



Report Summary  
of Webinar

# Building Coastal Community Resilience against Disasters



November 30, 2021

14:00 – 16:00 hrs.

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## INTRODUCTION

### Coastal Community Resilience against Disasters

India's coastal regions is home to about 170 million of the country's 1.4 billion people and are on the front lines of a shifting climate, experiencing sea-level rise, erosion, and natural disasters such as tropical storms and cyclones. Our nation has a coastline of approximately 7556 km and is highly prone to climate change consequences that lead to the degradation of the local economic environment further affecting the socio-economic conditions of coastal communities, particularly the fishers (MoEF, 2004; Senapati and Gupta, 2017).

According to the Internal Displacement Monitoring Centre, about 3.6 million Indians were displaced annually between 2008 and 2018, most as a result of flooding from monsoon rains that are the heaviest in South Asia in absolute terms. The impacts of disasters and climate change therefore have a significant impact on many lives and livelihoods of coastal communities, and therefore the assessment of coastal vulnerability is given importance worldwide (Dolan and Walker, 2004). Vulnerability to climate change is a multi-dimensional process (Geetha et al., 2017) and is often reflected in the condition of the economic system as well as the socio-economic characteristics of the population living in that system (Patnaik and Narayanan, 2009). Multidisciplinary nature of vulnerability often makes it difficult to assess and analyze it (Turner et al., 2003; Senapati and Gupta, 2012). The increased vulnerability of coastal communities to potential hazards is partly due to the constantly increasing coastal population (Adger et al., 2005). Currently, an estimated 23 percent of the world's population (1.2 billion people) lives within 100 kilometers (km) of a shoreline and 100 meters (m) of sea level (Small and Nicholls 2003). By the year 2030, an estimated 50 percent of the world's population will live in the coastal zone.

Most of the coastal population lives in relatively densely populated rural areas and small to medium cities, rather than in large cities. In these relatively rural communities, basic services and disaster warning and response mechanisms are limited. Restricted capacity of a community to plan for and respond to coastal hazards makes coastal populations increasingly vulnerable and increases disaster risk. The degradation of the coastal environment from chronic human-induced actions threatens food security, livelihoods, and the overall economic development and well-being of coastal communities. Economic development pressures along the coast, population density and distribution, and human-induced vulnerabilities, coupled with increasing frequency and duration of storms, sea level rise, and other chronic coastal hazards, increase risk. This will result in an increase of series of incidents in coastal areas and the time period between disaster event and recovery is becoming shorter, and some coastal communities find themselves in a state of perpetual response to and recovery from one disaster event after another.

Disaster resilience is a community's ability to anticipate, prepare for, withstand and recover from extreme weather events such as storms, flooding and drought. Resilient communities are better able to sustain vital services, healthy ecosystems and economic vitality, making them

less susceptible to future hazardous events and more attractive to businesses and residents alike. Building community resilience should be a community-based or 'bottom-up' approach, which yields important insight on local responses to disasters and hazards. Communicating risk due to flooding, sea level rise, storm surge, and other natural hazards is a complex task when attempting to build resilience in coastal communities. There are a number of challenges related to preparing for, responding to, and recovering from coastal storms. Successful resilience planning must include a wide range of sectors including, but not limited to local government, business, non-profit, religious, academia, and healthcare. Linkages between community development, coastal management, and disaster management processes and activities are needed to build CCR to both chronic and episodic coastal hazards

Community resilience is inherently multi-dimensional. Communities must identify their exposure to hazard impacts as a first step in becoming more resilient to proactively address emergency planning, response, and recovery and implement hazard mitigation measures. Plans must be regularly reviewed and updated based on new information and experiences and lesson learned from implementation and monitoring. It also provides the insight and lessons learned to adapt plans and programs for enhanced resilience and also provide information and data to measure progress.

We can develop and enhance rural coastal community resilience by focusing on locally perceived resilience needs as targets for capacity building workshops, management interventions, and climate action planning. This webinar focuses on giving an overview about coastal communities and the disasters and environmental threats they face on a daily life and to provide inputs on how to enhance coastal community resilience through coastal zone regulations and guidelines and to build resilience to disasters through and by communities.

In this context, the National Institute of Disaster Management (NIDM) organized a **Webinar** on “**Building Coastal Community Resilience against Disasters**” on November 30, 2021, from 2:00 pm – 4:00 pm (IST).

## **OBJECTIVES OF THE WEBINAR**

- To give an overview about coastal community resilience against disasters.
- To provide inputs to enhance coastal community resilience through coastal zone regulations and guidelines
- To provide inputs for enhancing coastal community’s resilience through community engagement.

## SESSION PLAN

Session Theme	Resource Persons	Time and Duration
<b>Inaugural Session</b>		
<b>Overview &amp; Introduction</b>	<b>Ms. Shipra Das, YP , NIDM</b>	2:00 – 2:05
<b>Opening Remarks</b>	<b>Prof. Santosh Kumar, Head, GiDRR, NIDM</b>	2:05 – 2:15
<b>Inaugural Address</b>	<b>Maj. Gen. Manoj Kumar Bindal, Executive Director, NIDM</b>	2:15 – 2:25
<b>Technical Session</b>		
Topics	Resource Persons	Time and Duration
<b>Understanding Hazard Risk of Coastal Community</b>	<b>Mr. Ali Haider, Jr. Consultant, NIDM</b>	2:25 – 2:45
<b>Introduction to Coastal Community Resilience</b>	<b>Ms Susan Sukanya, YP, NIDM</b>	2:45 – 3:05
<b>Enhancing CCR through coastal zone regulations and guidelines</b>	<b>Mr. Prabhjyot Singh, YP, NIDM</b>	3:05 – 3:25
<b>Building Coastal Community Resilience through Community Engagement</b>	<b>Ms. Sharmishtha Solanki, Freelance Consultant, Disaster Management</b>	3:25 – 3:45
<b>Open-house Discussion led by moderator</b>		3:45 – 3:50

<b>Concluding Remarks</b>	<b>Prof. Santosh Kumar, NIDM</b>	3:50 – 3:55
<b>Vote of Thanks</b>	<b>Ms. Shipra Das, YP, NIDM</b>	3:55 – 4:00

*Note: - Ms. Sharmishtha Solanki was not able to join the panel due to her urgent flight.*

## **PROGRAMME TEAM**

### **PATRON**

Major General Manoj Kumar Bindal, Executive Director, NIDM

### **CONVENOR**

Prof. Santosh Kumar, Head, Governance and Inclusive DRR Division, NIDM

### **COORDINATORS**

Mr. Ali Haider, Jr. Consultant NIDM

Ms. Susan Sukanya, Young Professional, NIDM

### **IT SUPPORT**

NIDM IT Team

## **PARTICIPANTS**

Open to all the stakeholders, students and community as a whole.

## SUMMARY OF THE SESSION

The National Institute of Disaster Management (NIDM) organized a **Webinar** on “**Building Coastal Community Resilience against Disasters**” on **November 30, 2021, from 2:00 pm – 4:00 pm (IST)** to discuss the methods of building resilience of coastal community against disasters. Ms. Shipra Das, Young Professional, NIDM, gave the brief of Webinar and the objectives which were aimed to achieve and she also introduced the distinguished panellists. Three technical sessions were carried out by Ms. Susan Sukanya, Young Professional; Mr. Prabhjyot Singh, Young Professional; and Mr. Ali Haider, Jr. Consultant, NIDM. Question and answer session was carried out after the technical sessions. Ms. Shipra Das, NIDM moderated the webinar and delivered the formal Vote of Thanks at the end of the programme. The Webinar was attended by 155 participants, detailed list of participants is attached with this report.

## PANELLISTS AND THEIR DELIBERATIONS

### **MAJOR GENERAL MANOJ KUMAR BINDAL (VSM), EXECUTIVE DIRECTOR, NATIONAL INSTITUTE OF DISASTER MANAGEMENT**



Major General M. K. Bindal is presently the Executive Director, National Institute of Disaster Management. He was commissioned into the Corps of Army Air Defence in December 1985. Having held all echelons of command within an Air Defence Regiment in diverse theatres, he commanded an Air Defence Regiment and an Air Defence Brigade in the Kashmir region against the backdrop of counter insurgency operations. He was General Officer Commanding of a sensitive Sub Area in the North East. He has also been posted as Deputy Director General in Directorate of Army Air Defence.

Major General M. K. Bindal served as the Provost Marshall in the United Nations Mission in Mozambique. He has been the Director, Centre for United Nations Peacekeeping (CUNPK) New Delhi. For three years he was also the Secretary of the International Association of Peacekeeping Training Centres.

Major General Bindal was the patron of this webinar.

**PROF. SANTOSH KUMAR, PROFESSOR & HEAD, GOVERNANCE & INCLUSIVE DRR AND DRR DIVISIONS, NATIONAL INSTITUTE OF DISASTER MANAGEMENT**



A Disaster Risk Reduction, Policy Planning and Capacity Development expert with more than 30 years of experience in different positions in the Development Planning and DRR Sector. A Ph.D. in Economics, he studied Gender & Development from IDS, Sussex, UK and received professional training in Disaster risk Management from Israel, backed with International work exposure at The World Bank and Inter- governmental body of SAARC. He has also worked at state levels in different capacities in UP Academy of Administration, Nainital and RIPA, Jaipur. He brings with him rare combination of operations and academia. His experience of working at the grass root to national to international level in all aspects spanning DRR is an added value. His specializes in disaster management planning, Post disaster loss and need assessment, Recovery and inclusive Disaster Risk Reduction.

Prof. Santosh Kumar was the convenor of this programme.

**MR. ALI HAIDER, JR. CONSULTANT, CENTRE FOR COMMUNITY BASED DRR, NIDM**

Mr. Ali Haider graduated in Civil Engineering and holds a masters in Environmental Engineering, pursuing research in Water Resource Engineering. He is engaged professionally in the field of Disaster Management. Ali is presently working as Junior Consultant in the Centre for Community Based Disaster Risk Reduction at the National Institute of Disaster Management, New Delhi. He has also worked in the infrastructures development sector.



Mr. Ali deliberated, during the session, on the topic **Understanding Hazard Risk of Coastal Community**. He comprehensively explained the process of building resilience of coastal community. He explained the terms ‘community’ and ‘resilience’ in elaborative manner. He explained the context of coastal hazard and the challenges faced by the coastal community. He also highlighted a case study of Tamil Nadu which assessed all the elements of coastal community resilience. He explained the initiatives taken by the community in the Phailin cyclone of Odisha.

**MS. SUSAN SUKANYA, YOUNG PROFESSIONAL, CENTRE FOR COMMUNITY BASED DRR, NIDM**



Currently working as a Young Professional in the centre for community-based Disaster Risk Reduction, GiDRR. She is a Postgraduate in economics and currently pursuing research in Health Economics. She has research experience from CDS, Sakhi Women's Resource Centre, NCERT, and also published and presented her research work in various national and international conferences and seminars. Her areas of specialization include rural development, education, gender, health and marginalized communities.

During the session, she deliberated upon the topic of **Introduction to Coastal Community Resilience**. She explained the frameworks of resilience building of coastal community. She also talked about the climate-adaptive livelihoods for enhanced resilience of vulnerable coastal communities and strengthened coastal and marine governance and institutional framework.

**MR. PRABHJYOT SINGH, YOUNG PROFESSIONAL, CENTRE FOR DRR IN GEOGRAPHICAL PLANNING, NIDM**

Prabhjyot is a town and country planning specialist and a graduate of the School of Planning and Architecture, New Delhi. He has worked with the Urban and Regional Studies Department, Indian Institute of Remote Sensing, Dehradun. His areas of specialization include Geographical Information systems, urban and regional planning. He is currently working as a Young Professional in the centre for DRR in Geographical Planning, GiDRR Division



He took a session on **Enhancing CCR through coastal zone regulations and guidelines** in the webinar. He talked about the existing rules and regulations for the development of coastal region. He explained in detail Coastal Regulation Zone (CRZ) rules.

The technical sessions were followed by the open house question & answer session, panellists took the questions from participants and satisfied them with their answers.

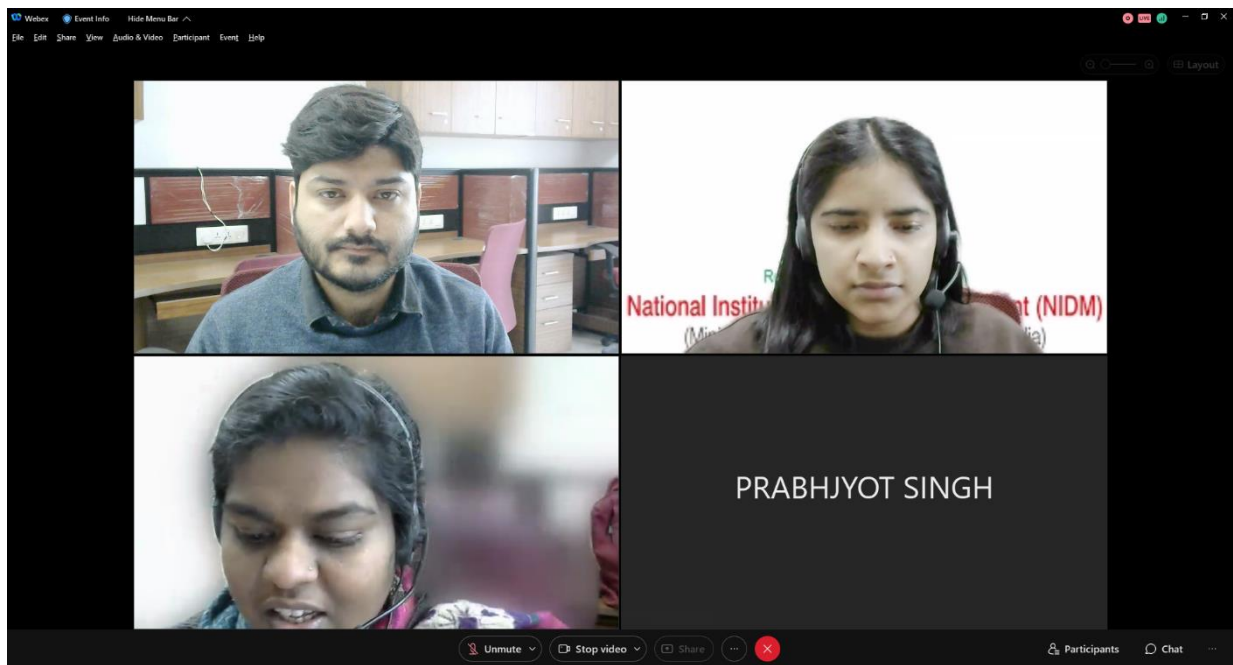
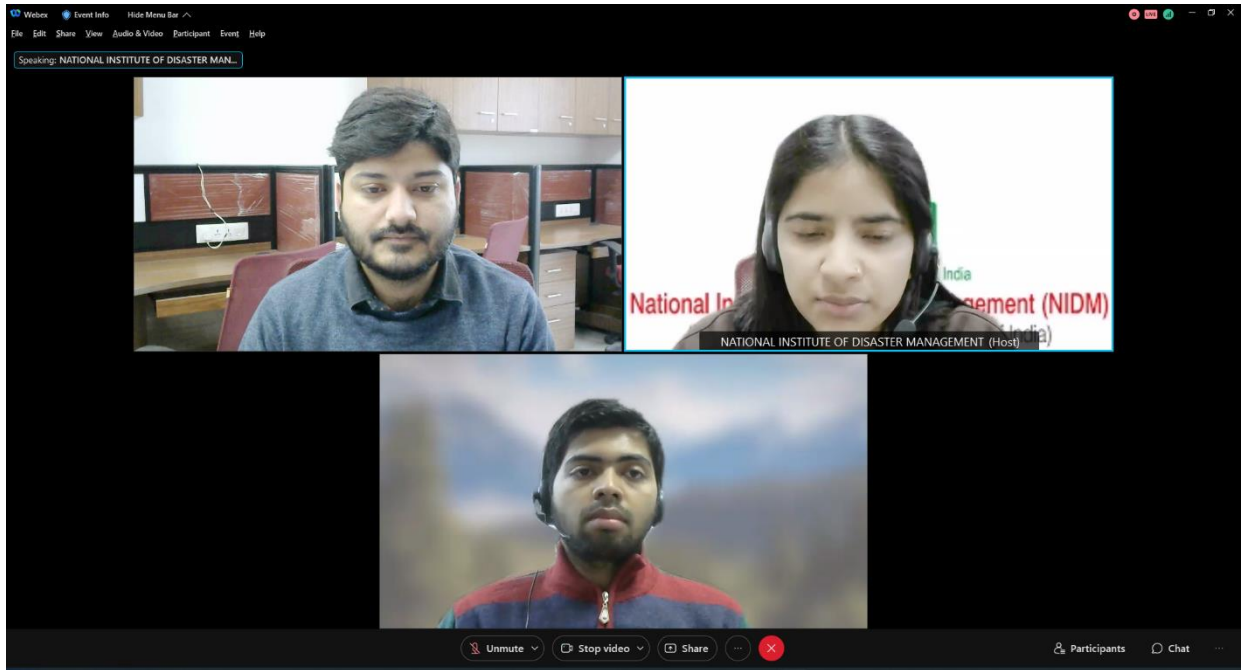
At the end of the webinar, Vote of Thanks was delivered by **Ms. Shipra Das**. She sincerely thanked Major General Manoj Kumar Bindal, Executive Director, National Institute of Disaster Management; Prof. Santosh Kumar, National Institute of Disaster Management; Ms. Susan Sukanya, Young Professional; Mr. Prabhjyot Singh, Young Professional; and Mr. Ali Haider, Jr. Consultant, NIDM and to all the respected participants.

## KEY TAKEAWAYS

Some of the key takeaways discussed during the webinar are as follows:

- Climate change is anticipated to increase the coastal hazard threat trends (sea level rise, floods, storm – both intensity & frequency)
- Knowledge of indigenous groups can be tapped for preserving forestry and their inputs can be valuable for watershed, forestry, fishery and other livelihood management programs.
- The majority of the coastal communities are completely dependent on fishing for their sustenance and lack skills and capabilities to shift occupation.
- The coastal villages lack the protection of dense mangrove belt which can minimize the impact of sea waves.
- The coastal population is not self-reliant during adverse situations and are exclusively dependent on external aid.
- Enhanced resilience of coastal and marine ecosystems and their services
- Climate-adaptive livelihoods for enhanced resilience of vulnerable coastal communities
- Strengthened coastal and marine governance and institutional framework.
- Development of coastal areas in line with the natural ecosystem and coastal zone regulations.
- Restoring ecosystem not only protect from disasters but also promote tourism, mitigate climate change effects etc.
- Innovative Use of NDZ for non-structural measures for CRZ 3 B to mitigate the impacts of climate change.
- As a long term measures, activities such as building people's institution, poverty alleviation programmes, self-help groups, mangrove plantation and developing village knowledge centres can be initiated.
- Gender sensitive disaster management and resilient plans must be developed keeping in mind the different requirements and challenges of different genders.


# PHOTOGRAPHS




**By Ms. Susan Sukanya**

# Introduction to Coastal Community Resilience

- Coastal is used to refer to things that are in the sea or on the land near a coast.
- The community is all the people who live in a particular area or place.
- Around one-third of the world's population lives in a coastal area.
- There are 1.6 million kilometers of coastline around 123 countries, and 40% of us live within 100km of the coast

- 
- Coastal areas are increasingly at risk from both natural and human-induced hazards.
  - Definition - Coastal community resilience as the ability of both human and natural communities to resume their normal lives; i.e., ‘bounce back,’ following events such as coastal storms, hurricanes, and flooding, rather than simply reacting to the impact of such events

- 
- There exists no universal approach to the assessment of community resilience, researchers agree that it is characterized by several dimensions of wellbeing, including political, social, economic, and physical.
  - Building community resilience should be a community-based or 'bottom-up' approach, which yields important insight on local responses to disasters and hazards.
  - Community-based coastal resource management (CBCRM) is a process of involving local communities in managing the coastal resources upon which they depend.

- Equitable development is expanding a community's infrastructure while maintaining its local culture and retaining affordable housing options.
- Consult with communities to assess needs, rebuild communities, and develop sustainable practices.

## **Coastal Community Resilience Frameworks For Disaster Risk Management**


- Coastal Community Resilience (CCR<sub>1</sub>)
- Climate Disaster Resilience Index (CDRI)
- Texas Community Disaster Resilience Index (TX-CDRI)
- Localized Disaster Resilience Index (LDRI)
- Baseline Resilience Indicators for Communities (BRIC)
- Indian Climate Disaster Resilience Index (IN-CDRI)
- Resilience Inference Measurement (RIM)
- Community Resilience Framework (CRDSA)
- Coastal Community Resilience (CCR<sub>2</sub>)



## Ways to Improve

- Conducting vulnerability assessment of the coast to inform planning of ecosystem- and community-based adaptation interventions
- Community-based conservation and restoration of coastal ecosystems for increasing ecosystem resilience

## **Enhanced resilience of coastal and marine ecosystems and their services**

- 
- Building climate resilient livelihoods and enterprises through value chains and strengthened access to markets
  - Improving capacities of local communities on ecosystem-based adaptation and climate-resilient livelihoods

## **Climate-adaptive livelihoods for enhance resilience of vulnerable coastal communities**

- Network of institutions for enhanced climate resilience and integrated planning and governance in all coastal states
- Integrating ecosystem-centric approaches to climate change adaptation into public and private sector policies, plans and budgets, and scaling up finance for Eco-system based adaptation.
- Knowledge management for coastal resilience

### **Strengthened coastal and marine governance and institutional framework**

- RESTORE
- EXPAND
- IMPLEMENT
- IMPROVE

**By Mr. Prabhjyot Singh**

# Enhancing CCR through coastal zone regulations and guidelines

30<sup>th</sup> November 2021

**Prabhjyot Singh**  
*Young Professional*  
*Center for DRR in Geographical Planning GIDRR Division*  
*National Institute of Disaster Management*  
*Email id – prabhjyot.nidm@gmail.com*



## Why we need Coastal Zone Regulations

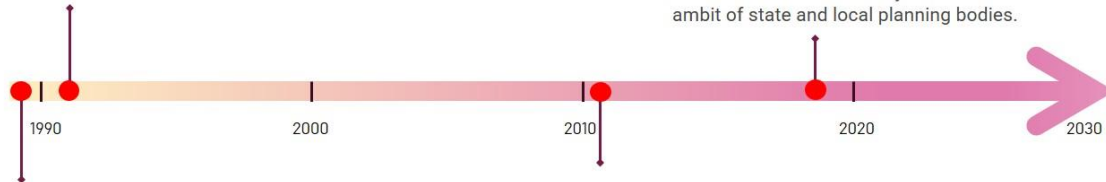
- Protection of Ecological Sensitive areas like mangrove, coral reefs which act as a shield against tsunami and cyclones
- Improving the lives of coastal communities like fishing communities
- Resilient measures for mitigating impacts of climate change and high intensity cyclones
- balance development with conservation of coastal environment
- The coastal regulation zone (CRZ) rules govern human and industrial activity close to coastline.

Coastal zone regulations and guidelines 1

## Timeline of major events in India

### Coastal Regulation Zone (CRZ) in 1991

- CRZ zones
- Prohibited activities
- Regulation of permissible activities
- Coastal zone management plan by states
- Procedure for monitoring and enforcement



### Environment Protection Act 1986

government to take appropriate measures for protecting and improving the environment

### Coastal Regulation Zone (CRZ) in 2011

- To conserve and protect coastal stretches;
- To ensure livelihood security to the fishing & local communities living in the coastal areas;
- To promote development in a sustainable manner based on scientific principles, taking into account natural hazards and sea-level rise.

### Coastal Regulation Zone (CRZ) in 2018

- The major objective behind the recommendations was to boost tourism, port construction and real estate.
- diluting the regulatory powers of the Central Government in the coastal areas. Except for those activities which require environmental clearances all other activity should fall under the ambit of state and local planning bodies.

## Coastal zone regulations and guidelines 2

### Coastal Regulation Zone Notification, 2018



#### Index

- CRZ I A: Eco-sensitive areas
- CRZ I B: Inter-tidal areas
- CRZ II: Areas which have been developed up to or close to the shore
- CRZ III A: CRZ-III areas, where the population density is more than 2,161 per sq km as per 2011 Census
- CRZ III B: Areas with population density of less than 2,161 per sq km, as per 2011 Census
- CRZ IV A: 12 nautical miles from the Low Tide Line towards the sea
- CRZ IV B: Tidal influenced waterbodies
- NDZ: 50 metres from High Tide Line in CRZ III A areas, 200 m from HTL in CRZ-III B areas

**Floor Space Index Norms Eased:** In CRZ, 2011 Notification, for CRZ-II (Urban) areas, Floor Space Index (FSI) was frozen as per 1991 Development Control Regulation (DCR) levels. In the CRZ, 2018 Notification, it has been decided to de-freeze the same and permits FSI for construction projects to enable redevelopment of these areas to meet the emerging needs.

**New Categories for densely populated rural areas:** For CRZ-III (Rural) areas, two separate categories have now been stipulated as below:

- **CRZ-III A** – These are densely populated rural areas with a population density of 2161 per square kilometer as per the 2011 Census.
  - Such areas will have a **No Development Zone (NDZ) of 50 meters** from the High Tide Line as against 200 meters from the High Tide Line stipulated in the CRZ Notification, 2011.
- **CRZ-III B** – Rural areas with a population density of below 2161 per square kilometer as per the 2011 Census.
  - Such areas shall continue to have an **NDZ of 200 meters** from the HTL.

**Tourism infrastructure in coastal areas:** Temporary tourism facilities such as toilet blocks, change rooms, drinking water facilities, etc. have now been permitted in Beaches. However, a minimum distance of 10 m from HTL should be maintained for setting up of such facilities.

**CRZ Clearances streamlined:** Only such projects/activities, which are located in the CRZ-I (Ecologically Sensitive Areas) and CRZ IV (area covered between Low Tide Line and 12 Nautical Miles seaward) will be required to be cleared by the Ministry of Environment, Forest, and Climate Change. For, the CRZ-II (urban) or CRZ III (rural) areas, the CRZ clearance will be considered at the state level by the Coastal Zone Management Authority (CZMA).

**No Development Zone (NDZ) of 20 meters for Islands:** For islands close to the mainland coast and for all Backwater Islands in the mainland, NDZ of 20 m has been stipulated.

- Ecologically Sensitive Areas have been accorded special importance: Specific guidelines related to their conservation and management plans have been drawn up as a part of the CRZ Notification.

**Pollution abatement:** In order to address pollution in Coastal areas treatment facilities have been made permissible activities in the CRZ-I B area (the area between the Low tide line and High tide line) subject to necessary safeguards.

**Defense and strategic projects** are exempted from regulations.

## Coastal zone regulations and guidelines 3

## Why are we talking about coastal community ?

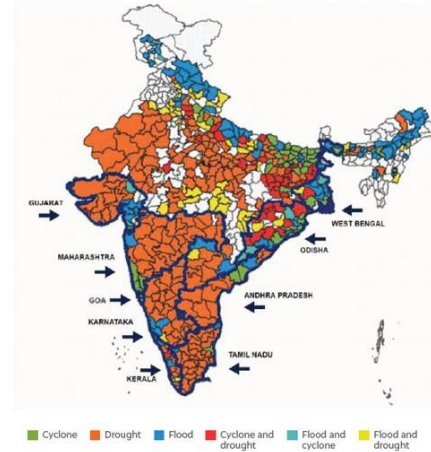
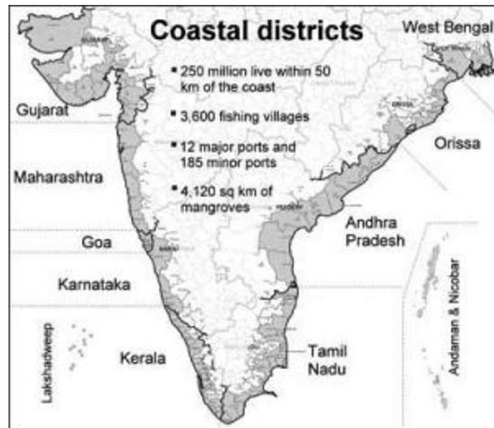


Figure 1  
More than 95 per cent of coastal Indian districts are extreme event hotspots  
Source: Mohanty 2020

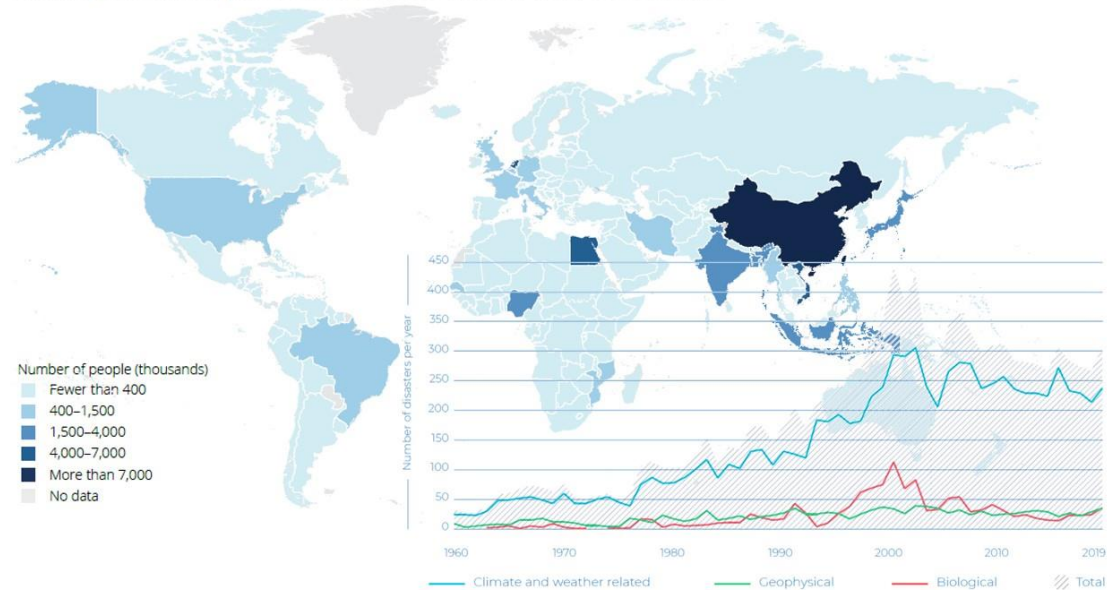
Source - Mohanty, Abinash and Shreya Wadhawan. 2021. *Mapping India's Climate Vulnerability: A District-Level Assessment*. New Delhi: Council on Energy, Environment and Water

## RISKS

4

## Why are we talking about coastal community ?

Absolute population exposed to coastal floods in 2050s under SSP3 scenario



## RISKS

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## How to Develop Resilience ?

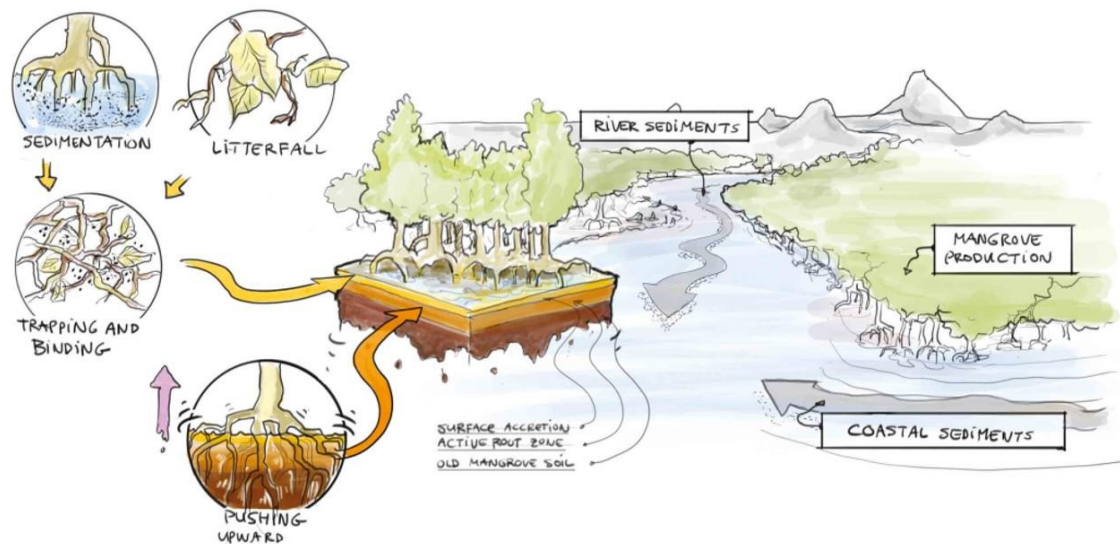
### Integrated coastal management plan concept

- Involves comprehensive planning and managing of human activities to minimize conflict among users;
- A collaborative approach that cannot be forced on anyone;
- A flexible and transparent planning process that respects existing divisions of constitutional and departmental authority,
- Does not abrogate or derogate from any existing Aboriginal or treaty rights.

### Integrated Management Principles

- ecosystem-based management
- sustainable development
- precautionary approach
- conservation
- shared responsibility
- flexibility and inclusiveness

## Integrated Coastal Zone Management Plan 6



## IMPORTANCE OF MANGROOVE

### Integrated Coastal Zone Management (ICZM) Project

#### INTRODUCTION

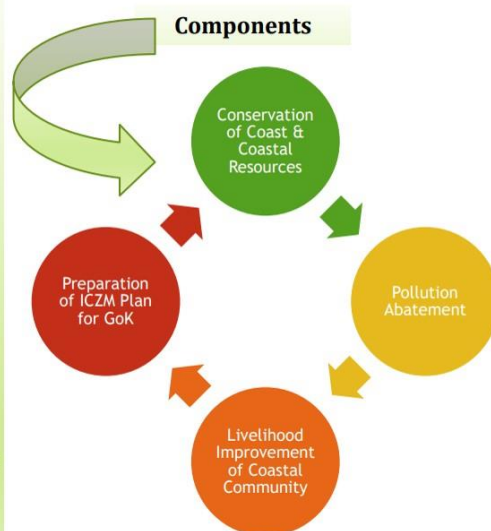
- World Bank & MoEF & CC aided Project
- Rs. 387.17 Cr investment
- Pilot Investment by States
- GEC, GEER foundation, GPCB, MNP&S, JMC, KFC, BISAG- Working as a project executing agency under ICZM project.
- **Gujarat Ecology Commission** is nodal agency/ State Project Management Unit (SPMU) for ICZM Project in Gujarat

#### What is ICZM?

- Integrated coastal zone management (ICZM) is a process for the management of the coast –
  - uses an integrated approach of all aspects of the coastal zone
  - includes geographical, administrative and political boundaries
  - an attempt to achieve sustainability

#### NEED FOR ICZMP

- ICZM should be a solution for the livelihood, economic and ecological security of the coastal areas
- Implementation of the CRZ & other law in a people-friendly manner
- Empowerment of local communities – Security of lives & livelihood



Source – SPMU, Gujarat

## Integrated Coastal Zone Management Plan 7

## Sea turtle conservation



In-situ and Ex-situ Turtle conservation was carried out by Marine National Park & Sanctuary and Kachchh Forest Circle

Okhamadhi hatchery was established by MNP&S, where 327 nests were collected, 33670 eggs collected and 25020 number of baby turtles released.

Mandavi hatchery was established by Kachchh Forest Circle, where 47 nests were collected, 5394 eggs collected and 4325 number of baby turtles released.

Training of 99 field staff and forest officials for handling turtle eggs and its conservation

Source – SPMU, Gujarat

## Integrated Coastal Zone Management Plan 8

- ✓ This was a successful attempt in collaboration with ZSI to bring back the presence of locally extinct branching corals (*Acropora* spp. and *Montipora* spp.) once again in the Gulf of Kachchh after some 10,000 years with heavy sedimentation rate impact (Satyanarayana *et al.* 2016).
- ✓ Reef fishes observed in the coral restoration sites, 17 Families of reef fishes recorded in the coral restoration sites
- ✓ Newly recorded two species, viz., *Carijoa riisei* (Duchassaing & Michelotti, 1860) and *Subergorgia suberosa* (Pallas, 1766) falling under the order Alcyoniidae, family Clavulariidae, and order Gorgonacea Lamouroux, 1816, Family Subergorgiidae Gray, 1859 respectively are described and illustrated from Marine National Park, Gulf of Kachchh (Kumar *et.al* 2014).
- ✓ Protocol development for coral transplantation & large scale transplantation – *Acropora* spp and local species



Source – SPMU, Gujarat

## Integrated Coastal Zone Management Plan 9



- ✓ **16570 ha** Mangrove Plantation through Community- has open a way to one of the first community driven Mangrove Plantation
- ✓ An addition of 1450 hac were then added
- ✓ as per ISFR [2017], approximately 3% of mangrove cover increased in State

**10,000 [Direct] & 35,000/ [Indirect] Member of the EDCs, CBOs and labours who are engaged in the mangrove plantation activities they are benefited directly and whole local community of the particular villages are benefited indirectly. Mangrove plantation activity has earned them more than Rs. 31 crore.**

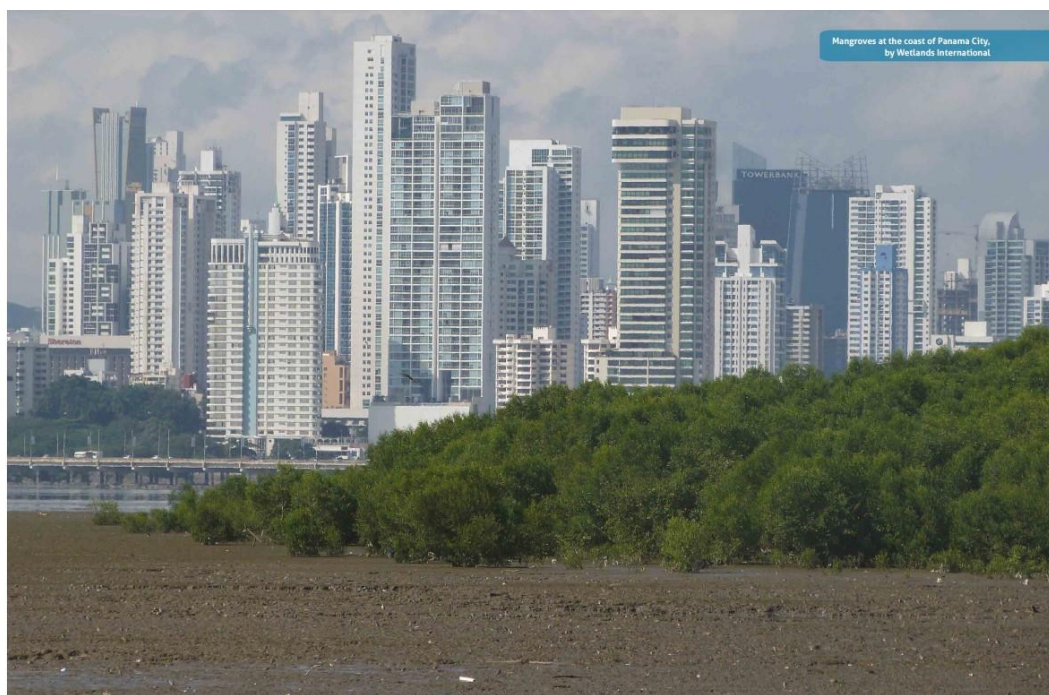
**Approximately 5000 people have worked every day for a period of 10 months, which has earned them more than Rs. 31 crore on daily wages**



Source – SPMU, Gujarat

## EXAMPLE

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Source - Mangroves for coastal defence - Guidelines for coastal managers & policy makers

## EXAMPLE

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Building with nature in Indonesia, By Nanang Sojana

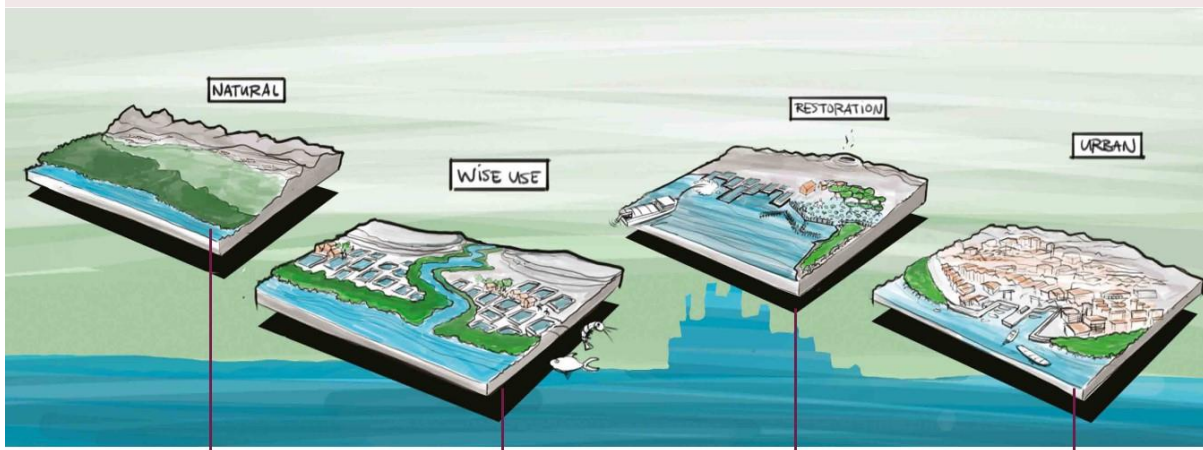
**BOX 4. RESTORING SEVERELY ERODING COASTLINES THROUGH BUILDING WITH NATURE**

Northern Java's coasts suffer from severe erosion. In one decade, some coastal areas have retreated by three kilometres. Development of coastal infrastructure and aquaculture went hand in hand with the removal of protective mangrove forests and the disturbance of sediment flows towards the coast and floodplains. Previous replanting efforts have not been successful, as the sediment balance is currently too disturbed to enable mangroves to survive. To counter this destructive erosion, a "Building with Nature" approach was tested in Timbul Sloko village in Central Java. The approach entails the placement of permeable dams that break the waves and trap sediment thus reclaiming land. Once the land is back, mangroves can recolonize the area and help protect the coastline against erosion. The waves are clearly much lower inside the grid of permeable dams than outside. In some cases, pioneering mangrove trees are already becoming established. In a direct response to these initial tests, the village signed a decree in 2014, demarcating 100 hectares of the recently lost land as protected area, ensuring that, upon recovery, it will not be damaged or destroyed again.

Source - Mangroves for coastal defence - Guidelines for coastal managers & policy makers

# EXAMPLE

# 13



**Natural setting** with no population. mangroves are capable of lowering storm surge height and of dampening the waves on top of the surge within the first few hundreds of meters of mangrove

**Wise use** of mangroves, in rural settings, ensures that a mangrove belt of hundreds of meters wide is maintained and continues to play a critical role in reducing wind or swell waves, thus reducing erosion

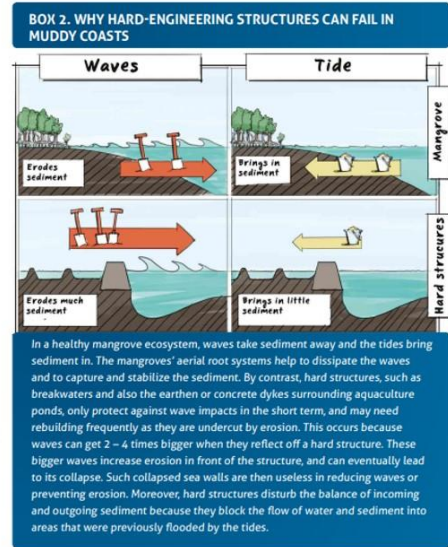
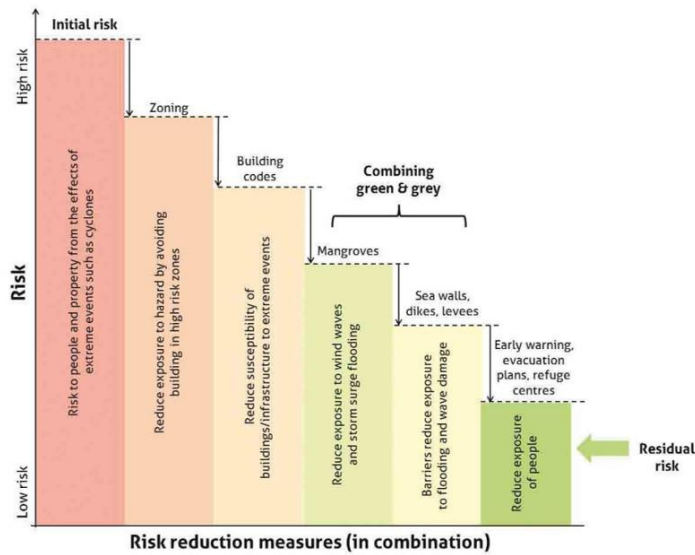
**Restoration** remains an important option in areas where mangroves have been lost – interventions to enhance sediment supplies, or using permeable barriers to reduce erosion, may help mangroves to become re-established

**urban settings**, where space is limited, even small areas of mangroves offer some protection from waves, reducing construction and maintenance costs for hard infrastructure behind them that in those settings are the primary defense

Source - Mangroves for coastal defence - Guidelines for coastal managers & policy makers

# PROTECTING COASTAL ECOSYSTEM

# 14



Source - Mangroves for coastal defence - Guidelines for coastal managers & policy makers

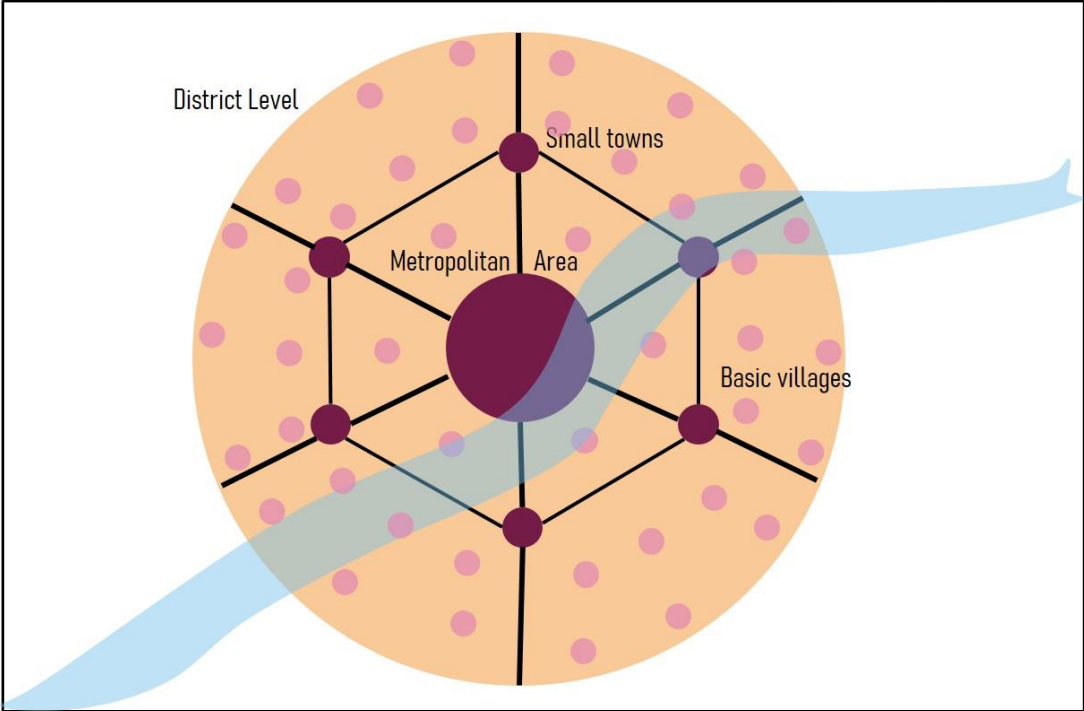
## RISK REDUCTION

15

- Development of coastal areas in line with the natural ecosystem and coastal zone regulations.
- Restoring ecosystem not only protect from disasters but also promote tourism, mitigate climate change effects etc.

## CONCLUSION

Environmental clearance  
from Ministry



Legislative framework for communities

16

**By Mr. Ali Haider**



# Building Coastal Community Resilience

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## Coastal Hazards Context

- ▶ Coastal **populations** dramatically increasing (leading towards more demographic vulnerabilities)
- ▶ **Climate change** is anticipated to increase the coastal hazard threat trends (sea level rise, floods, storm – both intensity & frequency)
- ▶ New problems of “**mega disasters**” emerging
- ▶ Disasters are **undermining years of development** efforts
- ▶ Increase in **anthropogenic** and human induced vulnerabilities

## Resilience

- “the capacity to survive, adapt and recover from a natural disaster.

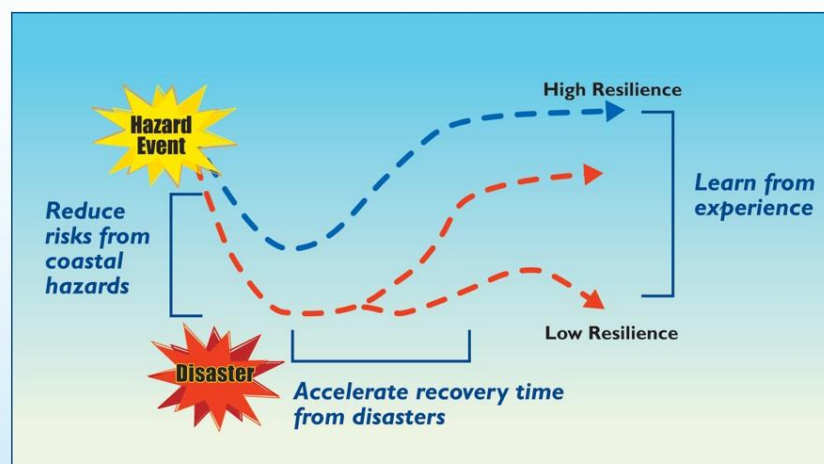
(IFRC, 2004)

- “the potential of a particular configuration of a system to: maintain its structure/function in the face of disturbance, and the ability of the system to re-organize following disturbance-driven change”

(Louis Lebel, 2001)

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 basic structure and functions.

## Goals of coastal community resilience



## Elements of Coastal Community Resilience



## Analysis of Resilient Element in Tamil Nadu

- As per the Vulnerability Atlas of 2006 prepared by Building Materials and Technology Pro- motion Council (BMTPC), India, in Tamil Nadu, out of total 30 districts, 11 fall under multi-hazard zone being affected by earthquake (Zone -III) cyclone (wind velocity on an average of 47 m/s indicating medium level cyclonic events), floods (1215.0% of its total area is flood prone) and land- slides affecting a population of nearly 21,514,396 people (2001 census)
- Study was conducted in 3 coastal districts (Cuddalore, Nagapattinam and Kanyakumari) of Tamil Nadu State, which is situated at the south-eastern extremity of the Indian Peninsula. (S. Guleria and Edward)



## Governance

Refers to availability of some critical facilities like schools, hospitals, roads, bridges, potable water etc.

- Residential colonies, restaurants, small hotels have been constructed on the coastal regulation zone
- Communities live near the coast had their houses as near as 20 m to the coast and also most houses are not made of concrete which cannot withstand the pressures of wave
- The water supply had deteriorated after tsunami due to pollution of ground water and breaking down of water supply pipe line.
- Most villages have inadequate electricity supply and these villages lack permanent multipurpose evacuation centers which can habitat the villagers when their own homes are unsafe during emergencies.



## Coastal Resource Management

Deals with the active management of coastal resources which sustains environmental services and livelihoods and reduces risks from coastal hazards like those of protected areas, conservation areas, management zones, critical habitat (coral reefs, wetlands) protective resources like man- groves etc.

- There were many active groups functioning in the villages comprising of many youth and minority groups, NGOs, churches, volunteer organizations, etc. whose potential and services can be tapped by both the State Government and Local Authorities.
- Knowledge of indigenous groups can be tapped for preserving forestry and their inputs can be valuable for watershed, forestry, fishery and other livelihood management programs.



## Land Use and Structural Design

Effective land use and structural design must complement environmental, economic and community goals to reduce risk from hazards.

- The coastal villages lacked the protection of dense mangrove belt which could minimize the impact of sea waves.
- Similarly bio-shield protective measures were found lacking in all villages.
- The coast line did not have any protective walls, break waters, which could act as necessary cushion during emergency situations



## Society and Economy

This aspect concentrates on the need for communities to be engaged in diverse and environmentally sustainable livelihoods resistant to hazards.

- It was found in the study that majority of the communities were completely dependent on fishing for their sustenance and lack skills and capabilities to shift occupation.
- Every year, the onset of monsoon results in small to medium intensity cyclones, effects the livelihood security of the fishermen which adds to their already low financial condition.



## Risk Knowledge

Deals with aspects of leadership and community members awareness about hazard areas, at-risk population, individuals with special needs and risk information.

- Study revealed that, the villagers had strong panchayat and local community systems but they do not involve much in imparting training or capacity building initiatives for the villagers.
- coastal population is still not well prepared and trained regarding safety and mitigation measures which are of utmost importance with respect to knowledge on risks.



## Warning and Evaluation

- Most of the casualties during the Tsunami event occurred because people were not aware of such a danger and were not well informed which lead of the state of unawareness amongst the community.

## Emergency Response

Establishing mechanisms and networks to respond quickly to coastal disasters and address emergency needs at community level.

- Religious institutions played a crucial role in post disaster relief and psychosocial support.



## Disaster Recovery

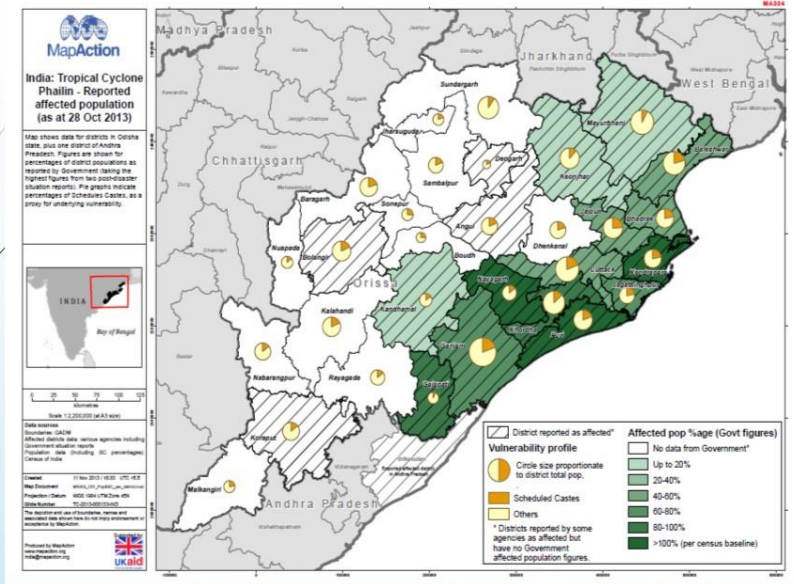
- keeping plans in place prior to hazard events that would accelerate disaster recovery, engage communities in the recovery process and minimize negative environmental, social and economic impacts for emergency supplies, redevelopment areas and coastal setbacks.
- The coastal population is not self reliant during adverse situations and are exclusively dependent on external aid.
- Also, most of the population is illiterate.



## Conclusion

- The increase in sea level rise and climate change can exacerbate the situation in low lying coastal zones.
- Periodic storm surges increased coastal erosion and damage to human settlements because of the removal or damage to natural protective elements like mangroves and dunes.
- As a long term measures, activities such as building people's institution, poverty alleviation programmes, self-help groups, mangrove plantation and developing village knowledge centers can be initiated.
- Specific vulnerabilities and resilience factors of the coastal communities must be addresses with respect to economic benefits, like those of farmers in the saline zone, marine fishers, forestry, and vulnerable ethnic communities.

# Cyclone Phailin and floods,



## Gendered recovery processes

regain income sources

restore assets

rebuild their homes

reinstall drinking water sanitation, menstrual hygiene

gender and social differences

hazard recurrence

impoverishment



## Self recovery initiatives



- outmigration,
- social networks - sharecropping,
- self-built latrines, and
- indebtedness
- limited investments

## Self recovery initiatives



Image 6. 16: Self-initiated Livelihood recovery activities in Puri district (clockwise- petty shops, livestock and poultry rearing, prawn culture and fishing net repairs)



## Self-built latrines



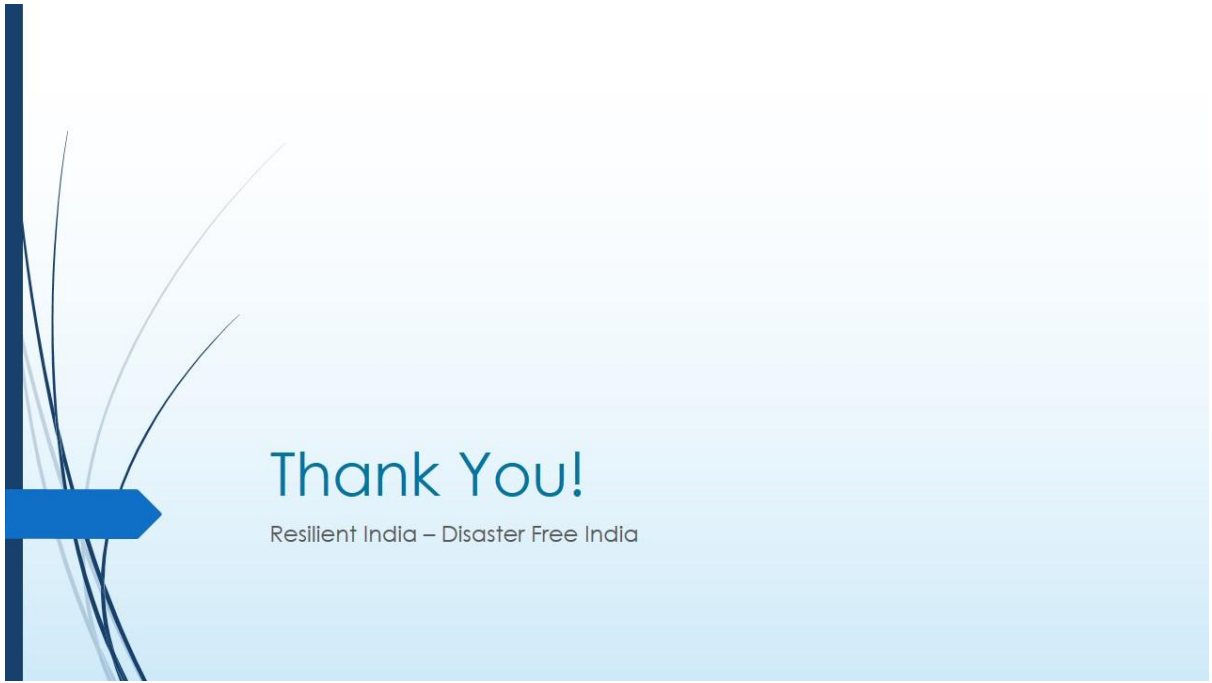


## WASH measures



## WASH measures





# Thank You!

Resilient India – Disaster Free India

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Prime Minister's 10 Point Agenda No. 1 on DRR

75 Azadi Ka Amrit Mahotsav

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Resilient India - Disaster Free India

Webinar on

# BUILDING COASTAL COMMUNITY RESILIENCE AGAINST DISASTERS

30 November 2021  
14:00 - 16:00 Hrs

**PATRON**  
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Executive Director,  
NIDM, MHA, GoI

**CONVENOR**  
Prof Santosh Kumar  
Head, GIDRR and DRR,  
NIDM, MHA, GoI

**SPEAKERS**

**Ms. Sharmishtha Solanki**  
Freelance Consultant,  
Disaster Management

**Mr. Ali Haidar**  
Jr Consultant  
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**Ms. Susan Sukanya**  
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