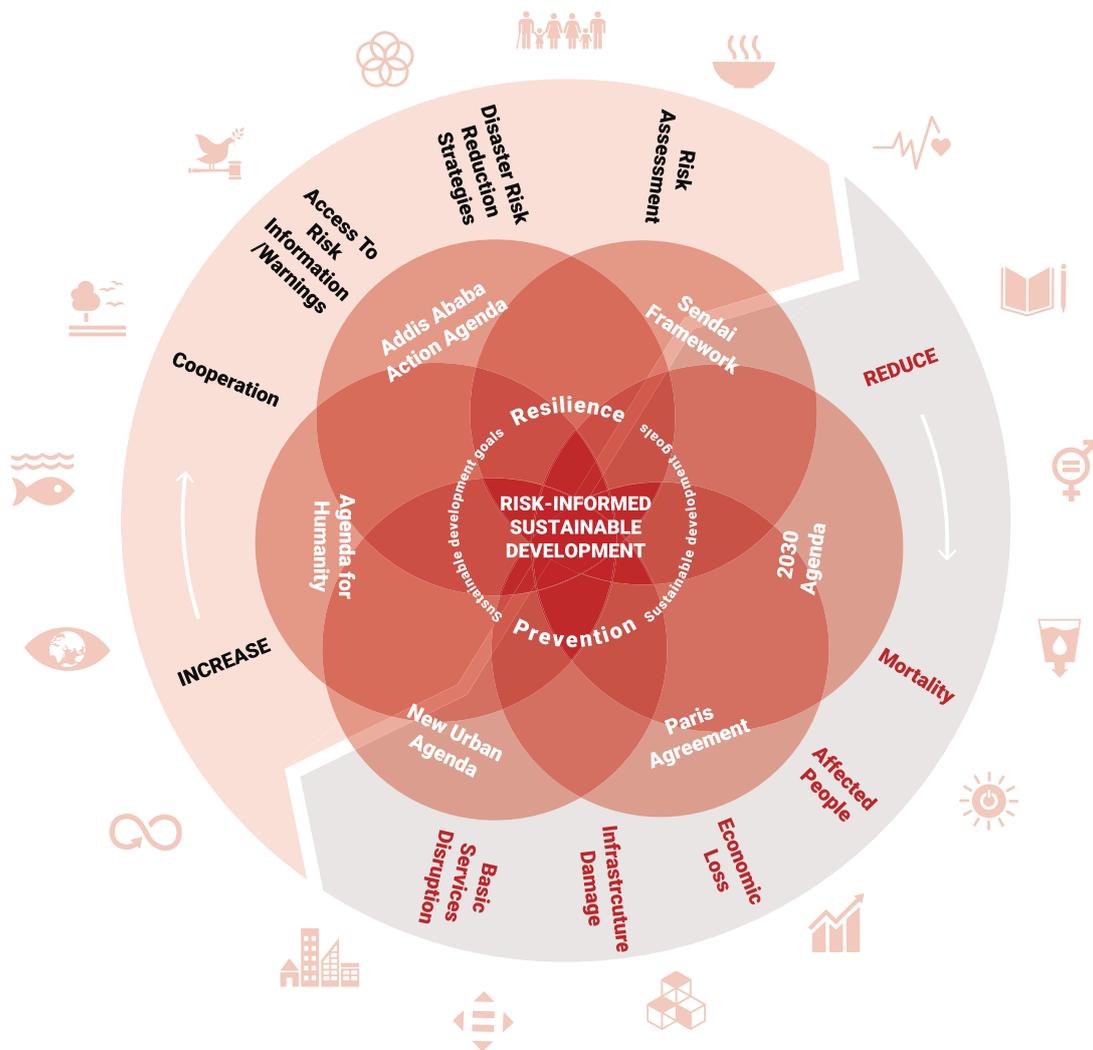


# Training Module

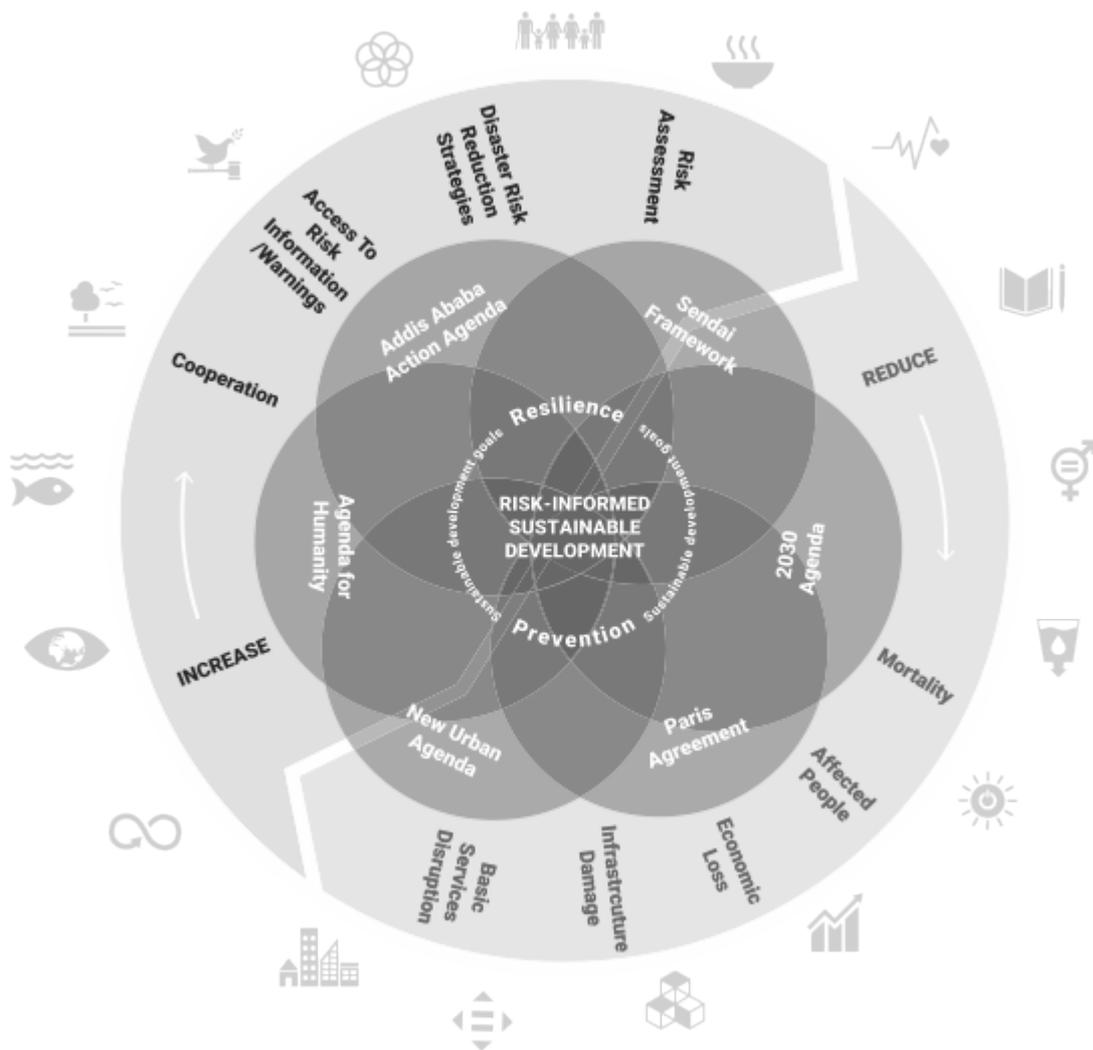
## Understanding Disaster Risk Management

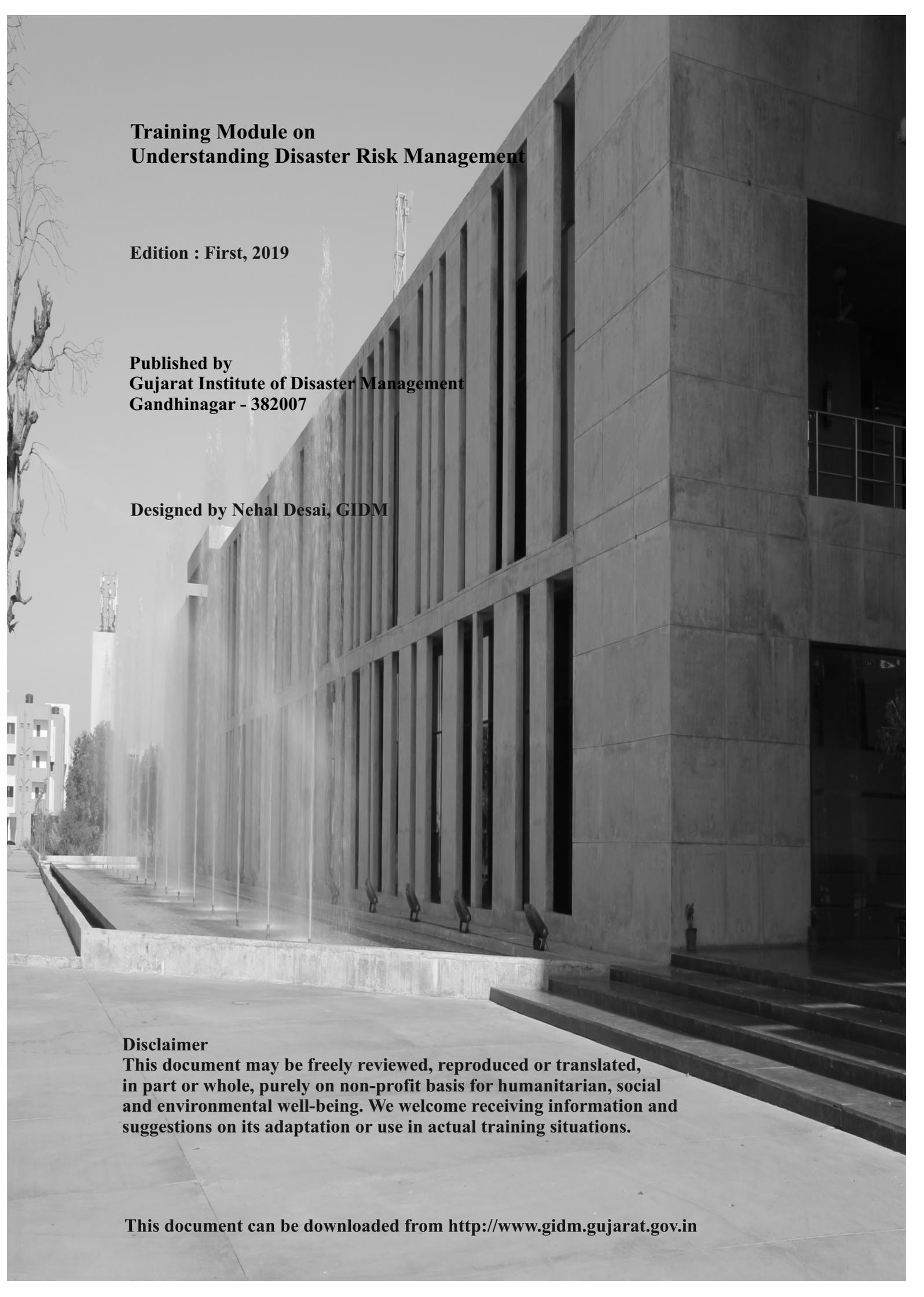




# Training Module

## Understanding Disaster Risk Management





**Training Module on  
Understanding Disaster Risk Management**

**Edition : First, 2019**

**Published by  
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Gandhinagar - 382007**

**Designed by Nehal Desai, GIDM**

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# Message



Disaster Management is perhaps one of those subjects which is unique in its own way. On one hand it has undergone a complete paradigm shift from mere management to risk reduction and risk management and on the other hand, countries and states, all over the world, are trying hard to mainstream disaster risk management in development planning. With global phenomenon like climate change looming large at the horizon, the consequences and aftermaths of any extreme event will be disastrous, if the risk which is posed by such events is not reduced or managed. And to this, everyone needs to contribute. The onus rests not only on the government and governing authorities but also on the citizens and residents. Thus, everyone needs to be empowered to understand the risks they live in. This particular training manual, which can be used by trainers as well as for self-education, does exactly that.

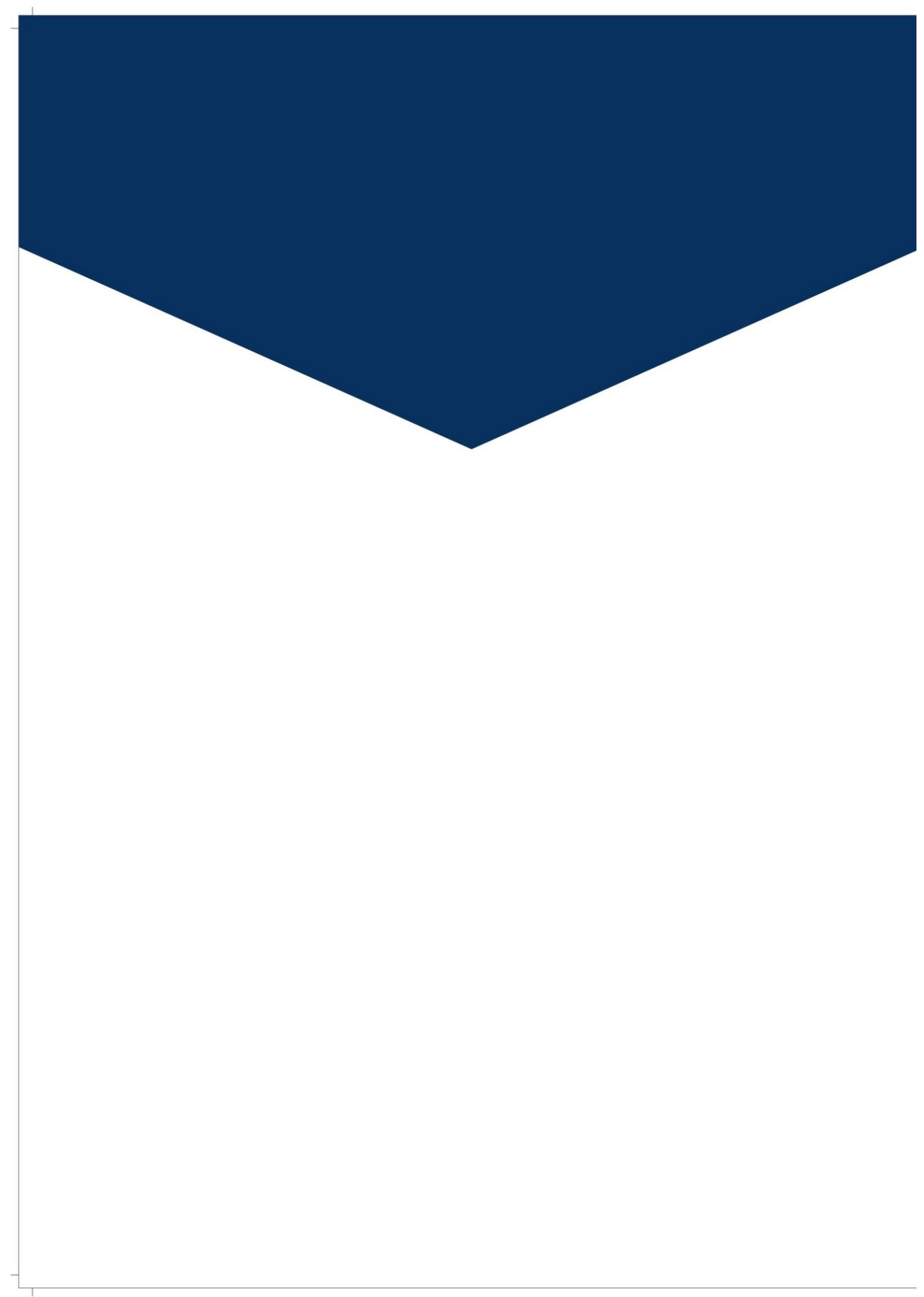
The different units of the module explain the various controllers of disaster risk and elaborates on how they are related to each other. Care has been taken to explain these crucial parameters as lucidly as possible. Starting from the fundamentals, the module builds upon and gradually talks about the different aspects of disaster risk management. In addition to this, national and international arrangements have also been discussed like the relevant statutes at national level, the Sendai Framework for Disaster Risk Reduction (SFDRR), Sustainable Development Goals which include 17 goals, the Paris Agreement under the United Nations Framework on Climate Change etc. The aim of including such national and international agreements is to lay stress on the fact that understanding risk is just the beginning and it needs to be complimented by risk governance, investment in resilience and preparedness which fosters disaster risk reduction and ultimately, disaster resilience.

I appreciate the efforts of GIDM team especially Dr. Repaul Kanji and Shri Nisarg Dave for coming up with the module of Understanding Disaster Risk Management. I hope this module will benefit trainees, students, researchers and professionals working in or simply interested to learn about disaster risk reduction and management. GIDM will eventually engage in capacity building programs based on this module to create critical mass of people to address disaster risks and mitigate impacts. I am sure concerted efforts in this direction would help in building and creating a culture of disaster resilience, which in turn would lead to a disaster resilient society and nation.



**(P. K. Taneja)**  
**Director General**

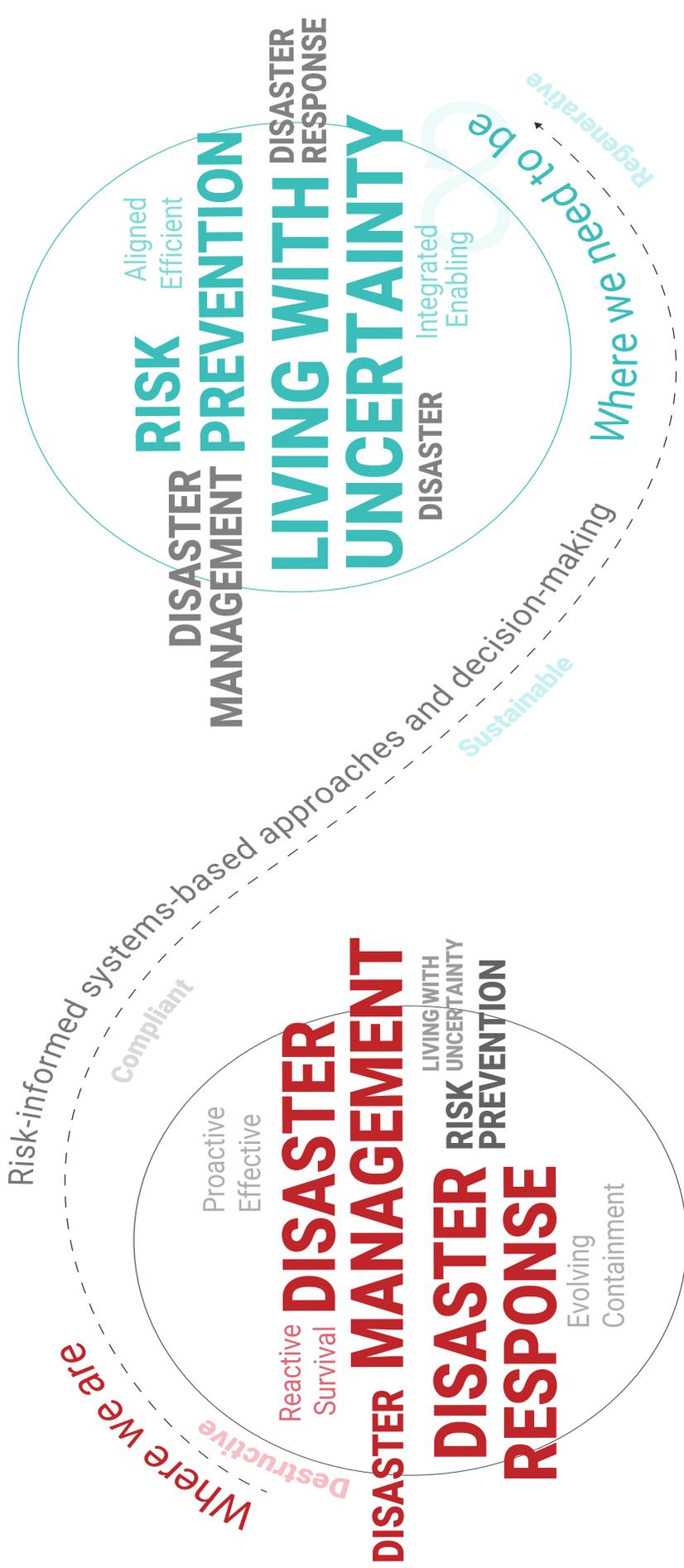
**May, 2019**  
**Gandhinagar**



## Abbreviations

CCA	Climate Change Adaptation
CoP	Conference of Parties (reference to CoP 21: Paris Agreement)
DDMA	District Disaster Management Authority
DEOC	District Emergency Operating Centres
DM	Disaster Management
DRM	Disaster Risk Management
DRR	Disaster Risk Reduction
EOC	Emergency Operating Centre
GIDM	Gujarat Institute of Disaster Management
GIS	Geographic Information System
GSDMA	Gujarat State Disaster Management Authority
HFA	Hyogo Framework for Action
HPC	High Powered Committee (reference to HPC Report, 2001)
HRVA	Hazard Risk and Vulnerability Assessment
IMD	Indian Meteorological Department
INCOIS	Indian National Centre for Ocean Information Services
IRDR	Integrated Research on Disaster Risk
IRS	Incident Response System
ISDR	International Strategy for Disaster Reduction
NBC	National Building Code
NDMA	National Disaster Management Authority
NDRF	National Disaster Response Force
NDRF	National Disaster Response Fund
NIDM	National Institute of Disaster Management
PDRI	Public Dissemination of Risk Information
SDG	Sustainable Development Goals
SDRF	State Disaster Response Fund
SDMA	State Disaster Management Authorities
SFDRR	Sendai Framework for Disaster Risk Reduction

Source: UNISDR 2019



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## Introduction to the Module

### About the module

*“The world has enough to meet our needs but not our greed.”*

In this busy era of globalisation and urbanisation, mankind seldom looks back to ponder upon the consequences of his deed. We move towards development in all aspects of our life without comprehending its cost and then one fine day the wrath of nature is unleashed upon us and we are left with nothing but a thought, “How could we have stopped this?” In fact, with more and more industrialisation and technological advancement, it is not only natural catastrophes that haunt us but also man-made ones. Examples are replete and requires no individual mention. Argument on whether such catastrophes can be completely averted, prevented, mitigated or just managed is a debate for the intelligentsia and while that happens, it is the masses, the residents, the commoners who are at risk and it is high time they understand this risk and be prepared for it.

The training module on Understanding Disaster Risk Management has been developed for trainers to educate the commoners about the risks around them and intuitively train them to be prepared for it. The module has been designed in an interesting way to avoid the use of technical terminologies and DRR jargons, which usually becomes confusing to a commoner after a point, and yet serve the purpose of educating everyone, across any demographic division, about disasters and disaster risk management. The training module focuses on all parameters of disaster risk like hazard, vulnerability, exposure and coping capacity to explain the fundamentals of risk assessment without going into the technicalities. The ultimate objective of the module is to empower every participant to be able to assess their risks and be prepared for it or have a plan to cope with it. An important aspect of disaster risk management or disaster risk reduction is hazard, risk and vulnerability assessment and engineers / professionals / experts are relied upon for this. However, this module aims to empower a common man to do the same, although not with such high precisions or on a large scale but with enough credibility to act upon it. Thus, in a way, the final aim of this module is to inculcate a culture of resilience among everyone.

Doing what is being taught is perhaps the best way to ensure that knowledge is retained and this forms the guiding principle of this training module. The module has been developed by

the Gujarat Institute of Disaster Management (GIDM) with inputs from professionals working in this sector and by referring to several research articles. GIDM is a premier institute entrusted with the responsibility of human resource development, capacity building, training, research and documentation in the field of disaster management.

### **Who shall use the Training Module?**

It can be used by trainers in the disaster risk management sector for imparting training to anyone on the basics and fundamental understanding. The module can also be used for self-study by disaster risk management professionals or anyone who has interest in this field and intends to learn more about it. The following would be the expected target groups for the module:

- Civilians / residents.
- Undergraduate students; post-graduate students in the field of disaster risk management.
- Government authorities, either to foster their own interest in this subject or just as a part of being aware and prepared.
- NGOs working in this sector

### **How to use the Training Module?**

The module has been designed rationally to help the trainers or the self-learners to understand what risk is. The module is a step-by-step guidance system; it starts from explaining the basics like hazard, vulnerability, exposure and then puts forth how each of them contribute to risk. The use of technical terms or jargons of DRR has been avoided till the end so that the basics are not overlooked. The chapterisation of this module follows the same flow; it starts with the basics of what constitutes risk and it is only in the last chapter that one gets to learn about disasters and how the world and the nation is dealing with it. Each chapter is a step towards understanding disaster as a whole.

Each session has been explained in detail, along with the session plan, content to be covered, methodology to be followed and a trainers' note. The content of the module is expected to be inherently dynamic as the field of disaster management is witnessing substantial change every

other day and the onus is on the trainer or the learner to look up the newest development. The module also retains a degree of flexibility in the sense that the trainer can innovate on the methodology or activities according to the profile and need of participants.

## Trainers' Guide

Disaster risk management, disaster risk reduction is inherently participatory in nature and that is why the training module has been designed keeping a participatory framework in mind. DRR is one of those fields where even the trainer can learn from the participants and go on to include his learnings in future lessons. The trainer should consider the following guidelines:

- Registration of the participants should be electronic and must be made open on the eve of the program. This will help the trainer to understand the type of participants and he / she may consider making few last minute changes in the style of delivery.
- The program must start with public dissemination of risk information of the venue which should be audio-visual (preferably) and the participants must be made aware of the evacuation routes, assembly points etc.
- A pre-test should be conducted by the trainer to gauge the knowledge of the participants before the beginning of the program. After the completion of the program, a post-test should be scheduled. The questions should be objective type and must be repeated in pre and post-test. An analysis of the pre and post scores would be an effective way of understanding the effectiveness of the course as well as the trainers ability to impart training.
- Instead of abiding by the traditional practice of trainer-participant introduction, the participants should be introduced to each-other and the trainer should come up with interesting ways to do so.
- Each lecture session should end in a discussion. This will not only help the participants to learn more from each-other but also the trainer to understand whether he has been capable enough to get his ideas across to the participants or not.
- If possible, a qualitative assessment of the trainer should be conducted at the end of every lecture session. The questions should focus only on qualitative aspects of the lesson and the trainer. Such an assessment would be an effective tool to measure the performance of the trainer.

- If the same trainer is taking more than one session, then, the test would be able to let the trainer know which sessions were good, which were average and which needs to be improved.
- If the same session has been taken by different trainers over a period of time, such a test would be an effective way of knowing which trainer is better in imparting training in that particular topic / subject.
- Post-lunch sessions should be more action based rather than discussions or lectures. The trainer, therefore, should plan the session in such a way that the first-half of the day is dedicated to teaching / learning, while the second-half is more about exercising the concepts that have been taught.
- In group activities and simulation exercises, care should be taken to ensure that the grouping is logical or rational in some way; hazard-wise, state-wise, district-wise etc.

### Target Group

The training is targeted towards the common man. It would not be out of place to suggest that the generic understanding of disaster risk management is either flawed or incomplete or reactive. These are major impediments to fostering a culture of disaster resilience and it is exactly these impediments that the module intends to address. Thus, anyone who is keen on learning about the basics of disaster risk management can be the target group. The style of delivery, however, may differ depending upon the target group.

A group size of 25 - 30 people would be ideal.

### Entry Behaviour

**Level of participants :** Anyone

**Age Group :** Less than 50 years

**Educational Qualification :** Anyone who has a basic understanding of science

**Disaster Experience :** Not at all mandatory

### Objective of the programme

The overall objective of the programme is to impart adequate knowledge and skill to the trainees to deal with risks in their respective spheres of life and empower them to formulate strategies/ action plan suitable to prevent risks and build resilience.

## **Learning Objectives**

At the end of the training, participants will be able to:

- I. Explain the various terminologies of DRM like hazard, vulnerability, exposure, coping capacity without any shred of ambiguity.
- II. Explain how risks can become disaster and how to identify and assess them.
- III. Take logical steps to manage / govern the risks and thereby be an active agent of fostering a culture of disaster resilience.
- IV. Explain the technical jargons and terminologies used in the context of disaster management.
- V. Explain the national and international frameworks in DRR, CCA and how they are intertwined.

## **Methodology**

The training will be conducted in an interactive mode with a judicious mixture of lectures, discussions, demonstrations, experience sharing, group work and case study analysis.

## **Teaching Aids**

Training will have to be conducted with the help of the following:

1. Background reading materials / reference materials
2. Electronic handouts of presentations or additional material
3. Simulation exercise
4. A group is to be created on a social media to ensure that the participants are in touch and are actively sharing knowledge amongst each other. Such groups can also function as crowd based sources of data.

## **Training Materials and Equipments Required**

The training will essentially be classroom based and for simulation exercises, the venue institute should be used. The training materials for classroom teaching like Computers, LCD projectors, flip charts, markers etc would be required.

## **Seating Arrangements**

The seating arrangements should preferably be four or five circular tables to facilitate group work and allow the trainer to move around the class for interaction.

## **Language of Instruction**

The medium of instruction will be English, Hindi and Gujarati

## Content Design

#	Session Title	Session Objectives	Time	Methodology
<b>Inauguration &amp; Pre-Training Assessment</b>				
	Informal introduction	<ul style="list-style-type: none"> <li>- Welcome participants</li> <li>- Informal introduction of participants to each other</li> <li>- <b>Public dissemination of risk information of the venue (PDRIV)</b></li> <li>- Overview of GIDM</li> <li>- Overview of the training</li> </ul>	40 minutes	Interaction, video, participatory activities
	Pre-test	<ul style="list-style-type: none"> <li>- Assessment of the knowledge of participants prior to the training program</li> </ul>	30 minutes	Objective type questions
	Inauguration	<ul style="list-style-type: none"> <li>- Inauguration to be presided by the head of the institute</li> <li>- Introductory speech by the head of the institute</li> </ul>	20 minutes	Interaction
<b>Unit 1: Comprehending hazards</b>				
U1L1	What is hazard?	<ul style="list-style-type: none"> <li>- Understand what hazard is and the ways in which hazard is perceived and understood.</li> <li>- Emphasise on the fact that disaster is different from a hazard</li> </ul>	45 minutes	Interaction
U1L2	Types of hazard	<ul style="list-style-type: none"> <li>- Understand the classification of hazards</li> <li>- Understand the causalities of some common hazards, at least the ones affecting the state.</li> </ul>	45 minutes	Interaction

U1L3	Hazards: An overview	<ul style="list-style-type: none"> <li>- Understand the national hazard profile</li> <li>- Understand the state and district level hazard profile</li> </ul>	45 minutes	Interaction
U1L4	The ever broadening scope of hazards	<ul style="list-style-type: none"> <li>- Explain how global phenomenon are transforming natural systems into hazards and sometimes even accentuating them</li> <li>- Explain how the scope of hazards is broadening every day primarily due to anthropogenic causes</li> </ul>	45 minutes	Interaction
<b>Unit 2: Getting a grip on vulnerability</b>				
U2L1	What is vulnerability?	<ul style="list-style-type: none"> <li>- Explain what vulnerability is</li> <li>- Explain the broad scope of vulnerability</li> </ul>	45 minutes	Interaction
U2L2	Dimensions of vulnerability	<ul style="list-style-type: none"> <li>- Explain the different dimensions of vulnerability.</li> <li>- Explain how one dimension is related to the other and is affected by each other.</li> </ul>	45 minutes	Interaction (detailed discussion to illustrate how the different dimensions of vulnerability are intertwined)
U2L3	How are you vulnerable because of yourself or others?	<ul style="list-style-type: none"> <li>- Create a culture of disaster resilience by explaining how ignorance accumulates and enhances vulnerability</li> </ul>	45 minutes	Interaction
U2L4	Dynamics of vulnerability	<ul style="list-style-type: none"> <li>- Show how vulnerability changes with time and space and how an act of today may render the future generation vulnerable</li> </ul>	45 minutes	Interaction

**Unit 3: Experiencing exposure**

U3L1	What is exposure?	- Explain what exposure is and how it is important	45 minutes	Interaction
U3L2	Scope of exposure	- Explain what all constitutes exposure and how it can be used to calculate damage and loss	45 minutes	Interaction

**Unit 4: Understanding risk**

U4L1	What is risk?	- Explain what disaster risk is and introduction to the different stages of the formula of disaster risk	45 minutes	Interaction
U4L2	Risk: A little mathematics does no harm	- Illustrate simple ways of risk calculation and can be communicated in a lucid manner through colours	45 minutes	Interaction
U4L3	How do we assess risk?	- Explain how to assess risk in a real-life scenario using the formulas through a participatory approach	45 minutes	Interaction

**Unit 5: Decoding disasters**

U5L1	What is coping capacity?	- Explain what coping capacity is and how vulnerability, its various dimensions included, is the inverse of coping capacity	45 minutes	Interaction
U5L2	Risk and coping capacity: Disasters	- Explain what disaster is & the categories of disaster - Explain the nuances of declaration of a disaster	45 minutes	Interaction

## Unit 6: Disaster management

U6L1	What is disaster management?	<ul style="list-style-type: none"><li>- Explain what disaster management is using the disaster management cycle</li><li>- Explain the various phases of disaster management cycle</li></ul>	45 minutes	Interaction
U6L2	How do we manage disasters?	<ul style="list-style-type: none"><li>- Illustration of risk management using bow-tie analysis</li></ul>	45 minutes	Interaction with exercise
U6L3	Evolution of disaster management: Shift from disaster management to disaster risk management	<ul style="list-style-type: none"><li>- Illustrate a paradigm shift is ongoing from management to mitigation and reduction steered by the advancement and use of science, engineering, technology and innovation.</li></ul>	45 minutes	Interaction

## Unit 7: Resilience

U7L1	What is resilience?	<ul style="list-style-type: none"><li>- Explain what disaster resilience is</li></ul>	30 minutes	Interaction
U7L2	How do we build resilience?	<ul style="list-style-type: none"><li>- Explain how disaster resilience can be achieved through sustainable development</li></ul>	30 minutes	Interaction
U7L3	Are disasters impediment to development or do they foster development?	<ul style="list-style-type: none"><li>- Stimulate discussions on whether development begets disaster or disaster begets development</li></ul>	30 minutes	Interaction

**Unit 8: Dealing with disasters**

U8L1	How is the world dealing with disasters?	- Explain the evolution of disaster risk management internationally and the parallel developments and evolutions which have a bearing on disaster risk reduction	45 minutes	Interaction
U8L2	How is India dealing with disasters?	- Explain the evolution of disaster management in India & introduction to latest developments	45 minutes	Interaction
<b>Post-training assessment and closing ceremony</b>				
	Post-training assessment	- Final assessment of the knowledge of the participants - Comparison of pre-test and post-test scores	30 minutes	Objective type questions
	Closing ceremony	- Open discussion on avenues of development of training and scope of training - Distribution of participation and completion certificate - Vote of thanks	20 minutes	Interaction

### **Trainers/ Facilitators/ Resource Persons Required**

Disaster risk management or disaster risk reduction is, no doubt, an inter-disciplinary field and therefore the proper delivery of this module demands experts from various sectors. However, this module primarily focusses on the basics and fundamentals of disaster risk management only.

For self-learners, this module will serve as a guiding light; the reference materials suggested by this module would be enough to form a basic idea of resilience. However, adjacent and supplement materials gathered from reliable and trusted sources would also be helpful.

### **Expected Outcome**

After going through the training program modelled in accordance to this training module, a participant will have a better understanding of:

1. Hazards, its classifications and various other dimensions of it.
2. Vulnerability and its dimensions .
3. How exposure affects risk.
4. How risks can be identified and assessed.
5. How hazards become disasters when risks surpass the coping capacity.
6. Resilience and what it means in the context of disaster risk management.
7. How to manage disaster risks and aim for disaster resilience?
8. What the world and India has done to manage, mitigate and reduce disaster risks.

### **Evaluation & Validation**

The process of evaluation adopted in this training module serves two purpose; first, through the pre-test and the post-test sequence, the effectiveness of the training is gauged. The questions in the pre-test and the post-test are should be same but the order should be different. In fact, the trainer may include some additional questions in the post-test too. The change in the average score of the pre-test and the post-test will show the effectiveness of the training and the change in the individual scores will reflect the degree to which a participant has grasped the subject. If there has been no substantial change in the pre and post-test score of an individual participant and both the scores were low to average (upto 50% of the total score), it would mean that the course has been ineffective for the participant. If the pre and the post-test score of a participant is on the higher side, it would mean that the participant is ready for the next level of training and if this be the case of the entire group of participants, it would mean that

the entire group can be branded as Master Trainers of Understanding Disaster Risk. This pool can then go on to train other groups of people and they themselves should be taken to the next level of training.

The process of evaluation doesn't end here; after each lecture session the participants would be asked to rate the trainer on the following parameters:

#### **A. Planning and preparation**

1. How much was the content relevant to the overall program or the objectives of the particular session?
2. How much knowledge the trainer had of the content? Was he able to clarify your doubts? Do you think he is the right person to deal with this section of the lecture / topic?
3. What the flow of instruction coherent? To what extent were you able to achieve the objectives set out at the beginning of the lesson?

#### **B. Classroom environment**

1. How much did the trainer encourage participation in the form of debates and discussions?
2. Were the discussions, moderated by the trainer, constructive in nature? (1 - Not at all constructive to 5 - Constructive and conclusive)

#### **C. Instruction**

1. Was the style of the lecture appropriate for the topic / session? (This is to understand the dynamics of delivery)
2. Was the speed of the lecture adequate to understand the concepts of the topic?
3. Was the choice of language appropriate for you?

These answers would be collected on a Likert scale and evaluated.

According to the pre-test and post-test results, future programs are to be designed and conducted.

## **Public Dissemination of Risk Information of the Venue (PDRIV)**

In case the training is being conducted at GIDM or at any other physical venue, it is mandatory that an audio-visual clip be shown about the venue that informs the audience / participants about the hazards the venue or the surrounding is prone to, the risks, the escape routes or evacuation plan and emergency assembly points. The audio-visual clip to be shown must not contain mere presentations or verbal directions. It should be a visual document of the actual evacuation route from common points like corridors or lounges to the assembly points, which may or may not be within the same establishment.

Primarily, a venue may be exposed to various different types of hazards and for an event of a day or two, hazards like flood or drought may be irrelevant and in such cases more immediate hazards like fire or earthquake should be dealt with. The focus should be on preparing the audience for evacuation if such a need arises during the program. The clip may be allowed to run repetitively while the initial arrangements are being made on the day of inauguration or when the participants start coming in and settling down for the first session of the training program.

In addition to the audio-visual clip, along with the registration kit, a single-page document should be handed over to the participants with the evacuation routes marked and assembly points mentioned. Emergency contact numbers may also be provided if the participants come from other parts of the world.

Proper preparation in this regard on behalf of the organisers is also necessary. The venue selected for the training course must have a minimum standard of disaster preparedness measures. First of all, the venue must have a disaster management plan and an emergency evacuation strategy within it. For the evacuation strategy to be effective, proper signage should be placed on and around the campus premises. The evacuation strategy should have been a tested through mock-drills a couple of times keeping in mind the different groups and types of participants that might join the training program like differently-abled individuals or senior old-age personnel and for a mock-drill to be executed, the establishment must have a disaster management plan. Thus, everything is dependent on the other with the disaster risk management plan serving as the key document.

## Inauguration and Pre-Training Assessment

### Need of the session

Participants of this course are expected to come from different walks of life with different levels of understanding of disaster management and disaster risks. Thus, it is utmost necessary to understand and assess their knowledge before starting the program.

It is not at all a great idea to start a one day or two-day long program with a test and therefore even before the test, the trainer will have the responsibility to informally introduce himself and facilitate the participants to introduce themselves. The trainer may indulge in innovative ways to do so; the more interesting he makes it, better participation he can expect throughout his course. The trainer or the course coordinator may also include asking the participants about their expectations from the course.

After the introduction is done away with, the participants are provided with a question paper comprising of a maximum of 25 - 30 questions which needs to be completed within 30 minutes.

With a five-minute break immediately after the test, the formal inauguration should start which should be chaired by the head of the institute and other dignitaries.

The course-coordinator may utilise this opportunity to inform the participants about:

- Session timings, i.e., the final schedule
- Lunch & Tea Breaks
- Formation of teams or groups for exercises and simulations
- Norms for interactions and discussions during sessions
- Mobile phone etiquettes
- Availability of facilities (telephone, internet etc)
- Smoking rules / bans etc.
- Evening engagements (if any)

### Objective of the session

This simple but elaborate session of around 90 minutes is expected to bring out:

1. The prior knowledge and understanding of the participants
2. To build a rapport between the participants and the trainer or the course-coordinator and also among the participants
3. Changes of content or delivery style that might be required on part of the trainer to meet the level of participants or their expectations from the course

### Training aids

PDRI clip, question paper, flip-charts, markers etc.

## Unit 1: Comprehending Hazards

### Need of the session

To understand risk or disaster risk, one must have a very clear idea of its constituent parameters, which are hazard, vulnerability, exposure and coping capacity. While coping capacity and vulnerability are literally intertwined and are complementary to each other, the other three parameters (hazard, vulnerability and exposure) are primarily what defines disaster risk. A hazard is not a disaster and yet we use these terms interchangeably very often and this is where we commit the first mistake. We, in general, have a tendency to link everything with a buzz-word and the current catch-phrase being climate change, there is trend of relating every phenomenon to climate change, global warming and such apocalyptic events. We simply ignore the science behind the genesis of hazards and go on to link it with bigger events. This is where we commit the second mistake. Ignorance is off-course a bliss but in disaster risk reduction and disaster preparedness, ignorance is a bane. This is where this unit comes in to bridge the gap.

### Units of the session

Unit 1 Lesson 1	:	What is hazard?
Unit 1 Lesson 2	:	Types of hazard
Unit 1 Lesson 3	:	Hazards: An overview
Unit 1 Lesson 4	:	The ever-broadening scope of hazards

### Objectives of the session

The primary objectives of this unit would be to:

- Understand the entry behaviour of the participants since this unit is the first session of the training program
- Explain to the participants what hazard is, the different types of hazard and the science behind their origin
- Exemplify how the scope of hazards is broadening due to other global phenomenon
- Illustrate how it is different from disaster and how it contributes to disaster risk

### Duration :

180 minutes. (45 + 45 + 45 + 45) minutes for the sessions and 15 minutes spillover time from each session.

## **Methodology**

The methodology of this session is no different from the overall methodology of the training program. Every lesson or every unit must start with a question to intrigue the participants and foster discussion. Building up on such discussions, the trainer must start his presentation or lecture.

## **Training aids**

Power-point presentation, flip-charts, markers etc.

## Unit 1 Lesson 1: What is Hazard?

### Note for the trainer

Hazard is to be explained *without using any standard definitions*. Examples are to be given from real-life so that participants can relate to it.

#### Flow of the session

The trainer may begin by narrating a small story or incident and asking the participant to identify the hazard in it.

*“An expert biker is riding his brand new bike on the Mumbai-Pune Expressway. It is the monsoons and the Western Ghat is looking absolutely stunning. All of a sudden, a small rock rolls down from the steep slopes and lands right in front of the biker. The biker, who was riding almost as fast as the wind, could not control his bike and skidded off the road.”*

The trainer will now have to instigate the participants to share their views on what the hazard in this particular example is. Interestingly enough, this particular example has two hazards; while one is evident the other one may not be so evident. Landslide, which caused the rock to roll down the slopes is itself a hazard and may be easily identifiable while the fact that the rock just happened to land in front of the biker while he was speeding is also a hazard. In fact, to understand the later proposition the trainer might have to explain that this would have been a hazard even if it was just a rock lying there on the road and not because of a landslide.

Similar examples can be discussed to understand that hazard is anything which may have adverse effect and the effects can be injury, health impact, damage to property, disruptions of any form and even loss of life.

Hazard should also be understood in terms of probability of happening. In light of the above example, the rock on a expressway is life threatening but its **probability of actually being a cause of an accident is a hazard**. To understand this, one must consider a similar scenario in a deserted road; had the rock tumbled down from a slop or had it been just lying there, it would not have caused any accident or injuries or death. Although, it is still a hazard, but it is not contributing to anything dangerous. This perception of hazard is more meaningful in the context of disaster management and disaster risk reduction.

At the end of this lesson, the participants must have a clear idea of the two ways hazard is perceived; one, causal agent of something nasty and two, probability of being the causal agent of something nasty.

The lesson should be concluded with a debate on whether the biker riding the bike at such high speeds is a hazard or not?

### **Objectives of the lesson**

The primary objectives of this lesson would be to:

- Explain what hazard is.
- Explain the ways in which hazard is perceived and understood.
- Give a hint of disaster not being the same as hazard

### **Duration**

45 minutes depending upon the potential of the trainer to fan discussion and debate.

### **Methodology**

An animated clip can be used to depict a similar scenario and then the participants may be asked to depict the hazard in the scenario.

If the participants have already been divided into groups, then each group can be handed out a sheet of paper and asked to write down all the hazards they can find out in the given scenario. After completing the session, just for a competitive flavour, the team who identifies the hazards correctly, may be given a score or a recognition.

### **Training aids**

Power-point presentation, flip-charts, A4s, markers, pens etc.

## Unit 1 Lesson 2: Types of Hazard

### Note for the trainer

Hazard has been classified in different ways by different organisations and bodies. To make the audience understand that such classifications are just in-depth or general categorisation of each other, the hazards identified by High Powered Committee of the Government of India is to be discussed first, followed by the IRDR classification of perils and finally the NDMP of India 2016.

#### Flow of the session

The first substantial work in disaster management in India was done through the constitution of the High Powered Committee (HPC) in August, 1999, just a few months before the Orissa super cyclone in November, 1999.

Depending on the causal agent / phenomenon, the HPC classified disaster as given in table 1.

*Table 1: HPC's classification of hazards*

Water and Climate related	Geologically related	Chemical, Industrial and Nuclear related	Accident related	Biologically related
Floods and drainage management	Landslides and mudflows	Chemical and industrial disasters	Forest fires	Biological disasters and epidemics
Cyclones	Earthquakes	Nuclear disasters	Urban fires	Pest attacks
Tornadoes and hurricanes	Dam failures / dam bursts		Mine flooding	Cattle epidemics
Hailstorm	Mine fires		Oil spill	Food poisoning
Cloud burst			Major building collapse	
Snow avalanches			Serial bomb blasts	
Droughts			Festival relates	
Sea erosion			Electrical disasters and fires	
Thunder and lightning			Air, road and rail accidents	
			Boat capsizing	
			Village fire	

While explaining this classification, the participants should be made aware of the fundamental terminologies associated with the common hazards like:

1. When the precipitation / rainfall is more than or equal to 100 mm in an hour it is identified as cloud burst.
2. Intensity and magnitude are two different things associated with earthquake and they are measured on different scales like Richter and Mercalli scales.
3. Earthquake zones and their significance
4. Difference between epicentre and hypocentre
5. Difference between P-Waves and S-waves and how S-waves proved that the outer core of Earth is not solid.
6. India is more prone to cyclones while the Pacific and Atlantic landmasses are prone to tornadoes and hurricanes.
7. Different types of drought like meteorological severe and moderate droughts according to IMD), hydrological (surface-water and ground-water), agricultural, soil-moisture, socio-economic and famine.

In this context, the trainer should be able to subtly impress upon the participants the science behind the majority of the common hazards.

After the above mentioned classification, the trainer should explain the classification put forward by the IRDR Peril Classification and Hazard Glossary (March, 2014) to bring home the fact that the idea behind classification is the same whether it is done nationally or internationally.

This would be a good time to present the participants with a question.

*Landslide, according to the HPC report is a geological hazard, but in most studies and cases it has been found that such landslides are triggered by heavy rainfall or moisture content of the soil. Thus, shouldn't it be re-classified?*

The discussion on this should be properly steered by the trainer such that a generic consensus is reached before revealing the IRDR classification. After having showed the IRDR, classification, the trainer is expected to explain the different perspectives of causalities and thereby introduce the topic of cascading hazards.

<b>Family</b>	<b>Main Event</b>	<b>Peril</b>
Geophysical	Earthquake Mass Movement Volcanic Activity	Ash Fall Fire following EQ Ground Movement Landslide following EQ Lahar Lava Flow Liquefaction Pyroclastic Flow Tsunami
Hydrological	Flood Landslide Wave Action	Avalanche: Snow, Debris Coastal Flood Coastal Erosion Debris/Mud Flow/Rockfall Expansive Soil Flash Flood Ice Jam Flood Riverine Flood Rogue Wave Seiche Sinkhole
Meteorological	Convective Storm Extratropical Storm Extreme Temperature Fog Tropical Cyclone	Cold Wave Derecho Frost/Freeze Hail Heat Wave Lightning Rain Sandstorm/Dust storm Snow/Ice Storm Surge Tornado Wind Winter Storm/Blizzard
Climatological	Drought Glacial Lake Outburst Wildfire	Forest Fire Land fire: Brush, Bush, Pasture Subsidence
Biological	Animal Incident Disease Insect Infestation	Bacterial Disease Fungal Disease Parasitic Disease Prion Disease Viral Disease
Extraterrestrial	Impact Space Weather	Airburst Collision Energetic Particles Geomagnetic Storm Radio Disturbance Shockwave

**Figure 1: IRDR classification of perils**

Moving on from the IRDR classification, the trainer should then introduce the participants to the classification as accepted by the National Disaster Management Plan of India (2016).

“The widely accepted classification system used by the Disaster Information Management System of DesInventar classifies disasters arising from natural hazards into five major categories (DesInventar2016):

- 1) **Geophysical** : Geological process or phenomenon that may cause loss of life, injury or other health impacts, property damage, loss of livelihoods and services, social and economic disruption, or environmental damage. Hydro-meteorological factors are important contributors to some of these processes. Tsunamis are difficult to categorize; although they are triggered by undersea earthquakes, and other geological events, they are essentially an oceanic process that is manifested as a coastal water-related hazard.
- 2) **Hydrological**: Events caused by deviations in the normal water cycle and/or overflow of bodies of water caused by wind set-up
- 3) **Meteorological**: Events caused by short-lived/small to meso-scale atmospheric processes (in the spectrum from minutes to days)
- 4) **Climatologic al**: Events caused by long-lived meso to macro-scale processes (in the spectrum from intra-seasonal to multi-decadal climate variability)
- 5) **Biological**: Process or phenomenon of organic origin or conveyed by biological vectors, including exposure to pathogenic micro-organisms, toxins and bioactive substances that may cause loss of life, injury, illness or other health impacts, property damage, loss of livelihoods and services, social and economic disruption, or environmental damage. “

After much deliberation, only the below listed hazards have been talked about in the national plan, and these are:

1. Cyclone and wind
2. Floods
3. Urban flooding
4. Seismic
5. Tsunami
6. Landslides and snow avalanches
7. Drought
8. Cold wave and frost
9. Chemical (industrial) disasters
10. Nuclear and radiological emergencies
11. Fires

However, recent developments have included hail-storm and pest attacks too.

*The trainer may take this opportunity to elaborate on the fact that the hazards mentioned in the National Disaster Management Plan encompasses provision of management but the List of Notified Disasters with the Disaster Management Division of the Ministry of Home Affairs, takes into account those disasters in which financial assistance can be extended from the funds allocated for this purpose, i.e, the State Disaster Response Fund (SDRF). If the trainer wishes to state this, he / she may also ask the participants why funds for disaster response are to be advanced from the SDRF and not the NDRF?*

*Tip: Disaster management is a state subject and the responsibility of response and recovery lies with the state until and unless the state is overwhelmed with the immediate burden on its resources.*

**To end this lesson, the trainer may urge the participants / groups to take a piece of paper and write down the hazards, not necessarily the ones mentioned in the national plan but any sort of hazard, that is predominant in their area and correctly classify it.**

### **Objectives of the lesson**

The primary objectives of this lesson would be to:

- Explain the classification of hazards by different groups, committees and organisations and the rationale of cascading hazards behind the classification.
- Explain the causalities of hazards.

### **Duration**

45 minutes.

### **Methodology**

A power point presentation is to be used to show the various classifications of hazard.

The last exercise to be given to the participants of hazard identification and their classification should be carried out either individually or in groups.

### **Training aids**

Power-point presentation, flip-charts, A4s, markers, pens etc.

### **Resource Material**

The Report of High Powered Committee on Disaster Management (October, 2001), IRDR Peril Classification and Hazard Glossary, National Disaster Management Plan of India (2016)

# Notes

## Unit 1 Lesson 3: Hazard: An Overview

### Note for the trainer

After having understood the logic behind classification of hazards, a brief introduction is to be given about the hazards affecting the India as well as the particular state, ensuring that each hazard discussed includes the basic science behind it.

#### Flow of the session

This session, after having formed a basic idea of what hazard is and how it has been classified based on its causalities and cascading effects, is to explain the participants of the hazard profile of India as a country and then of the state, Gujarat in this case.

The hazard profiles can be obtained from the national and state plans. After explaining the national hazard profile, the trainer should urge the groups of participants to explain the hazard profile of their state. This exercise will subtly force the participants to go through the disaster management plans of the state or even their district and present it to the other participants.

#### Case in point: Gujarat

**Earthquake** : As per Indian Seismic Zone Map, Gujarat region lies in three zones - Zone III, IV and V. Kachchh region (about 300km x 300km) lies in zone V where earthquakes of magnitude 8 can be expected. A belt of about 60-70km width around this zone covering areas of North Saurashtra and areas bordering Eastern part of Kachchh lie in zone IV where intensity VIII can be expected mainly due to earthquakes in Kachchh and some local earthquakes along North Kathiawar Fault in Northern Saurashtra. The rest of Gujarat lies in zone III where intensity VII earthquakes can be expected due to moderate local earthquakes or strong Kachchh earthquakes.

**Drought** : Gujarat is one the chronic drought prone state of India, with an average annual rainfall about only 700 mm with more than half of the Talukas of Gujarat receiving rainfall within the range of 200-400 mm. Substantial portions of the State are arid to semiarid. With large parts of North Gujarat and Saurashtra having no source of alternate irrigation, groundwater exploitation is leading increased threats of droughts. Falling water tables have added stress on crops and water supplies.

**Cyclone:** Gujarat falls in the region of tropical cyclone. With the longest coast line of 1600 km in the country, it is highly vulnerable to cyclone and its associated hazards such as floods, storm surges, etc. Two cyclonic storm seasons are experienced in Gujarat: May to June (advancing southwest monsoon) and September to November (retreating monsoon).

**Flood:** Majority of the area of Gujarat is flood prone, irrespective of the size of the catchment. The flood risk in Saurashtra is lower than that of the South Gujarat plains. The relatively flat plains in the lower basic areas with hilly catchments in upper parts of South Gujarat accentuate flood risks. Few villages in the North Gujarat are flood prone too.

**Tsunami:** Gujarat is prone to tsunami risk due to its long coastline and probability of occurrence of near and offshore submarine earthquakes in the Arabian Sea. Makran Subduction Zone (MSZ) -South West of Karachi is an active fault area which may cause a high magnitude earthquake under the sea leading to a tsunami.

**Fire, Industrial & Chemical, Accidents, Heatwave, Epidemic, Stampede**, etc. are also frequent in Gujarat.

### Objectives of the lesson

The primary objectives of this lesson would be to:

- Understand the national hazard profile
- Understand the state and district level hazard profile
- Create an opportunity to go through the disaster management plans of different levels

### Duration

45 minutes; national profile should be completed within 20 minutes with 40 minutes given to the participants to go through the disaster management plans of their state and district.

### Methodology

A power point presentation is to be used to show the hazard profile of India. A contingency preparation should also be made of a presentation containing the hazard profile of the state and the districts.

The last exercise is to be carried out in groups; either each group can be given a hazard to present or each group can be given a district of the state. This decision rests with the trainer who would judge the interest and the readiness of the participants to do so,

### Training aids

Power-point presentation, flip-charts, A4s, markers, pens etc.

### Resource Material

National Disaster Management Plan of India (2016), Gujarat State Disaster Management Plan

## Unit 1 Lesson 4: The Ever Broadening Scope of Hazard

### Note for the trainer

The list of hazards is not exhaustive in nature. The continuous growth of civilisation has led to many detrimental side-effects, which in turn affects the nature. The greed of mankind has led to the addition of many new hazards into the existing list and the list will continue to grow. In this light, the participants are to be made aware of how anthropogenic activities leads to global phenomenons like climate change, which in turn is and will be adding new hazards to our daily life.

*The context is to be exemplified using magnifying theatrical; start from the eagerness of a human to carry a plastic bag and end at how that is leading to the rise of sea surface temperature and sea-level rise resulting in frequent cyclones and vanishing islands like Tuvalu.*

### Flow of the session

In this lesson, the trainer is expected to paint a story of how anthropogenic activities is accentuating hazards; some of which were not even thought of few decades ago.

The trainer can begin this lesson by explaining the importance of greenhouse gases, specially of carbon dioxide, the absence of which would have resulted in a pretty cold earth, ice age. However, with the increased concentration of carbon dioxide and other green-house gases, the reflected infrared radiations bouncing back from the surface of the earth, are trapped and it gradually leads to an overall warming of the earth. This overall warming causes the polar ice sheets to melt which, in turn, leads to the rise of sea level and becomes a pertinent hazard to island countries like Tuvalu. The abnormal warming up of the sea-surface temperature, especially near the inter-tropical convergence zone, leads to increased frequency of cyclones.

*The participants would be able to appreciate this once the requisites of cyclone formation is made clear to them in the previous lesson.* The abnormality in sea temperature affects the cycle of ocean currents and this in turn affects phenomenon like El Nino or La Nina. A little interesting depiction El Nino Southern Oscillation (ENSO) may put across the fact that such phenomenon is utterly catastrophic and it affects not only a single nation or region but vast areas of the world; El Nino is responsible for thunderstorms on the eastern Pacific while it causes drought in the western Pacific regions, even affecting India.

*“The most prominent droughts in India, six of them, since 1871 have been El Nino triggered droughts, including the recent ones that occurred in 2002 and 2009. Nevertheless, it is important to note that all El Nino years do not lead to drought in India. The year 1997-98 is a stark reminder as it was a strong El Nino year but that did not cause drought in India, in fact, rainfall was in excess. On the other hand, a moderate El Nino in 2002 resulted in one of the worst droughts.*

*Going by historical data of 135 years from 1880 to 2014, about 90% of all evolving El Nino years have led to below normal rainfall and 65% of evolving El Nino years have brought droughts. From this fact, one thing is clear that El Nino years adversely affect the weather in India in terms of Monsoon rain, with very few exceptions. During an El Nino year, the rainfall is generally below the normal average, which has its negative bearing on crop production.”*

Although not necessary, but the trainer can speak about the different cycles of ocean current, and other global circulation patterns like the Hadley cell, Ferrel cell and the Polar cell, just so that the participants are educated about how these natural phenomena actually work.

*This will give the participants a very detailed idea of how global warming is contributing towards exaggeration of hazards, primarily their frequency and intensity. It will also make them understand that these hazards are natural phenomenon and very little can be done to contain them and so preparedness, mitigation to some extent and management is the only forward. Most importantly, these information will help the participants to ward themselves off of false claims and false beliefs and help them take informed decisions.*

The trainer should also talk about other, rather direct, aspects of anthropogenic causalities. Oil spills were, once, hazards which were never thought of but now they are prominent and deadly catastrophes harming multiple ecosystems, directly or indirectly. The greed of humanity to progress, develop and industrialise have led to more and more emissions of green-house gases and the world, since the age of industrialisation have started experiencing global warming. The constant effort to make human life easy and comfortable by using machineries like refrigerators and air conditioners have contributed to the emission of ozone layer depleting substances causing ultraviolet rays of sun to enter our biosphere. Taking forward this particular line of thought of resources, its depletion and nations fighting for it, the trainer should end this lesson asking the participants to contemplate about future hazards which we might not even have possibly thought of. *Care should be taken that such discussions do not become political or too heated.*

## Objectives of the lesson

The primary objectives of this lesson would be to:

- Explain how global phenomenon are transforming natural systems into hazards and sometimes even accentuating them
- Explain how the scope of hazards is broadening every day primarily due to anthropogenic causes

## Duration

45 minutes.

## Methodology

A power point presentation is to be used to discuss the global phenomenon like circulations. It would be even better if the trainer can explain such phenomenon using audio visual clips so the participants can retain the understanding. More than an articulated presentation, the trainer should focus on having a presentation that helps the participants to visualise how each system works and how, us, human beings are bending it to an extent of complete.

## Training aids

Power-point presentation, flip-charts, A4s, markers, pens etc.

## Resource Material

The best way to put across the idea of climate change triggered hazards leading to disasters is to illustrate it through recent happenings and Cyclone Idai is one of the best example. The trainer may make a small presentation based on the report of how rich countries are to be blamed for disasters like Idai.

# Notes

## Unit 2: Getting a grip on Vulnerability

### Need of the session

To understand risk or disaster risk, one must have a very clear idea of its constituent parameters, which are hazard, vulnerability, exposure and coping capacity. While coping capacity and vulnerability are literally intertwined and are complementary to each other, the other three parameters (hazard, vulnerability and exposure) are primarily what defines disaster risk. After the last unit, it is expected that a fair amount of understanding of hazards would have been developed. Hazard is not a disaster in itself but a phenomenon or an event which may cause some damage and it is the vulnerability of the individual or community or the system in consideration which defines the risk a hazard pose. It is to be noted that the word system to be used hereafter can refer to an individual, a community, an administrative unit, production house or even a nation depending on the context.

This session would primarily revolve around the understanding of what is vulnerability, how a system is vulnerable or becomes vulnerable and how to assess it.

### Units of the session

- Unit 2 Lesson 1 : What is vulnerability?
- Unit 2 Lesson 2 : Dimensions of vulnerability
- Unit 2 Lesson 3 : How are you vulnerable because of yourself or others
- Unit 2 Lesson 4 : Dynamics of vulnerability

### Objectives of the session

The primary objectives of this unit would be to:

- Explain to the participants what vulnerability is and the different dimensions of vulnerability
- Exemplify how vulnerability is born because of an individual or because of other elements of a system
- Illustrate the dynamism of vulnerability so that participants understand why is it so difficult to correctly assess vulnerability

### Duration

180 minutes. (45 + 45 + 45 + 45) minutes for the sessions and 15 minutes spillover time from each session.

## **Methodology**

This unit would primarily be informative with a pinch of posed inquisitions overall. The methodology of this session is no different from the overall methodology of the training program. Every lesson or every unit must start with a question to intrigue the participants and foster discussion. It is advised that the trainer begins the unit by taking forward the example of the biker from the first unit.

## **Training aids**

Power-point presentation, flip-charts, markers etc.

## Unit 2 Lesson 1: What is Vulnerability?

### Note for the trainer

*Vulnerability is to be explained **without using any standard definitions**. Examples are to be given from real-life so that participants or audiences can relate to it.*

#### Flow of the session

The trainer may begin by reminiscing the example cited in the first unit.

*“An expert biker is riding his brand new bike on the Mumbai-Pune Expressway. It is the monsoons and the Western Ghat is looking absolutely stunning. All of a sudden, a small rock rolls down from the steep slopes and lands right in front of the biker. The biker, who was riding almost as fast as the wind, could not control his bike and skidded off the road.”*

The hazards in this example has already been discussed and now the trainer should probe the participants as to state the vulnerabilities in the given scenario with a prior understanding that vulnerability is basically the potential of any event or phenomenon to cause damage. Similar examples can also be cited to involve the participants. The following questions can be posed by the trainer to instigate the participants:

- a) Was the unstable slope of the Ghats a vulnerability?
- b) Was the weather (monsoon) a vulnerability?
- c) Depending on the experience of the rider, can one comment on the vulnerability?

The trainer should understand that each of these questions affect the vulnerability of the rider and each of these question reflects parameters from different dimensions of vulnerability. Thus, it is the responsibility of the trainer to steer the participants into asking that how these above mentioned facts are vulnerabilities.

The concept of vulnerability being a degree or extent of impact is also to be illustrated here. To understand this, one must consider different simulations of the same example. If the rider is an expert and he was wearing a proper gear, would his vulnerability be lessened? Even if his bike skidded, if there was a hospital nearby so that he could just walk to the hospital or be carried by some passing by vehicle, would his vulnerability be lessened? These questions, targeted at the participants, would give them a feel that vulnerability has so many aspects and this would lead on to the next lesson.

At the end of this lesson, the participants must have a clear idea of how vulnerability is the extent of damage an event is caused and how broad its scope is.

The lesson should be concluded with a debate on whether the biker riding the bike at such high speeds is a vulnerability or not? This question should spark a debate as in the last unit the same question was posed to the participants asking whether the speed is a hazard or not.

### **Objectives of the lesson**

The primary objectives of this lesson would be to:

- Explain what vulnerability is.
- Explain the broad scope of vulnerability.

### **Duration**

45 minutes.

### **Methodology**

An animated clip, which was used in the last unit can be used again to fire the discussion on vulnerability. The questions that have been mentioned can be put into a slide of a presentation and be debated on.

### **Training aids**

Power-point presentation.

## Unit 2 Lesson 2: Dimensions of Vulnerability

### Note for the trainer

Vulnerability, in context of disaster risk, has been interpreted in a variety of ways; the most accepted interpretation is where vulnerability is perceived as a composition of three dimensions: physical, social and institutional.

*Stress has to be laid upon the fact that vulnerabilities are to be assessed in context of specific hazards and drawing a general conclusion is of no real significance. relate to it.*

### Flow of the session

Vulnerability is a trans-disciplinary concept and it has been understood and interpreted in a variety of ways. One of such interpretation is where vulnerability is seen as composite factor of **exposure, sensitivity and adaptive capacity**.

Understanding this interpretation is pretty simple if the same example of the rider is to be considered once again. Exposure in that particular context would be the evident fact that the rider was travelling through the Ghats in the rain. This very act of his made him exposed. If he is an expert rider, as it has been considered in the example, he would probably be wearing his riding gear and perhaps he has past experiences of his bike skidding. This would make him less sensitive to the event of his bike skidding. And finally, once again, if he has past experiences and he is fit enough to endure such an accident, he will be able to adapt to the physical and psychological trauma.

However, the trainer must steer the participant away from this interpretation as this is not the way it has been stated by international organisations like UNISDR. The reference to UNISDR or the use of standard definitions must be avoided and it would depend on the trainer, how he subtly shifts into the other interpretation of vulnerability.

Vulnerability has been perceived as a composition of three dimensions; physical, social and institutional. Each of these dimensions have a bearing on the resultant vulnerability of the system in consideration. The trainer will then have to illustrate the constituent elements of each of these dimensions.

The physical dimension can be divided into two sub-dimension; geographical and infrastructural.

*“5,700 Km out of 7,516 Km of the long coastline of India is vulnerable to cyclones, and tsunamis, 58.6% of the landmass is prone to earthquakes of moderate to very high intensity and 12% of the land is prone to floods and river erosion.”* (Ministry of Home Affairs, Government of India)

The above statement illustrates the vulnerability of any system due to its geographical location. Thus, any coastal district of Gujarat, by the virtue of its geographical location, is vulnerable to tsunami and cyclonic activity, if it has not taken proper measures to mitigate the effects of hazards like cyclone or Tsunami.

The second sub-dimension is infrastructural vulnerability. This is the vulnerability of the **structure** in consideration. For example, if the construction of a building in seismic zone 5 is not according to the building bye-laws and construction code, it is vulnerable by the virtue of its construction (structural vulnerability). In addition to the structures, another aspect that is accounted within infrastructural vulnerability is non-structural vulnerability. These are minute elements which adds to structural vulnerability like glass facades in case of earthquake or even cyclone, doors not opening in the direction of egress in case of fire hazard especially. In fact, come to think of it, such non-structural deficiencies can itself become hazards; imagine a glass façade crumbling down on people escaping a building during or post-shock!

The trainer may encourage the participants to write down structural and non-structural vulnerabilities, as noticed by the participants, in their homes or workplaces.

The trainer should then move on to the next dimension; social dimension of vulnerability. The social dimension, similar to the physical dimension, is also divided into two sub-dimensions, i.e., socio-cultural and socio-economic dimension. To understand the socio-cultural dimension, the trainer must be able to explain the six dimensions of culture as proposed by Hofstede and illustrate how culture affects vulnerability. For example, if the culture of a society is inclined towards avoiding uncertainty, it would prefer to be more prepared against the hazards they are prone to. If the society is identified by individualism, then its preparedness would be more self-centric and community based disaster management principle may not be successful in such areas. Similarly, the other four dimensions also have a bearing on how the vulnerability of the system is affected. Socio-economic vulnerability is the vulnerability of the system due to socio-economic conditions. For example, a slum is vulnerable to a hazard like fire not only because

of how it is unplanned but also because the socio-economic condition of the residents forced them to build their shelters in such a manner. In addition to this, due to their economic condition, the impact of a hazard, say fire, would be more brutal for them as compared to someone who is on the higher end of the socio-economic strata.

Institutional vulnerability is primarily the vulnerability added to the system due to the lack of readiness, leanness, agility and preparedness of the institutions which are burdened with the responsibility to respond in an event or the lack of capacity of the relevant institutes to incorporate a culture of preparedness and awareness. This includes the failure of the authorities to act in a desired manner in times of a catastrophic event. It can also include the lack of potential to perform the task of capacity building bestowed upon institutions and authorities or EOCs or DEOCs.

After a brief explanatory session on the dimensions of vulnerability, the trainer may then move onto explaining how each of these dimensions are also intertwined to an extent that it becomes so difficult to assess them and then quantify the results. The trainer may go on to explain the relations as follows; the socio-economic status of an individual or the community as a whole defines the structural and non-structural vulnerability that falls within the physical dimension. If a person coming from a community with very low uncertainty avoidance index, according to Hofstede's dimensions, is elected or appointed as an authoritative person in the institution or organisation that is supposed to look after the preparedness and capacity of a community, there is a high probability that he may not be able to deliver and that adds to institutional vulnerability. Thus, socio-cultural dimension is found affecting the institutional dimension. If the structure of the lifeline services like hospital and primary health centres is vulnerable, there is a very high chance that this physical vulnerability will prove to be an impediment to the service delivery and will then add to institutional vulnerability.

The trainer can use such examples to stimulate the participant to come up with more such interdependencies on their own so that they understand two things:

1. Vulnerability is the most complex parameter of disaster risk.
2. Vulnerability is one such dimension that encompasses tangible and intangible elements.

## **Objectives of the lesson**

The primary objectives of this lesson would be to:

- Explain the different dimensions of vulnerability.
- Explain how one dimension is related to the other and is affected by each other.
- Illustrate why vulnerability is the most complex parameter to assess in disaster risk.

## **Duration**

45 minutes.

## **Methodology**

Power-point presentation is to be used to illustrate the dimensions and sub-dimensions of vulnerability. However, the inter-relations and dependencies of one dimension on the other should be discussed and debated. The participants must be instigated so that they come up with these dependencies on their own and realise why vulnerability assessment is important and why it is the most complicated affairs amongst all others.

## **Training aids**

Power-point presentation and discussion.

## **Resource Material**

Hofstede's Cultural Dimensions.

## **Note to the trainer**

Dimensions of vulnerability, as per the standard and accepted understanding, is limited to physical, social, environmental and economic. However, the objective of the trainer would be to transcend this segregated understanding and establish the fact that vulnerability is dynamic, ever-changing and notoriously intertwined with multiple factors.

## Unit 2 Lesson 3: How are you Vulnerable because of yourself or others?

### Note for the trainer

This session is exclusively about making the participants aware of the fact that ignorance is not a bliss when it comes to disaster risk reduction.

#### Flow of the session

The concept of vulnerability is incredibly important as it is considered to be one of such entities that cannot be quantified or is very difficult to quantify and it is so because of the inherent and intertwined complexities and degree of dependence on a variety of factors. It is one such parameter where tangible and intangible aspects play equally important roles, making it more difficult to quantify. The domino effect between the different dimension is evident and have been illustrated in the last lesson. If we are to adhere to that particular kind of understanding, assessment of vulnerability will become impossible and perhaps, this is the reason why one can find a trend of macroscopic assessments of vulnerability which does not dive deep into the details of any dimension. The trainer can refer to the reports of INFORM to show to the participants how vulnerability has been assessed and rated for an entire nation. This will be the correct time to point out that such measures of macroscopic assessment are inadequate and vulnerability needs to be assessed in a hazard-specific manner as well as in a location-specific manner.

The trainer should then move on to explaining that in order to be able to assess and then govern such vulnerabilities at a detailed level, it is very important that people take an active part. The idea of disaster resilience rests not only with the government spreading awareness and preparing for a hazard to not become a disaster, but also on an individual to become resilient. Thus, an individual or a community, for that matter, must know its vulnerabilities and must act to minimise them.

At the core of the issue, one can easily realise that it is simply awareness or the lack of it that is causing the spilling over, i.e., whatever the socio-cultural or socio-economic background be, if a person is not aware of the fact that he should construct only a particular type of house in a

particular type of seismic zone, he is adding to his vulnerability as well as to the others. Agreed that a person residing in a slum may not have the means to construct a house that will be resilient to a number of hazards, say fire, but he must be aware of the fact that if such an event occurs, he will be left with nothing and maybe it is better to opt for some sort of nominal insurance. This particular thought will instigate him to act and if, in the process, he opts for an insurance, his socio-economic vulnerability will be minimised to a great extent because now after this event he would not have lost everything. The awareness of the hazard can come from various sources; past experience, government programs, awareness programs of NGOs etc. In this unit, the trainer must deal with this conundrum; **ignorance or the lack of awareness adds to vulnerability not only at an individual level but also at a higher level.**

The trainer must involve the participants in discussions to lay down how one's ignorance or lack of awareness can exaggerate a hazard into a disaster. The trainer can start the discussion with a few examples of his own. Say for example in a school, there are fire extinguishers placed at equal and convenient distances, but the teacher or the staff appointed as the caretaker of those is ignorant of the fact that they should be maintained at an interval of 1 year, he is adding to the vulnerability. If the team of the school disaster management committee responsible for the operation of the fire extinguishers is ignorant of how to use it, that also adds to the vulnerability. If someone in the school notices that the fire extinguisher has not been refilled or maintained for more than one year and it is not reported, even in that case it is an addition to the vulnerability.

*With this, the trainer should let the participants discuss how ignorance of a single person can affect him as well as others and such thoughts are to be put down on a chart-paper. If the trainer has already divided the participants into group, then this exercise can become a group exercise. A total of 20 minutes can be given for this exercise. It is not necessary for the participants to present their findings or thought but the trainer and the other coordinators must be attentive to every group so that their thoughts are steered in the right path.*

### **Objectives of the lesson**

The primary objectives of this lesson would be to:

- Create a culture of disaster resilience; a person should be aware of the hazards he or his area is prone to and how he should be prepared to be resilient to it.
- Explain how ignorance cumulatively contributes to vulnerability.
- Stimulate the participants to think how their ignorance or lack of awareness can lead to loss of life and property.

### **Duration**

45 minutes.

### **Methodology**

A power-point presentation can be used to illustrate the examples mentioned above of how ‘not knowing’ can lead to a disaster. The later part of the session, however, would be mostly discussion and exercise for the participants

### **Training aids**

Power-point presentation, discussion which are to be put down on chart-papers.

### **Resource Material**

YouTube videos may turn out to be useful in explaining this aspect of vulnerability. In addition to this, the trainer may discuss the different indexes that are used internationally to measure or assess vulnerability like the INFORM Index.

# Notes

## Unit 2 Lesson 4: Dynamics of Vulnerability

### Flow of the session

As already explained, vulnerability and its dimensions are not static; they change rapidly with time and space and off-course with different hazards. The trainer can start this session with a simple example to illustrate the same. A person from the coasts of Gujarat, who has only been exposed to tsunami, earthquake and cyclones, may not know how devastating a landslide can be or what catastrophe a cloudburst can bring upon. With changing locations, the hazards change and with it changes the awareness and preparedness of the hazards, which in turn makes the individual vulnerable. Even after knowing that the construction of the house is inadequate for the particular area, if someone builds it anyway, he is making his family and future generations vulnerable. Thus, vulnerability transcends through space and time. The trainer can continue this discussion on a broader spectrum. In order to meet with the fast paced life of this generation, we are constantly over exploiting resources and in a way that is contributing to global warming. Global warming is in a way affecting the frequency of extreme events. Thus, an extreme event like heavy rain or cyclone which was an annual affair now has more frequent recurrence making the coastal population vulnerable to it.

The trainer can then go on with similar examples or probe the participants to share their understanding and experiences of the same. The trainer can end this session with a mind-boggling question: *If somehow global warming and other such phenomenon is contributing to frequent recurrence of hazards, will it mean that its fright would psychologically push us towards better preparedness?* Japan is prepared way better than us because it is being hit by hazards every now and then. So, to achieve that level of preparedness should we continue to be environment insensitive and let nature unleash its wrath on use? Is that the way forward?

### Objectives of the lesson

The primary objectives of this lesson would be to:

- Show how vulnerability changes with time and space.
- Show how an act of today may render the future generation vulnerable
- Illustrate how environment insensitive action is making us prone to hazards.

### Durations

45 minutes.

## **Methodology**

This session is more discussion oriented. A power-point slide may be used to illustrate how environment insensitive actions is resulting in frequent extreme events but mostly the session would rely on the trainers ability to impose upon two facts; vulnerability transcends time and space and, two, if we do not act now, our coming generations would suffer.

## **Training aids**

Power-point presentation, discussion.

## **Resource Material**

The best example to illustrate this would be the aftermath of Mathew which affected Haiti and Cuba. The difference in the consequence clearly paints how the same hazard affects different spatial locations differently owing to the different degrees of vulnerabilities.

## Unit 3: Experiencing Exposure

### Need of the session

Exposure is, perhaps, the most important parameter when it comes to determining disaster risk. One needs to understand that hazard, which is an event or a phenomenon, will always be there and most of the time we can do very little to prevent it, but if we are exposed to it, it will surely impact us and then it is only our vulnerability which decides whether we would be severely, moderately or mildly impacted. This unit is about understanding the ideology of exposure in terms of disaster risk.

This session will re-iterate the complexity of disaster risk as it would once again, reinforce that although disaster risk is a constitution of three parameters, out of the three, the other two parameters, i.e., vulnerability and exposure have a strong interdependence on each other.

### Units of the session

Unit 3 Lesson 1: What is exposure?

Unit 3 Lesson 2: Scope of exposure

### Objectives of the session

The primary objectives of this unit would be to:

- Explain to the participants what exposure is.
- Explain the scope of exposure
- Illustrate what drives exposure

### Duration

90 minutes. (45 + 45) minutes for the sessions and 5 minutes spillover time from each session.

### Methodology

This unit would primarily be informative with minimum discussions. This session would simply focus on getting across the idea that exposure is the most important aspect of disaster risk and it can be perceived in various terms of evaluation.

### Training aids

Power-point presentation.

# Notes

## Unit 3 Lesson 1: What is Exposure?

### Note for the trainer

Exposure is to be explained without using any standard definitions. Examples are to be given from real-life so that participants or audiences can relate to it.

#### Flow of the session

The trainer may begin by going back to the standard example of the biker. To start the discussion, the trainer can pose the question that all things being the same, what would have been the case if the biker decided not to go out? Would he have met with any accident? The obvious answer is no. The trainer will then lead on from this that, this is what exposure is. Hazard of the rock falling was a chance and it could have happened or it could not have happened, but the biker riding exposed him to that event. And once he was exposed, it was the vulnerability of the entire system that decided his fate.

After this explanation or after few more deliberations, the trainer should be able to make the participants understand how the three parameters, conjointly, affected the fate of the rider. At this point of time, the trainer can explain that exposure circumscribes all the tangible and intangible elements which becomes susceptible when a hazard strikes. It can be human, property, infrastructure, farm produces etc.

Avalanches are very common in the higher reaches of Himalaya, yet they are our least concern because no one or nothing is exposed and if no one or nothing is exposed, there is no question of vulnerability. Interestingly enough, people and economic assets become concentrated in areas exposed to hazards through processes such as population growth, migration, urbanisation and economic development. Previous disasters can drive exposure by forcing people from their lands and to increasingly unsafe areas. Consequently, exposure changes over time and from place to place. Many hazard prone areas, such as coastlines, volcanic slopes and flood plains, attract economic and urban development, offer significant economic benefits or are of cultural or religious significance to the people who live there.

The trainer may also go on to explain that exposure, per se, can also not be controlled. Given the pace of urbanisation and development India is going through right now, the general populace is bound to be exposed. The trainer may cite a very simple example.

*A villager moves out of his village in search of job and finds one in one of the most developed*

*and urbanized cities. However, owing to his present economic condition, he is forced to reside in a slum or such a residential setup. He might even be aware of the fact that his residence is prone to hazards but he weighs the chances of such an incident occurring and decides to stay back anyways because the residence is cheap and it will enable him to save more for his family in the village.*

In addition to this interpretation, the trainer may also go on to explain a more focussed version of exposure. For example, flood-walling to reduce the exposure of flood etc.

### **Objectives of the lesson**

The primary objectives of this lesson would be to:

- Explain what exposure is and how it is important.

### **Duration**

45 minutes.

### **Methodology**

This session is an informative session which will go well with presentations showing how urbanisation and rapid development is increasing our exposure to hazards.

### **Training aids**

Power-point presentation.

## Unit 3 Lesson 2: Scope of Exposure

### Note for the trainer

Exposure is to be explained without using any standard definitions. Examples are to be given from real-life so that participants or audiences can relate to it.

#### Flow of the session

The trainer, in this lesson, should focus exclusively on the scope of exposure as it is the scope which defines the risk.

To start with, the scope of exposure is anything tangible that may be susceptible to the impact of a hazard. It can be human life, property, farms, production houses etc. This is what the basic of exposure is, however, one needs to delve into depths to understand the true bearings of exposure.

When considering human life, one needs to consider the demographics of the community or the area. Different age groups, or different sexes would have different levels of vulnerability to the hazard. Imagine a small town that has been setup by the coast just for the old people so that they can relax and enjoy their life after retirement. A cyclone hits this town. The loss would have been much lesser had this town been filled with youngsters because the old-aged population is more vulnerable. This is how demographics change the scenario. Even if it had been a school filled with children, the exposure of the school would be much more devastating than an office being exposed as the small children may not know how to act and react.

The trainer must be able to explain that exposure must account for the demographic divisions because vulnerability is ultimately decided by the demographics.

The next step would be to explain that it is exposure which actually contributes to the calculation of losses. If a farm is exposed to a hazard like flood, then the per hectare yield of the farm multiplied by the area of the farm exposed would be the resultant loss. Similarly, if an industry is exposed, then the worth of all of its processes, would be realised as the loss. However unethical it is, if a value can be assigned to human life, the numerical value of the population exposed to a hazard multiplied by the value of life would amount to the loss.

The last statement is indeed disturbing and the trainer must take care of whether to go with that or not. The basic idea is to explain that it is exposure which contributes toward calculation of losses.

### **Objectives of the lesson**

The primary objectives of this lesson would be to:

- Explain the scope of exposure, i.e., what all are said or considered to be exposed.
- Illustrate how exposure contribute to the calculation of losses.

### **Duration**

45 minutes.

### **Methodology**

This session is an informative session. In addition to this, if the trainer can show some examples of loss calculation of farm-yields, the concepts would be very easy to understand.

### **Training aids**

Power-point presentation.

## Unit 4: Understanding Risk

### Need of the session

Now that all the dependent terminologies have been clearly explained to the participants, risk can be explained to be a derivative of all the above factors. In fact, even before this session, the participants would have developed a subtle idea of how the three factors contribute to risk. In this session, the trainer would finally introduce the relation of disaster risk. Although the relation would seem logical and easy to understand semantically, the trainer would also try to explain how risk can be calculated, i.e., the trainer would introduce the participants to an easy tool to assess and then categorise risk.

Once again, the trainer must refrain himself from using established definitions at this point and instead use lucid day-to-day examples to exemplify how the three factors contribute to risk.

### Units of the session

Unit 4 Lesson 1: What is risk?

Unit 4 Lesson 2: Risk: A little mathematics does no harm

Unit 4 Lesson 3: How do we assess risk

### Objectives of the session

The primary objectives of this unit would be to:

- Explain to the participants what risk is.
- Explain how risk is defined by the use of three parameters
- Illustrate in a very simple way how risk can be assessed

### Duration

135 minutes. (45 + 45 + 45) minutes for the sessions and 5 minutes spillover time from each session.

### Methodology

This unit would primarily be informative with minimum discussions in the first two lessons. It would only be in the last session that a group exercise will be carried out to teach the participants how to assess risk.

### Training aids

Power-point presentation.

# Notes

## Unit 4 Lesson 1: What is Risk?

### Note for the trainer

Risk is to be explained without using any standard definitions.

#### Flow of the session

The trainer may start this session inviting reference to the example of the biker. The risk of the biker is defined by the hazard of the rock tumbling down, vulnerability of the biker and off course, his exposure to the situation. The trainer can move on to citing similar examples so as to explain the concept of disaster risk better. In case of an avalanche, there is a hazard, but there is no exposure and hence there is no disaster risk. If there is an earthquake, say in the night, there is a hazard and a school building is exposed to that hazard, but it has no vulnerabilities except the structural one. If the school building is also well constructed, then there are no vulnerabilities at all and hence there is no risk and the school can resume the next day without any impediment. The trainer can go on to ask participants if they can come up with similar situations where there is a hazard but the overall risk is negligible.

The trainer should take this opportunity to establish the fact that disaster risk is nothing but a probability; in fact, probability of loss expressed in any desired unit. Disaster risk is dependent on hazard which is actually the probability of occurrence of any event that **may** cause damage, vulnerability which is the degree of damage the hazard can wreak and exposure which is the quantity of tangible elements exposed. Thus overall, disaster risk is a probability or a chance of loss if the said hazard strikes.

*Intensive risk is disaster risk associated with low-probability, high-impact events, whereas extensive risk is associated with high-probability, low-impact events.*

The above statement means that the risks are higher for hazards which have lower chance of occurrence and yet have the potential to create maximum damage; earthquake of higher magnitudes for example have a very high return period but when they occur they are catastrophic.

Disaster risk has many characteristics. In order to understand disaster risk, it is essential to understand that it is:

- Forward looking: it talks about the likelihood of loss of life, destruction and damage
- Dynamic: it can increase or decrease according to our ability to reduce vulnerability
- Invisible: it is comprised of not only the threat of high-impact events, but also the frequent, low-impact events that are often hidden
- Unevenly distributed around the earth: hazards affect different areas, but the pattern of disaster risk reflects the social construction of exposure and vulnerability in different countries
- Emergent and complex: many processes, including climate change and globalised economic development, are creating new, interconnected risks

The trainer can end this session with busting a myth; *there is no such thing as natural disasters but disasters often follow natural hazards*. In addition to this, the trainer can also use the following statement: *Disasters threaten development, just as development creates disaster risk*.

The key to understanding disaster risk is by recognising that disasters are an indicator of development failures, meaning that disaster risk is a measure of the sustainability of development. However, the trainer must allow the participants to interpret this on their own through discussions.

*In addition to this, there is also acceptable and residual risk. The trainer may want to introduce the participants to these terminologies.*

### Objectives of the lesson

The primary objectives of this lesson would be to:

- Explain what disaster risk is

### Duration

45 minutes.

## Methodology

This session is an informative session which needs only a single slide illustrating the equations of disaster risk, i.e.,

1. **Disaster Risk = (Hazard) X (Vulnerability)**
2. **Disaster Risk = (Hazard) X (Vulnerability) X (Exposure)**
3. **Disaster Risk  $\propto$   $\frac{(Hazard) X (Vulnerability) X (Exposure)}{(Coping Capacity)}$**

Only the first two equations will be dealt with in this chapter, while the last equation would be explained in the next chapter.

The first equation talks only about the ‘impact’ of a hazard based on the probability of occurrence and the degree to which the hazard can cause damage.

The second equation helps in assigning an unit to disaster risk; if ‘this’ be the probability of occurrence and ‘this’ be the degree of damage it can cause and ‘that’ be the amount of assets costing ‘this much’, then the product of all these would give an idea of what damage and loss would be incurred by the hazard.

## Training aids

Power-point presentation.

# Notes

## Unit 4 Lesson 2: A little Mathematics does no harm

### Note for the trainer

The trainer must take care as to assess the behaviour of the participants before going into this lesson as this session involves a little bit of mathematics and would be fruitful only if the participants are interested to explore.

### Flow of the session

Identifying, assessing and understanding disaster risk is critical to reducing it. And in addition to that, communicating the risk in an easy perceptible manner is equally important. Thus, assessment of risk should be inclusive and participatory in nature and if not that, at least the communication of risk should be as vernacular as possible.

Risk has been calculated in many different ways. However, the trainer must not indulge in the higher forms of calculation since this entire module is about the basics. To start with, risk is to be illustrated as the combination of hazard and vulnerability only, i.e., the first formula in the previous lesson. The trainer must explain to the participants that this approach is to be used when risk is not to be assigned any unit, i.e., risk is not to be expressed in terms of money or lives lost. This expression is just about understanding risk.

In this case, hazard can take a value from 5 to 1 depending on the probability of occurrence. 5 is to be assigned to hazards which occur very frequently and 1 to hazards which are very rare. On the other hand, vulnerability would be the intensity of damage that particular hazard can cause with 5 being the highest and 1 being the lowest. Thus, for a hazard which is very frequent in occurrence and has the potential to cause a huge damage the risk would be 25 and the minimum value risk can have in this sort of an interpretation is 1. If three categories are defined from 25 to 15, 15 to 5 and then 5 to 1, these categories can be said to be severe, moderate and mild risks. The trainer must re-iterate that this categorisations are not strict and it is just the perception of the individual or the group doing this for their building, community etc. This particular categorisation has been done keeping Gujarat in mind; an earthquake of a very high magnitude is a rare occurrence, i.e., the hazard would be rated as 1 or 2, but the damage it can cause would be a havoc and has to be rated as 5. Thus, the risk in that case amounts to either 5 or 10 and falls in the category of mild risk.

The idea behind this is that this exercise needs to be done for every hazard the system is prone to. Once the risk for that particular hazard is computed, steps need to be taken to minimise the value over a period of time, i.e., steps have to be taken so that the vulnerability goes down from say, 5, to say, 2. If that is not the case, then the level of preparedness is not at all adequate and appropriate. Once the risk has been evaluated and categorised, it can be easily communicated to all other people in form of lucid representations like red for severe risk, orange for moderate risk and yellow for mild risk.

Another way of interpreting risk would be to incorporate the idea of perception of risk.

$$\text{Disaster Risk} = (\text{Hazard}) \times ((\text{Vulnerability})^{\text{Perception}})$$

In this case, risk would be hazard multiplied by vulnerability which is raised to the power of perception. Perception may take values from 3 to 1, where, 3 represents perception of higher damage and 1 represents perception of lower or no damage. Similarly, categorisations can be done taking the minimum and maximum value of risks into account. Case in point would be an earthquake of very high magnitude; in this case the hazard would be 1 or 2, vulnerability would be 5 and perception of damage would be high, i.e., 3. So, the risk in this case amounts to 250 or 125 depending upon the hazard rating. And, contrary to this will be tremors which have frequent occurrences, so 5 in hazard, vulnerability can also be rated as 5 but the perception of damage would be low as people are more used to it. Thus, the risk would be around 25. *This turns out to be more accurate representation of risk as scientifically speaking, an earthquake with regular recurrence will not have the potential to wreak much havoc.*

The trainer can then subtly touch upon the point that if risk is to be expressed in terms of monetary value, then probability of occurrence, i.e., hazard, needs to be evaluated along with exposure. However, the process involves higher forms of calculation and need not be discussed in the basic level.

$$\text{Disaster Risk} = (\text{Hazard}) \times (\text{Vulnerability}) \times (\text{Exposure of assets})$$

### Objectives of the lesson

The primary objectives of this lesson would be to:

- Illustrate simple ways of risk calculation.
- Explain how the calculated risk can be communicated in a lucid manner through colours.

### Duration

45 minutes.

### Methodology

This session is an informative session.

### Training aids

Power-point presentation.

## Unit 4 Lesson 3: How do we Assess Risk

### Note for the trainer

This session is a group exercise for the participants to understand how the concepts learnt in the last lesson can be implemented practically.

#### Flow of the session

The trainer should start this session by grouping the participants into hazards, if that has not yet been done. In context of Gujarat, groups can be made depending on the areas they come from; for example, people coming from districts prone to earthquake can be made to sit together while people coming from areas frequented by floods can be grouped together. Each group will then be asked to do the following.

1. Depending upon its return period, grade the hazard assigned to it from 1 to 5, 5 being very frequent to 1 being rare occurrences.
2. The participants will then be asked to list out all the issues which led to losses due that particular hazard in previous years. The reasons can be as minute as not knowing what to do when the hazard strikes.
3. Once such a list has been prepared, every member would be required to rate a particular issue in terms of how much damage it can cause. For example, in an earthquake prone area, ill construction might be an issue that has been identified. Similarly, many other issues would also have been identified. The issue of ill construction would be rated by the group members in terms of how much vulnerability it contributes. some will answer 5 and some 4.
4. After everyone has rated, an average for this issue is to be calculated.
4. After an average for every issue is calculated, the average rating of all the issues needs to be summed and then averaged. This final averaged value is the vulnerability to be used in the risk equation.
5. The last step would be putting the values and calculating risk. Higher the value, more risk the community is in.

If such an exercise is repeated at the community level, the list of vulnerabilities (issues) produced by the community will then become a guiding document; issues which have higher rating needs to be taken care of either by the community by themselves or by approaching the government. And, on recurrence of this exercise the sum total vulnerability must go down or at least attempts should be made to decrease the vulnerabilities.

The trainer can include the concept of perception but it is not required since, this exercise itself would give them a very realistic idea of risk assessment.

### Objectives of the lesson

The primary objectives of this lesson would be to:

- Help the participants learn how to assess risk in a real-life scenario

### Duration

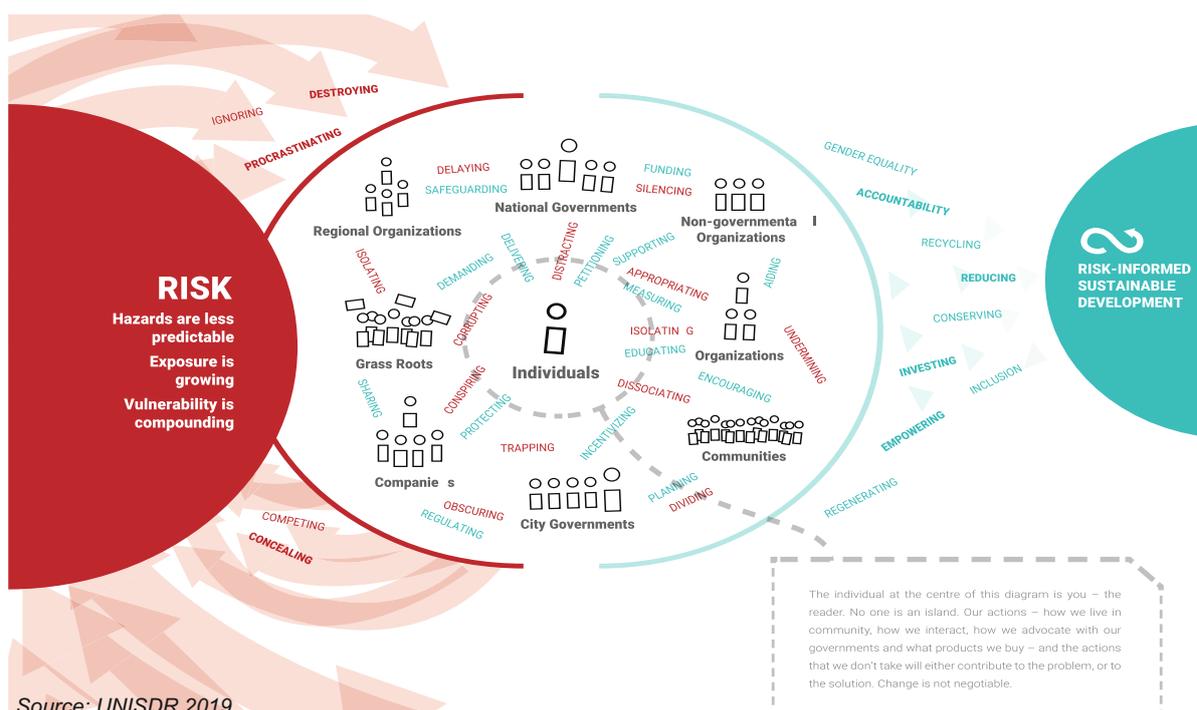
45 minutes.

### Methodology

This session is a group exercise and would require every group be provided with a chart-paper.

### Training aids

Power-point presentation to illustrate the formula and chart-papers for the groups.



Source: UNISDR 2019

## Unit 5: De-coding Disaster

### Need of the session

It has been well illustrated till now that hazards exist and will continue to exist and it is vulnerability of the system under consideration and the exposure that determines whether the hazard is a risk or not? Case in point, if the hazard is a risk, will it be a disaster? Does it mean that any event which has a degree of risk associated with it will be a disaster? Off-course not. Thus, what logically follows is the question that when do we identify an event as a disaster? This session takes into account this particular question and tries to simplify the concepts behind it.

### Units of the session

Unit 4 Lesson 1: What is coping capacity?

Unit 4 Lesson 2: Risk: Risk and coping capacity: Disaster

### Objectives of the session

The primary objectives of this unit would be to:

- Explain what coping capacity is
- Explain to the participants when an event can be identified as a disaster

### Duration

90 minutes. (45 + 45) minutes for the sessions and 15 minutes spillover time from each session.

### Methodology

This unit would primarily be informative with relevant discussions only. There will be no exercises in this session. However, if the trainer wants, he can provide an array of situations for the participants to discuss among themselves the relation between risk, coping capacity and obviously, disasters.

### Training aids

Power-point presentation.

# Notes

## Unit 5 Lesson 1: What is Coping Capacity?

### Note for the trainer

After having explained how vulnerabilities contribute to enhancing risk, the trainer must now explain what is coping capacity; the context can be individual coping capacity, community coping capacity and even national coping capacity. The trainer must be able to explain this context through relating coping capacity with vulnerability, i.e., coping capacity goes up if vulnerabilities are taken care of.

The lesson must be closed at a point where the participants understand that when coping capacity increases, vulnerability decreases (can be other way around also) and this affects risk; it also decreases.

### Flow of the session

The trainer may begin this session by inviting reference to the same example of the biker. By now the participants would have understood that owing to the hazard, vulnerabilities of different sorts and the exposure of the biker, a risk is imminent and due to this risk, if the rider meets with an accident, will the event be a disaster? It is here that the concept of coping capacity features.

Coping capacity is ideally the capacity of a system (the connotation of system is the same as used during the illustration of vulnerability) to deal with a given risk. The system can be an individual, can be a community or even an organisation, institute or authority for that matter. It is obvious that when the capacity of the system is not enough to handle the risk, the consequences of the event are grave.

Coping capacity can be understood under similar heads as illustrated for vulnerability; i.e. physical, social and institutional. In fact, the ideology of vulnerability is counter-intuitive. If a particular system is vulnerable with respect to a particular parameter, the coping capacity of the system in regard to that parameter is low. For example, while talking about structural vulnerability within the physical dimension of vulnerability, if a building in zone 5 is not built according to the relevant building code and standards, structural vulnerability is prominent and hence coping capacity of the system is also questionable. However, if an important building in zone 4 is built according to the standards and regulations of zone 5, structural vulnerability is negligible and it can be said that the building has the capacity to cope with an earthquake of a certain intensity of earthquake. Not only for physical dimension, same analogies can be drawn in other dimensions as well.

If a flood prone community with agriculture as its main source of income has invested in crop-insurance or the residents have enrolled in some sort of micro-insurance scheme, the financial burden on the community after an event would be very less. Thus, it can be said that the community has the financial capacity to cope with the economic fallout of the event, i.e., flood in this case.

Consider a state in India where mock-drills and mock-exercises are given due importance and they are carried out very frequently. Every stake-holding department, organisation, institute is involved in such an exercise and every officiating personnel is aware of their roles, responsibilities and duties that they need to assume during an event in accordance to the incident response system (IRS). In such a system, the institutional capacity to deal with the particular event is remarkable and vice versa, the institutional vulnerability can be said to be negligible.

The trainer can carry forward the session by giving several other examples to the participants to clarify the concept of coping capacity and its inverse relationship with vulnerability. The trainer can even perform a verbal exercise with the participants; the trainer can point out a very particular aspect in one of the dimensions of vulnerability and ask the participants to illustrate an example of how that aspect can contribute to vulnerability and how taking care of that aspect can increase the capacity. For example, the trainer can ask the participants to mention one aspect of socio-cultural dimension, the lack of which contributes to vulnerability and addressing it leads to improved capacity.

### **Objectives of the lesson**

The primary objectives of this lesson would be to:

- Explain what coping capacity is
- Explain how vulnerability, its various dimensions included, is the inverse of coping capacity

### **Duration**

45 minutes.

### **Methodology**

This session is an informative session. The first few slides may contain representation of the topics and the last few slides may contain examples for the verbal exercise for the participants.

### **Training aids**

Power-point presentation.

## Unit 5 Lesson 2: Risk and Coping Capacity: Disaster

### Note for the trainer

In this lesson, the trainer will, for the first time, explain that a hazard becomes a disaster, only when it is beyond the coping capacity, i.e., the risk of the hazard is too high for the community or even the individual or the nation state to contain by itself.

This should be followed by a detailed discussion or explanation of how disasters are different from accidents and how they are usually declared around the world and especially in India.

### Flow of the session

As understood in the last session, when the impending risk is beyond the coping capacity of the system, the consequences are grave. In fact, when the risk exceeds the coping capacity, the event is regarded as a disaster provided there are human, material, economic and environmental losses and impacts.

$$\text{Disaster Risk} \propto \frac{(\text{Hazard}) \times (\text{Vulnerability}) \times (\text{Exposure})}{(\text{Coping Capacity})}$$

Thus, to put it mathematically for understanding, a disaster risk will remain a risk if the coping capacity of the system under consideration is substantially high, but, if the coping capacity is not upto the mark, the disaster risk would eventually become a disaster or a massacre.

Understanding of disaster is often left to perception. One may even identify a small event as a disaster like fire in an apartment; such an event may be a disaster for the affected family but on a larger perspective, it can not be termed as a disaster. Thus, it would not be incorrect to suggest that the understanding of disaster is dependent on the scope of the system under consideration. Usually, the scope of consideration is not less than a community.

In continuation to this, the trainer may also discuss the procedure of declaration of disaster. The process varies from one country to the other.

One may consult the guidelines of FEMA to understand how it is done in the United States of America. Briefly, in the US, the Federal Emergency Management Agency (FEMA) coordinates

the government's role in disaster management. When an incident is of such severity and magnitude that effective response is beyond the capabilities of state and local governments, the Governor or Chief Executive of a tribe can request federal assistance under the Stafford Act. In special cases, the US President may declare an emergency without a request from a Governor. The Stafford Act authorises the President to provide financial and other assistance to local and state governments, certain private nonprofit organisations, and individuals following declaration as a Stafford Act Emergency (limited) or Major Disaster (more severe). India, however, has no such provisions of declaring a national disaster. Although, each state has its own Disaster Management Act, which clearly lays down the process of such declaration in a state. For example, Section 32 of the Gujarat State Disaster Management Act, 2003, states that the Collector of a district or a Commissioner, if the area under consideration surpasses a single district, must notify the state government if he feels a threat of an impending disaster, and the state government, thereon, may notify through an Official Gazette that such an area is disaster affected or disaster prone, as the case maybe.

*Interestingly, such declarations are left much to the discretion of the administrators with no hard statistics of damage or loss to take such decisions. The trainer may indulge the participants in such an open-ended discussion, if time permits.*

There is no such standard regulation in India for the declaration of a disaster in a state in India. However, one may have come across the demands put forth by ministers and politicians during or after a calamity or disaster to declare it as a national disaster or national calamity. As such disasters are categorised into following levels:

**L1: The event (disaster) can be managed at the district level with the state and the centre ready to provide assistance.**

**L2: The management of the disaster requires assistance and active participation of the state and mobilisation of state level resources.**

**L3: Events which require attention from the national level; the district or the state does not have the capacity to respond adequately.**

However, the above is more of a technical understanding of how disasters can be categorised depending upon the response it needs; casually, it is also a way of understanding that higher the levels, higher is the severity of the event. Past events like the Gujarat earthquake of 2001 and the super cyclone of 1999 were declared “calamity of unprecedented severity.” The 10th Finance Commission (1995-2000) examined a proposal that a disaster be termed “*a national calamity of rarest severity*” if it affects one-third of the population of a state. The panel did not define a “calamity of rare severity” but stated that a calamity of rare severity would necessarily have to be adjudged on a case-to-case basis taking into account, inter-alia, the intensity and magnitude of the calamity, level of assistance needed, the capacity of the state to tackle the problem, the alternatives and flexibility available within the plans to provide succour and relief, etc. The flash floods in Uttarakhand and Cyclone Hudhud were later classified as calamities of “severe nature”. When a calamity is declared to be of “rare severity” / severe nature”, support to the state government is provided from the national level.

The State Disaster Response Fund (SDRF), constituted under Section 48 (1) (a) of the Disaster Management Act, 2005, is the primary fund available with State Governments for responses to notified disasters. The Central Government contributes 75% of SDRF allocation for general category States / UTs and 90% for special category States / UTs (NE States, Sikkim, Uttarakhand, Himachal Pradesh, Jammu and Kashmir). The annual Central contribution is released in two equal installments as per the recommendation of the Finance Commission. SDRF shall be used only for meeting the expenditure for providing immediate relief to the victims. The disaster(s) that are covered under SDRF are cyclone, drought, earthquake, fire, flood, tsunami, hailstorm, landslide, avalanche, cloudburst, pest attack, frost and cold waves. In addition to this, a State Government may use up to 10 percent of the funds available under the SDRF for providing immediate relief to the victims of natural disasters that they consider to be ‘disasters’ within the local context in the State and which are not included in the notified list of disasters of the Ministry of Home Affairs subject to the condition that the State Government has listed the State specific natural disasters and notified clear and transparent norms and guidelines for such disasters with the approval of the State Authority, i.e., the State Executive Authority (SEC).

The National Disaster Response Fund (NDRF), constituted under Section 46 of the Disaster Management Act, 2005, supplements SDRF of a State, in case of a disaster of severe nature, provided adequate funds are not available in SDRF.

*The trainer may take this opportunity to fall back on the classification of hazards that was discussed in the first unit, i.e., the scope of disasters in the National Plan and the scope of disasters in the mandate of the National and State Disaster Response Funds.*

Now that the participants have a clear idea of what a disaster is and how it is classified or even categorised, the trainer must take this opportunity to impress upon the participants that the word disaster, at least in the context of disaster management studies, should not be used interchangeably with accident or even hazard. The scope and magnitude inherent in the term 'disaster' shall serve as a determinant of whether an event is a disaster or not. To put things in perspective, disaster has a profound impact on everything tangible and intangible.

By the end of this session, the trainer must be able to explain the participants risk and coping capacity are the two factors that determine whether an event, a hazard rather, becomes a disaster or not. Even if there is pertinent risk, an event may not become a disaster, if and only if there is adequate capacity to cope with the shock. The trainer must also take this opportunity to explain that there is a concept of risk being represented as a function of hazard, vulnerability, exposure and coping capacity, where all other parameters being directly proportional, coping capacity is indirectly proportional. It is to be explained that coping capacity, when talked of, is of a system and it circumscribes aspects which are two-faced, i.e, when they are addressed it enhances the capacity and when left alone adds to the vulnerability. Thus, the equation of risk with vulnerability and coping capacity does not hold true as both of these parameters are interdependent. Therefore, risk is when the vulnerabilities are accounted for and when these vulnerabilities are taken care of, the system develops a capacity to cope with the said event.

### **Objectives of the lesson**

The primary objectives of this lesson would be to:

- Explain what disaster is
- Illustrate the categories of disaster
- Explain the nuances of declaration of a disaster
- Explain the overall relationship of all the parameters discussed till now

### **Duration**

45 minutes.

### **Methodology**

This session is an informative session.

### **Training aids**

Power-point presentation.

## Unit 6: Disaster Management to Disaster Risk Management

### Need of the session

Now that the participants have a clear understanding of disaster, they are to be explained what disaster management is all about. This is to be done using the disaster management cycle. The trainer must make sure that he / she explains the disaster management cycle in the most intuitive manner possible; the participants are to be told that disaster management, however technical it might sound, is actually very logical and rational. The different phases of the cycle logically follow each other and the science can be found only within this phases and not between them. The participants must also be given a flavour of how they can manage disasters at their own level, preferably at the family level or community level. This is to be done by introducing the participants to the bow-tie analysis tool.

Once the participants feel empowered, they must be enlightened about the paradigm shift that is occurring; from disaster management to disaster risk management which circumscribes disaster risk reduction.

### Units of the session

Unit 6 Lesson 1: What is disaster management?

Unit 6 Lesson 2: How do you manage disasters?

Unit 6 Lesson 3: Evolution of disaster management: Shift from disaster management to disaster risk management

### Objectives of the session

The primary objectives of this unit would be to:

- Explain what disaster management is using the disaster management cycle
- Illustrate how disasters can be managed in a system.
- Explain about the ongoing transition from disaster management to disaster risk reduction

### Duration

135 minutes. (45+45+45) minutes for the sessions and 15 minutes spillover time from each session.

### Methodology

This unit would primarily be informative with relevant discussions only. There will be no exercises in this session.

### Training aids

Power-point presentation.

# Notes

## Unit 6 Lesson 1: What is Disaster Management?

### Note for the trainer

The trainer in this session will explain disaster management through the use of the disaster management cycle. Every aspect of the cycle should be explained using a proper example.

Care should be taken to take up case studies which are relevant to the participants. Thus, participant -need-centric approach should be adopted.

### Flow of the session

The trainer may begin this session by introducing the participants to the disaster management cycle.

One may find different versions of the disaster management cycle from different sources, but it is the responsibility of the trainer to explain to the participants that the core rationale behind all such version is the same and is very rational for one to follow.

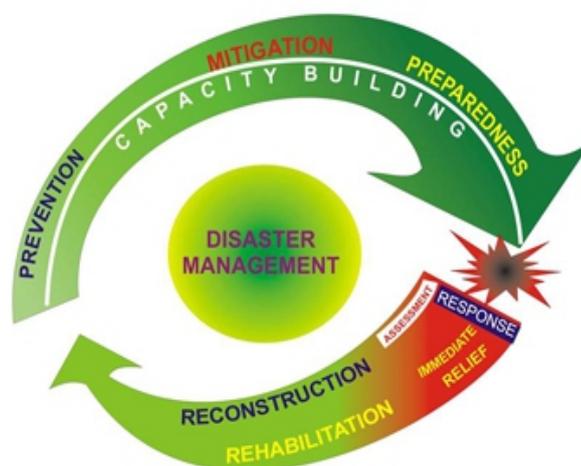


Figure 2: Disaster Management Cycle

### Phase I: Prevention and Mitigation

If it is known that a system (community, area, village etc.) is prone to or likely to be affected by a hazard or if it is established that there exists a risk, the first and the foremost logical thing to do would be to prevent the occurrence, if possible, or to mitigate the risk. This is what constitutes the first phase. Risks of hazards like earthquake can not be prevented but they can be mitigated by ensuring physical (structural and non-structural), social and institutional vulnerabilities are addressed and the system is endowed with adequate capacity to deal with

the risk. Fire risks can generally be prevented by taking care of points of failures (vulnerabilities); for example, in an organisation with a risk of fire hazard, fire alarms are to be installed, fire extinguishers are to be placed at regular intervals, staffs are to be trained on how to use extinguishers and what to do in case the alarm rings etc. If a fire occurs, due to any random reason, even with such steps of prevention, the magnitude of loss will be reduced many folds. Thus, the idea here is to ensure prevention or mitigation of the impact of loss in any terms.

The trainer can then go about giving examples of what steps are generally taken in this phase. Care is to be taken that such examples are primarily from Gujarat so that the participants can easily relate to. Examples can be cited of the Heat-wave Action Plan prepared by the Ahmedabad Municipal Corporation every year. The National Cyclone Risk Mitigation Project can also be explained by the trainer in this regard. In fact, the prevention and mitigation part of all the state and national level plans can serve as a good resource material for this phase as well this entire section.

### **Phase II: Preparedness**

Once all steps have been taken to prevent or mitigate the impact of losses, the second phase is all about readiness; to put it in terms of management and administration, this phase is about the preparedness of the system such that its leanness and agility is not compromised during the event.

The trainer can then go about giving examples of what steps are generally taken in this phase. Care is to be taken that such examples are primarily from Gujarat so that the participants can easily relate to. For example, the Gujarat School Safety Week Initiative is one of the most well known exercises carried out in this regard. Preparation of school disaster management plans, carrying out mock-drills based on that etc. are various steps that are taken to prepare the school community to respond to any unforeseen event. Similarly, training programs that are conducted by state and national institutes to build the capacity of different stakeholders is a crucial aspect of preparedness.

The trainer can use this opportunity to emphasise the role of Gujarat Institute of Disaster Management in preparedness through capacity building initiatives.

### **Phase III: Response**

After the first two phases, it is expected that the community or the system (speaking, generally), is ready to respond to any event. Off course, no one can predict the exact unfolding of events but then the first two phases of the cycle is all about preparing the system to respond to an event with the capacity to adjust to anything that exceeds the preparation.

Everything that the system has been trained for is put to use in this phase and the failure to do so will actually make the effort put in the previous phases futile.

The trainer can give examples of prepared responses and un-prepared responses as seen in Gujarat over the years. For example, the response in the 2001 earthquake can be compared to the response of any subsequent quakes. Response to floods as seen in Sabarkantha can also be exemplified here. The trainer must also emphasise on the fact that this phase constitutes of three prime activities; search, rescue and relief. Even these sub-phases are intuitive in their discourse; one must search for a victim and then rescue him and finally, transfer him to a safe haven / shelter / relief camp, where he will be treated.

### **Phase IV: Recovery**

After the immediate response to the event, what primarily becomes the objective of all and every operation is to reinstate normalcy. To put it in terms of management and administration again, the aim is to ensure business process continuity; the business here may refer to the day-to-day working of a community (district / state) and even the day-to-day life of an individual or a family. The core idea is however not just reinstating normalcy; it is more than that; the idea is to build back from the ruins to a system which would have the capacity to deal in a better way.

Examples can be cited from the recovery projects undertaken after the Bhuj Earthquake of 2001.

### **Build Back Better**

The trainer must lay emphasis on the fact that restoring normalcy, i.e., recovery is not the end. In fact, it is just the beginning of a new cycle. In the recovery phase, it is essential to find out the causalities of the disaster, the points of failure or simply put, the vulnerabilities and ensure that while recovering or 'building back', efforts are put to 'build back better'. The basis of this lies in the fact that if normalcy is restored or the system is recovered to the state it was before the disaster hit, the vulnerabilities will also be a part of it and that may result in similar consequences.

## Objectives of the lesson

The primary objectives of this lesson would be to:

- Explain what disaster management is using the disaster management cycle
- Explain the various phases of disaster management cycle using relevant examples

## Duration

45 minutes.

## Methodology

This session is an informative session coupled with relevant examples or even case studies to illustrate better to the participants about the different phases of disaster management.

## Training aids

Power-point presentation.

## Resource Materials

Heat-wave Action Plan by Ahmedabad Municipal Corporation, National Disaster Management Plan (2016). Gujarat State Disaster Management Plan, videos from different organisations like UNISDR, Asian Disaster Preparedness Centre, World Bank etc., Gujarat Earthquake Rehabilitation and Reconstruction Policy, Housing reconstruction and retrofitting after the 2001 Kachh earthquake, Disaster risk reduction: 20 examples of good practices from Central Asia, Nobody Left Behind etc.

## Unit 6 Lesson 2: How do you manage Disasters?

### Note for the trainer

The trainer, in this lesson, will introduce the participants to the bow-tie analysis. It is a simple algorithm which enables anyone to manage his / her risks.

#### Flow of the session

Prima facie, the disaster management cycle may appear to be a simplistic approach and it's only human that simple things are usually made complicated. Thus, the trainer, in this lesson, will enlighten the participants about how to manage their risks through a very simplified approach.

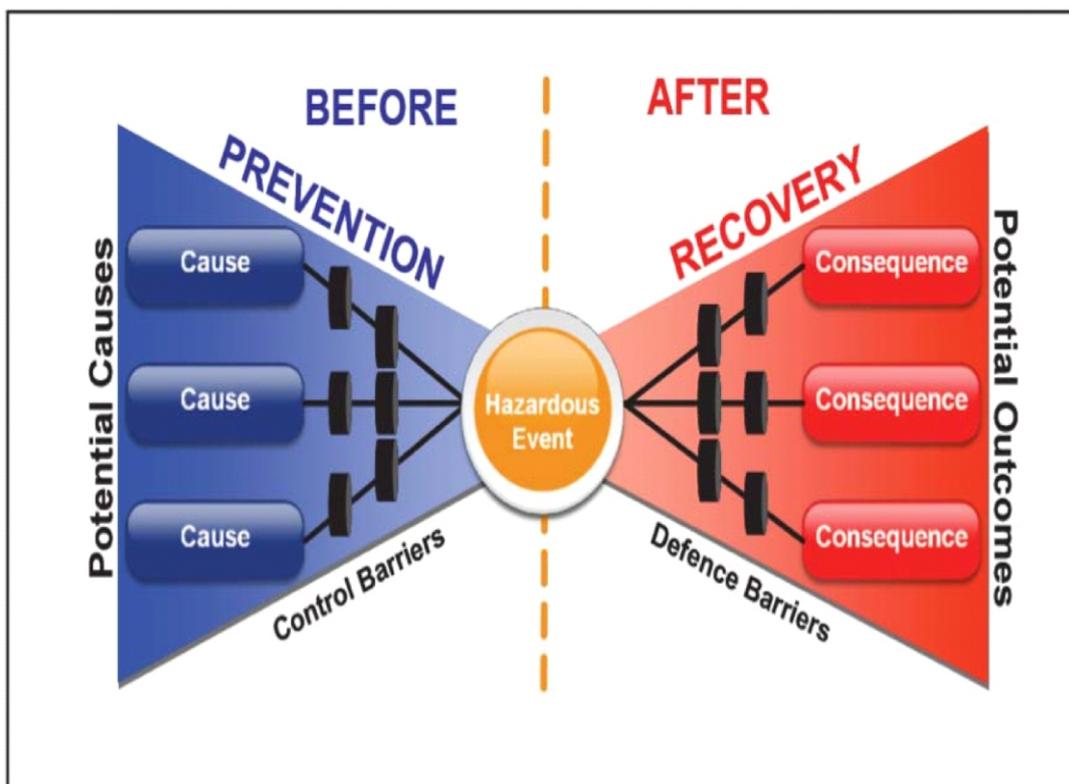


Figure 3: Bow-tie analysis

<b>Step 1</b>	The individual or the responsible group (to be referred to as group hereafter) must meet to decide the hazards surrounding them. The hazard constitutes the central circle in the above bow-tie. The hazard can be anything that the committee can think of like earthquake in an earthquake prone zone, flood, fire, pest-attack etc. Thus, in the first step the group will come up with a list of all such events which has the potential to do substantial damage.
<b>Step 2</b>	For each hazard identified, the possible consequences are to be listed. So, from the circle, the trainer directly moves the participants' attention to the extreme right side. In case of earthquake, the consequences can be loss of life and loss of property, majorly. These are the risks associated with the hazard. The discretion of qualitatively assigning a priority to the risks can be left to the group; for example, loss of life is of high priority but loss of household articles can be of low priority.
<b>Step 3</b>	<p>The trainer then moves to the extreme left of the bow-tie. The potential causes of the listed consequences (risks) are then mapped. In case of earthquake, what are the possible reasons of loss of life and property? Given that earthquake is a phenomenon which can neither be controlled, nor can it be predicted, what possible reasons can trigger the losses?</p> <ol style="list-style-type: none"> <li>1. Structural reasons</li> <li>2. Non-structural reasons</li> </ol> <p>In case of structural reasons, further deliberations would reveal that causes can be:</p> <ol style="list-style-type: none"> <li>1. Zone-insensitive construction</li> <li>2. Poor construction (Building code insensitive construction)</li> <li>3. Old construction</li> </ol> <p>And in case of non-structural reasons, the causes can be broken down to as detailed as:</p> <ol style="list-style-type: none"> <li>1. Physical non-structural <ol style="list-style-type: none"> <li>1. Glass facades</li> <li>2. Furnitures / Objects</li> <li>3. Chemicals</li> </ol> </li> <li>2. Non-physical non-structural <ol style="list-style-type: none"> <li>1. Ignorance about the dos and the don'ts</li> <li>2. Ignorance / non-existential evacuation routes</li> </ol> </li> </ol> <p>Non existential management plan</p>
<b>Step 4</b>	<p>With step 3, the outline of the bow tie is drawn. The trainer must then shift the attention of the participants to the prevention phase.</p> <p>The cause phase (step 3) determines the prevention phase.</p> <p>To prevent structural systems from failing, steps should be taken. Help of engineers may be sought to do safety checks. If there are issues with the structure, proper steps for retro-fitting should also be taken. If the construction is itself zone-insensitive, engineers must be consulted to understand what steps are to be taken.</p> <p>To ensure non-structural systems does not fail, the group must ensure that physical and non-physical issues are addressed.</p>
<b>Step 5</b>	The last step is the response and recovery; what to do after the event has occurred. The group is expected to come up with processes that might be needed during the event; How to evacuate? How to assemble? Who should be responsible for what? Whom to call and their phone numbers?

Once all these steps are explained, the trainer may embark on a small exercise to engage the participants in doing the same. Groups can be formed randomly and each group is to be assigned a hazard. Just for the sake of fun and entertainment; the trainer can assign funny hazards to the groups like falling ill because of eating too much street food or even, falling in love with an air-hostess.

The trainer, at the very end of the lesson, must help the participants to correlate that the procedural approach of risk management using the bow-tie analysis is just an algorithmic form of the disaster management cycle.

### **Objectives of the lesson**

The primary objectives of this lesson would be to:

- Show, first-hand, how easily risks can be managed using a simplistic approach
- Illustrate the use of bow-tie analysis

### **Duration**

45 minutes.

### **Methodology**

This session is an informative session. However, the trainer may include an exercise for the participants as well. The exercise will not be a typical exercise but just to break the monotony of lectures and engaging in something interesting while adhering to the processes that they might need for risk management.

### **Training aids**

Power-point presentation, A4 papers or chart papers to be used for the bow-tie analysis exercise.

# Notes

## Unit 6 Lesson 3: Evolution of Disaster Management: Shift from Disaster Management to Disaster Risk Management

### Note for the trainer

The trainer must attempt to explain the importance of science, technology, engineering and innovation in steering the paradigm from management to mitigation and reduction.

*By the end of this lesson, the participants should be able to appreciate and acknowledge the use of technology and the advantages of planning ahead in case of any risks.*

### Flow of the session

The trainer may begin this lesson by displaying statistics of loss suffered in the last decade. It will be explicit that the losses have considerably gone down. The trainer may then go about explaining why this has happened. In fact, he / she may also refer to the fact that mitigation and preparedness is way better than management as spending \$1 in mitigation and preparedness will ultimately save \$7, according to the United Nations.

The trainer may then categorically go ahead and explain the role of science and technology in steering the shift. The role of IMD, INCOIS as agencies of early-warning and their super-efficient prediction and dissemination system may be elaborated upon. New technologies that are being used for structural safety can also be shared with the participants. In this context, the trainer may introduce the participants to the concept of green and sustainable technologies. The core idea behind this is that disaster and development goes hand in hand; resources, the natural ones, are limited and full-fledged development can only be fostered when they are used along with the use of non-conventional sources. The depletion of natural resources or even their use and exploitation for the sake of development, will negatively impact the environment or the ecosystem and this will trigger the occurrence and recurrence of hazards. For example, building of dams is utmost necessary but their construction is always clouded with protests and negative impact assessment reports. Thus, development, in one way or the other, will trigger hazards, which, may or may not, become disasters. In fact, for a fast and steadily developing country like India, the use of natural resources is equally important as the use of non-conventional sources and thus, at the altar of development we are and we have to sacrifice, to some extent, the idea of not contributing to disaster risks. But, as is the case with so many other things, there

is also a silver lining to this. Since development will beget disaster risk, why not look at it from the opposite perspective? In case of a disaster, the general tendency is to build back better, i.e., to develop in a better way. Thus, disaster begets development as well. Amidst this confusion, the best way out is to adopt a principle of development which ensures that the future generations do not suffer the wrath of exploitation and while we are at it, we must ensure that existing risks are mitigated or reduced and no new risks are created in the process. This lesson in particular will remain the dynamic part of the module. It will be the responsibility of the trainer to make this lesson interesting through showing examples of the use of science and engineering in reducing disaster risk.

The trainer may also take this opportunity to explain the concept of acceptable risk and residual risk and the different sorts of measures that are taken in terms of risk management, i.e., corrective, prospective and compensatory.

### **Objectives of the lesson**

The primary objectives of this lesson would be to:

- Illustrate to the participants that a paradigm shift is ongoing from management to mitigation and reduction
- Explain to the participants that this shift has been steered by the advancement and use of science, engineering, technology and innovation.

### **Duration**

45 minutes.

### **Methodology**

This session is to be an interesting session and the onus rests on the trainer. Interesting examples, statistics, case-studies can be shown to emphasis on the fact that indeed there is a shift and science and its branches are driving it.

### **Training aids**

Power-point presentation.

### **Resource materials**

Report of the open-ended intergovernmental expert working group on indicators and terminology relating to disaster risk reduction

## Unit 7: Resilience

### Need of the session

Disaster resilience has become the operative word now; leaving behind the days of disaster management, the focus is now on disaster resilience and disaster risk management through disaster risk reduction. In fact, the only need of this particular unit is to ensure that the participants have a clear understanding of the term and its implications.

### Units of the session

Unit 7 Lesson 1: What is resilience?

Unit 7 Lesson 2: How do we build resilience?

Unit 7 Lesson 3: Are disasters impediment to development or do they foster development?

### Objectives of the session

The primary objectives of this unit would be to:

- Explain what resilience means and its implication in the context of disaster management and disaster risk reduction
- Explain how resilience can be built

### Duration

90 minutes. (30+30+30) minutes for the sessions and 5 minutes spillover time from each session.

### Methodology

The first two lessons of the unit would primarily be informative. However, the last session would be a discussion. The trainer would moderate the discussion and at the end must try to sum-up the understanding of the participant.

### Training aids

Power-point presentation.

# Notes

## Unit 7 Lesson 1: What is Resilience?

### Note for the trainer

Resilience is to be explained without using the standard or conventional statements and terminologies. However, since the term has been borrowed from a different field of study and has been perceived and explained with variations, the trainer must ensure that the participants have a glance of most of them.

### Flow of the session

Origin of the effort to define resilience can be traced back to the field of ecology, where it has been defined as *‘a measure of the persistence of systems and of their ability to absorb change and disturbance and still maintain the same relationships between populations or state variables.’* by Holling (1973, p.14). Over the years, this particular definition has been transformed into the urban disaster setting. In order to understand the evolution in the meaning of the term resilience, it will be proper to glance through its various definitions that have been anointed to it by different researchers, institutes, organisations over the time.

**“The ability of a system, community or society exposed to hazards to resist, absorb, accommodate, adapt to, transform and recover from the effects of a hazard in a timely and efficient manner, including through the preservation and restoration of its essential basic structure and functions through risk management.”**

United Nations Office for Disaster Risk Reduction (UNISDR) Terminology on Disaster Risk Reduction and Global Assessment Report, 2011.

**“The ability of a social or ecological system to *absorb disturbances while retaining the same basic structure and ways of functioning*, the capacity for self-organisation, and the capacity to adapt to stress and change.”**

- Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation, Intergovernmental Panel on Climate Change (IPCC), 2012.

**“The capacity of countries to *withstand, adapt to and recover* from national disasters and major economic crisis - so that their people can continue to lead the kind of life they value.”**

Building Resilience to Natural Disaster and Major Economic Crises, Economic and Social Commission for Asia and the Pacific (ESCAP), 2013.

**“The ability of countries, communities, businesses and individual households to *resist, absorb, recover from, and reorganise* in response to natural hazard events, *without jeopardising their sustained socio-economic advancement and development.*”**

“Investing in Resilience: Ensuring a disaster-resistant future, Asian Development Bank, 2013

**“The ability of countries, communities and households to manage change, by maintaining or *transforming living standards in the face of shocks or stresses* - such as earthquakes, drought or violent conflict - without compromising their long-term prospects.”**

- Defining Disaster Resilience: A DFID Approach Paper, Department for International Development (DFID), a United Kingdom government department responsible for administering overseas aid.

**“The ability of individuals, communities, organisations, or countries exposed to disasters and crises and underlying vulnerabilities to: *anticipate, reduce the impact of, cope with and recover from* the effects of adversity *without compromising their long-term prospects.*”**

“The Road to resilience: Bridging relief and development for a more sustainable future, The International Federation of Red Cross and Red Crescent Societies (IFRC), 2012.

**“The ability of a system, community or society to *resist, absorb, cope with and recover from* the effects of hazards and to adapt to longer-term changes in a *timely and efficient manner* without enduring detriment to food security or well-being.”**

“From Vulnerability to resilience, Pasteur 2011.

**“The ability to prepare and *plan for, absorb, recover from and more successfully adapt to adverse events.*”**

“Disaster Resilience: A national imperative, National Research Council (NRC), 2012.

**“System or community resilience can be understood as the capacity to: *anticipate, minimise and absorb* potential stresses or destructive forces through adaptation or resistance, manage or maintain certain basic functions and structures during disastrous events and recover or bounce back after an event.”**

“Characteristics of a Disaster Resilient Community, Twigg, 2009.

**“The ability of individuals, communities, organisations and states to *adapt to and recover from hazards, shocks or stresses without compromising long-term prospects for development.*”**

- GSDRC, a partnership of research institutes, think-tanks and consultancy organisations,

An OECD factsheet titled ‘What does “Resilience” mean for donors?’, takes a spectacular view of resilience; **“the ability of individuals, communities and states and their institutions to absorb and recover from shocks, whilst positively adapting and transforming their structures and means for living in the face of *long-term changes and uncertainty.*”**

The core idea of disaster resilience, *prima facie*, seems to be the same from the above excerpts (the core characteristics of resilience, in each definition, have been stated in *italics*). It is only when considered carefully, one realises that each definition has an intricate nuance associated with it, which inherently broadens the definition and understanding of disaster resilience like, *anticipation, timely and efficient recovery, effort and intent to minimise the effect of the hazard etc.*

Thus, to put in simple statements that echoes the same sentiments as all the above definitions and tries to achieve an aggregation of the above understandings,

“Disaster resilience is the ability of individuals (not limited to only those who are and can be accounted for by the authorities), communities, social systems, organisations and institutions, and states to

- anticipate the shocks and stresses posing a threat to them,
- plan to mitigate the shocks and minimise its effect, if at all it strikes,
- respond to resist it and thereby absorb the effect when it strikes,
- adapt and cope with the effects and the consequential changes, and
- recover through a learned reorganisation of basic structures and functioning in a sustainable, timely and efficient way to ensure that it has developed the potential to respond to future threats and uncertainties.”

### **Objectives of the lesson**

The primary objectives of this lesson would be to:

- Explain what disaster resilience is

### **Duration**

30 minutes.

### **Methodology**

This session is an informative session.

### **Training aids**

Power-point presentation.

### **Note to trainer**

The idea behind laying down so many definitions of 'Resilience' is not to bog down the participants but to establish the simple fact that disaster risk management is truly a trans-disciplinary field; a definition borrowed from a completely different field went through several changes by different organisations, down the year and it all points towards the same objective.

## Unit 7 Lesson 2: How do we build Resilience?

### Note for the trainer

Resilience should be explained to the participants in such a way that they understand that resilience is an integral part of sustainable development.

In this context, each and every goal set down as SDG, should be taken up by the trainer and discussed how resilience is a part of it and how important it is to consider it seriously.

Simple examples of how illiteracy or poverty can be an impediment to disaster resilience should be explained and discussed. The participants should be encouraged to explore how each of the 17 goals encompass resilience at its heart

### Flow of the session

After having explained what disaster resilience is, the trainer must answer the most obvious query of how to usher resilience or how to build disaster resilience. The answer lies in sustainability; the 17 sustainable development goals and its 169 associated targets is the key to disaster resilience.

*Figure 4: Sustainable Development Goals*



The trainer must take this opportunity to take up each and every goal and explain to the participants how resilience is at the heart of each of them. The trainer may also indulge the participants by asking them to share their understanding of how each of the goal is a path towards resilience after the trainer has showed them a few examples.

To start with, the first goal is ‘no poverty’; it goes without saying that those who are not financially well off are the worst to suffer and in fact, financial well-being like insurances and micro-insurances are some of the key aspects of socio-economic vulnerability. So, it is quite understandable that lesser the poverty, more resilient the community or individual is.

The 16th goal may sound irrelevant to disaster resilience but it is very much an enabler; post-event reports of social unrest is not rare, protests and judicial cases of allotments during rehabilitations is also not rare. Thus, maintenance of peace and just delivery of compensations is also a part of disaster resilience. In fact, this goal spills over into the next 17th goal; until and unless the various institutions and authorities / organisations are in sync and on the same page, nothing can be achieved. For example, the police system needs to be in loop with the disaster management authorities; disaster management authorities and organisations like IMD and INCOIS are required to be in perfect harmony; many such examples can be cited and the trainer must take this opportunity to talk about all the goals and prod the participants to talk their hearts out in case of some of the goals.

### **Objectives of the lesson**

The primary objectives of this lesson would be to:

- Explain how disaster resilience is to be achieved through targeting sustainable development

### **Duration**

30 minutes.

### **Methodology**

This session is primarily an informative session but the trainer can always involve the participants in the discussions to know their idea of how the sustainable development goals can be a path towards disaster resilience. This will, in fact, give an opportunity to the trainer to steer the participants in the right direction, if their thoughts appear to run astray.

### **Training aids**

Power-point presentation.

## Unit 7 Lesson 3: Are Disasters impediment to Development or do they foster Development?

### Note for the trainer

This session is primarily a debate session and the trainer is expected to function as a moderator only.

#### Flow of the session

In the last lesson as well as in the last unit, a lot of discussion has been done on disaster, development, rather sustainable development. A lot of hand-holding has also been done by the trainer to orient the participants on how disaster and development are related to each other and how they are affected and how the central idea is to develop resilience through sustainable development.

Keeping in line with these thoughts and discussions, the trainer may divide the participants in two groups; one would be speaking in favour of the topic and the other will be speaking against it. The topic of the debate would be, “Disasters foster development.”

The trainer may decide how to conduct the debate. A good idea would be to give every participant to speak for two minutes, ensuring that each speaker is contradicted by a speaker from the other group. The trainer will just facilitate the debate and finally conclude it. The trainer is not expected to contribute meaningfully in anyway. Perhaps, this would serve as a measuring stick for the trainer to understand how well he has been able to explain the ideologies that work behind disaster management.

#### Objectives of the lesson

The primary objectives of this lesson would be to:

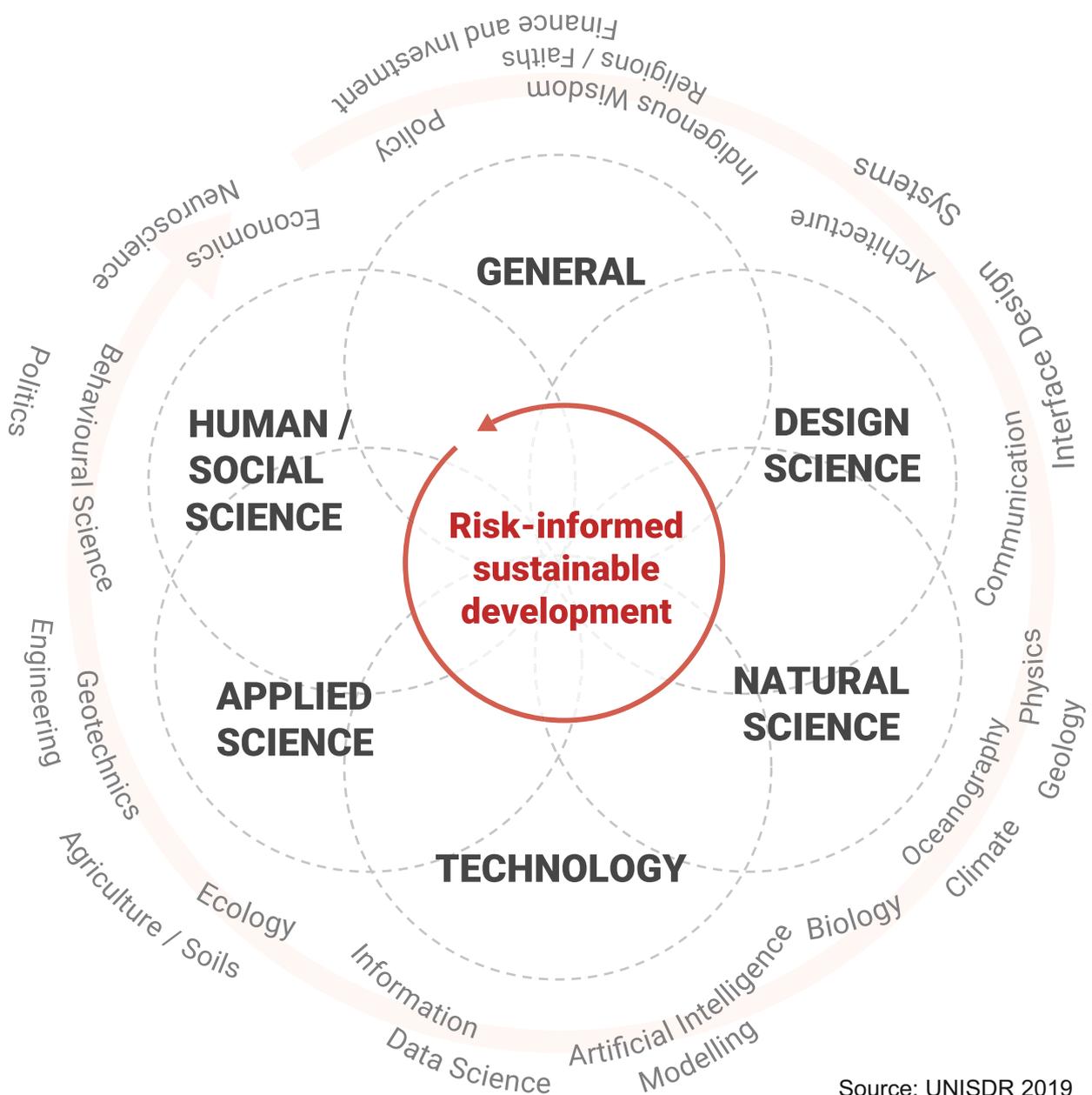
- Facilitate the participants to explore, by themselves, whether disasters foster development or development ensures disasters.

#### Duration

30 minutes.

#### Methodology

This is to be a debate session with the trainer being the facilitator only.



Source: UNISDR 2019

## Unit 8: Dealing with Disasters

### Need of the session

This is the last unit of the module and this is where, finally, the participants would be introduced to the international frameworks, definitions and terminologies. The first lesson will be about such developments and evolution at the international level, while, the second lesson will be about the evolution of disaster management in India.

The trainer will have the discretion to include as much as information as possible. On one hand he can restrict himself to the evolution and development of disaster risk reduction only and on the other hand, he can also update the participants about the parallel developments that are taking place in climate change negotiations, development goals of United Nations etc.

### Units of the session

Unit 8 Lesson 1: How is the world dealing with disasters?

Unit 8 Lesson 2: How is India dealing with disasters?

### Objectives of the session

The primary objectives of this unit would be to:

- Inform the participants about how disaster management has evolved over the years.
- Inform the participants of similar developments in India

### Duration

90 minutes. (45 + 45) minutes for the sessions and 15 minutes spillover time from each session.

### Methodology

Both the lessons are informative in nature and would involve the trainer doing most of the knowledge sharing. However, the trainer must also ensure that he helps the participants to correlate the concepts that have been already taught with the national and international definitions / terminologies etc. For example, after explaining the priorities of Sendai Framework, the participants should be informed that the steps of bow-tie analysis adhere to the priorities.

### Training aids

Power-point presentation.

# Notes

## Unit 8 Lesson 1: How is the world dealing with Disasters?

### Note for the trainer

The trainer may take this opportunity to inform the participants about the evolution of disaster management in the international scenario.

#### Flow of the session

The timeline of all the events can be summarised as in the diagram.



*Figure 5: Timeline of international developments*

In 1987, "The General Assembly recognis e(d) the importance of reducing the impact of natural disasters for all people, and in particular for developing countries; It decides to designate the 1990s as a decade in which the international community, under the auspices of the United Nations, will pay special attention to fostering international co-operation in the field of natural disaster reduction, ..."

Decides to designate the second Wednesday of October International Day for Natural Disaster Reduction, to be observed annually during the Decade by the international community; adopts the International Framework of Action for the International Decade for Natural Disaster Reduction;” In 1991, The GA **endorse(d)** the **New York declaration** and the recommendations contained in the first annual report of the Scientific and Technical Committee (STC) on the Decade as well as the proposal of the STC to **convene in 1994 a world conference of representatives of national committees for the Decade.**

## Yokohama Principles

1. Risk assessment is a required step
2. Disaster prevention and preparedness reduce the need for disaster relief.
3. Disaster prevention and preparedness are integral aspects of development policy and planning.
4. Development and strengthening of capacities to prevent, reduce and mitigate disasters is a top priority
5. Early warnings of impending disasters and their effective dissemination
6. Participation at all levels in prevention
7. Vulnerability reduction through proper design and patterns of development
8. Technology and information sharing
9. Environmental protection
10. Each country bears the primary responsibility for protecting its people, infrastructure and other national assets from the impact of natural disasters.

*Figure 6: Principles of Yokohama Strategy*

In 2003, The GA decides to convene a World Conference on Disaster Reduction in 2005, to conclude the review of the Yokohama Strategy and its Plan of Action; to identify specific activities aimed at ensuring the implementation of relevant provisions of the Plan of Implementation of the World Summit on sustainable development on vulnerability, risk assessment and disaster management; to share best practices and lessons learned to further disaster reduction within the context of attaining sustainable development and identify gaps and challenges; to increase awareness of the importance of disaster reduction policies; and to

increase the reliability and availability of appropriate disaster-related information to the public and disaster management agencies in all regions, as set out in the relevant provisions of the Johannesburg Plan of Implementation; . The ten-year review takes into account several relevant processes, such as the Johannesburg Plan of Implementation of the World Summit on Sustainable Development.



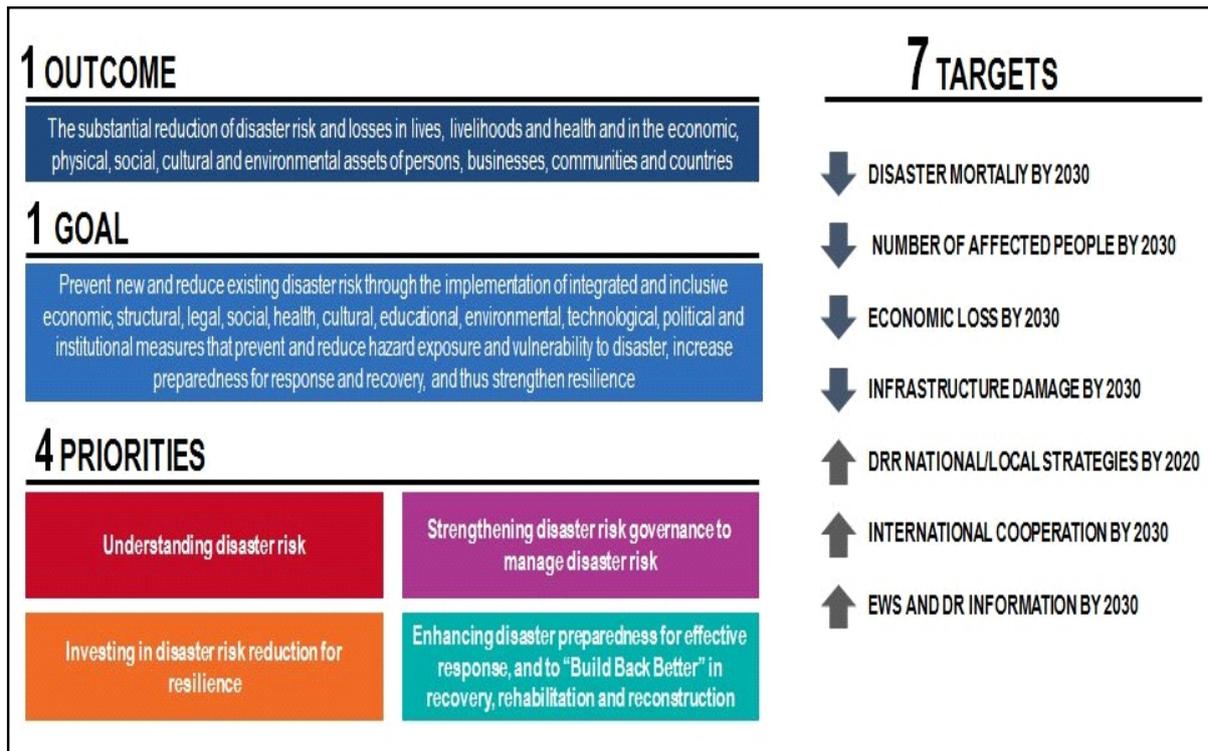
*Figure 7: Principles of Yokohama Strategy*

The Sendai Framework is the successor instrument to the Hyogo Framework for Action (HFA) 2005-2015: Building the Resilience of Nations and Communities to Disasters.

## Third World Conference on Disaster Risk Reduction, Sendai, Japan, 2015

The HFA was a 10-year action plan, effective from 2005 to 2015. During this decade, disasters around the world continued to produce human, economic, infrastructure, and ecological losses, especially in the most vulnerable and poorest nations. SFDRR has 7 targets and 4 priorities for action.

Understanding risk; risk governance; investment in risk reduction & building back better.



*Figure 8: Sendai Framework for Disaster Risk Reduction*

The trainer must take this opportunity to explain how the bow-tie analysis is congruent to the priorities of Sendai Framework.

The first step after selecting a hazard was to identify the risks associated with it. This is the first priority of Sendai Framework.

The second step of identifying the causes and reasons of the risk and acting to mitigate or prevent it forms the second and third priority; there can be no doubt that preparedness in the form of prevention, mitigation, sensitisation etc. would require investment, and that is how the third priority also fits in.

After the response to the event, i.e., after rescue, relief and rehabilitation, what remains is the incorporation of the lessons learnt and an attempt to build back better; this is how we move into the first phase of the disaster management cycle and this is the final priority of the Sendai Framework.

*In addition to this, the trainer may go ahead and give a brief idea about the parallel developments as well which he / she finds necessary and relevant.*

**United Nations Conference on the Human Environment** , Stockholm, Sweden, 5-16 June, 1972

1. Sweden, in 1968, was the first country to suggest to ECOSOC that UN should convene a conference to focus on human interactions with the environment.
2. *Soviet Union and Warsaw Pact nations boycotted the conference as East Germany was not allowed to participate in it.*
3. *The Indian Prime Minister [Indira Gandhi](#) in her seminal speech in the conference brought forward the connection between ecological management and [poverty alleviation](#).*

The **Stockholm Declaration** contained 26 principles, an Action Plan with 109 recommendations and a Resolution.

*The 1982 Earth Summit in Nairobi (Kenya): An Earth Summit was held in Nairobi, Kenya, from 10 to 18 May 1982. The events of the time (Cold War) and the disinterest of US President Ronald Reagan (who appointed his delegated daughter of the United States) made this summit a failure. It is not even mentioned as an official Earth Summit.*

**United Nations Conference on Environment & Development** , Rio, 3-14 June, 1992, which gave:

**1. Rio Declaration on Environment and Development (27 principles)**

1. Principle 1: Human beings are at the centre of concerns for sustainable development. They are entitled to a healthy and productive life in harmony with nature.
2. Principle 3: The right to development must be fulfilled so as to equitably meet developmental and environmental needs of present and future generations.

3. Principle 4: In order to achieve sustainable development, environmental protection shall constitute an integral part of the development process and cannot be considered in isolation from it.
  4. Principle 5: All States and all people shall co-operate in the essential task of eradicating poverty as an indispensable requirement for sustainable development, in order to decrease the disparities in standards of living and better meet the needs of the majority of the people of the world.
  5. Principle 7: States have common but differentiated responsibilities to conserve, protect and restore the health and integrity of Earth's ecosystem.
  6. Principle 10: Environmental issues are best handled with the participation of all concerned citizens, at the relevant level. At the national level, each individual shall have appropriate access to information concerning the environment that is held by public authorities, including information on hazardous materials and activities in their communities, and the opportunity to participate in decision-making processes.
  7. Principle 15: Precautionary principle
  8. Principle 16: Polluter pays
  9. Principle 20: Role of women in environmental management and development
  10. Principle 22: Indigenous and traditional knowledge
2. **Agenda 21**: non-binding action plan of sustainable development comprising of 40 chapters divided in 4 sections
- a. Section I: Social and economic dimension
  - b. Section II: Conservation and management of resources for development
  - c. Section III: Strengthening the role of major groups like youth, women, NGO etc
  - d. Section IV: Means of implementation like science, technology transfer, education etc.

Agenda 21 has been re-iterated in 1997 by UNGA, Rio+10, Rio+20 and off course, SDGs.

### 3. Forest Principles

#### 4. Convention on Biological Diversity

1. conservation of biological diversity
2. sustainable use of its components
3. fair and equitable sharing of benefits arising from [genetic resources](#).

The Convention was opened for signature at the [Earth Summit](#) in Rio de Janeiro on 5 June 1992 and entered into force on 29 December 1993. At the 2010 10th Conference of Parties (COP) to the **Convention on Biological Diversity in October in Nagoya, Japan, the Nagoya Protocol was adopted** in 2010 and entered into force in 2014.

1. **United Nations Convention to Combat Desertification** is a Convention to combat [desertification](#) and mitigate the effects of drought through national action programs that incorporate long-term strategies supported by international cooperation and partnership arrangements.

## **6. Framework Convention on Climate Change:**

Adopted in 1992 and entered into force in 1994. The parties to the convention (CoP) (197 ratifiers and 165 signatories) started meeting annually from 1995.

1. Kyoto Protocol (1997): It is based on two facts; global warming is happening and anthropogenic CO<sub>2</sub> is the primary cause. It is effective from 2005 and the first commitment period was 2008 to 2012. A second commitment period was agreed upon in Doha (CoP 18) but the Doha Amendment requires ratification of 144 states and till August, 2018, only 114 states have accepted it.
2. CoP 1: Berlin, 1995; In CoP 16 or CMP 6: Cancun, 2010, it was agreed upon by parties for 100 billion USD per annum, a.k.a. Green Climate Fund to help poor countries to adapt to climate impacts.
3. CoP 21: Paris, 2015. (*Greenhouse gas emission mitigation, adaptation and finance*). The agreements long term goal is to keep the increase in global average temperature to well below 2 °C above pre-industrial levels; and to limit the increase to 1.5 °C, since this would substantially reduce the risks and effects of climate change.
  1. Paris Agreement is not legally binding as Kyoto Protocol and it emphasises on consensus, i.e., nationally determined contributions that work bottom-up! The NDCs are not legally binding but every nation is legally bound to get their progress monitored, reviewed and reported every two years.
  2. It went into effect in November, 2016 when at least 55 countries contributing to 55% of the world's greenhouse gas emissions ratify, accept, approve it.

While at it, the trainer may go on to explain the timeline of the climate talks, so as to establish the fact that how long it takes to build a consensus at the international level and how each of such decisions are dependent on each other. (Figure 9)

To impress upon the participants that such international agreements are always complimentary and supplementary to each other, the trainer may go on to mention the following too.

### **Vienna Convention for the protection of Ozone layer (1985)**

*It was agreed upon in 1985 and entered into force in 1988.*

### **Montreal Protocol on Substances that Deplete the Ozone Layer (1987)**

*It was agreed upon in 1987 and entered into force in 1989. It has undergone revision several times with the latest being in Kigali in 2016. The Kigali agreement has not been adopted yet but it is in force.*

*Montreal Protocol talks about phasing out of Chlorofluorocarbons (CFC), Hydrochlorofluorocarbons (HCFC) primarily responsible for depleting the ozone layer. The Kigali Agreement requires to phase out HFCs also.*

### **Millennium Summit, UN HQ (NYC), 2000**

Its purpose was to discuss the role of UN at the turn of the 21st century. The outcome was Millennium Declaration.

**Millennium Development Goals (MDG)** derived from the Millennium Declaration was adopted to help everyone have a better life by 2015. The 8 MDGs are:

1. Eradicate extreme poverty and hunger
2. Achieve universal primary education
3. Promote gender equality and empower women
4. Reduce child mortality
5. Improve maternal health
6. Combat HIV/AIDS, malaria and other diseases
7. Ensure environmental sustainability
8. Develop global partnership for development

# Climate talks down the line

Since its formation 25 years ago, UNFCCC has overseen two major agreements on paper, but not much has been achieved

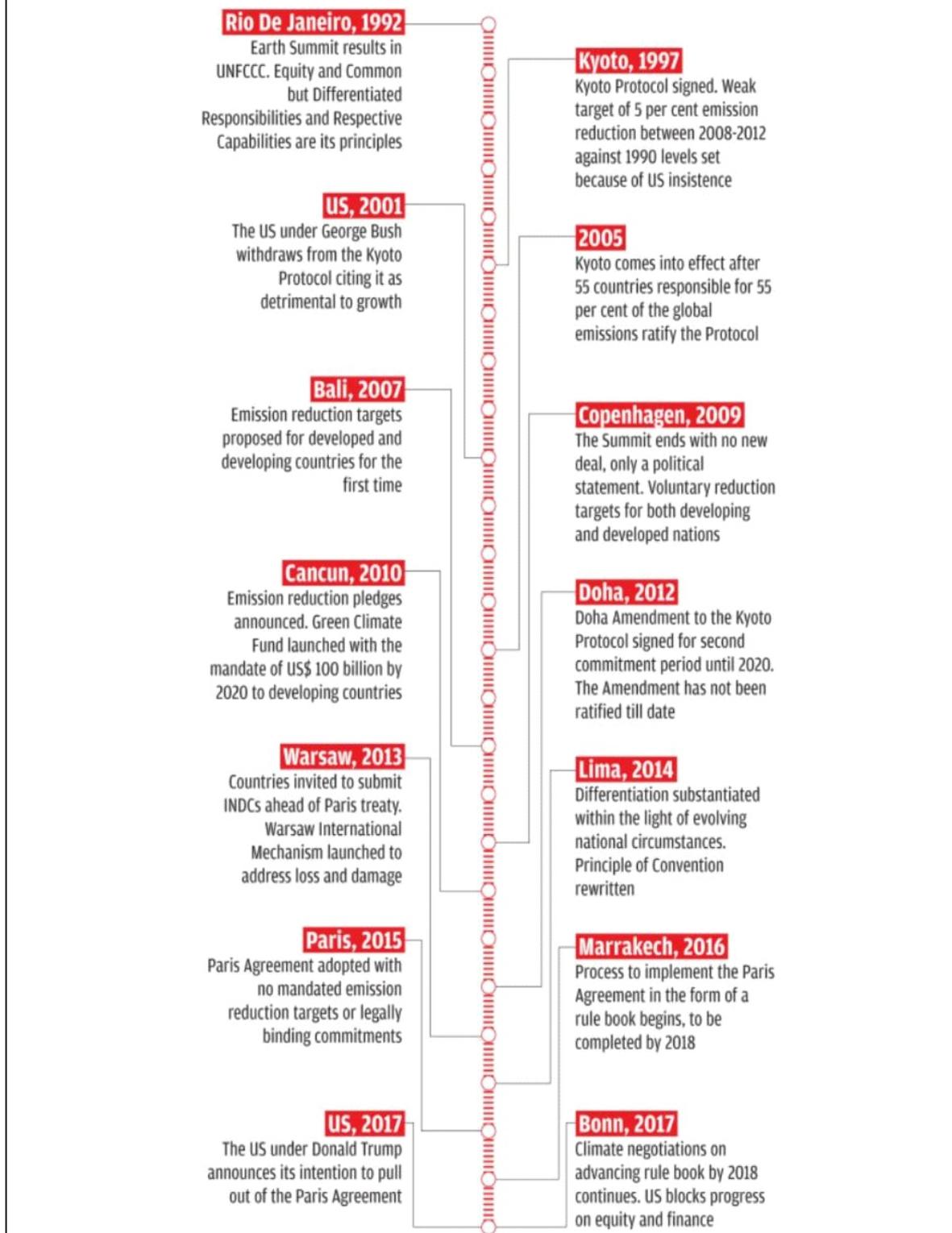


Figure 9: Timeline of climate talks

### **World Summit on Sustainable Development, Earth Summit 2002 at Johannesburg**

It is an agreement to focus particularly on "the worldwide conditions that pose severe threats to the sustainable development of our people, which include: chronic hunger; malnutrition; foreign occupation; armed conflict; illicit drug problems; organised crime; corruption; natural disasters; illicit arms trafficking; trafficking in persons; terrorism; intolerance and incitement to racial, ethnic, religious and other hatreds; xenophobia; and endemic, communicable and chronic diseases, in particular HIV/AIDS, malaria and tuberculosis.

### **World Summit on Sustainable Development, 2005 at NYC**

It talked about various developmental aspects like peace-building commission to help countries emerging from conflict, establishment of human rights council, responsibility to protect when national governments fail to fulfil their responsibility etc.

### **United Nations Conference on Sustainable Development, Rio+20, Earth Summit 2012**

1. "The Future We Want", a 49 page work paper which talks about supporting the development of Sustainable Development Goals (SDGs), a set of measurable targets aimed at promoting sustainable development globally. It is thought that the SDGs will pick up where the Millennium Development Goals leave off and address criticism that the original Goals fail to address the role of the environment in development.
2. Nations agreed to explore alternatives to GDP as a measure of wealth that take environmental and social factors into account in an effort to assess and pay for 'environmental services' provided by nature, such as carbon sequestration and habitat protection.
3. Recognition that "fundamental changes in the way societies consume and produce are indispensable for achieving global sustainable development."
4. All nations reaffirmed commitments to phase out fossil fuel subsidies.

### **Sustainable Development Goals (SDG)**

In January 2013, the 30-member UN General Assembly Open Working Group on Sustainable Development Goals was established to identify specific goals for the SDGs. The Open Working Group (OWG) was tasked with preparing a proposal on the SDGs for consideration during the 68<sup>th</sup> session of the General Assembly, September 2013 – September 2014.

On 19 July 2014, the OWG forwarded a proposal for the SDGs to the Assembly. After 13 sessions, the OWG submitted their proposal of 17 SDGs and 169 targets to the 68th session of the General Assembly in September 2014.

On 5 December 2014, the UN General Assembly accepted the Secretary General's Synthesis Report, which stated that the agenda for the post-2015 SDG process would be based on the OWG proposals.

The trainer may also go on to mention the following:

**New Urban Agenda (UN HABITAT III)**

**Addis Ababa Action Agenda (Financing for Development)**

The trainer may go ahead with introduction of the definitions of the different terminologies used in disaster management as per UNISDR.

**Objectives of the lesson**

The primary objectives of this lesson would be to:

- Explain the evolution of disaster risk management internationally.
- Explain the parallel developments and evolutions which have a bearing on disaster risk reduction.

**Duration**

30 minutes.

**Methodology**

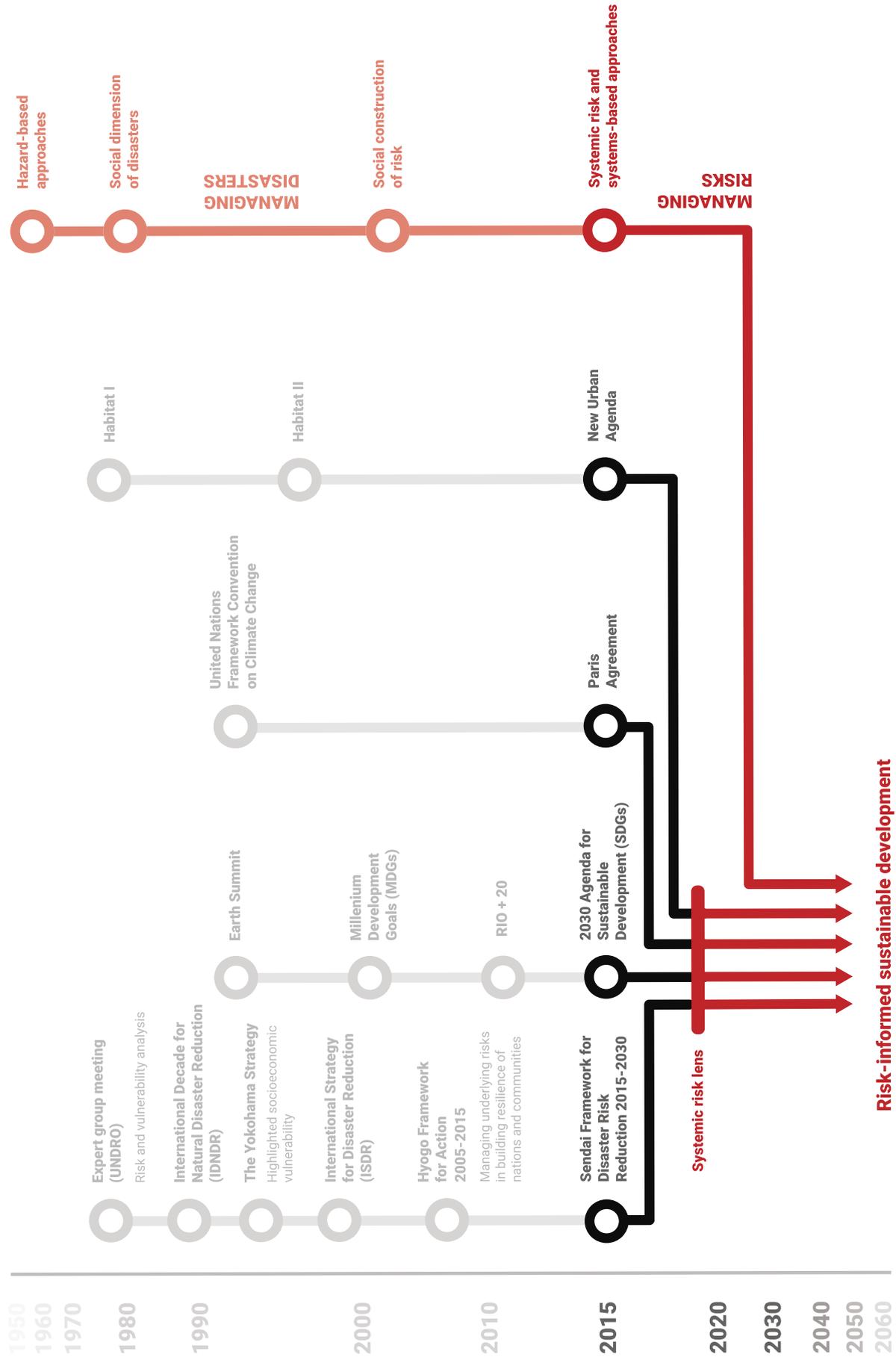
This session is an informative session.

**Training aids**

Power-point presentation.

**Resource materials**

Report of the open-ended intergovernmental expert working group on indicators and terminology relating to disaster risk reduction



Source: UNISDR 2019

## Unit 8 Lesson 2: How is India dealing with Disasters?

### Note for the trainer

The trainer must explain the timeline of disaster management in India and also introduce to the participants the definitions of standard terms as given in the national or state acts. The trainer may opt to draw a similarity between such definitions and the definitions of UNISDR introduced in the last lesson

### Flow of the session

Although the super-cyclone of 1999 remains as a dark memory and it is with this event that disaster management became a concern for the nation. Followed by the establishment of the Orissa Disaster Management Authority, India was once again vehemently shook to senses on the Republic day of 2001. This led to a series of developments; submission of a report by the high powered committee on disaster management in 2001, Gujarat State Disaster Management Act, 2003 followed by Bihar State Disaster Management Act, 2004 and the National Disaster Management Act, 2005. In 2009, the National Policy on Disaster Management was approved. The primary responsibility for management of disaster rests with the State Government concerned. The institutional mechanism put in place at the Centre, State and District levels helps states to manage disasters in an effective manner. Disaster Management is a multidisciplinary activity which is to be performed in cohesive synergy among all stakeholders. The National Policy on disaster management puts in place an enabling environment for all. Finally, in 2016, the National Disaster Management Plan was released, which religiously adheres to the Sendai framework and has hints and flavours of sustainable development goals (SDGs) in it.

The legal definitions of disaster, disaster management as per the acts should now, for the first time, be explained to the participants. Various intricate details and nuances of the act should be discussed like NDMA, NIDM, NDRF etc.

The legal requirement of having a disaster management plan for every ministry and department should also be laid stress upon. The requirement of reviewing and updating the plan annually should also be mentioned.

*The trainer may take this opportunity to show the hazards which have been considered in the national plan and the hazards which were outlined by the high powered committee, to give the participants a feel of the fact that the hazards to be considered during planning need not be limited but can be an exhaustive list of any number of events that poses a risk or a threat to the system in consideration.*

The trainer may end this session with Indian Prime Minister Narendra Modi's 10-point agenda for efforts towards disaster risk reduction, which was delivered at the Asian Ministerial Conference on Disaster Risk Reduction held in New Delhi, in 2016. These are:

1. All development sectors must imbibe the principles of disaster risk management.
2. Work towards risk coverage for all - starting from poor households to SMEs to multi-national corporations to nation states.
3. Encourage greater involvement and leadership of women in disaster risk management.
4. Invest in risk mapping globally.
5. Leverage technology to enhance the efficiency of disaster risk management efforts.
6. Develop a network of universities to work on disaster issues as they have social responsibilities too.
7. Utilise the opportunities provided by social media and mobile technologies and recognise the potential of social media and develop applications for all aspects of disaster risk management.
8. Build on local capacity and initiative.
9. Ensure that the opportunity to learn from a disaster must not be wasted.
10. Bring about greater cohesion in international response to disasters.

The trainer should ensure that he / she explains the relevance of the 10 points in light of the international frameworks and particularly in the Indian context.

The trainer may then go about explaining the definitions and attempt to compare the definitions given in the state act and the national act. In fact, similarities between the acts should be showcased and difference, if any, should also be explained. The trainer may handout the national and state plans to the participants so that they can get a clear idea of what a plan looks like. The trainer may also establish a similarity between the plans approach towards disaster risk reduction and the bow-tie analysis approach.

### **Objectives of the lesson**

The primary objectives of this lesson would be to:

- Explain the evolution of disaster management in India

### **Duration**

45 minutes.

### **Methodology**

This session is primarily an informative session. The trainer should make sure that the participants, at least, glances through a disaster management plan.

### **Training aids**

Power-point presentation.

## Post Training Assessment and Valedictory

### Need of the session

At the end of the training, evaluation of the knowledge, skill and attitude of the participants would determine their exit behaviour. The level of increase of knowledge and skill from the inputs given through the training has to be evaluated. Feedback from trainees regarding the training and related facilities would help in modifying future modules to make it more effective.

### Objectives

- Discuss a framework for improvement of the present module
- Evaluate the quality of training imparted through the program
- To assess the exit behavior of the participants at the end of the course.
- To evaluate the knowledge and skills gained during the course.
- To carry out formal internal evaluation

### Duration

50 minutes. (30+20) minutes.

### Methodology

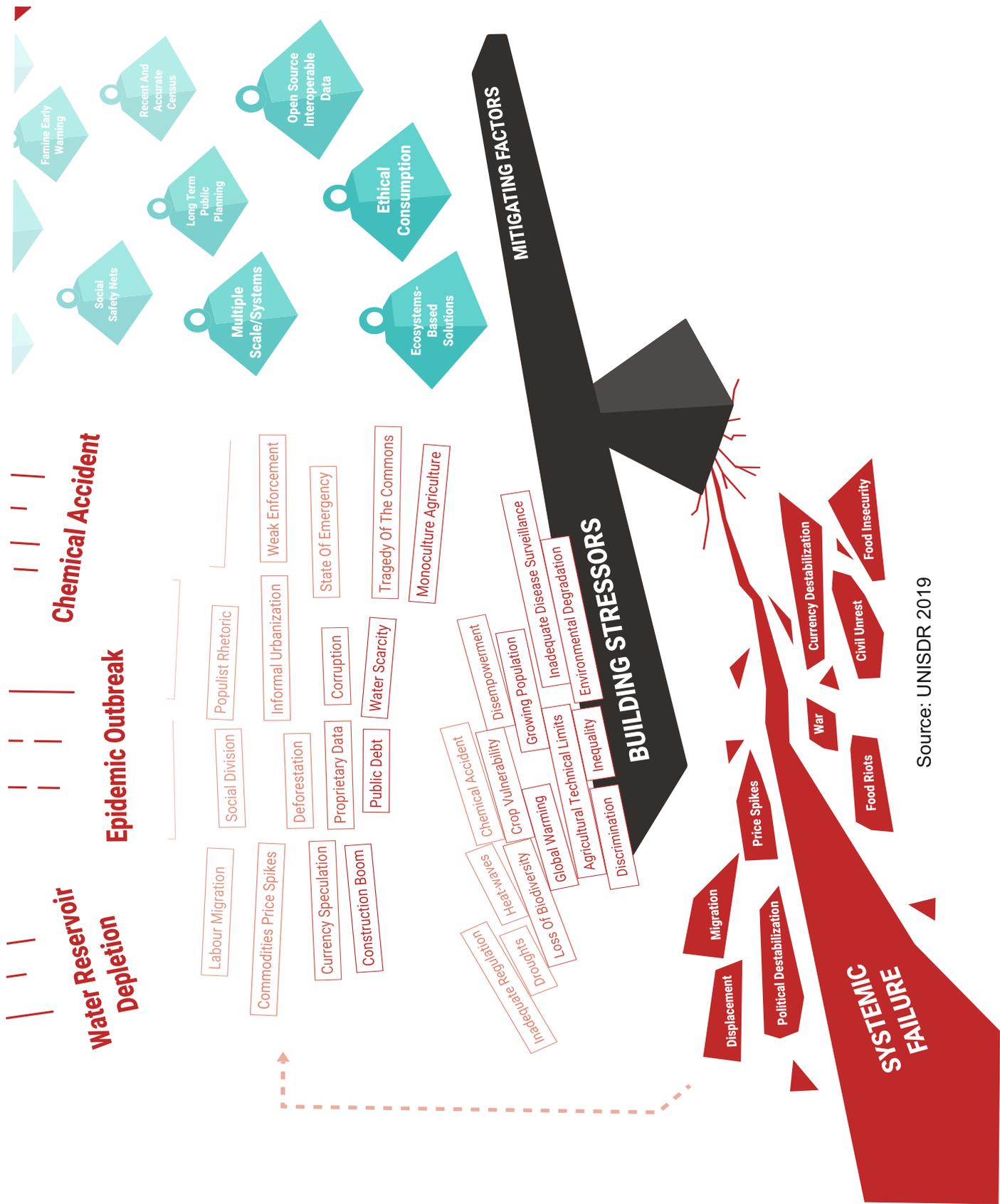
Any one of the following methods can be followed, according to the trainers' discretion:

1. Formal structured questionnaire – Each trainee is asked to fill up a structured questionnaire that evaluates their knowledge gained through the course.
2. Quiz on the course – Divide into groups and give points for correct answers. The group that wins gets a small prize.
3. Informal discussion– The trainees divide into groups and identify the key learning points of the training and write them on a flip chart. After they finish, they move on to the next flip-chart and add or comment on the points raised by other groups. At the end of the exercise, all the points are collated by the trainer and discussed.

### Training/ Performance Aids

Depending on the methodology chosen:

- Copies of pre-decided questionnaires or
- Flip charts, Markers, Tag-boards to pin the hand-outs



Source: UNISDR 2019





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