



# Mainstreaming Disaster Resilience into Infrastructure Projects

Insights from Infrastructure Sectors in India

Finance for Resilient Infrastructure Programme (FRIP)

## Background

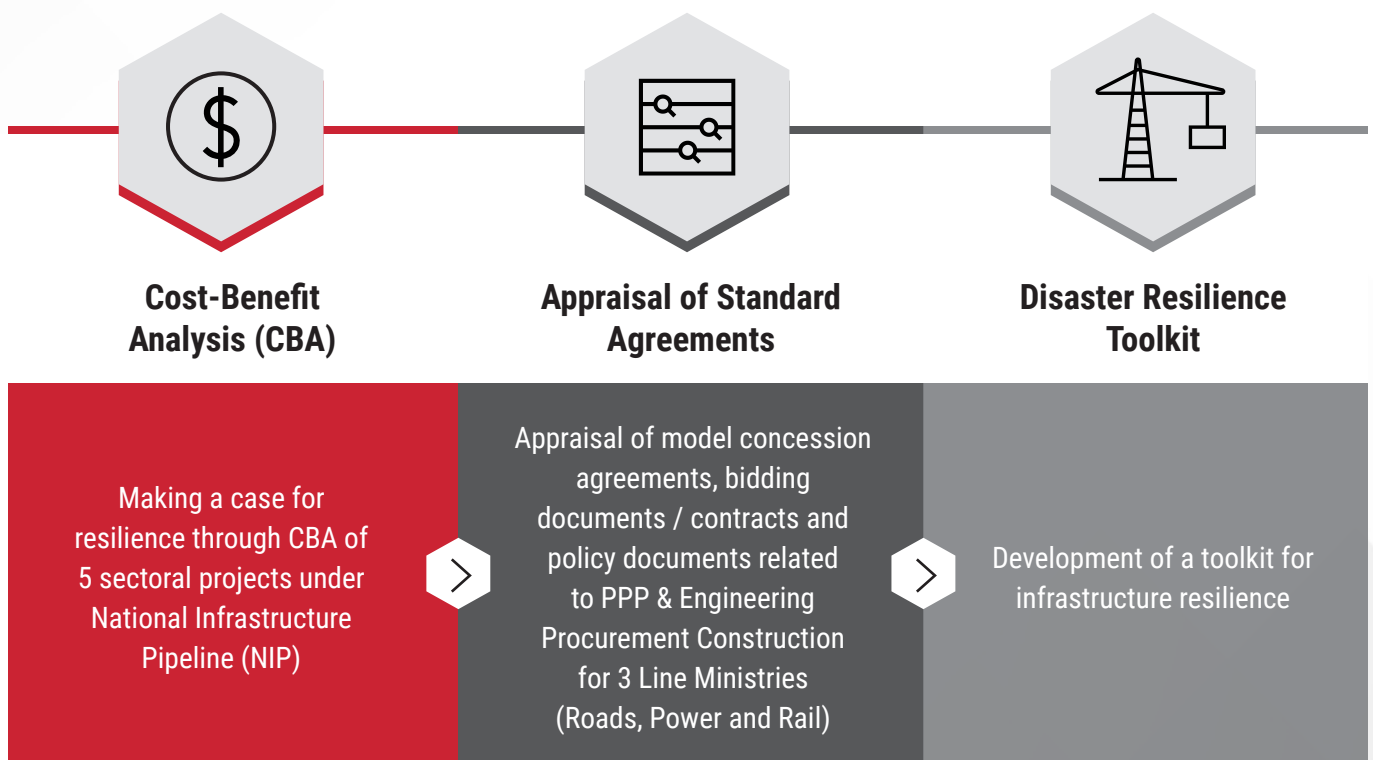
The world is facing more frequent and extreme weather events and natural hazards.

The Coalition for Disaster Resilient Infrastructure's GIRI model estimates the average annual loss (AAL) in India for infrastructure assets, including buildings, which stands at \$ 31.59 billion for the existing climate scenario.

CDRI, in partnership with the Government of India's Department of Economic Affairs (DEA), Ministry of Finance, and other Line Ministries, is supporting projects within India's infrastructure sectors to incorporate disaster and climate resilience considerations.

## Objective

Mainstreaming disaster resilience in infrastructure projects in India.



### Key outcomes envisaged

- Strengthening of sectoral infrastructure resilience
- Reduction in physical damage and financial losses
- Disaster resilient investment decision-making tool
- Allocation of foreseeable disaster risks during procurement phase

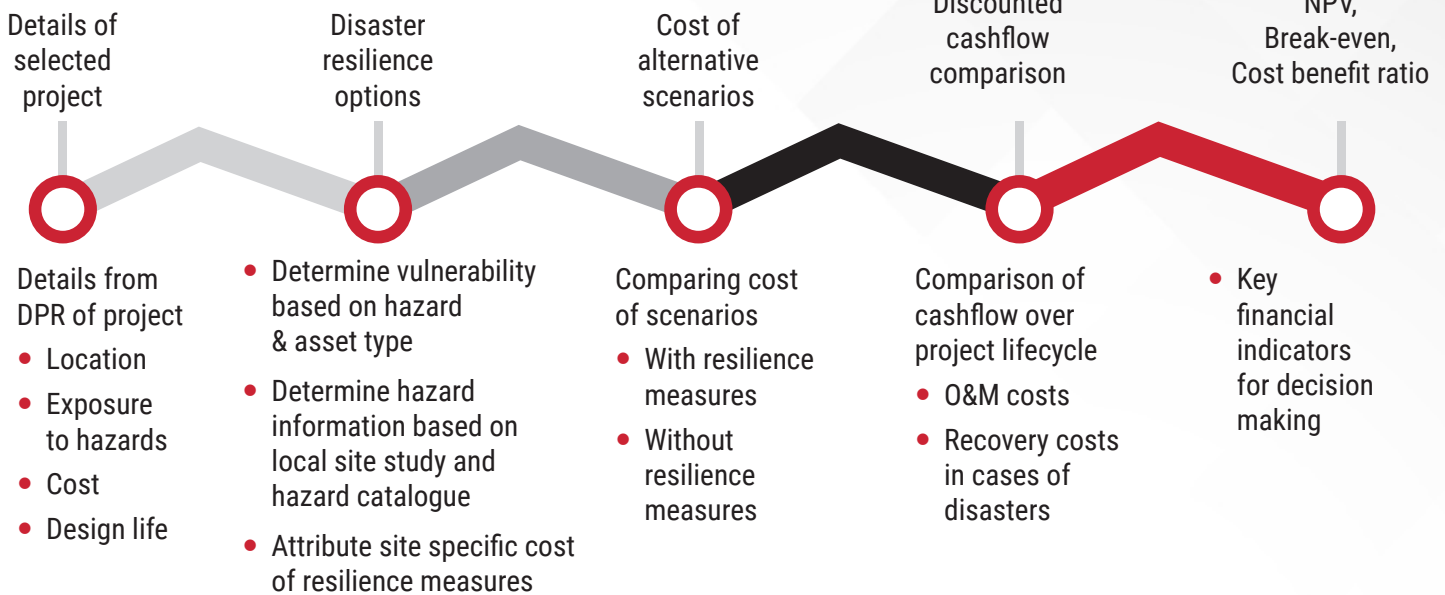
### Applicability

- Line ministries
- Implementing agencies
- Potential bidders
- Financial institutions

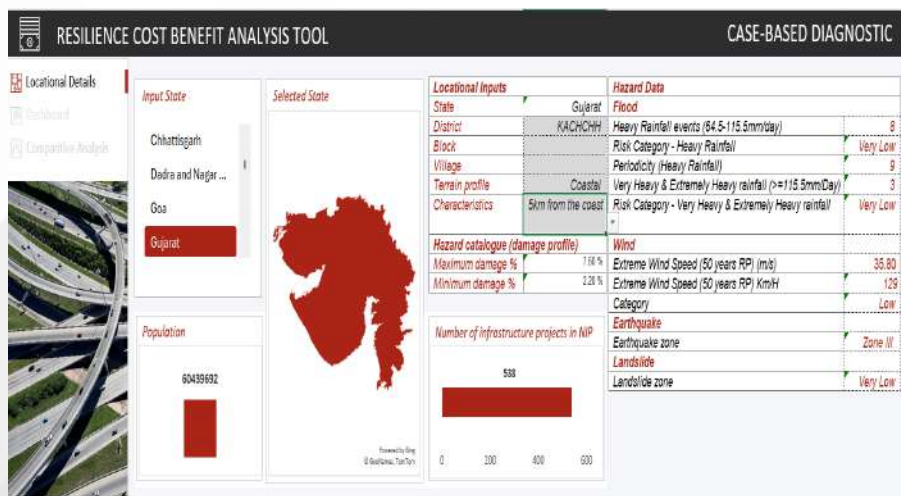
# Resilience Cost-Benefit Analysis tool

## Making a case for resilience at project scale through CBA tool

### Method



### Illustrative Dashboards



### CBA tool – Dashboard

It showcases key financial indicators to determine the incorporation of resilience measures

- NPV of all future cashflows
- Absolute savings on recovery/reconstruction needs for incorporation of resilience measures
- Break-even point for additional investment
- Cost-benefit ratio

## Incorporating resilience in policy and contractual considerations

### Focus area



Appraisal of standard contractual documents for resilience gaps

- Model concession agreements
- Procurement guidelines
- Service agreements



Identify gaps and provide suggestions in indicative sections for

- Incorporating **risk-sharing in model agreements**
- Defining force majeure clauses for EPC and PPP modes of implementations

### Standard documents to be studied



**Road sector:** Revised standard EPC agreement of national highways and centrally-sponsored road works proposed to be implemented on EPC mode



**Railway sector:** Standard EPC tender document for single stage two packet system



**Power sector:** Revised guidelines and standard bidding documents for procurement ISTS through TCB process

## Preparing a disaster resilience toolkit to guide incorporation of resilience measures

Disaster resilience toolkit	List of resilience measures	Guidance document for evaluation and project development	
Content	List of resilience measures to be included in SBD's/MCA's	Incorporating disaster risk considerations in project identification and appraisal	To guide preparation of project proposals that include disaster resilience goals
1. Owner	Line ministries and DEA	Line ministries and DEA	DEA, line ministries and potential bidders
2. User	Line ministries, DEA, implementing agencies and potential bidders	Line ministries	Potential bidders
3. Applicability	Project and bid evaluation; project funding	Navigate the toolkit locations in standard documents to incorporate resilience	Guidelines on preparing disaster resilience proposal
4. Outcome	Disaster risk management; resilient projects	Disaster resilient standard agreements with defined responsibility sharing	<ul style="list-style-type: none"> <li>• Winning bids achieving resilience goals in infrastructure projects</li> <li>• Increased eligibility for funding</li> </ul>

### Content of the Toolkit

#### Part 1: List of resilience measures for bidding and contractual documents

Suggested modifications into standard documents with focus on clauses related to

- Maintenance
- Defect liability
- Force majeure
- User safety
- Insurance & more

#### Part 2: List of design options for asset resilience

Structural / Engineering design options for the three infrastructure sectors based on

- National &
- International best practices

#### Part 3: Project identification and appraisal guidance document for line ministries

1. Resilience check list for line ministries
2. Applicability
3. User manual for RCBA tool

#### Part 4: Project proposal preparation guidance document for potential bidders

1. Resilience check list for potential bidders
2. Applicability
3. User manual for RCBA tool

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