

# **DISASTER RISK MANAGEMENT**

Universita di Roma Tor Vergata  
B.A. Global Governance

Spring 2022

Session 13 – May 24, 2022

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# Learning Objectives

**The course aims to make you better prepared for crises:**

Conduct a risk assessment and decide how to manage your risk;

Define normal and crisis, evaluate the scope of a crisis;

Understand the process of response/recovery/reconstruction;

Improve your ability to manage a personal or professional crisis.

**Effective learning involves a change of thought and/or behavior**

# Session 13 – Material Review

Main Concepts – Definitions

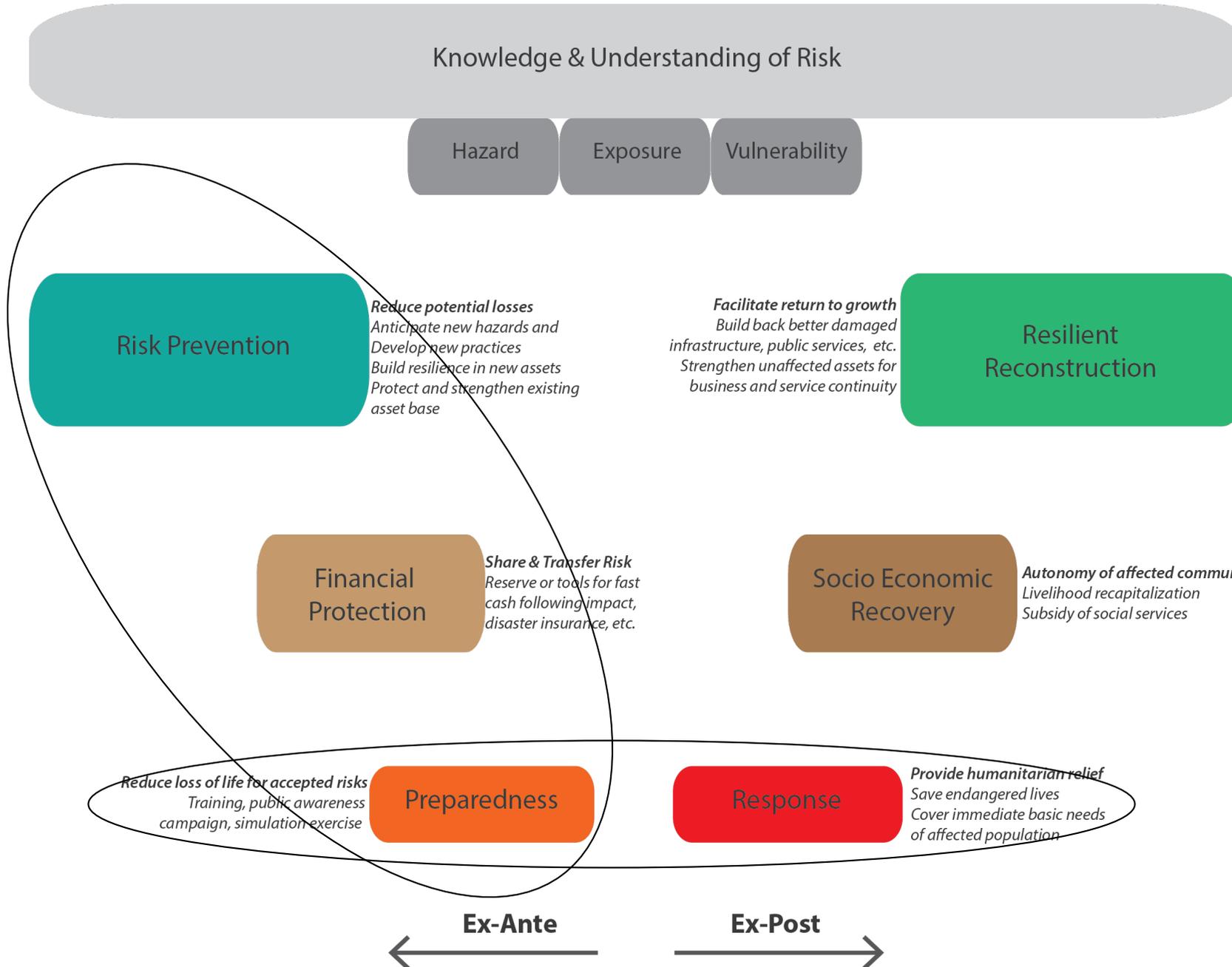
Risk Assessment – 3 steps, risk matrix

Disaster Management – Most common actions

Risk Management – Most common actions

# **MAIN CONCEPTS**

# Disaster Risk Management



# **Elements of Risk**

## **Hazard**

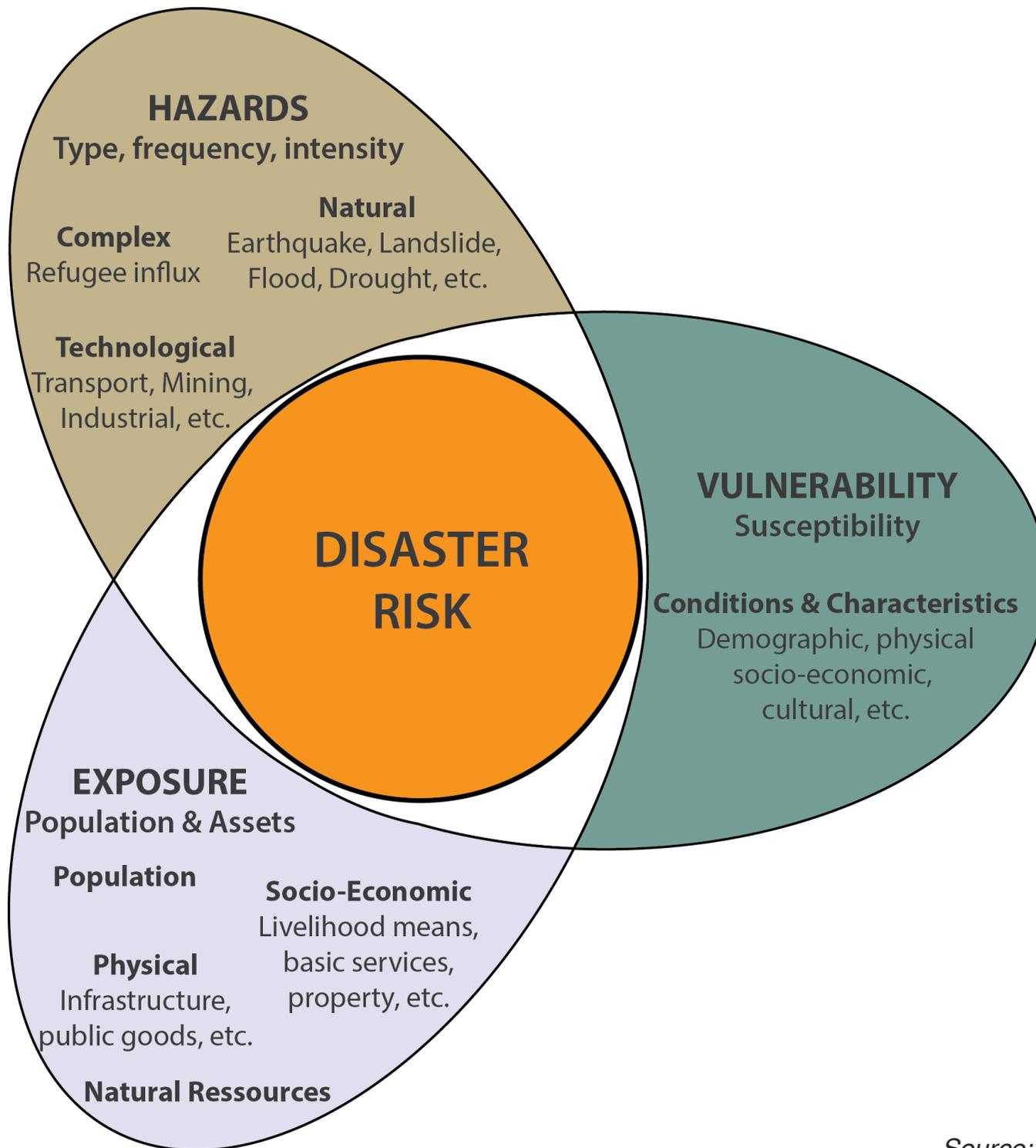
A dangerous phenomenon, substance, human activity or condition that may cause loss of life, injury or other health impacts, property damage, loss of livelihoods and services, social and economic disruption, or environmental damage

## **Exposure**

People, property, systems, or other elements present in hazard zones that are thereby subject to potential losses.

## **Vulnerability**

The characteristics and circumstances of a community, system or asset that make it susceptible to the damaging effects of a hazard.



# Hazards

Geological – Earthquakes, Landslides, Volcanic Eruption, Tsunamis

Hydrological – Coastal Erosion, Land Subsidence, Snow Avalanches, Expansive soil

Meteorological – Extreme Heat, Wildfires

Hydro Meteorological – Floods, Drought, Hurricanes, Storm surges, Winter storms, Hail, Thunderstorm, Tornadoes

Pandemics – Flu (Spanish/Avian/Swine), Covid/SARS, Ebola, Plague, Malaria

# Exercise

Atlantic hurricane season	H
Housing near coastal areas	E
Degradation of ecosystem services	V
Decreasing mental capacity of the elderly population	V
The heavy snowfall of 2016 will increase risk of flooding	H
Using palm oil endangers the habitat of tropical species	H
Exams are stressful for our mental health	H
Not studying for an exam increase the probability of stress	V
Not buying insurance for your laptop increases..	V
Informing your family of your whereabouts decreases..	V

# Structural Changes\*

**Change is not new but the pace and the quality is. There are key trends to follow as they impact society as a whole, they are structural changes:**

Urbanization and Infrastructure

Demographic changes

Industrial to Creative economy

Technology

Climate Change

# Resilience

The ability of a system, community or society exposed to hazards to resist, absorb, accommodate to and recover from the effects of a hazard in a timely and efficient manner, including through the preservation and restoration of its essential basic structures and functions.

# Resilience

Type 1 = Go back to normal

**Type 1 resilience** models systems as close to a stable steady state.

Resilience is thus defined through the speed of return to the steady state after a perturbation. For the economy, this would mean a full recovery of activities and return to the pre-disturbance state. For a business, it means being back with same products and clients.

**Type 1**

Efficiency of function

Single stable state

# Resilience

Type 2 = Adapt to new normal

**Type 2 resilience** focuses on conditions far away from steady states and look for how instability can alter the behavior regime of a system towards another stability domain.

Resilience is the magnitude of disturbance that the system can absorb while preserving the same controlling variables and process. For the economy, this would mean to explore alternative activities and modes of operations while achieving similar productivity, growth, employment, etc. goals.

**Type 2**      Existence of function      Range of states & emergence

# **RISK ASSESSMENT**

# Risk Assessment

The structured process of risk assessment consists of:

## **Risk Identification**

Find, recognize and describe risks

## **Risk Analysis**

Comprehend the nature of risk and determine its level

## **Risk Evaluation**

Decide whether risk is acceptable or not

## **ISO 31010:2009 (Risk Management – Risk Assessment Techniques)**

Contains 31 different techniques, from pure qualitative to pure quantitative

The technique you use depends on your needs and available resources

Is the accepted reference of best practice for the EU

# Step 1 – Risk Identification

Annual Probability of occurring in any one year	Annual chance of occurring in any one year	Classification
100% or greater	1 in 1 or above	Virtually Certain
10% (to 100%)	From 1 in 10 to 1 in 1	Probable
1% (to 10%)	From 1 in 100 to 1 in 10	Possible
0.1% (to 1%)	From 1 in 1,000 to 1 in 100	Improbable
Less than 0.1%	Less than 1 in 1,000	Highly Unlikely

Magnitude 8 EQ  
7 registered in the last millennium

Cat 5 Hurricane  
30 registered since 1850

Intense drought  
4 in the last decade

Overflow of river  
150 in the last century

## Step 2 – Risk Analysis

<i>Impact</i>	<i>Classification</i>
Affect large areas, and/or many sectors. Loss of services 1,000,000 people or more	Catastrophic
Affect significant areas, and/or few sectors. Loss of services between 100,000 and 1,000,000 people	Extensive
Affect limited areas, and/or few sectors. Loss of services between 10,000 and 100,000 people	Moderate
Affect small areas, and/or one sector. Loss of services up to 10,000 people	Low
Affect small areas, loss of services up to 1,000 people	Trivial

**Sector or Topic Specific**

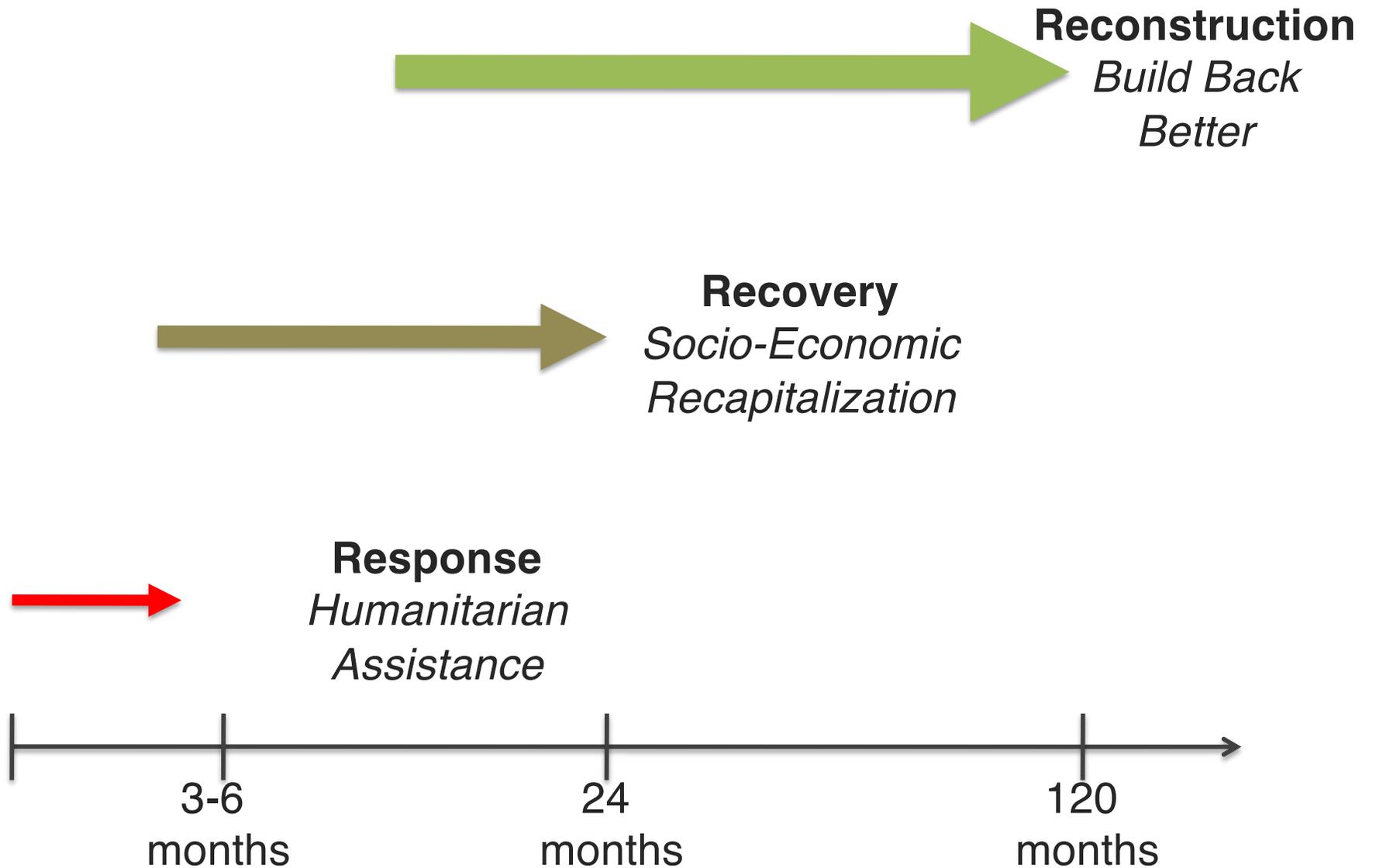
# Step 3 – Risk Evaluation

<b>S</b> <b>e</b> <b>v</b> <b>e</b> <b>r</b> <b>i</b> <b>t</b> <b>y</b>	Catastrophic	5	5	10	15	20	25
	Significant	4	4	8	12	16	20
	Moderate	3	3	6	9	12	15
	Low	2	2	4	6	8	10
	Negligible	1	1	2	3	4	5
				1	2	3	4
			Improbable	Remote	Occasional	Probable	Frequent
			<b>Likelihood</b>				

Red = Prevention + Protection + Preparedness  
 Yellow = Protection + Preparedness  
 Green = Preparedness

# **DISASTER MANAGEMENT**

# Disaster Management



# System approach

## **RESPONSE focus is on human impact.**

Save lives and provide basic needs

Unit of analysis: individuals

Timeline: 0 to 3-6 months

## **RECOVERY focus is on socio-economic impact.**

Restore autonomy and generate revenue

Unit of analysis: the household

Timeline: early to 24 months

## **RECONSTRUCTION focus on buildings and infrastructure.**

Build back better and avoid creation of new risk

Unit of analysis: buildings, infrastructure

Timeline: up to 120 months

# **Disaster Management**

## **Response**

The provision of emergency services and public assistance during or immediately after a disaster in order to save lives, reduce health impacts, ensure public safety and meet the basic subsistence needs of the people affected.

## **Recovery**

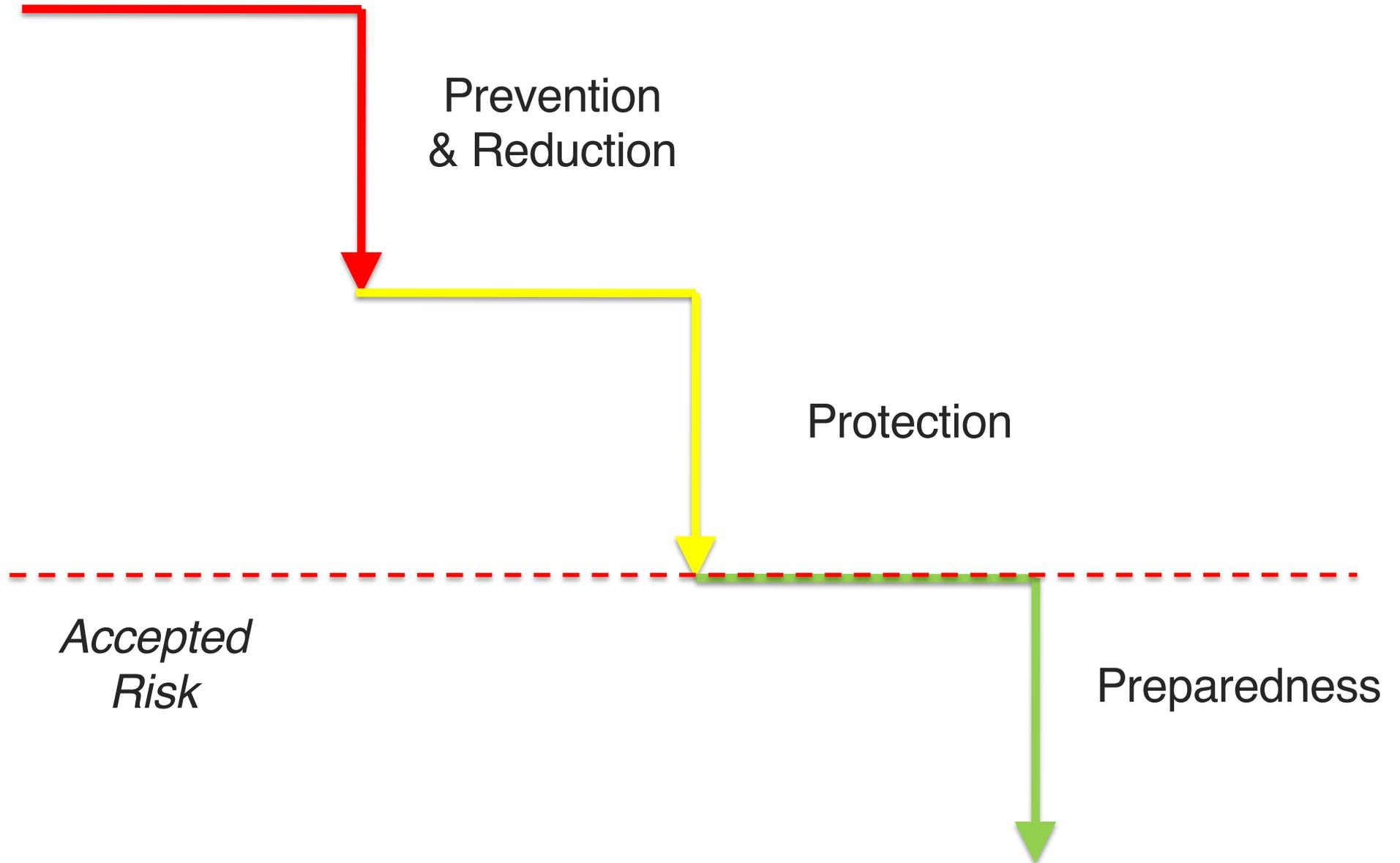
The restoration, and improvement where appropriate, of facilities, livelihoods and living conditions of disaster-affected communities, including efforts to reduce disaster risk factors.

## **Reconstruction**

The medium- and long-term rebuilding and sustainable restoration of resilient critical infrastructures, services, housing, facilities and livelihoods required for the full functioning of a community or a society affected by a disaster, aligning with the principles of sustainable development and “build back better”, to avoid or reduce future disaster risk.

# **RISK MANAGEMENT**

# Risk Management



# System Approach

**PREPAREDNESS is the first tier. Risk is accepted and we prepare to face it.**

Save lives and meet most basic needs

Timeline: short term

**PROTECTION is the second tier. Risk is shared and transferred.**

Build safety nets and protect assets & activities

Timeline: Long/mid term

**PREVENTION is the third tier. Risk is controlled and reduced.**

Avoid new risk and decrease existing risks

Timeline: Long term

# Risk Management

## Preparedness

The ability to quickly and appropriately respond when required.

## Protection

The process of formally or informally shifting the financial consequences of particular risks from one party to another whereby a household, community, enterprise or state authority will obtain resources from the other party after a disaster occurs, in exchange for ongoing or compensatory social or financial benefits provided to that other party. (Also known as **Risk Transfer**)

## Prevention

The outright avoidance of adverse impacts of hazards and related disasters.

## Reduction (Mitigation)

The lessening or limitation of the adverse impacts of hazards and related disasters.

# Preparedness/Response Components

- 1- Scenario
- 2- Evacuation
- 3- First Aid
- 4- Basic Needs
- 5- Communication
- 6- Debrief
- 7- Crisis Management
- 8- Simulation

# Recovery/Protection Components

1 – Household survey	Socio-economic Survey
2 – Work	Community Organization
3 – Vocational training	Job market analysis
4 – Recapitalization	Insurance
5 – Loans	Insurance
6 – Subsidies	Alternative economies
7 – Bail out	Sovereign National Finance

# Reconstruction / Prevention Components

1 – Development Agenda

Development Agenda

2 – Impact Assessment

Risk Assessment

3 – Risk Reduction

Structural control

4 – Sectoral strategies

Retrofitting/Maintenance

5 – Regulations & policies

Building codes/Land Use

6 – Financing

Financial incentives

7 – Implementation

Implementation

# QUESTIONS

# Sample questions

Write down the definition of resilience in your own terms and explain the 2 different forms of resilience.

Urbanization along the coastlines increases the quantity of infrastructure and housing \_\_\_\_\_ to flooding.

Keeping refugees without proper working options makes them more \_\_\_\_\_ to engage in criminal activities.

Driving faster increases the chance of having an accident, so we can say speed is a source of \_\_\_\_\_.

When we evacuate a community, we move people out of harm's way. We decrease their \_\_\_\_\_.

# Exercise

Declaration of a state of emergency  
Tax break on affected households

Response  
Recovery

Mandatory or voluntary insurance  
Cash for work or food for work

Protection  
Recovery

Corruption concerns after subsidies  
Creating work after a disaster

Recovery/Prot.  
Recovery

Cost benefit analysis for resilience options  
Having an exit strategy

Prev./Reconst.  
All phases

Level of readiness of your community  
Distorting the market with free goods

Preparedness  
Response

# Exercise

Mandatory flood insurance for business owners  
Recapitalization of livestock

Protection  
Recovery

Moratorium on education fees in affected areas  
Providing free health care for a limited time

Recovery  
Response

Search and Rescue operations  
Building a levee

Response  
Prev/Red/Rec

Updating building codes  
Building an Early Warning System

Prev./ Reconst.  
Preparedness

# Exercise

Build back better using a cash for work program	Recov+Reconst.
Subsidies for building material after disaster	Recov.+ Reconst.
Lockdown for Covid-19	Prevention
Use of personal masks for Covid-19	Reduction
Debrief each week during lockdown	Response
New hygiene standard in universities	Prev./Reduct.
Land use planning taking for climate change	Prev./Reconst.
Rebuild flooded houses with mandatory insurance	Protect+Reconst.

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