outputs
- The ability of building external partnerships and synergies with other initiatives.

The summary of the findings and common themes from the interviews is presented below.

4.1.1. Internal management, communication, and functioning

The main part of the interviews were directed at testing the internal processes and communication in the consortium. In particular, three main areas were touched upon: 1) the way the consortium has been managed and how the group of partners has been working and communicating together; 2) whether the consortium has the right partners and whether their roles and responsibilities have been properly assigned; and 3) whether there were significant delays in delivery milestones and how to avoid such delays in the future.

Consortium management and communication

As a whole, the overwhelming impression received by the partners is that the consortium has been working very well together and Kay Smith, METEOR Project Manager (PM) from BGS, has been doing a "fantastic job" –as one respondent put it. People noted that the fact that several of the partner organisations had worked together before (i.e. BGS, ImageCat, GEM, HOT, and NSET) helped smooth the technical collaboration and keep the discussions in meetings about the processes, results and future plans open and constructive.

In terms of helpful processes, most partners interviewed pointed out how meeting in person every quarter at the **Quarterly Meetings (QMs) has been extremely helpful** to make the point on where the project is and coordinate future tasks in an orderly manner. Having QMs in Tanzania and Nepal also was highly appreciated by the interviewees, as they recognised it helped the project to be closer to the needs of the beneficiaries and raised project awareness with national stakeholders. The **monthly catch up calls** arranged by the PM, although being "quick and flying through things", they have also been reported to be especially useful to set up side conversations on specific tasks among the relevant subset of partners. Generally, **interviewees seemed happy with the scope and number of meetings and calls**, and they usually took a realistic approach to recognise that METEOR is not the only project the team is working on and they feel they are "getting the right balance of communication and project efforts".

Concerning key delays in the delivery of milestones, the partners interviewed did not report any major ones. Only few small delays of up to 6 weeks were reported and mostly due to the limited availability of staff.

One of the things that some have described as something that could be improved is the overall coordination among the Work Packages. Indeed, a couple of people felt there was **"a bit of disconnect between all the pieces"**, whereby you have each partner working on their own deliverable and, even if the work is often done in collaboration with others, it is difficult to follow when other tasks will be performed and by whom. *Again, partners have underscored that the PM is doing a great job in "directing the orchestra", but ideally there should be a way to facilitate the overview of the project by everyone.*

Another issue related to the overall coordination is the one of **better identifying the critical path of tasks**. The main example of this issue is related to the exposure dataset. Although originally it was planned to be delivered almost at the end of the project, there has been some pressure on ImageCat to deliver the exposure dataset much sooner, because it is a crucial input in the vulnerability data and because it is probably the most innovative output of the project and it is important to gauge interest from potential users. In hindsight, the original work plan should have probably set to have the exposure dataset to be delivered earlier. Another example of issues with the delivery plan could be the request of having a Sustainability Plan before being able to show draft outputs to the potential users or customers. Indeed, it is objectively a challenge to forecast the buy-in and expectations of the insurance industry, for instance, before letting them see concrete examples of what the project will deliver. *We understand that the timing for providing the Sustainability Plan has mainly been set by the Donor's requirements, rather than the PM, so perhaps this is a specific lesson for the UKSA. Furthermore, it is to be noted how the PM, at the beginning of the project, has indeed gone through the output delivery time and path dependencies among tasks with partners and perhaps some of the issues reported above could have been picked up at that point.*

The main challenges reported in terms of the internal functioning of the consortium have probably been those related to the co-development of METEOR's outputs with local organisations and the effective communication with the Tanzanian partners.

METEOR has been set up as a project with high standards for **co-developing the METEOR outputs** with local organisations to maximise their ownership and, therefore, their uptake of the outputs themselves. The fact that METEOR has set some ambitious goals in this regard is well expressed by the words of an interviewee who said that in all the previous projects he worked on: "this is the first time I see so much focus on co-development". He went on saying that: "this is a learning curve for all parties".

The general view is that **co-development and communication in general worked better in Nepal than Tanzania**. There are several reasons for this, most of which – the point of view of the local partners – are further explained in the respective Country Case Studies (see Section 2.3.2). According to the interviewees, the facts that **NSET is a more "technical" partner than DMD** and that **several METEOR partners had previously worked with NSET** definitely helped in getting quicker responses and closer technical collaboration in Nepal. Nevertheless, the general understanding was that the main issues for the engagement of the Tanzanian counterparts in the project activities were the **financial barriers in being able to make payments to the DMD** for project costs. The importance of the payment issue has been verified by the PEA undertaken for the Country Case Study (see Section 2.3.2). On the positive side, some of the people interviewed underscored their "confidence in the BGS' efforts to solve the financial issues with DMD", efforts that an interviewee also acknowledges have been taken in equal measure by the DMD and the UKSA as well.

More than one person also pointed out how DMD and other Tanzanian stakeholders "have been very engaged when we were in Tanzania", making one interviewee saying that "**physical presence has been very important, and we probably underestimated it**" at the beginning. This last point is related to another question the process evaluation questionnaire included, that is whether the right consortium partners were chosen to deliver the project and whether responsibilities were well defined and distributed. The response received highlighted how generally people felt the international partners were the right ones and their responsibilities were appropriate, whereas **most of the interviewees (including the ones from the local partners) wondered whether having additional local organisations in Tanzania and Nepal within the consortium would have brought about benefits for the co-development and local ownership aspects**. This would encourage greater representation from both government and non government partners. Indeed, people from the BGS also acknowledged the importance of working with a broader spectrum of national organisations and pointed out that: a) the

proposal for an extension to include the Geological Survey of Tanzania (GST) was unfortunately unsuccessful; b) METEOR has actively involved other stakeholders beside the official partners in both countries, including ICIMOD in Nepal and the University of Dar es Salaam and the World Bank / DFID Tanzania Urban Resilience Project (TURP) in Tanzania.

Finally, without hopefully sound too partisan, more than one interviewee reported that they felt **having a dedicated partner for Monitoring and Evaluation (M&E), such as OPM, had been helpful** to keep the Theory of Change in mind and keep thinking about how to move from outputs to outcomes and impact.

4.1.2. Fostering government's ownership of METEOR outputs

The interviewees from the METEOR consortium were asked what steps they felt had been taken to ensure ownership of the project process and outcomes within government counterparts. This aspect is relevant to both the effectiveness and sustainability of the project. The section below distinguishes between general points and country-specific ones.

In general terms, **people felt the government ownership aspects were given close consideration by the consortium**. In particular, several specific factors were highlighted. Firstly, **having concrete samples of outputs to show and get feedback on** have proven to help raising the interest of government counterparts, as evidenced in Nepal (see Section 2.3.2). There is the expectation that once sample datasets will be presented to stakeholders in Tanzania, the level of interest and subsequently engagement will go up too. Secondly, **"having a physical presence"** in the two countries was also mentioned as an important factor to foster local ownership. References were done of both local partners (including HOT and OPM, which both have offices in both countries), and of the participation to local events (e.g. the Understanding Risk Tanzania) and direct meetings/workshops with government representatives. Finally, **capacity building and knowledge transfer** was something highlighted as a crucial task that the project had to "get right" in order to support local ownership of the outputs. Someone pointed out how the User Requirement Documents from Tanzanian and Nepal need to be updated and treated as "live documents to be monitored throughout the project". This was in line with a reiterated area that is the need of tailoring the scope and types of capacity building activities to the needs of the national stakeholders, especially considering that NSET is a technical organisation, while DMD is a political one with the main mandate of coordination of more technical stakeholders. Partners felt it will be important to work with both NSET and DMD to tailor the training packages for the two countries.

Concerning Nepal, generally the interviewed partners felt confident that the project was on the right path to obtain a good level of government ownership of the METEOR outputs. The positive factors reported were: a) the successful efforts by NSET to identify the key national users and take the lead in their engagement with the project; b) the offers received by owners of key national platforms (e.g. YILabs/MoHA first and foremost) to host the METEOR outputs; and c) the establishment of a METEOR Advisory Committee in Nepal to include pivotal DRRM governmental stakeholders. These factors have also come out during the National Case Study of Nepal (see Section 2.3.2). In terms of challenges, one reported the fact that the **federalist change of the form of government** after the project was won, implied the importance of sub-national DRRM authorities for the project unexpectedly grew. Despite a request for a budget extension to widen the scope of the project to the sub-national level was unsuccessful, the consortium has been looking at ways to at least influence the use of METEOR data at the local level by involving the Ministry of Federal Affairs and General Administration (MoFAGA).

The challenges to achieve a strong buy-in and ownership of the project's outputs are definitely bigger in Tanzania. This is the subject of the Country Case Study included in Section 2.3.2. In addition to the **financial/payment issues** already mentioned (efforts to fix them are ongoing), the fact that **no draft outputs have been shown to local stakeholders to date** can partially account for the differences

in government engagement. At this point, it appears that the co-development of METEOR outputs in Tanzania was tied to the involvement of HOT/*Ramani Huria* doing on the ground validation of the exposure data. Country-specific hazard data, such as the volcanic and flooding hazard footprints would benefit from the "live" involvement of Tanzanian experts, but lack of capacity and engagement did not make it possible, with the consequence of having those outputs to be mainly based on the literature. **The team has so far put extra effort to broaden the government engagement in the country**, such as attending key events (e.g. Understanding Risk Tanzania), where DMD were present and other key stakeholders such as World Bank and DFID had leadership roles. Moreover, a 5-day training session in Dar es Salaam has been planned by HOT and BGS for March and it will focus on aspects around the generation of primary data for exposure and hazard assessment purposes in conjunction with Earth Observation data. DMD will be the main target of the training and other national stakeholders (e.g. GST, TMA, academia) will be involved in a stakeholder workshop, similar to the one held in November in Nepal. Finally, it has to be underscored that **the government response so far has not been negligible either**, especially showing to be keen to have ownership of the project implementation process (e.g. by making sure they were involved in conversations with local stakeholders) and suggesting ways to improve the project engagement with Tanzanian institutions (e.g. through the National Disaster Management Platform (see Section 2.3.2)).

4.1.3. Building external partnerships and synergies

Finally, the process evaluation sought to test how well the METEOR team has been collaborating with other development initiatives to support the sustainability of the project's outcomes after its end.

The interviewees generally felt the team have been putting decisive efforts to build external partnerships and synergies with other initiatives. The main examples provided are:

- Using the **Advisory Board** members to disseminate METEOR's outputs to their networks and link to initiatives of their organisations for sustainability beyond the project e.g. the World Bank geoportals, addressing/reporting against UN SDGs.
- Setting up an **Insurance Industry Advisory Group (IIAG)** with key links to the Advisory Board as well (e.g. through Stuart Fraser and its links to the Insurance Development Forum (IDF)).
- Trying to **tap into broader funding streams** such as DFID's "Partnerships for Development"[3] (successfully) to expand METEOR's capacity building activities.
- **In Tanzania**, the key initiatives targeted are *Ramani Huria* and the World Bank/DFID funded TURP, including its Resilience Academy initiative.
- **In Nepal**, by working long-term with NSET to use them as a conduit to build synergies with other initiatives, e.g. the Building Information Platform Against Disaster of the Youth Innovation Labs (YILabs) and MoHA, Tomorrow's Cities, and disaster risk management training of local organisations and authorities.

4.2. Global study

The "Global Study" of this midline evaluation provides some indications of the relevance and sustainability potential of the METEOR outputs for the target stakeholders outside Tanzania and Nepal. The three main categories of global stakeholders targeted by the project are: the global humanitarian community; the insurance industry; and other LDC governments. In Section 2.3.1, we have illustrated our plans for gathering the feedback of members of the insurance industry and other LDCs. The outcomes of those interactions will be included in two *addenda* to this main report. Therefore, **this section only presents the findings of the interviews with three members of the**

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[3] https://devtracker.dfid.gov.uk/projects/GB-1-205191/transactions.

METEOR Advisory Board, taken as a proxy of relevant stakeholders of the global humanitarian community.

4.2.1. Midline findings from the METEOR Advisory Board

The interviewees, coming from DFID, the World Bank and the UNDRR, were provided with the same list of questions. Two of them have responded in writing to the questions, while one was interviewed on the phone. The questions focused on three main areas to be tested: 1) their familiarity with the METEOR outputs as a proxy of the level of communication and engagement experienced; 2) the relevance of METEOR outputs to their work and the DRRM work in their organisation and to a certain extent the potential for the project's success (effectiveness); 3) the sustainability of the METEOR outputs after the end of the project.

Level of communication and engagement
The interviewees were asked: "How familiar are you with the METEOR project and the outputs it supposed to deliver? Have you seen any draft output yet?". The reason for these questions was twofold: on the one hand, to provide a hint of their interest in the project and its outputs; and on the other hand, we wanted to verify how much they had been kept up to date about and involved in the project by the BGS and the rest of the METEOR consortium.

The answers revealed that **all of the respondents felt comfortable with their level of familiarity with the intended project outputs and what it seeks to achieve**. They all seemed to have some direct interaction with the project activities: one person reported attending two Quarterly Meetings in person and Advisory Board meetings; another one had read and commented on the project's "foundational documentation" in consultation with a colleague; and the final one have participated in Advisory Board meetings and is working closely with the project team to liaise them with the insurance industry.

At the same time, though, at the time of the interviews (January and early February 2020), **only one out of three had seen any draft output** and the feeling given was that they were not aware that draft outputs were ready to be viewed. For instance, someone expressed the interest of reviewing the draft protocols produced, but he did not know when they would have become available. *As they all showed interest in taking a look at the demos as soon as they were ready and reviewing outputs, the METEOR team might be missing an opportunity to receive some timely and precious feedback, and wider promotion by the Advisory Board.*

Relevance and effectiveness
In order to test the relevance of the METEOR outputs and, to a certain extent, the effectiveness of the project, the interviewees were asked: 1) "Based on what you know of the project and the draft outputs you might have seen, do you think the METEOR products can strengthen the discipline around the development of exposure and risk data? Why / In what way?"; and 2) "How likely do you think your organisation would use the open source/access METEOR products in the future? For what?".

The response received was overwhelmingly positive. The range of the possibility of their organisation using the METEOR products went from being "certain" to "very likely, with plenty of opportunities". This shows that the project is targeting the right international users and it is on the path of achieving its Outcome 3[4], at least for the portion of the "wider DRR community" corresponding of the global humanitarian and international development community. **Interviewees also showed appreciation for the type of outputs and the methodology used by METEOR**. Key factors highlighted

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[4] The Outcome 3 in the Theory of Change reads: "METEOR outputs are used and adopted by the wider DRR community globally". Within the wider (i.e. outside Tanzania and Nepal) DRR community relevant to METEOR, we include the global humanitarian community, the international scientific/research community, the insurance industry, DRR practitioners in the private sector and civil society, and other LDC governments.

were: a) The fact that METEOR is addressing two main weaknesses of the risk management sector that showed growing interest by the international community, namely a **rigorous discipline of assessing exposure and the multi-hazard aspects of disaster risk**. One person told us that the level of detail in classifying building attributes in METEOR exposure protocols was something that "I have not seen through my work with geospatial data in developing countries". b) The **transparency used in developing and publishing all the protocols**, which was considered a real added value of the METEOR project compared to other ones. Publishing the protocols was reported to be important for: better understand the robustness and limitations of the outputs; allow the expansion of the research to improve the outputs, rather than starting from scratch; support "conversation with governments on what is needed/gaps to improve the data". c) The **commitment to publish the data openly and freely**, which will make the METEOR outputs become "global public goods".

Interest was also raised for the sharing of any lessons coming from the capacity building activities METEOR will undertake in Tanzania and Nepal.

The key limitations identified – which are known to the METEOR consortium – have been mainly related to the limitations in availability and robustness of the input data from Tanzania and Nepal. Nevertheless, the availability of open protocols will make it easier to be aware of those limitations when the METEOR outputs are used in risk assessments and decision-making.

Sustainability

Finally, interviewees were asked a question related to the potential of sustainability of the project: "How likely do you think your organisation would pay to use or expand the METEOR products in the future (e.g. in other countries or projects)? For what?".

The response was unanimous in saying that **none of the three organisations, DFID, UNDRR, and the World Bank, would be likely to pay to directly access the METEOR products.** This point was well explained by one interviewee: "The global trend in risk data is toward free and open access. There is no shortage of expensive proprietary risk information available on the market from consultancies, insurance firms and other services, and [my organisation] has not felt limited by the growing ocean of free, open and accessible sources". Indeed, the free and open access nature of the METEOR products has been a factor of excitement and added value for the METEOR outputs and the answer is not surprising.

However, when the question was rephrased to match the non-commercial character of the stakeholders interviewed, the response was different. The question was rephrased as follows: "How likely do you think your organisation would fund work to expand (in terms of countries beyond Tanzania and Nepal or additional hazards or similar) the METEOR products in the future? For what?". **Both DFID and the World Bank interviewees have explained that they see a high likelihood that their organisations would pay for more work in other countries, depending the availability of specific funding streams**. The UNDRR representative explained that they are not an "operational organisation so probably wouldn't prioritise one (paid) product when there are many ways of understanding risk". He also added that "UNDRR is a secretariat organisation that does not have or particularly use risk data – though we have in the past. Our focus is now more on convening and connecting good risk information to users seeking to make good risk-informed decisions."

4.3. Nepal findings

4.3.1. Country context update

Baseline summary

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. These include fire, heat and cold waves factored by various phenomena like damaging windstorms, intense rainfall, thunderstorms (lightning), and rapid, unplanned infrastructure and urbanisation, and lack of awareness at different levels. The country is also exposed to a broad range of natural hazards, including many of those of interest to METEOR , such as earthquakes, landslides, and floods.

Recent disasters include the 2015 Gorkha earthquake of 7.6 magnitude, which resulted in 8,790 fatalities, over 22,300 injuries, and an estimated USD 7 billion in damages and losses[5]. 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[6].

In 2015, Nepal adopted a new Constitution[7]. 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.

From a legal and regulatory perspective, in the last few years, the governance around DRRM in Nepal has made great progress with the adoption of several important laws and policies. The 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. 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 reduction and appropriate financing arrangements for post-disaster response.

In terms of key DRRM stakeholders in the country to be engaged by the METEOR project, Figure 3 updates the list of relevant government stakeholders identified during the baseline. 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. The ones that the baseline evaluation identified as priority stakeholders for METEOR are: DFID, the United Nations Humanitarian High Commissioner for Refugees (UNHCR), the United States Agency for International Development (USAID), NSET, ICIMOD, Practical Action, and Disaster Preparedness Network- Nepal (DPNet-Nepal).

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[5] NPC. (2015b). *Nepal Earthquake 2015: Post Disaster Needs Assessment: Key Findings*. *Vol. A.* Kathmandu: National Planning Commission, Government of Nepal.

[6] Asian Development Bank (2018). The Enabling Environment for Disaster Risk Financing in Nepal: Country Diagnostic Assessment. Unpublished draft.

[7] See ANNEX 4 of the Baseline Evaluation Report for more details are parts that related to DRRM.

Figure 3: Key DRRM government stakeholders in Nepal
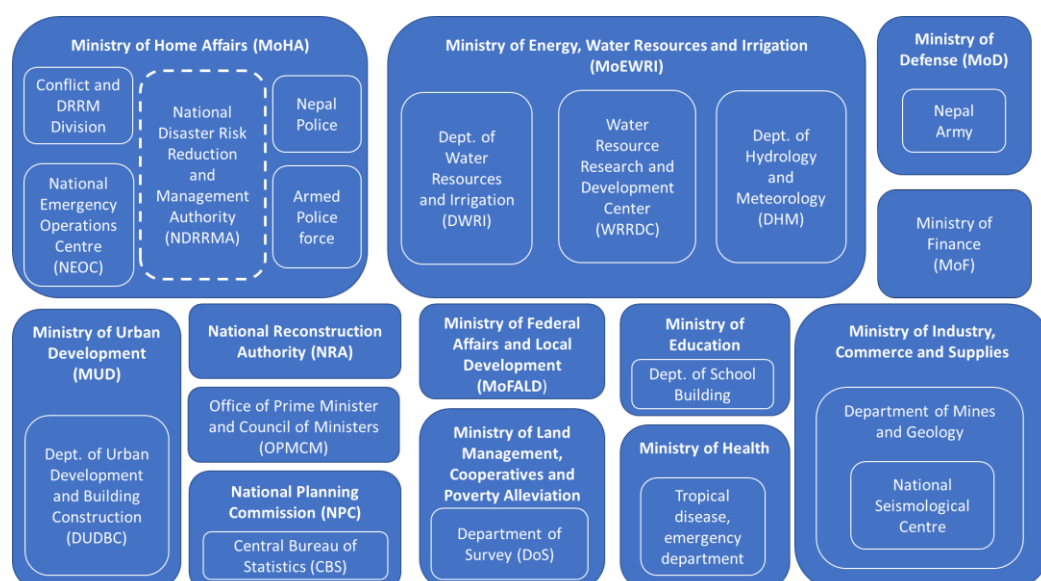
Source: Authors

Evolving risk context

In 2019, disasters have been a major issue for government core business. The monsoon, which started 10 days later than average, led to destruction around the country in mid-July. More than 100 people were killed, and 100 others went missing following landslides and flooding triggered by continuous monsoon rain across the country. The Ministry of Energy, Water Resources and Irrigation (MEWRI) estimated in NPR 2.1122 billion[8] (~GBP 14 million) the repair costs from damages to irrigation infrastructures by floods and landslides in July and August 2019. Nepal also faced an unprecedented windstorm in April, 2019. The tornado type of cyclone in southern Nepal killed 28 people, injured 668 and damaged 2,400 houses of which 869 houses were fully damaged.

Governance of disaster risk management update

The DRRM Act 2017 was revised in 2019. The DRRM Act 2017 (amended in 2019) puts at the top of the DRRM governance a multi-stakeholder *National Council for Disaster Risk Reduction and Management (NCDRRM)* chaired by the Prime Minister. 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. Finally, sitting underneath the Executive Committee, the DRRM Act creates a *Disaster Risk Reduction and Management Authority (NDRRMA)* to coordinate DRRM activities across Nepal. The NCDRRM manages the Authority's main financial resources (the Prime Minister's Disaster Fund and the Central Calamities Relief Fund) and approves plans and policies prepared by the Authority. The sources for both of these funds are resources allocated by government, donations from the public or international donor funding.

With regards to NDRRMA, the amended act envisions a 3-member recommendation committee chaired by the Secretary of the Ministry of Home Affairs (MoHA) for the appointment of the NDRRMA Chief Executive Officer (CEO), whose tenure is 5 years. In December 2019 the Cabinet has appointed the CEO of NDRRMA.

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[8] To put it in perspective, Nepal's GDP in 2018 was ~GBP 22 billion (source World Bank), so the estimated damage of the flooding and landslides of July 2019 is about 0.64% of that.

The roles and responsibilities of NCDRRM, NDRRMA and Executive Committee is outlined in Figure 4.

Figure 4: Roles & Responsibilities at Federal Level[9]

National Council for Disaster Risk Reduction and Management (NCDRRM)

- Approving plans and policies made for national disaster management
- Providing direction to the Executive Committee and the National Disaster Reduction and Management Authority (NDRRMA)
- Giving policy guidance to province and local level disaster management committees
- Managing financial resources required for disaster management
- Evaluating activities done for disaster management

Executive Committee

- Submitting national plans and policies to the council for approval and implement the approved ones
- Implementing policies and programs related to disaster risk reduction, disaster response, rehabilitation and mitigation
- Determining the roles of public, private and non-government organisations on disaster management
- Determining the roles and responsibilities of the concerned ministries, departments and other institutions regarding disaster management

National Disaster Risk Reduction and Management Authority (NDRRMA)

- Providing technical support to the NCDRRM in order to formulate policies, guidelines, plans, strategies and standards for disaster management activities
- Categorising disasters based on DRRM Act, international conventions signed by the Nepal government
- Working as a resource centre for disaster reduction and management
- Studying and conducting research on the causes and mitigation of disasters
- Forming a search and rescue team at national, province and local levels to increase their capacity to handle disasters
- Mobilising security forces, search and rescue teams and creating awareness about disaster management

Source: 2019 Amendment of the Disaster Risk Reduction and Management Act 2017

The Act has also created provincial Disaster Risk Reduction and Management Councils chaired by Chief Ministers (with 15 max members) as well as Provincial and Local Disaster Risk Reduction and Management Committees (PDMCs and LDMCs) chaired by the Minister of Interior of Provinces and Local Government heads respectively. The plan and policies of these committees will also be approved by the National and Provincial Councils.

Furthermore, the Act has envisioned for a District Disaster Risk Reduction and Management Committees led by the Chief District Officers (CDO - currently a federal government's deconcentrated unit). Province, District and Local Disaster Risk Reduction and Management Committees are empowered to create disaster funds (which can receive money from government, the public and donors (upon receiving the agreement of the Ministry of Finance). In addition, the Act has defined prominent roles for local communities, donors, international organisations and others in DRRM. The 2019 amendment of the DRRM Act 2017 has provisioned that Province Disaster Management Committees can mobilise District Disaster Management Committees (DDMCs) and make funds available for them. However, the provincial committees are not incentivised to mobilise DDMC, as there is no formal (legal) mechanism to communicate directly with CDOs.

The roles and responsibilities of province, district and local level is outlined in Figure 5, while Figure 6

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[9] P. Nepal; N. R. Khanal; and B. P. Pangali Sharma / The Geographical Journal of Nepal Vol. 11: 1-24, 2018

presents the current architecture of the DRRM governance of Nepal.

Figure 5: Roles and responsibilities of Province, District & Local Disaster Management Committees[10]

Province Disaster Management Committee (PDMC)

- Implementing disaster related medium-term and short-term policies, plans and programmes at province level
- Facilitating and coordinating activities for the effectiveness of LDMC preparedness activities
- Coordinating with national, provincial and local level to ensure the effectiveness of search and rescue activities
- Managing drinking water, food, clothes and medicines in disaster affected areas
- Replacement of people from unsafe to safe areas during disasters

District Disaster Management Committee (DDMC)

- Implementing policies, plans and programmes approved by the council, executive committee and province committee
- Preparing and implementing district Disaster Response Plan
- Mobilising the district emergency operation centre
- Conducting search and rescue works in the affected areas
- Managing of drinking water, food, clothes and medicines in disaster affected areas
- Keeping intact security forces
- Coordinating of national and international assistance during disaster
- Keeping the information flowing about disasters

Local Disaster Management Committee (LDMC)

- Designing and implementing local disaster management plan
- Allocating budget for disaster reduction
- Coordinating public, private, NGOs, local volunteers and social mobilisers to conduct disaster management activities
- Implementing building codes and standards/guidelines
- Forming disaster preparedness committees at ward and community level
- Managing rescue and relief in affected areas

Source: 2019 Amendment of the Disaster Risk Reduction and Management Act 2017

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[10] P. Nepal; N. R. Khanal; and B. P. Pangali Sharma / The Geographical Journal of Nepal Vol. 11: 1-24, 2018

Figure 6: Disaster risk reduction and management governance architecture of Nepal

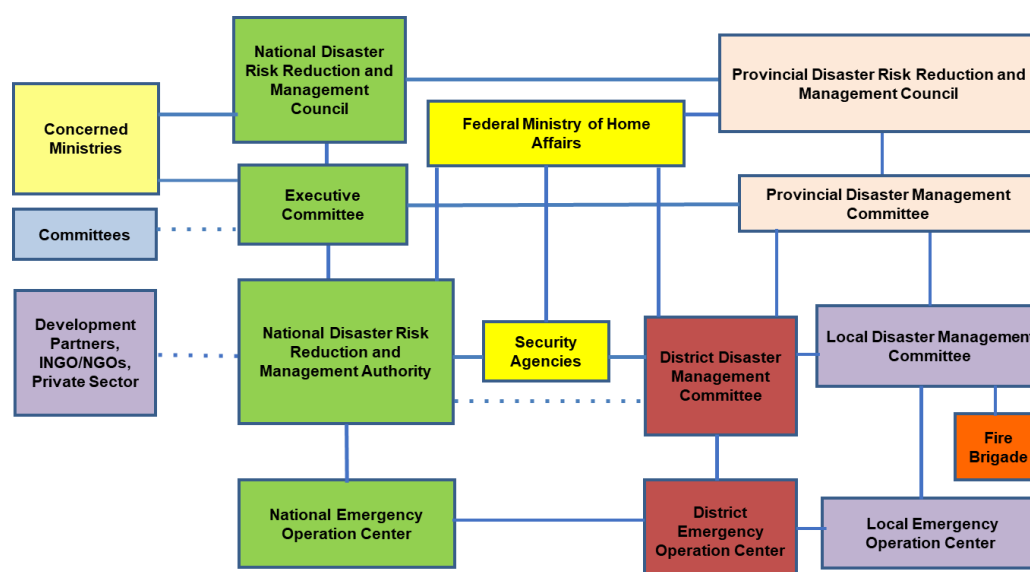*Source: Authors*

The amendment of the DRRM Act 2017 attempts to standardise and coordinate plans of all government, by stating that the provincial and local government can formulate by-laws based on the DRRM Act. However, provincial and local government are not obligated to follow the DRRM Act, which is a federal act. In fact, there is a precedence of a Supreme Court ruling on a local government's decision of transferring staff on the basis of by-laws formulated based on federal acts as illegal, stating that by-laws should be based on acts that are passed by the parliament (or council) of the respective government level.

One of the key gaps in the DRRM Act is that it does not define specific monitoring mechanisms of DRRM activities and deployment of resources, particularly in relief aid distribution. The monitoring mechanisms and indicators are laid out in the strategic action plan. For example, there have been many cases of misuse of relief materials and cash, and also incidences of victims not getting relief aid as planned. For instance, there has been complaints on the post-disaster needs assessment of the 2015 earthquake, which was revised in 2017 and is still under revision by the National Reconstruction Authority (NRA). Many donors have commissioned international agencies to monitor relief and reconstruction, particularly of the 2015 earthquake and the floods of 2017.

There is also ambiguity in the DRRM coordination among the three layers of governments and their ministries, departments and sub-division offices. The opacity in inter-agency coordination poses technical and practical challenges due to the imprecision of the working scope of the committees and the governance layer responsible for developing public amenities at economical cost, which will affect preparedness, response and relief delivery.

Box 1 provides some extra evidence of the issues of the functioning of the DRRM system in Nepal taken from a PEA carried out by OPM focusing on inter-governmental coordination in the response and relief to windstorm disasters in Bara and Parsa.

A windstorm, locally known as Sundi, hit a number of areas in Bara and Parsa districts on 31st of September 2019. The windstorm seriously affected people, livestock, and physical properties in 21 wards in 11 rural and urban municipalities leading to 28 deaths and over 600 wounded. Over 2,000 families were affected and 12,000 people needed assistance. Government agencies, political parties, the private sector, humanitarian agencies and civilians engaged in delivering rescue and relief materials. However, poor preparedness and response and the lack of coordination between government levels highlighted the need for better disaster risk reduction and management systems.

A rapid Political Economic Analysis (PEA), carried out by the OPM-led Policy and Institutions Facility (PIF), looked at the effectiveness of preparedness focusing on inter-governmental coordination. The findings showed that Inter-governmental/agencies coordination after the windstorm in Bara and Parsa was inconsistent, yet somewhat functional and effective. Indeed, the frequency and quality of communication and coordination between agencies and governments was compromised due to both the pressure for a response from affected areas, and the pressure from federal and provincial leaders to organise their schedule and security. Despite these pressures, local and district level agencies still managed to use their local knowledge, resources and networks to initiate rescue and relief efforts to prevent further loss of human lives.

It was also found that disaster management is often exploited as a springboard for political aspirations. The interests and incentives of those driving DRRM often overlook the need for inter-governmental coordination and communication. Common political interests include being in influential spheres and meeting individual and communal needs. Institutional operations, as well as humanitarian agencies, suffered in the tussle between parties. Political parties activated internal communications lines and mechanisms which ran in parallel to official channels.

The multi-layered governance context illustrated above has clear implications on the ability to the METEOR project to have an impact. For example, *as the new NDRRMA becomes operational, the METEOR consortium needs to ensure it is appropriately engaged.* This would mean to identify the key individuals in the NDRRMA that would have the interest and power to use the METEOR outputs in their DRRM activities. Ideally, the team, led by NSET and OPM Nepal, would be able to identify and target key people moving to the NDRRMA from stakeholders that already showed interest in using the METEOR outputs. Furthermore, *the diffused nature of the DRRM responsibilities along the federal-local governance continuum requires the METEOR project to find ways to influence the different sub-national stakeholders without having specific resources to directly work at the sub-national level.* However, it is positive in this regard to notice that the project is already engaging with federal stakeholders that have a pivotal role in DRRM at the different governance levels, such as the Federal Ministry of Home Affairs, the Executive Committee, the Ministry of Federal Affairs and General Administration, and the National Emergency Operational Centre (see Figure 6). Finally, NSET itself does work to promote capacity building and good DRRM practices from the federal down to the local levels, and it has already expressed its will to use the METEOR outputs to support its work.

4.3.2. Country case study findings

The midline evaluation findings for Nepal are largely based on the in-country interviews, group discussions and observation of the stakeholder workshops, all held during the period of 5-14 November 2019. The main focus of the midline probe in Nepal was:

- Checking the level of relevance of METEOR project and outputs has not decreased compared to the baseline, and in particular crystallise the added value that the project is expected to bring to DRRM policy and practice in Nepal
- Getting feedback from the local stakeholders about the approach to output co-development utilised so far to assess if it was effective, met their expectations, and was improvable

- Assessing which of the building pieces of the road between output delivery and outcome achievement have been already laid and which ones have not.

The November mission to Nepal was a very interesting one to witness to from a midline evaluation perspective, as it represented the **first stakeholder test of a number of METEOR outputs**, including: draft flood, earthquake, and landslide hazard and multi-hazard footprints for Nepal; and draft national exposure data for Nepal.

One of the key findings of the midline activities in Nepal is that **the relevance of the METEOR project to the user requirements is still very high**. During all of the meetings and sessions, we witnessed clear manifestations of interest in the project outputs. The fact that stakeholders were able to visualise some of the intermediate hazard and exposure data on national maps and "play" with the datasets certainly helped that outcome. The availability of a **visual demonstration of some of the draft outputs** had two main positive consequences. On the one hand, it made the once technical and complex description of the METEOR outputs simpler to understand for a wide range of local stakeholders coming from different backgrounds, including technical and non-technical users. This is important, for being able to influence both technical and policy users is **crucial to the project having an impact at the national level**. On the other hand, this created extra confidence in potential users that the project partners would deliver what they promised, and that the actual outputs will be useful to them. Finally, it also allowed stakeholders to ask questions to BGS and the rest of the METEOR team on specific outputs, and consequently understand what the project will and, importantly, will not deliver, thus better clarifying how the outputs can be used.

Indeed, the stakeholder exchanges in Nepal were useful to pro-actively **identify the concrete added value of METEOR outputs to a longlist of current and future policy and scientific activities** related to disaster risk assessment.

Table 9. Concrete DRRM activities to which METEOR outputs can add value, identified by stakeholders

DRRM activity to be informed by METEOR	METEOR outputs involved	Target stakeholders
National disaster risk assessments	All METEOR outputs	MoHA, MoFE, *NDRRMA*
Building codes review and implementation	All METEOR outputs	DUDBC, NAST, NSET, MoFAGA
Sub-national risk sensitive land use plans	All METEOR outputs	MoFAGA
Flood loss estimation & flood hazard assessment	Flood hazard, exposure, fragility/vulnerability	DHM
National Financing Strategy on DRR	All METEOR outputs	NPC
Further study impact of climate change on landslides and flooding	All METEOR outputs	ICIMOD
Tomorrow's Cities project	METEOR protocols	TC Consortium
Prioritise the areas of deployment of EQ EWS	All METEOR outputs	NAST

The longlist of concrete DRRM activities to be potentially informed by METEOR outputs in Nepal are summarised in Table 9, which also shows the national stakeholders/potential users involved and the specific METEOR outputs likely to be useful. Each DRRM activity identified is briefly explained below:

- **Once operational, the NDDRMA will have to prepare a national multi-hazard risk assessment**. The project team should aim for that study to be informed by the METEOR multi-hazard footprint, the METEOR exposure dataset, the METEOR fragility and vulnerability functions, and follow the METEOR protocols as much as possible. (Source: NSET)
- **MoHA is preparing national disaster risk assessments for six hazards**, three of which are landslides, earthquakes, and flooding, i.e. the ones covered by the METEOR project. METEOR

data and protocols can be used for the assessment of risk associated with those hazards. (Source: MoHA National Emergency Operational Centre)

- The Department of Urban Development and Building Construction (DUDBC) together with other stakeholders involved in the review of **Nepal's Building Codes** (namely, the Nepal Academy of Science and Technology (NAST) Building Research Centre and NSET) could use the METEOR fragility/ vulnerability datasets for informing the technical parameters to be included in disaster risk resilient building codes. In addition, DUBC could use the METEOR hazard footprints to define the building parameters to be applied in specific geographic areas (Source: DUBC/NAST Building Research Centre)

- DUBC and the Ministry of Federal Affairs and Government Administration (MoFAGA), the Ministry in charge of local planning, could use the METEOR exposure dataset for **sub-national (e.g. district and municipal level) risk sensitive land use planning** (Source: DUBC/NAST Building Research Centre). Indeed, MoFAGA is preparing the risk sensitive land use planning / vulnerability assessment for every local government unit. METEOR data can be useful to validate the info the local authorities are providing. (Source: MoFAGA)

- Using all METEOR products to **support further studies on the impact of climate change on landslides and flooding in Nepal**, by incorporating climate projections into them. (Source: ICIMOD)

- The Department of Hydrology and Meteorology (DHM) under the Ministry of Energy, Water Resources and Irrigation (MEWRI) is responsible for flood risk assessment in Nepal. They reported that the METEOR flood hazard, vulnerability and exposure data could support their efforts to undertake **flood loss estimation assessments at the national level**, something they have not conducted before. (Source: DHM)

- In addition, national flood hazard footprint from METEOR could complement the existing river basin data that DHM collects and analyse to **expand their flood hazard assessment to the entire country**. (Source: DHM)

- **The National Planning Commission (NPC) is currently working on a National Financing Strategy on DRR**. METEOR could aim for its outputs to inform the NPC's assessment of the financial resource requirement for DRR in Nepal. (Source: NPC)

- Potentially, the METEOR outputs could be used to **inform the prioritisation of the areas of deployment of an earthquake Early Warning System** in Nepal, i.e. which areas to prioritise for sending the SMS warnings. (Source: NAST)

- Both BGS and NSET are partners in the recently-started five-year research and innovation project **"Tomorrow's Cities"**, which aims to reduce disaster risk for the poorest people living in four major cities in Nepal, Ecuador, Kenya and Turkey. In Nepal, the project will focus on Kathmandu and the declared key aim of the project is to "integrate multi-hazard disaster risk reduction into prevailing planning practice"[11]. Consequently, the Tomorrow's Cities project represent a good opportunity to have the METEOR protocols to be used and tested in other countries (Turkey, Kenya, and Ecuador) and at a lower geographical scale. (Source: Tribhuvan University (TU), NSET, BGS)

Another positive note is that **a number of organisations in Nepal have offered to host the METEOR data on their portals**, including important ones such as:

- **The Building Information Platform Against Disaster (BIPAD)** (http://bipad.gov.np/), which is a Government owned one stop platform and disaster information system. It is a national initiative led by the National Emergency Operation Centre (NEOC) of MoHA with the technical support from Youth Innovation Lab. *This is the number one portal that is used by the Government of Nepal (GoN) to support DRRM decisions and the fact that METEOR outputs will*

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[11] https://www.tomorrowscities.org/city/kathmandu.

be used on BIPAD, directly implies the project's data will be integrated in national DRRM policies and risk assessments.

- **The National Data Profile portal** (http://nationaldata.gov.np/) hosted by the Central Bureau of Statistics, which collects national statistics from the entire GoN, including sections dedicated to natural disasters and SDGs data. To be noted that at the moment the platform is nothing more than an empty box, but it is due to be fully operational in the next year or so.
- **The ICIMOD Regional Database System portal** (http://rds.icimod.org/), which is a geospatial website that aims to be "a one-stop data portal for the Hindu Kush Himalaya". The portal is used by the scientific and practitioner communities to inform studies and projects and the presence of METEOR data on it would increase the regional outreach of the project as well as their use in advancing disaster risk assessments.

Despite the very positive feedback on and perspectives for METEOR, some **challenges** have been identified. For instance, **coordination among multiple actors and initiatives remains crucial to the effectiveness and efficiency of the project**. Nepal remains a crowded space, with numerous national and international DRRM initiatives, and coordination among them is not always an easy task. So far, *our findings show that the METEOR consortium has been able to remain informed of and sometimes even involved in other initiatives (e.g. see Tomorrow's Cities and the many DRRM initiatives by NSET).* The additional complexity for the project is the presence of a federal system with multiple institutions with mandates related to DRRM, which operate at multiple governance levels. Once again, our assessment shows that *NSET has been very effective in opening doors and liaising with the right stakeholders, and those interactions have been effectively followed up by the other international METEOR partners to get the buy-in of pivotal government stakeholders*. This is evidenced by the offering of hosting the METEOR outputs on government-owned portals as well as the opening by MoHA and other institutions to use METEOR data in their official DRRM activities.

Perhaps the main criticism received by METEOR in Nepal has been on **perceived limited involvement of local experts in the technical preparation, and therefore co-development, of the METEOR products**. In fairness, there has been evidence of direct involvement of local experts by the METEOR partners, including training of NSET staff at GEM's headquarters in Pavia, Italy, a two-week secondment of an NSET member of the team to ImageCat's offices in California, USA, and a knowledge elicitation workshop in Nepal coordinated by BGS to gather key information and expert judgement by local experts on landslide hazard. However, the view of some Nepalese experts is that additional benefits in terms of ownership of the METEOR outputs would have come by actually co-working on the production of the outputs, rather than providing info and judgement to build the outputs. This spurs two considerations. *Firstly, wanting to see a positive aspect in this criticism, someone could underscore the very high interest of local stakeholders in being part of the project, which raises reasonable expectations that METEOR's outputs will actually be used. Secondly, as the initial outputs for Nepal are already ready, unfortunately now there is limited scope for bringing in technical responsibilities by NSET or other Nepalese experts in their development. Therefore, the engagement of national stakeholder in the validation of the METEOR outputs will be important to sustain their acceptability among the DRRM decision makers.*

Linked to the last point is the topic of **knowledge transfer to the local stakeholders**. Indeed, the clear interest in the METEOR outputs shown in Nepal and the opportunity for their wide accessibility in the country requires to be accompanied by transferring the knowledge of the data and protocols to the right users (both technical and policy-makers), so that they can test their robustness before becoming accepted. Failure to do so would risk hampering the sustainability of the project. For example, during the stakeholder workshops there were several questions about the sources and methodologies used to develop the draft datasets. This underscored the eagerness of potential local users to be able to trust the outputs and therefore use them. Another example came during the one-to-one meeting with

the Department of Hydrology and Meteorology, where they explained to us they are very interested in using the METEOR data, for instance in flood loss estimation assessments, but they would need to closely screen the protocols to have enough confidence in the robustness and accuracy of METEOR's methodologies.

To address the issue of validation of the outputs and support their uptake in Government, NSET has been working to set up a **METEOR Advisory Committee in Nepal**. The Advisory Committee has been designed to be a multi-stakeholder group led by key figures in the GoN and including governmental and non-governmental DRRM actors. The National Planning Commission has offered to chair the Committee and help coordinate among the other government agencies. As we write, we understand that NSET is preparing the Terms of Reference of the Advisory Committee, to be approved by the GoN. *Undoubtedly, the METEOR Advisory Committee has the potential to increase the legitimacy of the METEOR outputs for the Nepalese stakeholders. Nevertheless, the sustainable uptake of the METEOR products will require the use of capacity building in a strategic manner.*

METEOR has part of its budget earmarked for training and capacity building activities. However, at this point, **it is unclear what the content of capacity building activities in Nepal (and Tanzania) will be**. According to the internal discussion at past Quarterly Meetings, we understand that most of the training activities will be carried in the last quarter of the project for an unspecified number of days in both Nepal and Tanzania. *Since the resources for capacity building are limited, it is the M&E team's opinion that a strategic approach to link targeted capacity building to maximise the uptake of METEOR outputs in prioritised DRRM activities is needed.* This is something we had mentioned and discussed at the QM in November 2019 in Nepal and we will further focus on at the next Annual Learning Event in March 2020. The strategic approach for METEOR to the uptake of the outputs is discussed in detail in the Conclusions section (Section 5).

4.4. Tanzania findings

4.4.1. Country context update

Baseline summary

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[12]. 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[13]. That earthquake killed at least 17 people, injured several hundred, and caused significant damage to local infrastructure.

The impact of disasters affect not only individuals and their property, but also lead to costly damage of public infrastructure[14]. This damage in turn hampers the overall development process and undermines the national and international efforts geared towards poverty reduction[15]. Exacerbating these issues are rapid urbanisation and the large - and mostly unplanned - spatial expansion of urban areas. For example, it is estimated that, in Mwanza, over 80% of households reside in hazard-prone areas, and 75% of the population in Dar es Salaam live in unplanned settlements[16] . Dar es Salaam is

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[12] United Republic of Tanzania (2008). Disaster Risk and Capacity Needs Assessment for Tanzania Mainland.
[13] https://www.gov.uk/foreign-travel-advice/tanzania/natural-disasters
[14] United Republic of Tanzania (2014) National Operational Guidelines for Disaster Risk Management, 2014
[15] Ibid.
[16] 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.

Africa's fastest growing urban centre with the total population expected to expand by more than 85% by 2025[17]. It is likely to achieve "megacity" status—10 million residents or more—by the early 2030s[18].

The legal and policy framework guiding DRRM activities in Tanzania include several key pieces of legislation, the most important of which is the **Disaster Management Act 2015,** which replaced 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 situation is still dynamic and some of these had yet to be fully operationalised.

At baseline, the structure for disaster management was coordinated by the **Disaster Management Department (DMD)** in the Prime Minister's Office (PMO). That is still the case today. 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 Committee (TADMAC)**, which is made up of the Permanent Secretaries (PS) of all key ministries and holds the ultimate responsibility for DRM. The Chair of TADMAC is the Permanent Secretary in the Ministry responsible for disaster management and the secretary is the Director General of DMD. In addition, the Disaster Management Act 2015, calls for the formation of a National Disaster Management Platform chaired by the Director General of the DMD, which is required to convene at least twice annually to provide a platform for relevant stakeholders from line Ministries, the private sector, development partners and academia to meet and discuss strategic issues related to disaster management and advise the Government accordingly. Some of these stakeholders are as per Figure 7 below which provides an updated list of the main DRRM stakeholders in Tanzania.

In addition to the GoT, there are several other key stakeholders and programmes in DRRM that are relevant to the METEOR projects. From our perspective, two programmes stand out in terms of synergies with METEOR. The first one is the World Bank funded **Tanzania Urban Resilience Programme (TURP)**, which is specifically focused on DRRM in urban areas, principally Dar es Salaam, with the aim to increase Tanzanian resilience to climate and disaster risk. TURP has four pillars of implementation: namely data collection for risk identification; risk reduction planning; emergency management and preparedness; and, lastly, the Resilience Academy. The fourth pillar, that is the Resilience Academy[19] is an initiative established to ensure the sustainability of knowledge and systems that are developed under this partnership programme between the GoT, World Bank and DFID. The Resilience Academy "aims to curate and transfer data, tools, and models of the program into a local academic and technical platform"[20]. It is an initiative that involves a dedicated faculty in five academic institutions in Mainland Tanzania, Zanzibar and Finland. These institutions include the University of Dar es Salaam, Ardhi University, Sokoine University of Agriculture, State University of Zanzibar, and University of Turku in Finland.

The second relevant project to be highlighted is the ***Ramani Huria*** project (funded under TURP) to create highly accurate geospatial datasets of the most flood-prone areas of Dar es Salaam. The project is led by the METEOR partner, HOT.

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[17] See https://www.afdb.org/en/knowledge/publications/tracking-africa's-progress-in-figures/
[18] https://www.citylab.com/design/2015/02/the-bright-future-of-dar-es-salaam-an-unlikely-african-megacity/385801/
[19] https://resilienceacademy.ac.tz/
[20] World Bank. 2019. *Tanzania Urban Resilience Program : Annual Report 2019 (English)*. Washington, D.C. : World Bank Group. http://documents.worldbank.org/curated/en/132061570739508217/Tanzania-Urban-Resilience-Program-Annual-Report-2019.

Figure 7: Key DRRM stakeholders in Tanzania
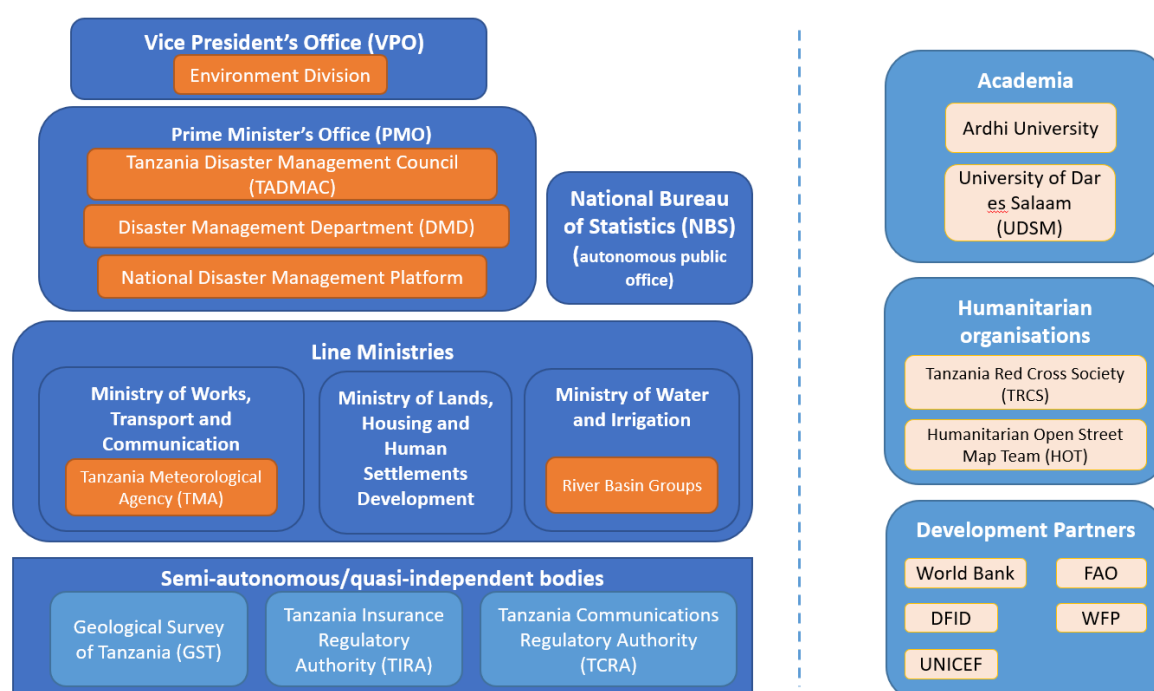
Evolving risk context

Tanzania is becoming increasingly vulnerable to tropical storms, droughts and floods with the national costs of climate-related hazards estimated to be around 1% of GDP in recent years. These disasters result in disruption of daily lives, destruction of infrastructure, health problems and food insecurity.

In May 2019, in Dar es Salaam alone, 1,215 households were displaced, and 1,560 dwellings swept away as a result of uninterrupted rains causing flooding that also destroyed roads and bridges in the commercial capital of the country[21]. Dar es Salaam received 144mm of rain between 5th and 7th May, which is close to the rainfall average of the entire month of May. In the South of the country, a week of torrential rain left 5 people dead and 2,500 homeless in Kyela District, Mbeya Region[22].

In October of 2019 at least 44 people died as a result of heavy rains resulting in flooding in Morogoro, Tanga (Handeni District), and Mara Region (Rorya and Musoma rural)[23]. Towards the end of the year, in December 2019, rains in Morogoro and the Kilimanjaro Region (Mvomero District) resulted in the displacement of people, and damaged and destroyed houses[24].

In December 2019, TMA released an alert for heavy rains during the first three weeks of January 2020 in 13 regions in the country including Lindi and Iringa Regions. So far 3 people have died, 60 houses

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[21] World Bank (2020). Draining Dar's Economy – The Impact of Floods on Tanzania's Commercial Capital. https://www.worldbank.org/en/news/opinion/2019/10/01/draining-dars-economy---the-impact-of-floods-on-tanzanias-commercial-capital.

[22] Erman, Alvina; Tariverdi, Mercedeh; Obolensky, Marguerite; Chen, Xiaomeng; Vincent, Rose Camille; Malgioglio, Silvia; Rentschler, Jun; Hallegatte, Stephane; Yoshida, Nobuo. 2019. Wading Out the Storm : The Role of Poverty in Exposure, Vulnerability and Resilience to Floods in Dar es Salaam. Policy Research Working Paper;No. 8976. World Bank, Washington, DC. © World Bank. https://openknowledge.worldbank.org/handle/10986/32269 License: CC BY 3.0 IGO.

[23] https://reliefweb.int/disaster/fl-2019-000145-tza.

[24] http://floodlist.com/africa/tanzania-floods-morogoro-december-2019.

have been damaged and 300 people displaced in Iringa Region following rains on the 27th January. In Lindi, 600 people are reported to have been affected by the flooding with villagers having to be rescued by fishermen boats.[25]
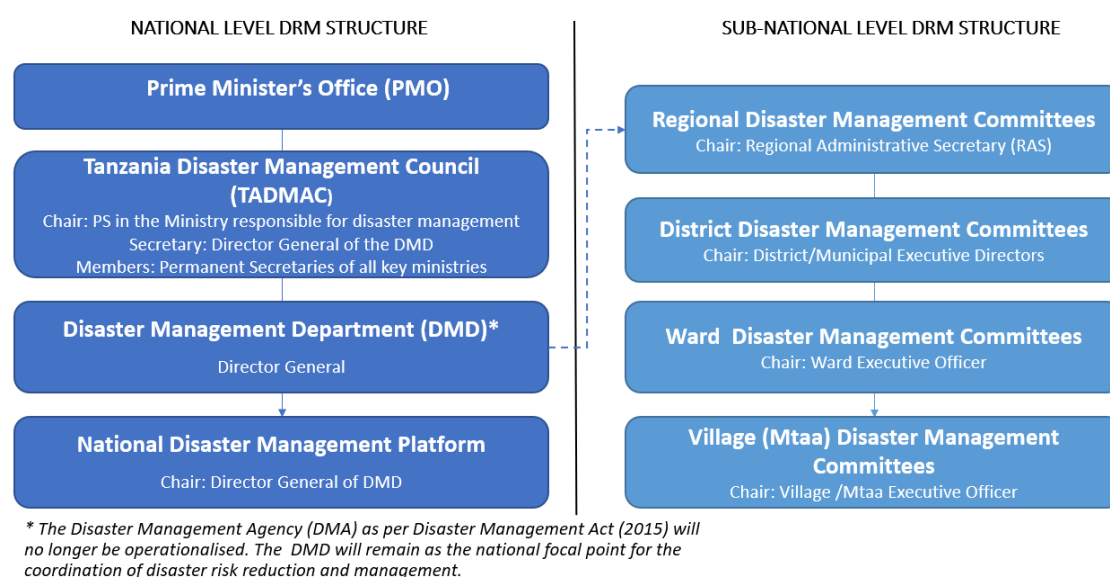
Governance of disaster risk management update

The Disaster Management Act (2015) that provides the overarching legal framework for disaster preparedness and response in Tanzania stipulates that the DMD is to be replaced with a Disaster Management Agency (DMA) to allow for easier division of resources, and the Tanzania Disaster Management Council (TADMAC), which is meant to oversee the management of the affairs of the DMA. Based on what the DMD told the midline evaluation team in a Focus Group Discussion (FGD) we conducted in October 2019, we understand that, ultimately, **the DMA will not be formed and the DMD will remain as is under the Prime Minister's Office,** with the Permanent Secretary as the overall Accountable Officer/Manager. Under the DMD, the Director General currently has 3 Deputy Directors that report to him. Under each Deputy Director, there are two principal disaster coordinators followed by three senior disaster coordinators. **TADMAC will remain as the body that oversees the operations of the DMD** as per Figure 8 below that provides a simplified illustration of the updated national and sub-national level DRM structure.

The reason behind the decision not to form the DMA is the lack of final parliamentary approval for the formation of the Agency. The perspective of the Parliament was that the activities that the DMD conducts can be done within the existing structure under the Prime Minister's Office, without the need for a separate corporate body. The budgetary implications of an independent agency were also among the factors for deciding not to pursue the DMA. The reasons for the initial push for a DMA was mostly related to better allocation of resources.

The way we see it, the fact that the DMA will not be formed can have both positive and negative consequences for METEOR. On the positive side, DMD is already in the consortium and the team will not need to go through the risk of engaging new actors. On the potential negative side, it is the fact that the PMO will still hold the definitive decisional power on DRRM and *the project will need to strengthen its communication to the PMO to ensure the institutional uptake of the METEOR outputs.*

Figure 8: National and sub-national DRM administrative structures (simplified)

NATIONAL LEVEL DRM STRUCTURE

Prime Minister's Office (PMO)

Tanzania Disaster Management Council (TADMAC)
Chair: PS in the Ministry responsible for disaster management
Secretary: Director General of the DMD
Members: Permanent Secretaries of all key ministries

Disaster Management Department (DMD)*
Director General

National Disaster Management Platform
Chair: Director General of DMD

SUB-NATIONAL LEVEL DRM STRUCTURE

Regional Disaster Management Committees
Chair: Regional Administrative Secretary (RAS)

District Disaster Management Committees
Chair: District/Municipal Executive Directors

Ward Disaster Management Committees
Chair: Ward Executive Officer

Village (Mtaa) Disaster Management Committees
Chair: Village /Mtaa Executive Officer

* The Disaster Management Agency (DMA) as per Disaster Management Act (2015) will no longer be operationalised. The DMD will remain as the national focal point for the coordination of disaster risk reduction and management.

Source: Authors

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[25] https://www.ippmedia.com/en/news/flash-floods-kill-three-leave-600-homeless.

Furthermore, although during the baseline evaluation there was mention of a possible assessment of the 2004 Disaster Policy for purposes of determining its relevance, or if it might need an update, which is yet to happen.

As part of its national commitments under the Sendai Framework for Disaster Risk Reduction 2015-2030, efforts are underway by the DMD to establish a National Disaster Risk Reduction Strategy to guide national DRR efforts as informed by current government strategies and in line with the current DRM regulations.

Other relevant activities and projects that the DMD is currently engaged in include:

- A United Nations Office for Disaster Risk Reduction (UNDRR) project on modelling of impact drought and floods at district level depending on a changing climate. This project will involve disaster risk assessment and modelling.

- Dissemination of the Disaster Management Act (2015) in different regions and municipalities of the country.

The midline interviews recently conducted show some continuity of general challenges of the DRRM sector with those identified at baseline. These include the fact that, while policies and plans seem to be in place, **DRRM is not a sector that is given as much priority or resources as other ones**. This has the potential to negatively influence uptake of METEOR outputs. Moreover, there is still a sentiment from stakeholders that **the approach to disasters is still reactive in nature and needs to be more proactive**. Less is invested in proactive planning, partly due to limitations in resources. Another identified DRRM issue is the **general lack of awareness of risk of disasters to them or their homes and how to respond to them**. These were all key issues identified at the time of the baseline evaluation, which saw little or no improvement since then, with the exception of the effort of planning more proactively for disasters, which will possibly be improved by the development of a DRR Strategy by the DMD.

4.4.2. Country case study findings

The METEOR team has objectively noted some challenges in engaging with DMD, particularly in getting DMD representatives to travel to Quarterly Meetings (QMs) outside of Tanzania (none attended so far), to participate in monthly catch-up calls with the rest of the consortium, and to provide inputs following email requests. It is also fair to say that the DMD team has shown high level of interest and participation in the project when activities have been carried out in-country and during the QM in Tanzania in March 2019. Moreover, it is clear that the focus of the project in Tanzania is more policy-oriented for DMD relative to the more technical focus for NSET in Nepal, and this may have had specific implications in the different levels of engagement achieved in the co-development process.

Based on these important, but previously not fully understood issues, the M&E team focused its midline evaluation efforts in Tanzania on assessing the key reasons behind the challenges encountered by the METEOR project in the co-development and remote engagement aspects and, henceforth, identifying possible entry points for overcoming them. The key findings of such an assessment are presented below, mainly resulting from KIIs and informal discussions with DMD officials and other Tanzanian stakeholders.

The findings of the assessment identified the main causes of the barriers in the co-development process in Tanzania and engagement of the local partner as the result of multiple and concurring factors linked to: **a) barriers in the payment systems; b) institutional matters; c) lack of formal government accreditation; and d) internal dynamics within the DMD**. These factors are explored in this order below.

The DMD operates under the broader umbrella of the Prime Minister's Office, with the Permanent Secretary as the ultimate accountable officer. The nature of this institutional set up implies that **funds cannot go directly to the DMD** as they have no payment systems and ability to raise invoices as a Department. This must be done via the PMO, which involves risks of a long bureaucratic process to get the funds to DMD, and the concrete possibility that METEOR funds are diverted by the PMO to other Departments. In addition, payment rules on both UKSA and the GoT sides are also fairly rigid, for instance not allowing for the payment of per diems for overseas trips or direct payments of fees to the accounts of individual DMD staff for work related to METEOR. The result of this system is that, despite the project having a budget set aside for DMD for METEOR activities, no invoice has been raised by the Tanzanian counterparts so far, and therefore no payment <u>for labour costs</u> has been made to either the Department, or to the individual DMD team members involved in the project. Understandably, the level of participation on METEOR activities by the DMD has taken a toll because of the inability to pay the DMD team members involved. By speaking with both DMD and BGS representatives, the M&E team understands that efforts from both the UK and Tanzanian sides to try and find a viable solution to appropriately allocate the METEOR funds to the DMD are currently ongoing. *Although at the time of writing a solution has not been officially reached, there seems to be a viable option identified and action is being taken.*

Another institutional challenge for METEOR in Tanzania is the fact that **disaster risk data ownership is not centrally located in DMD, but rather scattered among several institutions.** That said, a solution to that problem would be for DMD to mobilise the different national DRRM stakeholders to gather the data relevant to METEOR. However, this has not happened as effectively as the project would have required, principally for two reasons we identified. On the one hand, the inability to channel METEOR funds to the DMD has affected the pro-active engagement of DMD with the METEOR team and activities, and thus with the stakeholder coordination efforts. On the other hand, a small number of Tanzanian interviewees have pointed out a certain level of dissatisfaction with the way the METEOR partners have engaged with them, especially underscoring that, rather than being involved in the co-development of the METEOR outputs, they were only asked to provide data, information or feedback. This issue – which is treated more in detail in the next section – has to a certain extent affected the ability of DMD to engage with Tanzanian stakeholders.

Additional challenges to the DMD's ability to facilitate the engagement with other local stakeholders are posed by the **lack of formal accreditation of the project by the right local institution**. In particular, as the METEOR project has not gone through the accreditation process with the Tanzania Commission for Science and Technology (COSTECH), this might have affected the engagement of some Tanzanian stakeholders as they might not have seen the project as sufficiently legitimated by the Government. COSTECH is a parastatal organisation responsible for coordinating and promoting research and technology development activities in Tanzania. Although the impact of the COSTECH accreditation on DMD's ability to mobilise national stakeholders is just a reasonable assumption referred to us during interviews, the possible inability by stakeholders to officially use METEOR data is a concrete concern as a new law in Tanzania forbids the use of statistics and data that has not been approved by the government for official use. When questioned on this point, BGS replied that, currently, undergoing the accreditation process to COSTECH may bear more risks to the METEOR project than benefits. In fact, there are concerns about the lack of transparency of the COSTECH accreditation process, which could not exclude the risk of a rejection of the METEOR data. A rejection by COSTECH would have enormous consequences on the METEOR's impact in Tanzania, as it would practically kill any chance that the GoT would use the METEOR outputs. In addition, there are other authoritative examples (e.g. other World Bank funded projects) that have not been COSTECH-approved, but have still been used by Tanzanian stakeholders. *In conclusion, undergoing the COSTECH accreditation process would be an important step for METEOR's effectiveness and sustainability, but it requires support by DMD to make*

clarity on the criteria used by COSTECH to provide its approval and therefore lower the risk of a rejection of the METEOR data. However, it is our opinion that, unless the other issues are resolved (especially the one about the ability to pay the DMD), such support from DMD might be difficult to get. In addition, our research identified among the COSTECH approval criteria the need for foreign applicants to get a letter of recommendation from a local relevant institution to register a "scientific study". The obtainment of the letter may require additional efforts by the METEOR international partners to involve local universities or technical government departments (beyond the DMD) in the co-development of the METEOR outputs.

Finally, we found that DMD's participation in the co-development process has been hampered to a certain extent by **internal dynamics in the DMD team**. For example, whilst the issues listed above have been negatively influencing the position of the METEOR project on the DMD agenda, there are also coincidental frustrations of some of the local team members that clearly feel personally interested in the project and would like to dedicate more time on it. So, for instance, the non-attendance of QMs by DMD does not reflect a lack of interest in the project by single team members, but rather blockages in the authorisation process for their participation. *We believe that solving the current impasse in paying the DMD could improve the availability of DMD staff to work on the project and, considering the personal motivation seen, we have every reason to believe that the contribution provided to the METEOR co-development process will be important. Additionally, it is positive to notice that the DMD management has provided multiple points of contacts in the team for METEOR, which can overcome the challenge of having bottlenecks in communications due to the busy schedule of the management or their possible relocation to other departments.*

Stakeholder engagement, sustainability and ownership

Overall, the DMD senior officials we interviewed expressed general satisfaction with the internal project management of METEOR and how the consortium partners work together. Nevertheless, there appear to be some key concerns about the way METEOR has engaged (or not engaged) with mandated institutions and stakeholders in Tanzania.

A concern raised by interviewees was around **the foreign nature of the consultants/ firms involved in implementing METEOR** and the need to have more local partners in the consortium. They felt that using local stakeholders in the technical delivery of the project would be important as one of the means of ensuring METEOR is building capacity in-country and creating ownership of the METEOR outputs.

Indeed, some of the interviewees are concerned that **the nature of METEOR's engagement with Tanzanian stakeholders (technical experts and others) has mostly been informative in nature** and needs to go beyond this to ensure sustainability and ownership. Such stakeholders do not only include the PMO-DMD, but also other organisations (namely other government counterparts) that are mandated to hold data and play other more technical roles beyond coordination. Some of the examples provided include the GST that holds all risk and exposure data, University of Dar es Salaam (UDSM) and University of Dodoma (UDOM). During the interviews in October, OPM was also contacted by a hydrologist at the Ministry of Water, Department for Water Resources enquiring on the draft outputs of the project and if these could be shared with them.

Furthermore, **some of the interviewees felt that the timing of the midline evaluation was premature**, as they had not seen any intermediate outputs yet and they felt not much had happened since the inception and baseline interactions with the METEOR project. This reflected a more general perception by Tanzanian stakeholders of problems in their engagement in the project activities or basic communication of progress. Once again, this is in contrast with the actual high interest in the

project shown by interviewees, who manifested slight concerns about the apparent lack of involvement or communication by the METEOR project.

Key informants recommended for METEOR to engage with and disseminate its products through the National Disaster Management Platform, which provides an opportunity for different stakeholders to meet and advise the Government on disaster management issues. The platform includes representatives from different relevant line Ministries, humanitarian organisations (e.g. the Tanzania Red Cross Society (TRCS)), TMA, GST, different tertiary institutions and other relevant stakeholders. The platform, according to the Disaster Management Act 2015 must meet at least twice a year but can be convened for a specific issue if need be. Engagement of this platform with METEOR would need to be as soon as possible should the project opt for it, and definitely before the final products are developed to ensure adequate levels of ownership. Indeed, it will be important that the stakeholders within the Platform do not feel like they are being brought on board rather late in the development of the products and that there is time for them to provide inputs.

Another engagement and dissemination forum for METEOR identified by the interviews is the Development Partners' Group on Environment. This covers issues on water, health, and occasionally DRR. Currently, this is chaired by the German and American Embassies. As there is no coordinating body for donors working in DRRM that exists at present, the Group on Environment might be an efficient option to engage with multiple development partners at the same time.

Uptake and use of METEOR outputs

Interviews show that there is continued interest and appetite for the METEOR outputs in Tanzania. The key issues are the pathways that need to be taken to ensure uptake and sustainability. As previously touched on, interviewed stakeholders see the **registration with COSTECH as a useful but not sufficient requirement** to ensure use, uptake and engagement of local institutions beyond providing them with updates on the project and final outputs.

In addition to that, as a minimum, **there is a need for ensuring that initial project outputs are disseminated earlier on,** so that input is provided by different institutions on the format and capacity needs of the institutions to be able to use the outputs. This was highlighted in interviews with different government stakeholders. **A step further would have been to involve key technical stakeholders in Tanzania in the co-development of the METEOR outputs**, although the way in which the project was designed and the issues related to pay and work with DMD have possibly closed the road to this option. If that is the case, *giving national institutions the opportunity to provide data and knowledge inputs and therefore have a stake in the outputs will likely enhance ownership of the METEOR products.*

A positive finding was that, as the custodian of exposure and risk data, **GST has a clear understanding of the project outputs and their possible applications.** For instance, GST is currently working on developing a seismic hazard map for Tanzania that can be narrowed down to the District level, and METEOR hazard footprint can definitely improve GST's data.

Some of the **uses of the METEOR outputs** identified by different stakeholders include:

- Assessing risk by the construction industry prior to the construction of buildings.
- Assessing risk by the Tanzania National Roads Agency (*TANROADS*) prior to road and infrastructure construction.
- Assessing the safety of underground mining in the mining industry.
- Assessing and better understanding ground responses prior to the drafting of building codes. Building codes once drafted should be used to inform land use planning.

- Tertiary institutions could continue using METEOR outputs beyond the project life. Examples include the Geology Departments at the UDSM and UDOM. Here there is room for METEOR to be involved in the TURP Resilience Academy (see above).
- Supporting disaster risk assessments by insurance companies.

Although the list above can be deemed a positive note, we believe it falls short of representing "unprompted, appropriate and realistic use cases for METEOR outputs" (see the midline targets of Outcome Indicators 1.1 and 2.1). Unlike in Nepal, where the DRRM activities identified are specific assessments, studies or similar that are already planned to happen and the authors of which have identified METEOR to be appropriate and useful inputs for them, the list of uses in Tanzania stops at the level of general suggestions for uses in entire sectors or similar. That is why, for Tanzania, we can only assess the midline target for the Outcome Indicators 1.1 and 2.1 as partially achieved.

5. Conclusions

5.1. Summary of Key Findings

Based on the findings that emerged during the interviews and other activities, in this section we summarise the key conclusions and common themes of the midline evaluation.

5.1.1. Process evaluation

The general conclusions of the process evaluation are that:

a) **All consortium members feel that the project has been managed very diligently and effectively by the BGS**.

b) There are **no major delays** in the delivery of milestones to be reported.

c) Meeting in person at the **Quarterly Meetings is seen as an added value** of the METEOR project compared to other projects in which the team had worked before. The benefits of having QMs in Tanzania and Nepal are greater than ones in the UK, although consortium members are generally happy with the frequency of in-country QMs.

d) The main value of **monthly catch-up calls** is seen in getting an update on other WPs and, most of all, in setting up side conversations to act on specific tasks.

e) METEOR is a complex project with a large consortium of specialised organisations working on different pieces of the same puzzle. While monthly calls do provide updates on the progress of each WP, **there seems to be the need to facilitate the regular communication of the progress of the "overall puzzle" and the path dependencies among the different tasks**. This is not for lack of reporting though (e.g. a monthly report is also shared by the PM with the entire consortium). *An idea could be that the key points from the monthly reports are included in the body of the email as well, so that even the people who do not have time to open the document can grasp the progress updates in one go.*

5.1.2. Global study

Regarding the general conclusions of the Global Study for the part related to the global humanitarian and DRRM community are that:

a) **Advisory Board members understand well** what the project will deliver and how it intends to deliver it.

b) **Advisory Board members show high interest in the project** and their organisations are very likely to use METEOR outputs in the future.

c) **Advisory Board organisations are unlikely to purchase METEOR datasets, but are very likely to fund additional work in line with the METEOR project**, that the METEOR consortium would be well-positioned to win.

d) **The key features that make METEOR outputs especially interesting** for them are:
   o The rigorous discipline applied in assessing key gaps in the DRRM world's body of knowledge, such as exposure and the multi-hazard aspects of disaster risk;

- o The transparency used in developing and publishing all the protocols;
- o The commitment to publish the data openly and freely, which will make the METEOR outputs become "global public goods".

e) *Due to the high relevance of and interest in METEOR,* ***initial outputs needs to be shown to them as early as possible*** *to receive their feedback, and allow them to promote the METEOR outputs within their organisations and networks.*

5.1.3. National case studies

Based on the common themes observed in the findings of the midline National Case Studies of Tanzania and Nepal, some conclusions can be drawn around three key areas of interest:

a) **Fostering government's ownership of METEOR outputs**
1. **Having a physical presence in-country** has been highlighted more than once as a really crucial element for fostering the buy-in and ownership of METEOR outputs by national stakeholders. From in person discussions during QMs to bilateral meetings and workshops, the evidence show that the levels of engagement and the awareness benefit of national stakeholders have been consistently higher than when working remotely.
2. In addition to that, the benefits in perceived buy-in and ownership have been greater when the physical presence has been coupled with the **visualisation of demo versions of the outputs**. This proved to be important in Nepal to increase the understanding of what METEOR will deliver by national stakeholders and give them confidence that the project is on track to provide useful evidence to support DRRM decision-making. The use of visual and interactive aid was also helpful to ignite exchanges between the METEOR team and national stakeholders to actively seek their feedback and acceptance.
3. **It is important to widen the accessibility of outputs in the country**. METEOR has been doing this by: publishing the open protocols of the outputs' development; securing (particularly in Nepal) the upload of the outputs on platforms which key national DRRM stakeholders use; and building partnerships with other initiatives to amplify the dissemination and cross-fertilisation effects.
4. Often, awareness and accessibility are necessary, but not sufficient elements to achieve "full ownership" of the outputs. *Capacity building activities need to be used strategically to maximise the lasting transfer of knowledge to the right institutions, and people within them.* Section 6, which specifically looks at the project's sustainability, provides more insights on the design and delivery of effective capacity building (see Table 11).

b) **Co-development**
1. The team recognises that the project has set some **ambitious goals concerning the co-development of METEOR outputs** and a number of actions have been taken (e.g. knowledge elicitation on landslide hazard in Nepal, short-term visits between NSET, and GEM and ImageCat; various requests of data and input to DMD and NSET).
2. However, the views we received from a number of local organisations in both countries is that the **national partners and/or other organisations could have been involved more in the "technical development"** of the METEOR outputs. This theme was reiterated several times during the week-long trip in Nepal and by more than one interviewee in Tanzania.
3. Our view is that "pure co-development", i.e. the sharing of responsibilities on a technical output between two or more consortium partners (including national ones), is challenging and involves resources for ongoing knowledge exchange and capacity building that METEOR does not have. **The impression is that the definition of co-development of the international partners differed to the national ones**. In fact, it does not seem that something went wrong and thus the local partners were involved in the output co-

development less than originally planned, but rather that there has been a mismatch in expectations.

4. Even though the initial outputs might not have been developed with the level of co-development desired by the local partners (although with definitely "some" amount of co-development), that does not mean the METEOR outputs will not be accepted in the two countries. *However, **it becomes even more important that now the team puts extra effort in the other activities that will foster national buy-in and ownership** (see above, e.g. physical presence, visualisation, tailored capacity building/knowledge transfer).*

c) **Working and thinking politically**

1. The midline activities have once again highlighted the **importance of working and thinking politically**, as the institutional context and key political economy dynamics in each country require to be addressed by different uptake strategies.

2. **In Tanzania**, the midline evaluation brought to evidence the key barriers to a more effective engagement of DMD and other national stakeholders. The main priorities for METEOR now appear to be:
   o **Solving the financial issues to be able to pay DMD**. This can be pivotal in unblocking the other restrictions to DMD's involvement and therefore to reach the project outcomes in Tanzania.
   o **Reducing the risk of rejection and subsequently pursuing the accreditation with COSTECH**. This will clear any doubt on the possibility for the METEOR outputs to be referenced and used by government institutions and academia.
   o **Exploring early-on ways to involve other Tanzanians technical organisations into the initial outputs' "validation" or acceptance process**, including through the visual demonstration of the outputs.
   o **Strategically tailor the capacity building and knowledge transfer activities**, considering the different level of DRRM awareness and technical skills, and likely uses of the outputs.

3. **In Nepal**, gaining the interest of national stakeholders appears to have been already largely achieved and the priorities for the METEOR team can now focus on:
   o **Supporting the formation and functioning of the Nepal METEOR Advisory Committee** to receive important feedback from national stakeholders and enhance the METEOR outputs' "acceptability".
   o Like in Tanzania, **strategically tailor the capacity building and knowledge transfer activities**, considering the different level of DRRM awareness and technical skills, and likely uses of the outputs.

5.2. Key risks for the project sustainability

The midline evaluation has found that the METEOR project is generally in line with its work plan and there is a positive prospective for it to have some lasting outcomes. However, we see **two main key challenges or factors of risk** that could compromise the full achievement of the METEOR Theory of Change: 1) Improving the "level of ownership" of the Government of Tanzania; and 2) Transferring skills and knowledge strategically and effectively. Table 10 presents the risk matrix of the two risk factors in terms of level of risk for the project sustainability.

Table 10: Risk matrix for key risks to METEOR's sustainability

Risk	Likelihood (1-5)	Impact (1-5)	Risk Rating (1-5)
The "level of ownership" of the Government of Tanzania remains low	3	4	12
Skills and knowledge are not effectively transferred to the right stakeholders in Tanzania and Nepal	2	4	8

Legend:

Very High 5, High 4, Medium 3, Low 2, Very Low 1

The challenges linked to the current low engagement and ownership of the METEOR outputs by the Government of Tanzania are already on the radar of BGS and the rest of the METEOR consortium. The feeling that this is the highest risk to the project sustainability is diffused in the team and solving the payment issues to the DMD have been given top priority by the METEOR management, the DMD itself and the UKSA. Both the problems and some of the potential solutions have been amply explored in the pages above.

The other key risk is that the limited resources of METEOR for capacity building are not used strategically enough to effectively transfer skills and knowledge to the right stakeholders and, ultimately, they are not willing and/or able to habitually use the outputs without the METEOR partners' support. This is another risk that the consortium is aware of and some steps have been already taken to address it. Most notably, comprehensive "Draft Training Protocols" (Report Number: M8.7/CIC) have been developed. It is very positive to see that the draft training protocols discuss the needs of tailoring the training contents and delivery methods to the specific audience in Nepal, Tanzania and the other 45 LDCs. The draft protocols even get to the point of identifying some of the key stakeholders in Tanzania and Nepal and segmenting the trainee types into: Government Agencies, Policy Makers – Central, State and Local; Local experts with a technical background including Academic and Research Organisations; and Community Level Users. *The draft protocols represent a very solid step to efficiently develop the contents of specific training efforts. However, they need to be followed up by the definition of an action plan to apply the protocols strategically, to maximise the impact of the capacity building activities with the limited budget left in the project.*

In the next section, we provide some key recommendations to approach these and other challenges to support the project sustainability in moving from the delivery of Outputs to the achievement of Outcomes and the project Impact.

6. Recommendations

Below, we analyse some of the key conclusions to derive some strategic recommendations for both the adaptation of the project implementation and its monitoring and evaluation. A summary of all recommendations included in this report is provided as an appendix (Section 7.4).

6.1. Moving towards Outcomes and Impact

Midline evaluations are useful means to take stock of the likelihood that a project will be able to reach its outcomes and ultimate impact in a sustainable way, i.e. in a way that will see the project impact sustained long-term after the current project activities have ended.

Now that the initial datasets and their protocols are all closed to have been produced, it is a good time to **reflect on the steps that will increase the likelihood of the METEOR project to move from outputs to outcomes (and influence the desired impact).** Indeed, with less than a year left to the project implementation, this will help allocate efficiently the limited project resources in a strategic way.

It is useful to let our reasoning be guided by the METEOR Theory of Change, which is where the team has explained what they want to achieve and how. Furthermore, let us focus for a moment only on the sought outcomes for Tanzania and Nepal. Figure 9 puts together three key elements of METEOR's sustainability: 1) the ToC with the outputs, outcomes and impact relevant to Tanzania and Nepal; 2) the "Continuum of Change" that unpacks the levels of ownership of METEOR outputs by national end-users, from being unaware of them to using them to practise sustained change in DRRM; and 3) the key steps that we think can most efficiently and effectively sustain METEOR's passage from outputs to outcomes and ultimately impact.

Figure 9: Summary of the METEOR's pathway from outputs to impact
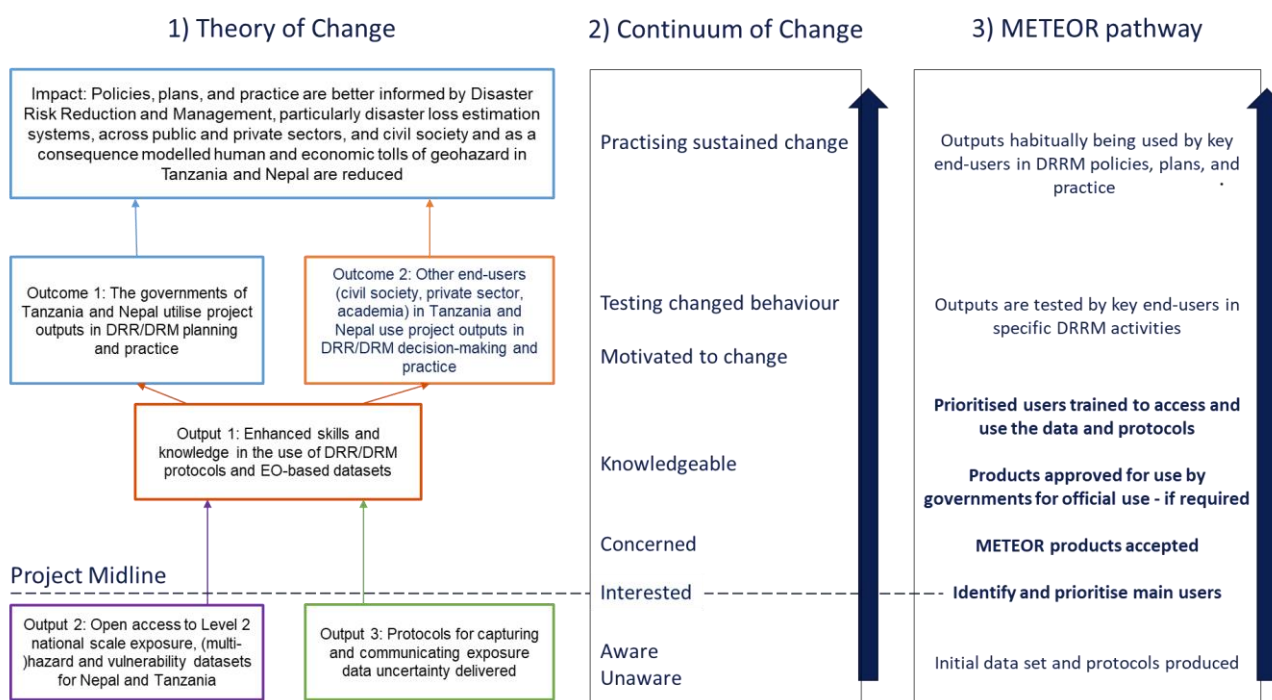
The current position of the project at midline is shown by the broken line in the figure, which is fairly in line with the original plan. The bottom position of the midline in the figure should not mislead the reader in thinking that few has been done in METEOR so far. Quite the opposite, the reader needs to realise that what the project will directly deliver is represented by the three "Outputs" in the figure,

and two of them have been completed to a large extent. That said, the fact that the "unachieved" part of the Theory of Change covers the greater part of the figure illustrates how ambitious the project goals are, and that much still needs to happen to reach the desired outcomes and impact.

If we had to draw a line in Figure 9 showing where we should aim to be by the end of the project, that line would go through the Outcomes at the level of "Outputs are tested by key end-users in specific DRRM activities". Indeed, even though the final versions of the METEOR datasets and protocols are publicly released very late in the project, *the team should still make a concrete effort to have the draft METEOR outputs tested in one or two influential national DRRM activities in both countries.*

Is the project in line to that goal? The midline evaluation showed that at this point, many of the initial datasets (Output 2) and protocols (Output 3) have been produced, and the team has put in place some activities to foster the METEOR outputs' buy-in and ownership of key national stakeholders in both countries. It is fair to say that these efforts have brought the average "level of ownership" of key national end-users on the continuum of change to the "interested" level – with possibly a good part of stakeholders in Nepal being already at the "concerned" level, and the Tanzanian ones still pending more towards the "aware" level.

Therefore, the pathway to the outcomes of having targeted national stakeholders to use the METEOR outputs goes through enhancing the right skills and knowledge (Output 1) that will allow and motivate them to change.

Based on the analysis above, we can define a number of **key actions that can guide the project in moving from the midline point to the achievement of the outcomes** and, hence, enhance its likelihood to support the impact (see the "METEOR Pathway" in Figure 9). Table 11 summarises the key steps and proposed actions for METEOR to go from the midline point to its outcomes. Some of these points have been already discussed during the last QM in Nepal and will be the main focus of the upcoming Annual Learning Event.

Table 11: Key steps from midline to the achievement of METEOR outcomes

#	Step	Recommended actions
1	**Identify and prioritise main users**	• Engage with local partners and stakeholders to identify the specific DRRM activities (policies, strategies, studies, etc.) that can be informed by the METEOR products. Each DRRM activity will be linked to a specific national implementer. • Prioritise the DRRM activities that has the best likelihood of bring to sustainable METEOR outcomes, based on pre-defined criteria decided by the consortium, such as: importance of the activity within the national DRRM system, degree of technical skills and knowledge of the lead implementing institution, degree of initial buy-in of the METEOR products, presence of individuals in the lead implementing institution who are likely to play the role of internal "champions" promoting the use of METEOR products.
2	**METEOR products accepted**	• Engage with small but pivotal/influential group of local stakeholders to receive their feedback on the METEOR products, including their robustness and the user-friendliness of their presentations. The group would ideally include some of those "champions" identified above. • Once the group of reviewers is satisfied, support the interface between them and the key national policy-makers and technical stakeholders the project wants to influence.
3	**Products approved for use by government for official use – if required**	• Work towards a formal accreditation by the government of the METEOR products as needed, e.g. with COSTECH in Tanzania, or through the METEOR Advisory Committee in Nepal.
4	**Prioritised users trained to access and use data and protocols**	• Use the limited METEOR training budget strategically, by working backward from the prioritise DRRM activities/outcomes to define a capacity building action plan, defining for each DRRM activity: the key target audience of the training, the knowledge gaps, and the approach to be taken to cover those gaps.

#	Step	Recommended actions
		• Ensure that the knowledge gaps are identified through a demand-driven approach, e.g. using a capacity needs assessment. • Aim to train more than one person for each organisation, in order to mitigate the risk of staff turn-over (see Output Indicator 1.4). • Ensure the institutional "champions" are among those involved in the definition and delivery/reception of the training to foster their ownership of the METEOR products. They will be the ones who most likely will use and promote the products in the country after the end of the project.
5	**Products are tested by key end-users in specific DRRM assessments**	• Be sure the final METEOR outputs are publicly released and available on key online platforms as soon as possible, including by familiarising with the process of getting the outputs approved and hosted on the platforms. • Ensure the application/testing of METEOR products in specific DRRM activities is one of the main goals of the training and knowledge transfer efforts (Output 1). • Using the selected DRRM activities as case studies of specific hand-on sessions and/or helpdesk support from the METEOR experts (including the local ones) would facilitate the final uptake of the products.
6	**Products habitually being used by key end-users in DRRM policies, plans, and practice**	• Before the end of the project, make plans with the UKSA to fund a legacy evaluation. • Use the endline evaluation to assess the achievements in the METEOR products' uptake in both countries, based on the above action plan. • Between the endline and legacy evaluations, regularly check-in with the METEOR partners and institutional champions in Tanzania and Nepal. Be available to provide some "pro-bono" remote support/backstopping in case some troubleshooting is needed.

The other outcome in the METEOR ToC is **Outcome 3: "METEOR outputs are used and adopted by the wider DRR community globally"**. As mentioned, the team identified three main types of end-users outside of Tanzania and Nepal, which are the global humanitarian and DRRM community, the insurance/re-insurance industry, and the other LDC governments. If it is fair to say that the project aims to have the METEOR outputs be mainstreamed into the national DRRM decision-making systems of Tanzania and Nepal (at least at the impact level), it is equally fair to point out that the project <u>does not</u> aim to reach the same level of uptake for the wider global DRR community. Translated into the "Continuum of change" metaphor used in Figure 9, **we could expect that, based on the focus of and resources available to the project, achieving Outcome 3 would entail bringing a selected number of global stakeholders to the "Interested" level of ownership of the METEOR outputs**.

We believe the METEOR team has been successfully laying the basis for making the global humanitarian and DRRM community and, to a certain extent, the global insurance/re-insurance industry "Interested". Among the pieces of evidence behind this statement we find: the satisfaction about and pledges to use METEOR outputs by the Advisory Board representatives interviewed; the establishment of the IIAG with some planned follow up actions to further foster their interest level; and the efforts made so far made by the team to present to numerous key international events, going beyond the team's expectations defined at baseline (see exceedance of the target of Output Indicator 5.3).

The project seems to be more behind the curve for what concerns getting a positive feedback from other LDC governments, not much because they provided a negative one, but rather because the team had limited chances to interact with other LDCs within the METEOR activities. Nevertheless, the team's global network and portfolio of projects, the numerous presentations and attendance at international events, and the very positive feedback received by the stakeholders in the two LDCs the project is focused on (Tanzania and Nepal), are all elements that give us confidence in the achievement of Outcome 3 for the other LDC governments too.

The key recommendations for facilitating the achievement of Outcome 3 can be summarised as follows:

1. **Get the Advisory Board and the IIAG members to see and "play" with the initial datasets and protocols as soon as possible.** A sensible way to do so could be to give them personalised live demonstrations and providing them access to the METEOR platform for a limited period (2 weeks?), followed by a feedback session (e.g. a Focus Group Discussion).
2. **Once the buy-in from the Advisory Board and IIAG members is high, explore the best way to use their network to expand the dissemination** efforts of METEOR outputs in the wider global DRR community.
3. **Internally agree how the METEOR consortium will present itself** as a service and/or data provider to the wider global DRR community after the end of the UKSA funding period. This will imply considering other sustainability issues, such as legal, intellectual property, marketing etc.
4. **Continue to attend and present at selected international events** with the same level of effort.
5. **Identify relevant LDC stakeholders with prior relationships with the METEOR partners and develop an "engagement plan"**, covering stages from the exploration of ways to interact with them, to the demonstration of the METEOR outputs, and the identification of commercial/ donor-funded opportunities in other LDCs.

6.2. Recommendations for the M&E process

We end this report with some key considerations and recommendations to the design of the next evaluation stages of METEOR.

As noted, the milestones delivery schedule has the quite unique feature of foreseen that the public release of the METEOR products happen within the last project quarter. This has two main direct implications for the M&E process: 1) the Endline Evaluation will only be able to capture evidence of the delivery of the Outputs and, to a certain extent, of specific examples to be used as proxies of the Outcomes, but it will be too early to witness the Impact; 2) therefore, the need for a Legacy Evaluation appears to be strongly motivated. Below we unpack these implications.

Firstly, in terms of **timing of the future evaluations**, if the capacity building activities and the public release of the METEOR datasets and protocols will only happen within the last 3 months of the project, then the Endline Evaluation activities will need to be compressed to the very end of the project, with most of the data collection to happen as late as January or February 2021, i.e. just a month before the end of the funded period. There is a risk that even if the delivery of the Endline Evaluation Report will occur before the end of March, there will simply be no more time left for reflecting on it by the consortium at, for example, an Annual Learning Event. *Two risk mitigation measures can be put in place: a) data collection activities for the Global Study and the National Case Studies are conducted independently as soon as likely evidence of the Outputs and Outcomes achievement are available, e.g. after each training event or after feedback sessions with the Advisory Board or IIAG are held; b) discussions with the UKSA to explore the possibility of a short time extension to the project can be held, so that the final Annual Learning Event can be conducted in April or May 2021.*

The timing implications for the possible Legacy Evaluation are that enough time will need to pass between the public release of the METEOR outputs and the legacy activities to be able to find evidence of "mainstreaming" of the use of METEOR outputs in the national and international DRRM decision-making. *Holding the Legacy Evaluation after 1.5 years after the publication of the final METEOR products (e.g. mid- or late- 2022) appears to be a sensible timing to suggest. This implied the need for the team to discuss with the UKSA the possibility of funding a Legacy Evaluation of the METEOR project, well beyond the end date of the IPP Call 2 programme.*

In terms of the **scope and focus of future evaluations**, few other conclusions can be drawn. First of all, **it is not to be expected that the Endline Evaluation will be a proper "impact evaluation"**. There simply will have been enough time lapsed from the delivery of the Outputs to expect to see, by the

end of the project, the Impact as enunciated in the ToC. Therefore, the focus of the Endline Evaluation will rather be assessing the effectiveness of METEOR in reaching specific Outcome targets as per logframe indicators, and having laid the basis for its long-term sustainability, including in the commercial aspects. **The actual "impact evaluation" will then be the Legacy Evaluation**, which will likely focus on finding evidence of broaden and sustained uses of METEOR outputs in Tanzania, Nepal, and beyond.

However, it is to be noted the **challenges in evaluating "impact" in this project**. The METEOR Impact includes contributing to reduce life and economic loss from natural disasters in Tanzania and Nepal. There are two main issues in evaluating such impact. On the one hand, you would "ideally" (sic!) need to have comparable natural disasters to happen in Tanzania and Nepal before and after the project. This is an assumption which is definitely outside of the project's control. On the other hand, even if that happens, it would be difficult to clearly define the contribution of the METEOR project to the different impact of those natural disasters that occurred before and after the project. There are simply too many variables at play. This is why the team, in agreement with Caribou Digital, decided not to define specific targets for the project in the reduction of life and economic loss (Impact Indicators 1 and 2 in the logframe). *Impact will then be assessed in two ways: 1) qualitatively, by looking at the "progress towards mainstreaming the use of robust DRR data to systematically inform policy changes across public and private sector, and civil society" (Impact Indicator 3); and 2) by modelling the estimated contribution of the METEOR project in the reduction of direct economic loss because of natural disasters, through the Cost Effectiveness Analysis (CEA).*

7. Appendices

7.1. Evaluation Questions

Table 12: Evaluation Questions

Criteria	Evaluation Question	Indicative supporting questions
Efficiency	Did the project design and deliver level-one exposure data and protocols for most ODA countries and level-two data and protocols for Nepal and Tanzania? Was the delivery cost-efficient? What worked well and not so well?	- Do the protocols/data sets provide more representative exposure data (not skewed to known urban areas)? - How has the consistency and quality of the exposure data in pilot countries (Nepal and Tanzania) improved overtime? - Has the project delivered open-source exposure data? - Is the provision of protocols and level two data cost-efficient to make it feasible and practical to replicate efforts in Tanzania and Nepal across other ODA countries?
Effectiveness	To what extent did the design and delivery of exposure data, protocols, and training lead to improvements in the capacity and ability of national stakeholders to knowledgably utilize exposure data, improving their work products related to DRR and DRM?	- Are Nepal and Tanzania using the data in their planning processes? - Are users satisfied with the tools? Are they providing the right level of information? - Have national experts improved their capacity to use EO data to generate information relevant for risk reduction? - Are national technical experts better positioned to serve as regional experts or "lighthouses" in the space?
Impact	Is there evidence to suggest that the project has improved in-country DRR/DRM policy and planning? And, if so, is there a reasonable expectation that, in the event of a disaster, countries will experience an improved response, reducing disaster-related deaths, loss and damage?	- How and in what ways have the protocols and project activities led to improved national DRR/DRM policy and planning? - Has the project led to improved, rapid access to relevant information on exposure? - Has the information lead to improvements in decision-making process of NGOs, policy makers and insurers? - Is there evidence to suggest that the project has led to improved mitigation strategies and the regional distribution of resources? - Do we see changes/improvements in DRR resource allocation?
Sustainability	Is there sustained interest by DRR/DRM stakeholders (e.g. other LDC governments, NGOs, the insurance industry and the humanitarian community) in these data and protocols?	- Is there evidence to suggest that humanitarian actors such as UNICEF are or plan to use these tools when evaluating loss and damage related to a disaster? - Do the protocols and datasets improve and support the development of insurance products for use in developing countries?
Relevance	In developing countries, is there a real need and/or demand for exposure data protocols that validate the uncertainty process?	- Has the project strengthened the discipline around the development of exposure data? - Is there evidence that the project has improved the lineage and characterization of uncertainty? - Have other ODA countries expressed interest in these data? - Has there been uptake of level one data by other ODA countries? - Do we see broader uptake and use of the protocols? - Assuming the lack of data is the issue that governments face.

7.2. Interview Questions

Table 13: Interview Questions

Interview group	Type of evaluation	Questions
Consortium partners	Process evaluation	**Efficiency, Effectiveness, and Sustainability:** - How did you feel the consortium has been working together to achieve the agreed results? Any suggestions to improve collaboration? - Do you feel the right consortium partners were chosen to deliver the project? Were any partners missing? Any suggestions for how roles could be adjusted to improve collaboration? - When there were significant delays on key milestones, what do you feel were the main factors causing this? Do you feel the main factors have been addressed in the meantime, to prevent future delays? Any suggestions on minimising risks of delay in future? - What steps do you feel have been taken to ensure ownership of the project process and outcomes within government counterparts? Do you feel enough has been done – or more needs to be done? Any suggestions? - What steps do you feel have been taken to collaborate sufficiently with other relevant development initiatives so that the results achieved are likely to be sustained beyond project-end? Do you feel enough has been done – or more needs to be done? Any suggestions?
LDC Government representatives	Formative evaluation (Global Case Study)	**Relevance and Sustainability:** - What type of data sets/models does your organisation use for characterising the exposure and risk of disasters in developing countries? Where does the information come from? How do you access this information? Who else is involved? - How familiar are you with the METEOR project and the outputs it supposed to deliver? Have you seen any draft output yet? - Do you think the METEOR products can strengthen the discipline around the development of exposure and risk data? Why / In what way? - How likely do you think your organisation would use the open source/access METEOR products in the future? For what? - How likely do you think your organisation would fund or request donor-funded work to replicate and/or expand (e.g. in terms of additional hazards or similar) the METEOR products in the future? For what?
Insurance Industry Advisory Group	Formative evaluation (Global Case Study)	**Relevance and sustainability:** - What type of data sets/models does your organisation use for characterising the exposure and risk of disasters in developing countries? Where does the information come from? How do you access this information? Who else is involved? - How familiar are you with the METEOR project and the outputs it supposed to deliver? Have you seen any draft output yet? - Based on what you know of the project and the draft outputs you have seen, do you think the METEOR products can strengthen the discipline around the development of exposure and risk data? Why / In what way? - How likely do you think your organisation would use the open source/access METEOR products in the future? For what? - How likely do you think your organisation would pay to use or expand the METEOR products in the future? For what? - Do you think any METEOR product (and if so which ones) have high potential to lead to the creation of insurance products in LDC or other developing countries? Why / In what way?
Advisory Board	Formative evaluation (Global Case Study)	**Relevance and sustainability:** - What type of data sets/models does your organization use for characterising the exposure and risk of disasters in developing countries? Where does the information come from? How do you access this information? Who else is involved?

Interview group	Type of evaluation	Questions
		- How familiar are you with the METEOR project and the outputs it supposed to deliver? Have you seen any draft output yet? - Based on what you know of the project and the draft outputs you have seen, do you think the METEOR products can strengthen the discipline around the development of exposure and risk data? Why / In what way? - How likely do you think your organisation would use the open source/access METEOR products in the future? For what? - How likely do you think your organisation would fund work to expand (in terms of countries beyond Tanzania and Nepal or additional hazards or similar) the METEOR products in the future? For what?
Nepal Focus Group	Formative evaluation (National Case Study)	- Have you been using METEOR products in support to your risk assessments? If so, how/for what? - How satisfied are you with the METEOR products you have been using? Are they providing the right level of information? - Have the products improved the quality of the exposure/hazard/vulnerability data you were using before? Have the products improved your understanding of the discipline to develop high quality exposure/hazard/vulnerability data? - Do the products provide a better characterisation of uncertainty than what you were using before? - Have you been involved in co-developing any METEOR product? If so, how? - How satisfied are you with the level of and process for your involvement in the co-development of METEOR products? Have you got suggestions to improving it?
Tanzania Focus Group	Formative evaluation (National Case Study)	**Project partners engagement** - How did you feel the consortium has been working together to achieve the agreed results? Any suggestions to improve collaboration? - What do you think has worked well so far or what concrete measures need to be taken to improve co-development of METEOR outputs? - Do you feel the right consortium partners were chosen to deliver the project? Were any partners missing? Any suggestions for how roles could be adjusted to improve collaboration? **Engagement of other stakeholders** - What steps do you feel have been taken to collaborate sufficiently with other relevant development initiatives so that the results achieved are likely to be sustained beyond project end? Do you feel enough has been done – or more needs to be done? Any suggestions? - Sustainability and relevance - What steps need to be taken to ensure both uptake and sustainability of METEOR outputs? - Any other activities/events/processes in country that the project can piggy-back on to ensure more reach of METEOR and sustainability? - What are the steps needed to ensure better ownership of the outputs? Do you see the project outputs being utilised for improving national DRR/DRM? - Are there any in-country factors/risks that might affect uptake and sustainability of the project? How can the project mitigate these risks? - Do you have any concerns or recommendations going forward? **Policy status** - Status and future of disaster policy and review? - Status of the DRR strategy being developed by DMD in line with the 2015 law? - Whether/ how DMD will change into DMA? Status of the transition and implications for METEOR project? - What other activities is the DMD currently implementing/engaging with?
Tanzania Key Informant Interviews	Formative evaluation (National Case Study)	- What do you do at your organisation? - How is your organisation engaged in DRRM, if at all? - Are there any overlaps between the role of your organisation and what DMD does? - Is there interest in the METEOR outputs? Are the METEOR outputs relevant to what you do? - Which departments or units within your organisation should METEOR engage with? - How can we best ensure uptake and sustainability of METEOR outputs?

Interview group	Type of evaluation	Questions
		- In your opinion, what are the major challenges facing Tanzania when it comes to planning for and responding to a disaster?

7.3. Updated METEOR Logframe at midline

IMPACT 1	Impact Indicator 1		2018*	2019*	2020*	2021*	TOT	Assumptions
Policies, plans, and practice are better informed by Disaster Risk Reduction and Management, particularly disaster loss estimation systems, across public and private sectors, and civil society and, as a consequence, modelled human and economic tolls of geohazard in Tanzania and Nepal are reduced	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 **(aligned with SDG indicators 11.5.1 and 13.1.1)**	Planned	0.00					
		Achieved						
		Source						
	Official national statistics							
	Impact Indicator 2		2018*	2019*	2020*	2021*	TOT	
	Total modelled direct avoided economic loss attributed to disasters in Nepal and Tanzania (in GBP £)	Planned	0.00					
		Achieved						
		Source						
	Official loss and damage estimation by national partners							
	Impact Indicator 3		2018*	2019*	2020*	2021*	TOT	
	Qualitative indicator: progress towards mainstreaming the use of robust DRR data to systematically inform policy changes across public and private sector, and civil society	Planned				Qual		
		Achieved						
		Source						
	Key Informant Interviews and workshops in baseline and endline							

##	Indicator	Midline target	Endline target
IM 3	**Qualitative indicator: progress towards mainstreaming the use of robust DRR data to systematically inform policy changes across public and private sector, and civil society**	N/A	There is evidence of: 1) Buy-in of METEOR outputs by the senior decision-makers of relevant Ministries (e.g. PMO in Tanzania and MoHA in Nepal) and of other end-users (e.g. NSET, ICIMOD, DFID in Nepal, and Red Cross, World Bank in Tanzania); 2) Ownership of METEOR outputs by key technical users in relevant governmental and other end-users (e.g. DMD, GST, TMA, UDSM, Resilience Academy in Tanzania, and NSET, ICIMOD, MoHA, DHM in Nepal).

OUTCOME 1	Outcome Indicator 1.1		2018*	2019*	2020*	2021*	TOT	Assumptions
The governments of Tanzania and Nepal utilise project outputs in DRR/DRM planning and practice	Qualitative indicator: progress towards use of project outputs by the governments of Nepal and Tanzania to inform their DRR/DRM decision-making and practice	Planned			Qual	Qual		• Natural disasters occur up to one year after the project and are of similar magnitude and location of those before the project. • Relevant stakeholders are constrained to improve their DRR/DRM policy and planning by a lack of knowledge and awareness of the proper protocols, tools and data. • Political will is in place
		Nepal			Achieved			
		Tanzania			Partially achieved			
		Source						
	Key Informant Interviews and workshops in baseline and endline							
	Outcome Indicator 1.2		2018*	2019*	2020*	2021*	TOT	
	Feedback from relevant Ministry (or decision-maker) on the usefulness of the project outputs for improving their national DRR/DRM **(KPI 1)**	Planned			Qual	Qual		
		Nepal			Achieved			
		Tanzania			Partially achieved			
		Source						
	Feedback from the Ministries through KII at baseline, midline, endline							

##	Indicator	Midline target	Endline target
OC 1.1	**Qualitative indicator: progress towards use of project outputs by the governments of Nepal and Tanzania to inform their DRR/DRM decision-making and practice**	Relevant government stakeholders in Tanzania and Nepal provide unprompted, appropriate and realistic use cases for METEOR outputs to support their DRR/DRM decision-making and practice	1. Relevant government stakeholders in Tanzania and Nepal confirm their intention to use METEOR outputs to support specific DRR/DRM assessments, technical studies, policies or strategies. 2. Between Outcome Indicator 1.1 and Outcome Indicator 2.1, end-users in Tanzania and Nepal have used the METEOR outputs in at least 1 DRRM activity per country.
OC 1.2	**Feedback from relevant Ministry (or decision-maker) on the usefulness of the project outputs for improving their national DRR/DRM (KPI 1)**	Relevant Ministries in Tanzania and Nepal offer to host METEOR datasets on official/government-led platforms.	METEOR datasets are hosted on official/government-led platforms in Tanzania and Nepal.

OUTCOME 2	Outcome Indicator 2.1		2018*	2019*	2020*	2021*	TOT	Assumptions
Other end-users (civil society, development partners, private sector, academia) in Tanzania and Nepal use project outputs in DRR/DRM decision-making and practice	Qualitative indicator: progress towards use of project outputs by the other end-users in Nepal and Tanzania to inform their DRR/DRM decision-making and practice	**Planned**			Qual	Qual		• Relevant stakeholders are constrained to improve their DRR/DRM policy and planning by a lack of knowledge and awareness of the proper protocols, tools and data.
		Nepal			Achieved			• Resources are allocated
		Tanzania			Partially achieved			• End users have willingness to change
		Source						• Capacity levels of emergency plan implementers are adequate
		Key Informant Interviews and workshops in baseline, midline, and endline						

##	Indicator	Midline target	Endline target
OC 2.1	**Qualitative indicator: progress towards use of project outputs by "other end-users" (civil society, development partners, private sector, academia) in Nepal and Tanzania to inform their DRR/DRM decision-making and practice**	"Other end-users" in Tanzania and Nepal provide unprompted, appropriate and realistic use cases for METEOR outputs to support their DRR/DRM decision-making and practice	1. "Other end-users" in Tanzania and Nepal confirm their intention to use METEOR outputs to support specific DRR/DRM assessments, technical and/or scientific studies, strategies or inform their support to the government's DRR/DRM efforts. 2. Between Outcome Indicator 1.1 and Outcome Indicator 2.1, end-users in Tanzania and Nepal have used the METEOR outputs in at least 1 DRRM activity per country.

OUTCOME 3	Outcome Indicator 3.1		2018*	2019*	2020*	2021*	TOT	Assumptions
METEOR ouputs are used and adopted by the wider DRR community globally	Qualitative indicator: Feedback from the global community (e.g. UNICEF, UNISDR, WB, GFDRR) in respect of usefulness of project outputs **(KPI 4)**	**Planned**			Qual	Qual		• Resources are allocated
		Achieved			Achieved			• End users have willingness to change
	Source							• Capacity levels of emergency plan implementers are adequate
	Key Informant Interviews in baseline and endline evaluations							
	Outcome Indicator 3.2		2018	2019	2020	2021	TOT	
	Qualitative indicator: Progress towards creating insurance products informed by METEOR data and/or protocols	**Planned**			Qual	Qual		
		Achieved			TBC			
	Source							
	Key Informant Interviews in baseline, midline, and endline evaluations							
	Outcome Indicator 3.3		2018*	2019*	2020*	2021*	TOT	
	Number of dissemination nodes where METEOR KPs and datasets are available to be accessed	**Planned**			0	6		
		Achieved			1			
	Source							
	KIIs at endline and legacy and internet search							

##	Indicator	Midline target	Endline target
OC 3.1	**Qualitative indicator: Feedback from the global community (e.g. UNICEF, UNISDR, WB, GFDRR) in respect of usefulness of project outputs (KPI 4)**	Advisory Board members have confidence that METEOR outputs: 1. Can strengthen the discipline around the development of exposure and risk data 2. Will be put at use by their own organisations	There is evidence that the organisations on the METEOR Advisory Board are going to use the METEOR outputs in supporting DRRM activities in developing countries
OC 3.2	**Qualitative indicator: Progress towards creating insurance products informed by METEOR data and/or protocols**	The Insurance Industry Advisory Group members have confidence that METEOR outputs can be useful to create new insurance products in developing countries	Insurance companies are engaged in creating new insurance products
OC 3.3	**Number of dissemination nodes where METEOR KPs and datasets are available to be accessed**	0	6 dissemination nodes in total, of which 1 global, 1 Tanzanian and 1 Nepalese

OUTPUT 1	Output Indicator 1.1		2018*	2019*	2020*	2021*	TOT	Assumption
Enhanced skills and knowledge in the use of DRR/DRM protocols and EO-based datasets	Percentage of professionals trained in Nepal and Tanzania reporting increased knowledge on the training topic (disaggregating males and females)	Planned				75%	75%	• Decision-makers are willing to use the datasets they approve and find useful
		Achieved						• Trained stakeholders are able to use the knowledge gained during training to increase the overall capacity of their organisation
		Source						• Trained organisations in Tanzania and Nepal and end users downloading project outputs elsewhere are willing to use them and share their knowledge
	Training feedback surveys and KIIs in baseline, midline, and endline							
	Output Indicator 1.2		2018*	2019*	2020*	2021*	TOT	
	Number of professionals trained in Nepal and Tanzania (disaggregating males and females)	Planned	0	0	0	50	50	
		Achieved		0	0			
		Source						
	Training logs							
	Output Indicator 1.3		2018*	2019*	2020*	2021*	TOT	
	Number of organisations that had representatives trained in Nepal and Tanzania	Planned	0	0	0	10	10	
		Achieved		0	0			
		Source						
	Training logs							
	Output Indicator 1.4		2018*	2019*	2020*	2021*	TOT	
	Percentage of targeted institutions and organisations in Nepal and Tanzania that had at least two people trained	Planned				75%	75%	
		Achieved						
		Source						
	Training logs							
OUTPUT 2	Output Indicator 2.1a		2018*	2019*	2020*	2021*	TOT	Assumption
Open access to Level 2 national scale multi-hazard exposure datasets of Nepal and Tanzania	Percentage of Nepalese and Tanzanian territory covered by Level 2 exposure data (aligned with SFDRR Global Target g and Priority Area 1) **(KPI 2a.1)**	Planned	0%	0%	100%	100%	100%	• Decision-makers are willing to use the datasets they approve and find useful
		Nepal		0%	100%	100%	100%	• Trained stakeholders are able to use the knowledge gained during training to increase the overall capacity of their organisation
		Tanzania		0%	100%	100%	100%	• Trained organisations in Tanzania and Nepal and end users downloading project outputs elsewhere are willing to use them and share their knowledge
		Source						
	Data on online platforms							
	Output Indicator 2.1b		2018*	2019*	2020*	2021*	TOT	
	Percentage of Nepalese and Tanzanian territory covered by Level 2 multi-hazard data (aligned with SFDRR Global Target g and Priority Area 1) **(KPI 2a.2)**	Planned	0%	0%	50%	100%	100%	
		Nepal		0%	0%			
		Tanzania		0%	100%	100%	100%	
		Source						
	Data on online platforms							
OUTPUT 3	Output Indicator 3.1		2018*	2019*	2020*	2021*	TOT	Assumption
Protocols for capturing and communicating exposure data uncertainty delivered	Workplan on track to achieve completion within deadline	Planned			Qual	Qual		• Decision-makers are willing to use the datasets they approve and find useful
		Achieved			Achieved			• Trained stakeholders are able to use the knowledge gained during training to increase the overall capacity of their organisation
		Source						• Trained organisations in Tanzania and Nepal and end users downloading project outputs elsewhere are willing to use them and share their knowledge
	Project records at midline and endline							
	Output Indicator 3.2		2018*	2019*	2020*	2021*	TOT	
	Percentage of approached users reporting satisfaction with METEOR protocols (disaggregating males and females)	Planned				75%	75%	
		Achieved						
		Source						
	Midline and endline evaluations; Online user surveys							
OUTPUT 4	Output Indicator 4.1		2018*	2019*	2020*	2021*	TOT	Assumption
Open access to Level 1 exposure data for 47 LDCs	Number of Level-1 datasets for LDCs uploaded on online platforms (aligned with SFDRR Global Target g and Priority Area 1) **(KPI 2b)**	Planned	0	0	0	45	45	• Decision-makers are willing to use the datasets they approve and find useful
		Achieved		0	0			• Trained stakeholders are able to use the knowledge gained during training to increase the overall capacity of their organisation
		Source						• Trained organisations in Tanzania and Nepal and end users downloading project outputs elsewhere are willing to use them and share their knowledge
	Data on online platforms							

OUTPUT 5	Output Indicator 5.1		2018*	2019*	2020*	2021*	TOT	Assumption
Communication products shared (CPs - Policy papers, training materials, publications, conference presentations, case studies etc.)	Policy paper on the use of national-scale exposure data for insurance and other risk-transfer mechanisms published and shared	Planned	0	0	0	1	1	• Decision-makers are willing to use the datasets they approve and find useful
		Achieved		0	0			• Trained stakeholders are able to use the knowledge gained during training to increase the overall capacity of their organisation
		Source						
		Data on online platforms						
	Output Indicator 5.2		2018*	2019*	2020*	2021*		
	Number of communication products shared	Planned	0	7	7	5	19	• Trained organisations in Tanzania and Nepal and end users downloading project outputs elsewhere are willing to use them and share their knowledge
		Achieved		7	7		14	
		Source						
		Data on online platforms						
	Output Indicator 5.3		2018*	2019*	2020*	2021*	TOT	
	Number of conferences or workshops hosted or attended by consortium members at which METEOR's findings are shared or discussed	Planned	0	2	3	5	10	
		Achieved		3	6		9	
		Source						
		Monthly Reporting to UKSA						
	* The milestone dates all refer to the 7 February of each year							

7.4. Summary of final recommendations

Table 14. Summary of the recommendations from the Midline Evaluation

##	Recommendation	Page in the report
Process and project management		
1	Facilitate the overview of the project implementation and path dependencies by everyone in the consortium. An idea could be that the key points from the monthly reports are included in the body of the email as well, so that even the people who do not have time to open the document can grasp the progress updates in one go.	Pp. 21, 44
Global Study – Getting interest and use by wider global DRR community		
2	Provide a demonstration of the initial outputs to the Advisory Board members as soon as possible, to receive their feedback, and allow them to promote the METEOR outputs within their organisations and networks.	Pp. 25, 45, 52
3	Once the buy-in from the Advisory Board and IIAG members is high, explore the best way to use their network to expand the dissemination efforts of METEOR outputs in the wider global DRR community	P. 52
4	Internally agree how the METEOR consortium will present itself as a service and/or data provider to the wider global DRR community after the end of the UKSA funding period. This will imply considering other sustainability issues, such as legal, intellectual property, marketing etc.	P. 52
5	Continue to attend and present at selected international events with the same level of effort.	P. 52
6	Identify relevant LDC stakeholders with prior relationships with the METEOR partners and develop an "engagement plan", covering stages from the exploration of ways to interact with them, to the demonstration of the METEOR outputs, and the identification of commercial/ donor-funded opportunities in other LDCs.	P. 52
Country Case Studies – Nepal		
7	As the new NDRRMA becomes operational, the METEOR consortium needs to ensure it is appropriately engaged.	P. 32
8	Find ways to influence the different sub-national stakeholders without having specific resources to directly work at the sub-national level	P. 32
9	Now that initial outputs are ready, carefully assess ways of: a) further involve local experts in the technical refinement of the outputs; and b) appropriately engage national stakeholders in the acceptance of the outputs (incl. through the project Advisory Committee).	P. 35
10	Related to point X, support the formation and functioning of the Nepal METEOR Advisory Committee	P. 47
Country Case Studies – Tanzania		
11	As the Disaster Management Authority is not likely to be formed anymore, the project will need to strengthen its communication to the PMO to ensure the institutional uptake of the METEOR outputs.	P. 39
12	Continue in the effort to unblock fee payments to the DMD as soon as possible.	P. 41

##	Recommendation	Page in the report
13	Work with DMD to make clarity on the criteria used by COSTECH to provide its approval and therefore lower the risk of a rejection of the METEOR data. Then apply for COSTECH accreditation.	P. 42
14	Explore the possibility to engage with and disseminate the METEOR products through the National Disaster Management Platform and the Development Partners' Group on Environment.	P. 43
15	Ensuring that initial project outputs are disseminated earlier on, so that input is provided by different institutions on the format and capacity needs of the institutions to be able to use the outputs.	P. 43
16	Work with GST to pilot the use of METEOR outputs in the seismic hazard map for Tanzania they are preparing.	P. 43
Country Case Studies – Both countries		
17	It is important that now the team puts extra effort in activities that will foster national buy-in and ownership (e.g. physical presence, output visualisation, tailored capacity building/knowledge transfer).	P. 47
18	Starting from the "Draft Training Protocols" delivered, define and apply a strategic capacity building and knowledge transfer action plan for Nepal and Tanzania as outlined in Table 11 in Section 6.	Pp. 36, 46, 48,
19	Even though the final versions of the METEOR datasets and protocols are publicly released very late in the project, the team should still make a concrete effort to have the draft METEOR outputs tested in one or two influential national DRRM activities in both countries, before the end of the project.	P. 50
Future M&E activities		
20	Ensure that endline data collection activities for the Global Study and the National Case Studies are conducted independently as soon as likely evidence of the Outputs and Outcomes achievement are available, e.g. after each training event or after feedback sessions with the Advisory Board or IIAG are held.	P. 52
21	Discuss with the UKSA the possibility of a short time extension to the project, so that the final Annual Learning Event can be conducted in April or May 2021.	P. 52
22	Make plans with the UKSA to have the scope and budget for a Legacy Evaluation of METEOR approved.	P. 52
23	Discuss with the UKSA the possibility of funding a Legacy Evaluation of the METEOR project, well beyond the end date of the IPP Call 2 programme, e.g. e.g. mid- or late- 2022	P. 52