PRAGYA

DMS HIMALAYA

TOOLKIT

INTRODUCTION

This manual has been prepared by **Pragya** (www.pragya.org), a not-for-profit, development organization working for the appropriate development of the vulnerable communities and sensitive ecosystems of the world.

The Himalayas represent one of the world's most disaster-vulnerable zones. Challenging terrain, poor infrastructure and the remoteness of the Himalayan villages render timely warning and response process difficult. Lack of information also results in higher toll on life, livelihood and property and assistance for relief and recovery often turn out to be inadequate and inappropriate.

Pragya has long experience of working in some most remote and marginalized regions in the country. Based on rigorous consultative research, it has come up with an area-specific, cost-effective, decentralised system: "**DMS Himalaya**" for two critical components of the Disaster Management cycle:

i. Early warning and grassroots preparedness;
ii. Post-disaster damage and needs assessment and communication system

These process innovations and tools supplement the capacity building efforts and communication resources/networks in pilot locations and help in the mainstreaming and effective execution of Disaster Management plans of the local authorities.

DMS Himalaya is being implemented across 2100+ villages in India across 5 states/UTs Ladakh, Himachal Pradesh, Uttarakhand, Assam and Meghalaya. DMS Himalaya is funded and supported by **Elrha**'s **Humanitarian Innovation Fund (HIF)**, Pragya UK and other donors. Elrha's HIF is a grant making programme which improves outcomes for people affected by humanitarian crises by identifying, nurturing and sharing more effective and scalable solutions and is funded by the **Netherlands Ministry of Foreign Affairs**.

ACCOLADES:

Initial research phase supported by Elrha's Humanitarian Innovation Fund (HIF)

Recognised among Top 20 Innovations in Risk Award by UNISDR and Munich Re foundation at the Third UN World Conference on Disaster Risk Reduction, Sendai - 2015

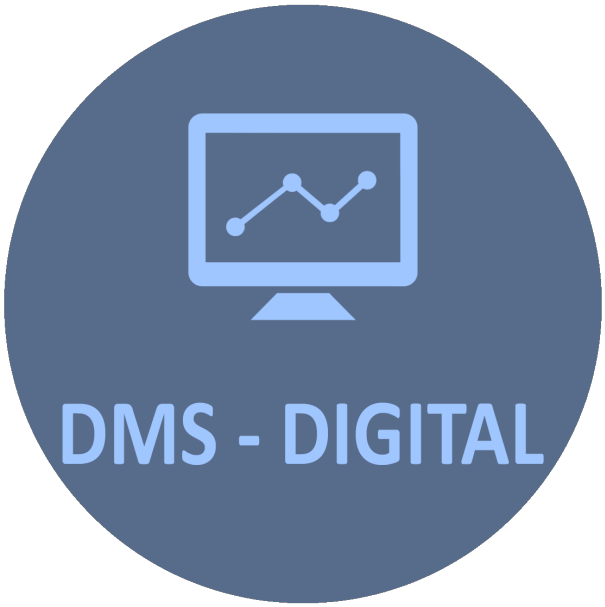
Showcased at World Humanitarian Summit Innovation Marketplace, Geneva - 2015, Istanbul - 2016

Showcased at the Seventh Annual Conference of University College London Institute for Risk and Disaster Reduction, London – 2017

Selected among Top 25 CBDRM cases in Asia by Asian Disaster Preparedness Center, Bangkok, 2018

WHY DMS-HIMALAYA?

- DMS Himalaya catalyzes effective, composite disaster response at 3 windows of opportunity: pre-disaster preparedness, early warning, and immediate post-disaster relief - that can reduce the toll of extreme events considerably.
- It incorporates 2 tools – "**Go-Risk**" (early warning tool with grassroots measurement grids and communication channels for pre-disaster use) and "**RnR-Comm**" (relief & response information-sharing tool to help multi-agency response coordination for post-disaster use) to enhance local self-reliance and improve effectiveness of humanitarian support.
- DMS Himalaya develops structures and networks to connect communities with state and civil society responders, ensuring flow of information and effective coordination.
- It adopts the approach of risk governance for dynamic management of hazards, vulnerabilities, disasters, and to facilitate linkages for people-state collaboration for timely action/support.



DMS-HIMALAYA
DIGITAL TOOLKIT

DIGITAL TOOLKIT COMPONENTS

• **Settlement profiles**: To be collected for each settlement. To be updated monthly for any changes.

Settlement Profile	Details				
Name of Settlement	Name:		Unique DMS Settlement ID:		
Name of Panchayat					
Location	Coordinates:		State:		
	District:		Block:		
DRT Representative & Contact	Name:		Phone:		
Community Representative & Contact	Name:		Phone:		
ASHA / ANM Representative	Name:		Phone:		
Associated PoP Contact	Location:		Phone:		
Distance from nearest settlement	Name:		Distance (km):		
Distance from nearest road head	Distance (km):		Type of road:		
Distance from nearest PoP	Distance (km):				
No of Households	Total:	BPL:	SC:	ST:	OBC:
Population	Total:		SC:	ST:	OBC:
	Male:	0-5 yrs:	6-14 yrs:	15-60 yrs:	60+ yrs:
	Female:	0-5 yrs:	6-14 yrs:	15-60 yrs:	60+ yrs:
Vulnerable population	PwD:	Elderly:	Pregnant/ Lactating:	Infants (0-1):	
Selected mode of communicating alerts					
"Go-Risk" Monitoring sites:	No of sites:	Data frequency:	Last update received on:		
Landslide			Date:	Time:	
Flood/cloud burst			Date:	Time:	
Avalanche			Date:	Time:	
Forest Fire			Date:	Time:	
Bank Erosion			Date:	Time:	
Drought			Date:	Time:	
Others: _____			Date:	Time:	
Others: _____			Date:	Time:	
Hazard / Disaster Profile					
Landslide	Frequency in last 5 yrs:		Deaths:	Injury:	HHs affected
Flood/cloud burst	Frequency in last 5 yrs:		Deaths:	Injury:	HHs affected
Cyclone					
Forest Fire	Frequency in last 5 yrs:		Deaths:	Injury:	HHs affected
Bank Erosion	Frequency in last 5 yrs:		Deaths:	Injury:	HHs affected
Earthquake					
Locust Menace					
Cyclone					
GLOF	Frequency in last 5 yrs:		Deaths:	Injury:	HHs affected
Avalanche					
Drought	Frequency in last 5 yrs:		Deaths:	Injury:	HHs affected
Others: _____	Frequency in last 5 yrs:		Deaths:	Injury:	HHs affected
Others: _____	Frequency in last 5 yrs:		Deaths:	Injury:	HHs affected

• **DRT profiles and reporting schedules:** To be fine-tuned for the DRTs. DRT Profiles would be maintained at DDMSU/LDMU. Please refer to GO-RISK REPORTING FREQUENCY and Hazard Specific Tools for more details.

DRT Profile	Details	
DRT	Name:	Unique DRT ID:
	Age:	Gender:
	Literacy level:	Received DMS Training:
	Languages spoken:	Received Responder Training:
Name of Settlement Represented	Name:	Unique DMS Settlement ID:
Name of Panchayat		
Location	Address:	State:
	District:	Block:
Phone number	Option 1:	Option 2:
Associated PoP Contact	Location:	Phone:
Distance from nearest road head	Distance (km):	
Distance from nearest PoP	Distance (km):	

• **"Go-Risk" Monitoring Site profiles**: Sites for monitoring environmental parameters would be identified. Relevant instruments/ signage for measuring the changes in parameters would be set up. Baselines and threshold levels of each parameter would be recorded for each site. Details to be updated on DMS Digital database for tracking.

Monitoring Site Profile	Details	
Measurement Site:	Unique DMS Site ID:	State:
	District:	Block:
	Latitude:	Longitude:
	Altitude:	
Name of Settlement Represented	Name:	Unique DMS Settlement ID:
DRT Representative & Contact	Name:	Phone:
Associated PoP Contact	Location:	Phone:
Parameter Tracked		
Type of instrument used		
Monitoring frequency		

• **PoP profiles:** PoP Profiles would be maintained at DDMSU/LDMU. These would be available as part of the Resource Directory as well.

PoP Profile	Details	
PoP	Type of facility:	Unique PoP ID:
	No of PoP Managers:	No of DRTs reporting to PoP:
Location	Address:	State:
	District:	Block:
Phone number	Option 1:	Option 2:
Email ID:		
Primary PoP Contact	Name:	Phone:
Distance from nearest block HQ	Distance (km):	
Distance from nearest district HQ	Distance (km):	
No of Settlements Represented	No:	Average distance:

• **District profiles**: A comprehensive overview would be available on DMS Digital database for each district, depicting "Go-Risk" and "RnR Comm" status of all sites, DRTs, PoPs. This would serve as the main navigation panel, linking all profile and data components. This data would also be presented through two geographic overview maps with various layers depicting "Go-Risk" and "RnR-Comm" updates.

District	Block	Cluster Name	Cluster Name	Village Name	Hazard	Threshold Breached	Created at
A	ABC	ABC_01	A/ABC/Name_01	Lorem Ipsum 1	Landslide	No Alert	Date | Time
A	ABC	ABC_01	A/ABC/Name_01	Lorem Ipsum 2	Landslide	No Alert	Date | Time
A	ABC	ABC_01	A/ABC/Name_01	Lorem Ipsum 3	Drought	No Alert	Date | Time
A	ABC	ABC_02	A/ABC/Name_02	Lorem Ipsum 4	Flood	Threshold breached	Date | Time
A	ABC	ABC_03	A/ABC/Name_03	Lorem Ipsum 5	Forest Fire	No Alert	Date | Time

• **Data Software**:

- The digital platform enables SMS and email based updates to Nodal center/network partners, sending alerts to Direct Response Teams (DRTs), Points of Presence (PoPs) and Responders, generating trends and status update reports for “Go-Risk” and “RnR Comm” tools for the selected time frame.
- It facilitates data aggregation and disaggregation as per suitable scales of choice (settlement level, Panchayat level, district level etc).
- It facilitates data disaggregation and viewing by various parameters (type of hazards, altitude etc).
- Datasets on digital platform are viewable by date / date range to enable the tracking of trends.
- Data is collated by DDMSU/LDMU using unique DRT and PoP location IDs and settlement/monitoring site profiles.
- Alerts/warnings are communicated to DRTs and PoPs using SMS based alerts.

• **Data updation and management**:

- The DMS Digital database displays updated “Go-Risk” and “RnR Comm” status of all sites, DRTs, PoPs.
- The digital platform enables data submission by PoPs / DRTs using their unique IDs through online forms on mobile hand-held device (offline data entry enabled) and integration of DMS Digital database post verification/ authorization by DDMSU/LDMU staff.
- While the full dataset is available for viewing by all stakeholders, only DDMSU/LDMU staff would have unique Login ID and passwords for updating data for specific districts and sending alerts/messages.
- IT Support Team for DMS Digital database possess a master password for full database access and troubleshooting.
- The DMS Digital database hosts the Resource Directory prepared through a mapping exercise, which is regularly updated.
- “Go Risk” data is collated and shared by DDMSU/LDMU with network institutions for validation of threat levels.
- “RnR Comm” data is collated and shared by DDMSU/LDMU with DDMA/Tehsildars for validation of damage reports.
- Data on outreach is sourced by DDMSU/LDMU from Responders and shared.
- Data is summarised and shared through the online platform and regular e-mail updates.

- **Hazards Definitions**

Flood	A flood is an excess of water on land that is normally dry.
Cloudburst	A cloudburst refers to particularly heavy precipitation (e.g. 100 mm/hour rainfall) in a short period of time over a limited geographical area (e.g. few square kilometres).
Drought	A drought is a period of time when an area or region experiences below normal precipitation. Note that it is a temporary aberration.
Landslide	Landslides are the downslope movement of rock, debris and/or earth under the influence of gravity.
Avalanche	An avalanche is a rapid slide of snow mass down a mountainside. Specifically, there is a downslope movement of snow, ice, and associated debris such as rock fragments, soil, and vegetation.
GLOF	Glacial lake outburst flood (GLOF) occurs when the meltwater and debris dammed by a glacier or moraine is suddenly released and causes flooding in the downstream.
Desertification	Desertification is the degradation process by which a fertile land changes itself into a desert by losing its flora and fauna.
Forest fire	Forest fire refers to an uncontrolled combustion or burning of plants in a natural setting, which consumes the natural fuels and spreads based on environmental conditions such as wind and topography.
Locust menace	Locusts are transboundary migratory pests that can form swarms containing millions of locusts, and cause devastating impacts on crops, pasture, and fodder.
Bank erosion	Bank erosion occurs where streams begin cutting deeper and wider channels as a consequence of increased peak flows or the removal of local protective vegetation.
Earthquake	An earthquake is a series of underground shock waves and movements on the earth's surface caused by natural processes within the earth's crust.
Cyclone	A cyclone is a weather system consisting of an area of low pressure, in which the wind circulates inward in either a clockwise direction (Southern hemisphere) or anticlockwise direction (Northern hemisphere).

GO-RISK TOOLKIT

GO-RISK REPORTING FREQUENCY

• For **RAPID ONSET** Disasters:

Type of hazard	If threshold is breached	During potential hazard months as per calendar	Otherwise
Landslide	As per monitoring frequency	Once every week	Once every month
Flood/cloud burst	As per monitoring frequency	Once every week	Once every month
Avalanche	As per monitoring frequency	Once every 15 days	Once every month
Forest Fire	As per monitoring frequency	Once every week	Once every month
Bank Erosion	As per monitoring frequency	Once every week	Once every month
Locust Menace	As per monitoring frequency	Once every 15 days	Once every month
Earthquake	N/A	N/A	N/A
Cyclone	N/A	N/A	N/A
GLOF	As per monitoring frequency	Once every 15 days	Once every month

• For **SLOW ONSET** Disasters:

Monitoring of weather and visible indicators by DRTs
Tracking of Thresholds by DDMSU/LDMU

Type of hazard	If threshold is breached	During potential hazard months as per calendar	Otherwise
Drought	Once every week	Once every 15 days	Once every month
Desertification	N/A	N/A	Once every month

GO-RISK COMPONENTS

• **Hazards Calendar:** To be computed at district level. Can be maintained for each settlement. One digital copy would be available at DDMSU/LDMU.

Type of hazard	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Landslide												
Flood/cloud burst												
Avalanche												
Earthquake												
Forest Fire												
Bank Erosion												
Locust Menace												
GLOF												
Drought												
Others: _____												
Others: _____												

• **Village Level Disaster Plans:** To be developed for each settlement based on the NIDM Manual on Village Disaster Management Plan.

• **Hazard Specific Tools:** To be used for the specific type of natural hazard for monitoring threshold levels and triggering alerts. Described in detail in the following sections.

GO-RISK - LANDSLIDE

PARAMETERS

1. Rainfall duration and intensity

ALERT!

- When rainfall measurement crosses 12 mm/hour for 10 hours
- When rainfall measurement crosses 2 mm/hour for 100+ hours (4 days+)
- When rainfall measurement crosses 144 mm in 24 hours

2. Slope / soil movement

FREQUENCY

1. Rainfall measurement:

- Once a day during potential landslide hazard months as per seasonal calendar
- During slight rainfall – once every 12 hours
- During heavy rainfall – once every 1 hour

2. Surveillance of slope / soil movement:

- Once a day during potential landslide hazard months as per seasonal calendar for vulnerable sites
- Once a week for general surveillance

TOOLS

1. Low cost tools:

- Bell and bottle rainfall measurement device
- Simple rain gauge, tipping bucket rain gauge
- Landslide hazard – physical observation checklist

2. High cost tools:

- Wireless rain gauge with battery operated transmitter
- Digital extensometer; chain deflect meters, single or multi-drill hole extensometers
- Acoustic EWS device
- Solar-powered radio telemetry system for remote transmission
- Wire loop breaking alarm
- SGI rod inclinometers, Kirby's T-pegs, strain probes in flexible boreholes

MONITORING SITES

1. Precipitation measurement:

- 1 per settlement

2. Surveillance for mass movement:

- All potential landslide zones are identified during mapping

NETWORK INSTITUTION

- District Disaster Management Authority
- State Disaster Management Authority (SDMA) / State Emergency Operation Centre (SEOC)
- Geological Survey of India
- Indian Meteorological Department
- National Institute of Disaster Management
- Wadia Institute of Himalayan Geology
- Department of Civil Engineering - IIT Mandi

GO-RISK Landslide hazard – physical observation checklist

- ☐ Broken water lines; sticking doors and windows, and visible open spaces indicating jambs and frames out of plumb
- ☐ Tilting or cracking of concrete floors and foundations
- ☐ Ancillary structures such as store and cattle shed tilting and/or moving relative to the main buildings
- ☐ Unusual bulges in the ground, street/pavements or sidewalks; sunken road beds
- ☐ Leaning electricity poles, trees, walls or fences; offset fence lines
- ☐ Unusual sounds, such as trees cracking or boulders knocking together; a faint rumbling sound that increases gradually as the landslide nears
- ☐ Falling of rocks, soil, debris etc. in small amounts at regular intervals.

Total number of observed signs

1	2	3	4	5	6	7

No caution — Extra caution — Evacuate

GO-RISK - CLOUDBURST /FLOOD

PARAMETERS

1. Rainfall intensity

ALERT!

• When rainfall measurement crosses 100 mm/hour

2. Level of water in water channels

To be calibrated for each stream or location separately

ALERT! (example)

• 0.8m above regular high flow level – Alert
• 1m above regular high flow level - Get Prepared
• 1.3m above regular high flow level - Evacuate

FREQUENCY

1. Rainfall measurement:

2. Level of water in water channels - observation:

• Once a day during potential flood hazard months as per seasonal calendar
• During slight rainfall – once every 12 hours
• During heavy rainfall – once every 1 hour

TOOLS

1. Low cost tools:

• Bell and bottle rainfall measurement device
• Simple rain gauge, tipping bucket rain gauge
• Water level markers in streams, rivers (new markers installed / existing pillar/post or part of bridge)

2. High cost tools:

• Wireless rain gauge with battery operated transmitter

	• Rainfall data logging system with battery operated logger • Network of rain gauge (upstream) for entire stream basin or watershed • Automated water level sensors, bubbler, Radar Level for non-contact water level measurement, Self-contained Continuous Flow Bubbler with integrated pressure sensor • Eco Net data logger.
MONITORING SITES	
	**1. Precipitation measurement:** • 1 per settlement **2. Water-level measurement:** • 2 or more sites (if possible, upstream every 500 m along the stream based on distance from settlement and availability of personnel) • Better to have monitoring sites upstream to allow higher response time
NETWORK INSTITUTION	
	• District Disaster Management Authority • State Disaster Management Authority (SDMA) / State Emergency Operation Centre (SEOC) • Indian Meteorological Department • National Institute of Disaster Management • National Institute of Hydrology • National Water Academy

GO-RISK - EARTHQUAKE

PARAMETERS	
	**1. P-wave and S-wave of earthquake** • Displacement amplitude of the P-wave's vertical component (Pd) **2. Traditional indicators** **ALERT!** • Restlessness in cows in cattle sheds (Reliability rating: 1/5) • Mice / rats running out of house (Reliability rating: 4/5)
FREQUENCY	
	**1. P-wave and S-wave of earthquake** **2. Traditional indicators** • Continuous
TOOLS	
	**1. Low cost tools:** N/A **2. High cost tools:** • QuakeGuard™ Seismic Warning Systems • Earthquake Alarm Systems (ElarmS) • SEP seismometer • RockWave vertical sensor • P-Alert acceleration sensor

	• MEMS (micro electro mechanical systems) accelerometer • Early Warning Earthquake System
MONITORING SITES	
	**1. Earthquake amplitude measurement:** • One per district; away from sites with artificial/human triggered vibrations (construction/mining sites etc)
NETWORK INSTITUTION	
	• District Disaster Management Authority • State Disaster Management Authority (SDMA) / State Emergency Operation Centre (SEOC) • Indian Meteorological Department (IMD) – nodal agency • Earthquake Risk Evaluation Centre (EREC) – part of IMD • National Institute of Disaster Management • National Seismological Network (NSN) – maintained by IMD

GO-RISK - AVALANCHE

PARAMETERS	
	**1. Snowfall and precipitation intensity** **ALERT!** • When snowfall measurement crosses 2.5 cm/hour **2. Snow storms with high precipitation intensity** **ALERT!** • When snowfall measurement crosses 4 cm/hour • When new snow accumulation depth crosses 50 cm within 12 hours **3. Accumulation of wind driven snow or new snowfall on slope (>15 deg)** **ALERT!** • When snowfall measurement crosses 3-5 cm/hour • When new snow accumulation depth crosses 30-50 cm within 12 hours • Along with the above, when air temperature increases 3°C/hour or more, especially if temp rises above 0°C **4. Wind speed** **ALERT!** • Along with the above, when wind speed crosses 7 m/sec
FREQUENCY	
	**1. Snowfall measurement:** **2. Temperature measurement:** **3. Wind speed measurement:** • During snowfall – once every hour
TOOLS	
	1. Low-cost tools: • Simple thermometer; digital thermometer • Handheld anemometer

	• Traditional snow gauge **2. High-cost tools:** • Web/alert thermometers • Mounted anemometer • Automated remote reading gauges; Snow Pillow snow sensor connected to a manometer; Electronic Snow Density Gauge • RAMMS (Rapid Mass Movements System) software • Wireless Sensor Network; 'SiteMonitor' laser monitoring system
MONITORING SITES	
	**1. Precipitation, wind speed and temperature measurements:** • 1 site per settlement
NETWORK INSTITUTION	
	• District Disaster Management Authority • State Disaster Management Authority (SDMA) / State Emergency Operation Centre (SEOC) • Indian Meteorological Department • National Institute of Disaster Management • Snow and Avalanche Study Establishment • SCA- Himalayas – Swiss Cooperation Office

GO-RISK - GLOF

PARAMETERS	
	**1. Observable Thresholds** **ALERT!** • Volume of Lake increases • Lake level relative freeboard • Seepage evident through dam • Ice cored moraine dam **2. Visible triggers** **ALERT!** • Calving of ice cliff • Ice / rock avalanche at/near the site • Supra-glacial or en-glacial drainage
FREQUENCY	
	**1. Identification:** • Once a month for identifying hazardous glacial lakes – corroboration by network partners **2. Surveillance (post-identification):** • Potentially hazardous lake is identified twice a day • Continuous monitoring by Network partners using satellite images
TOOLS	
	1. Low cost tools: • Scoring sheet for GLOF Hazard • HF communication set / satellite telephone

2. High cost tools:
- Satellite images, aerial photographs, GIS
- Water-level sensors, data logger, remote transmitter and solar powered
- Warning stations based on Extended Line of Sight (ELOS) VHF radio technology equipped with Meteor Communications Corporations (MCC) 545-transceiver, solar-panel, battery, antenna and amplifier with siren

MONITORING SITES

1. Observation sites:
- High-altitude sites as identified during preliminary mapping

NETWORK INSTITUTION

- District Disaster Management Authority
- State Disaster Management Authority (SDMA) / State Emergency Operation Centre (SEOC)
- Indian Space Research Organisation
- National Institute of Disaster Management
- Wadia Institute of Himalayan Geology
- SCA Himalayas – Swiss Corporation Office

GO-RISK GLOF Hazard Scoring – for moraine-dammed lake

Components	0	2	10	50	Score
Volume of lake	N/A	Low	Moderate	Large	
Calving risk from ice cliff	N/A	Low	Moderate	High	
Ice/rock avalanche risk	N/A	Low	Moderate	High	
Lake level relative to freeboard	N/A	Low	Moderate	Full	
Seepage evident through dam	None	Minimum	Moderate	Large	
Ice cored moraine dam / thermokarst features	None	Minimum	Partial	Moderate	
Compound risk present	None	Slight	Moderate	Large	
Supra/en-glacial drainage	None	Low	Moderate	Large	

Total: _____

Hazard Rating

0	25	50	100	125	150	150+
None		Minimal	Moderate	High		Very High

GO-RISK – FOREST FIRE

PARAMETERS	
	**1. Observable Thresholds** **ALERT!** • Visible smoke rising out of forested area • Visible flames in forested area • Presence of Ground fire / Surface fire / Crown fire • Direction of fire spreading **2. Weather data** • Temperature data - Maximum (°C) • Temperature data - Minimum (°C) • Wind speed data (km/h)
FREQUENCY	
	**1. Identification:** • Once a week during potential months – corroboration by network partners **2. Surveillance (post-identification):** • The site and fire spreading is observed twice a day • Continuous monitoring by Network partners using satellite images
TOOLS	
	**1. Low cost tools:** • Scoring sheet for Forest Fire Hazard • HF communication set / satellite telephone **2. High cost tools:** • Satellite images, aerial photographs, GIS
MONITORING SITES	
	**1. Observation sites:** • Potential sites as identified during preliminary mapping
NETWORK INSTITUTION	
	• District Disaster Management Authority • State Disaster Management Authority (SDMA) / State Emergency Operation Centre (SEOC) • State Forest Departments • Forest Survey of India (FSI) • Indian Space Research Organisation (ISRO)

GO-RISK – LOCUST MENACE

PARAMETERS	
	**1. Observation - Locust presence** **ALERT!** • Isolated individual locusts; 1 locust per 400 m (transect walk) • Scattered low number of locusts; Upto 20 locust per 400 m (transect walk)

	• Active group of locusts; moving in swarms ; >20 locust per 400 m (transect walk) • Active group of locusts; breeding - egg laying on ground or group of hoppers spotted (transect walk) **2. Type of locust** • Desert Locust / Migratory Locust / Bombay Locust / Tree Locust
FREQUENCY	
	**1. Identification:** • Once a week during potential months for identifying any occurrence – corroboration by network partners **2. Surveillance (post-identification):** • Every 24 hours for next 1 week • Continuous monitoring by Network partners involving field staff
TOOLS	
	**1. Low-cost tools:** • Observation sheet for Locust Menace / Locust surveys or population monitoring • HF communication set / satellite telephone **2. High-cost tools:** • Satellite Remote Sensing and GIS Applications
MONITORING SITES	
	**1. Observation sites:** • Agriculture farms
NETWORK INSTITUTION	
	• District Disaster Management Authority • State Disaster Management Authority (SDMA) / State Emergency Operation Centre (SEOC) • State Agriculture Departments • Directorate of Plant Protection Quarantine and Storage, Ministry of Agriculture & Farmers Welfare

GO-RISK – BANK EROSION

PARAMETERS	
	**1. Observation Threshold** **ALERT!** • Bankline retreat in one site • Bankline retreat in multiple sites • Bankline retreat with high volume of material eroded away **2. Erosion monitoring pins** **ALERT!** • Number of erosion monitoring pins washed away from the monitoring plot None / 1 / 1-5 / >5

	3. Bank retreat distance (with reference to control points) None / <1 m / 1-2 m / >2 m
FREQUENCY	
	**1. Identification:** • Once a week during potential months for identifying any occurrence – corroboration by network partners **2. Surveillance (post-identification):** • Every 24 hours for next 1 week • Continuous monitoring by Network partners involving field staff
TOOLS	
	**1. Low-cost tools:** • Observation sheet for Bank Erosion • HF communication set / satellite telephone **2. High-cost tools:** • Satellite Remote Sensing and GIS Applications
MONITORING SITES	
	**1. Observation sites:** • Agriculture farms
NETWORK INSTITUTION	
	• District Disaster Management Authority • State Disaster Management Authority (SDMA) / State Emergency Operation Centre (SEOC) • State Agriculture Departments • Directorate of Plant Protection Quarantine and Storage, Ministry of Agriculture & Farmers Welfare

GO-RISK - DROUGHT

PARAMETERS	
	**1. Steep drop in annual precipitation** **ALERT!** • When SPI value is -1.5 • When annual rainfall measurement is <75% of long term mean annual precipitation **2. Traditional indicators** **ALERT!** • Occurrence of locusts (Reliability rating: 5/5) • Significant reduction in discharge of perennial springs (Reliability rating: 5/5)
FREQUENCY	
	1. Rainfall measurement: • Once a day; reporting once a month

	**2. Traditional indicators:** • Once a week during potential drought hazard months as per seasonal calendar
TOOLS	
	**1. Low cost tools:** • Simple rain gauge, tipping bucket rain gauge • Digital software for calculating SPI value based on rainfall data **2. High cost tools:** • Wireless rain gauge with battery operated transmitter • Rainfall data logging system with battery operated logger • Computer for calculation/data comparison
MONITORING SITES	
	**1. Precipitation measurement:** • 1 per settlement
NETWORK INSTITUTION	
	• District Disaster Management Authority • State Disaster Management Authority (SDMA) / State Emergency Operation Centre (SEOC) • Indian Meteorological Department • National Institute of Disaster Management • National Centre for Medium Range Weather Forecasting (NCMRWF) • National Remote Sensing Centre

GO-RISK - DESERTIFICATION

PARAMETERS	
	**1. Vegetation cover; Leaf Area Index (LAI)** **ALERT!** • Vegetation scarce and short, coverage of vegetation <10% - Severe Desertification • Coverage of stable perennial vegetation 10-20% - Medium Desertification • Semi-sand and semi-grass, coverage of vegetation 20-40% - Slight Desertification **2. Evidence of wind erosion** • Big areas of concentrated quicksand hills - Severe Desertification • Surface of land seriously damaged by wind erosion, shrub-coppice dunes and big areas of quicksand - Medium Desertification • Surface of land partially damaged by wind erosion and small plot of quicksand has appeared - Slight Desertification **3. Presence of quick sand; soil organic matter content** • Area of quicksand about 50% of the land - Severe Desertification • Area of quicksand about 30%-50% of the land - Medium Desertification • Area of quicksand about 10-30% of the land - Slight Desertification

FREQUENCY

1. Observations:
- Once in 3 months

TOOLS

1. Low cost tools:
- Scoring sheet for Desertification Hazard

2. High cost tools:
- Plant Canopy analyzers (PCA)
- Portable Leaf Area Meters
- Evapotranspiration Monitoring Station
- Portable Laser-Induced Breakdown Spectroscopy (LIBS) equipment
- Near-Infrared Spectroscopy (NIRS) for soil organic matter
- Digital wind erosion monitoring station with sediment traps

MONITORING SITES

1. Observation sites:
- 1 to 2 undisturbed natural vegetation sites identified for a settlement during preliminary mapping (one site per 1000 hectares across the district)

NETWORK INSTITUTION

- District Disaster Management Authority
- State Disaster Management Authority (SDMA) / State Emergency Operation Centre (SEOC)
- Indian Meteorological Department
- Central Arid Zone Research Institute
- National Institute of Disaster Management
- National Remote Sensing Centre

GO-RISK Desertification – physical observation checklist

Components	0	1	2	3	Score
Evidence of wind erosion	None	Loose sand; pedestals	Micro ripples on surface	Dunes	
Increase in number of dry months	None	1	1-3	3+	
% canopy cover	Above 40%	20-40%	10-20%	<10%	
Type of vegetation	Perennial	Perennial	Semi-grass	Scarce, short	
Presence of quick sand	None	small plot	30-50%	>50%	
Crusting & compaction of soil	None	Minimum	Partial	Moderate	
Presence of soil organic matter	Dark soil	Distinct dark topsoil	Slightly dark topsoil	Light colour topsoil	

Total: _____

Hazard Rating

0	3	6	9	12	15	18
None			Caution	Extra Caution	Emergency	

RNR-COMM TOOLKIT

RNR-COMM DATA FREQUENCY

• For **RAPID ONSET** Disasters:

Type of hazard	SOS	Stage 2	Tracking Emerging Needs
Landslide	Every 12 hours for first 3 days	Every 24 hours for 7 days	Every week for 3 weeks
Flood/cloud burst	Every 6 hours for first 3 days	Every 24 hours for 7 days	Every 3 days for 3 weeks
Avalanche	Every 6 hours for first 1 day	Every 24 hours for 3 days	Every 3 days for 1 week*
Earthquake	Every 6 hours for first 1 day	Every 24 hours for 3 days	Every 3 days for 3 weeks*
Forest Fire	Every 6 hours for first 1 day	Every 12 hours for 3 days	Every 3 days for 3 weeks
Locus Menace	Every 12 hours for first 3 days	Every 24 hours for 7 days	Every 3 days for 1 week
Bank erosion	Every 6 hours for first 1 day	Every 12 hours for 7 days	Every 3 days for 1 week
Cyclone	Every 6 hours for first 1 day	Every 12 hours for 7 days	Every 3 days for 1 week
GLOF	Every 6 hours for first 1 day	Every 24 hours for 3 days	Every 3 days for 3 weeks*

* in case of severe damage

• For **SLOW ONSET** Disasters:

Type of hazard	SOS	Stage 2	Stage 3
Drought	Every week for first 1 month	Every 15 days for 2 months	Every 15 days for 1 year*
Desertification	Every month for first 3 months	Every 3 months for 2 years	---

* in case of drought continues

RNR-COMM COMPONENTS

• **Assessment Updates** for Natural Disasters:

SOS Report First Communication / Flash report	**Overview** Type of disaster; date and time – Safe reporting; or Damage & needs reporting; affected area; no of casualties; estimates of severity; emerging threats
SOS Report Damage Assessment / Initial Report	**Preliminary Needs Assessment** Number of people affected and their location(s) Disaggregated by sex, age, disability, etc. Deaths, permanent disabilities, major injuries, minor injuries and missing persons Immediate priorities for external relief Where material is required and approximate quantities related to following sectors: Water Supply Sanitation and Hygiene Food Security and Nutrition Shelter, settlement and non-food items Health Systems Access conditions
Tracking Emerging Needs Continual updates	**Assessment of Emerging needs** Likely movement of people Security of the affected population / special security risks for vulnerable groups Access to public places, resources

RNR-COMM – SOS

LEVEL OF EMERGENCY

Level 1
- Safe; No assistance required at the moment

Level 2
- Some relief assistance required; no urgent requirements

Level 3
- Relief assistance required

Level 4
- Immediate relief assistance required; critical medical emergencies

Level 5
- Immediate evacuation, search & rescue needed; Immediate relief assistance required

SCALE OF EMERGENCY

1. No of Deaths:
• Male: • Female: • Children

2. No of Persons Missing:
• Male: • Female: • Children

3. No of Persons Injured/Need Medical Attention:
• Male: • Female: • Children

4. No of Persons Particularly Vulnerable:
• Pregnant/lactating women:
• People with Disabilities:
• Elderly:
• Infants (0-1 years):
• Children (0-5 years):

SPECIFIC REQUIREMENTS

1. Safe water requirement:
• Upto 100 people: • Upto 500 people: • 500+ people

2. Sanitation facility requirement:
• Upto 100 people: • Upto 500 people: • 500+ people

3. Food requirement - Adults:
• Upto 100 people: • Upto 500 people: • 500+ people

4. Food requirement - Infants:
• Upto 10 infants: • Upto 50 infants: • 50+ infants

5. Emergency Healthcare requirement:
• Upto 100 people: • Upto 500 people: • 500+ people

6. Temporary Shelter requirement:
• Upto 100 people: • Upto 500 people: • 500+ people

SITUATION UPDATE

1. Fresh Incidents:
• None / Yes, but not significant / Yes, caused further damage

2. Access condition:
• Cut-off / reachable only by air
• Reachable on foot / pack animals
• Reachable by road
• Reachable by waterways

INFRASTRUCTURE DAMAGE

1. Damage to School:
• None/Partial/Full

2. Damage to Health Center:
• None/Partial/Full

3. Damage to Houses:
• Not affected: • Partially damaged: • Fully damaged:

AVAILABLE RESOURCES

1. Food stock available:
• No food / Available for 1 day / Available for 3 days / Available for 3+ days

2. Health personnel available:
• None / Traditional healer / Paramedic or CHW / Certified doctor

3. Cooking / boiling facility available:
• Not available / Available but inadequate / Available:

4. Medicines available:
• No medicine / Available for 1-3 days / Available for 3-7 days / Available for 7+ days

RNR-COMM – TRACKING EMERGING NEEDS

DISPLACED POPULATION

1. No of Persons Displaced:
• Male: • Female: • Children

EMERGING CONCERNS

1. Cases of Gender Based Violence:
• None / Isolated incidents reported / Frequent incidents reported

2. Cases of Violence Against Children:
• None / Isolated incidents reported / Frequent incidents reported

3. Cases of discrimination and reduced access to resources:
• None / Isolated incidents reported / Frequent incidents reported

	4. Psycho-social trauma care: • Not available / Available but inadequate / Available **5. Child Friendly Spaces:** • Not available / Available **6. Disease outbreak:** • None / Isolated incidents reported (specify disease ___) / High number of incidents reported (specify disease ___) **6.a Disease outbreak:** • If high number of incidents reported – specify number of cases: ___
SITUATION UPDATE	
	**1. Fresh Incidents:** • None / Yes, but not significant / Yes, caused further damage **2. Access condition:** • Cut-off / reachable only by air • Reachable on foot / pack animals • Reachable by road • Reachable by waterways

Hazard specific variations

The RNR reporting is similar for most hazards. However, there are customized reporting requirements for some specific hazards – as mentioned below.

RNR-COMM – LOCUST MENACE

SCALE OF EMERGENCY	
	1. No of farmers affected: Farmers: _____[number field] **2. Area of farmland affected:** In hectares: _____[number field] **3. List of crops damaged: [text field]** _____ _____ _____
SITUATION UPDATE	
	**1. Fresh Incidents:** • None / Yes, some hoppers or adult locusts visible/ Yes, swarms of locusts still present **2. Available support:** • Pesticide sprays deployed by government • Pesticide sprays deployed by farmers • Farmers using fire / drums / destroying eggs • No action taken so far

RNR-COMM – FOREST FIRE

SCALE OF EMERGENCY

1. Area of forestland affected:
In hectares: _____[number field]

2. Area of rangeland affected:
In hectares: _____[number field]

3. No of days the fire has been raging:
In days: _____[number field]

4. List of villages threatened: [text field]
_____
_____
_____

5. No of Deaths:
Male: _____[number field]
Female: _____
Children: _____

6. No of Persons Missing:
Male: _____[number field]
Female: _____
Children: _____

7. No of Persons Injured/Need Medical Attention:
Male: _____[number field]
Female: _____
Children: _____

SITUATION UPDATE

1. Fresh Incidents:
• None / Yes, some smoke visible/ Yes, some flames visible - with limited spread / Yes, raging fire clearly visible – and spreading rapidly

2. Available support:
• Fire fighters deployed by government
• Water sprays deployed by communities
• Fire breaks / firelines set up
• Communities / animals evacuated
• No action taken so far

RNR-COMM – ALL STAGES

COMMUNICATION

1. Low cost tools:
• SMS based reporting to DDMSU/LDMU
• Toll-free phone number with voice mail and call recording facility at

	DDMSU/LDMU • Dedicated email ID at DDMSU/LDMU • Excel conversion App for SMS based data • RE powered communication facilities and battery backup **2. High cost tools:** • HF Radio/Manpack transceiver-based reporting to DDMSU/LDMU and network partner • Local police wireless systems / walkie talkies • Grid/balloon for extended wireless access • WLL/Satellite phone based reporting to DDMSU/LDMU and network partner
NETWORK INSTITUTIONS	
	• District Disaster Management Authority • State Disaster Management Authority (SDMA) / State Emergency Operation Centre (SEOC) • National Disaster Management Authority • National Disaster Response Force • State Disaster Response Force • Inter Agency Group (IAG) • United Nations Disaster Management Team

ANNEXURE

GLOSSARY OF ABBREVIATIONS USED

- ASHA – Accredited Social Health Activists
- BPL – Below Poverty Line
- DDMA – District Disaster Management Authorities
- DDMP – District Disaster Management Plan
- DDMSU/LDMU – District Disaster Management Support Unit / Local Disaster Management Unit
- DMS –Disaster Management System
- DRT – Disaster Response Team
- ELOS – Extended Line of Sight
- EREC – Earthquake Risk Evaluation Centre
- EWS – Early Warning System
- GBV – Gender Based Violence
- GIS – Geographical Information System
- GLOF – Glacial Lake Outburst Flood
- HF – High frequency
- HQ – Headquarter
- ID – Identification
- IMD – India Meteorological Department
- LAI – Leaf Area Index
- MCC – Meteor Communications Corporations
- MEMS – Micro Electro Mechanical Systems
- N/A – Not Applicable
- NIDM – National Institute of Disaster Management, India
- NSN – National Seismological Network
- OBC – Other Backward Class
- PCA – Plant Canopy Analyzers
- PoP – Points of Presence
- PwD – People With Disabilities
- RAMMS – Rapid Mass Movements System
- SC – Scheduled Caste
- SMS – Short Messaging Service
- SOS - (…---…) International Morse code distress signal
- SPI – Standardized Precipitation Index
- ST – Scheduled Tribe
- VHF – Very high frequency
- WLL – Wireless in Local Loop / Rural Landline


PRAGYA