



ROADMAP FOR DISASTER RISK REDUCTION
2015-2030
GOVERNMENT OF BIHAR

“Rajya ke khajane par aapda-prabhaviton ka pehla haq hai...”original Hindi script
(The disaster affected people have the first right on the state’s treasury)

- Shri Nitish Kumar, Hon’ble Chief Minister, Bihar in his inaugural address of the First Bihar Conference on Disaster Risk Reduction (BCDRR), 13th- 14th May 2015.

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Glossary:

Disaster Risk Reduction (DRR) continues to be an evolving field. As disaster risks evolve, and DRR practitioners undergo cycles of learning and reflection, different concepts take prominence to understand and act on disaster risk reduction. This section provides a glossary of how terms are understood and used by this Roadmap.

Disaster: The Disaster Management Act 2005 defines disaster as “a catastrophe, mishap, calamity or grave occurrence in any area, arising from natural or human-made causes, or by accident or negligence which results in substantial loss of life or human suffering or damage to, and destruction of, property, to damage to, and degradation of, environment, and is of such a nature or magnitude as to be beyond the coping capacity of the community of the affected area”.

Disaster affected persons: Disaster affected persons are defined as those who have experienced either or all of the following due to disaster events -

(i) suffered injury, illness or trauma,

(ii) have lost members of family and / or livestock,

(iii) damage to house,

(iv) economic loss {for e.g. damage to property, agriculture (crop, seeds, inputs, land, stored harvest), animal husbandry (livestock-cattle, goats, poultry, sheds and related inputs), fishery, employment (daily-wage labour, sharecropping), and enterprises (small producers and vendors, cottage industries, small, medium and large industries), and

(v) access to basic services (like water, sanitation, health, food and nutrition, education, and protection) is disrupted.

Disaster Management: continuous and integrated process of planning, organising, coordinating, and implementing measures which are necessary or expedient for dealing with disasters once they are imminent or have occurred, including:

- Preparedness to deal with any disaster
- Prompt response to any disaster, including assessing the severity of situation
- Evacuation, rescue and relief
- Rehabilitation and reconstruction

Disaster Risk Reduction: the policy objective of anticipating future disaster risk, reducing existing exposure, vulnerability or hazard, and strengthening resilience.

Infrastructure Continuity Plan: plans that identify how the functions / services of critical infrastructure will operate immediately following a disaster (response phase) and how it expects

to regain functionality or return to 'functioning as usual' in the quickest possible time afterwards (recovery phase) and evolve with enhanced level of resilience than before over a period of time.

Resilience: the capacity of an individual, household, community or system to anticipate, absorb (through better preparedness foreffective response and mitigation) and recover from hazards and other shocks and stresses without compromising its existence and functioning in the long term.

Service Delivery Continuity Plan: plans that identify how the basic services will operate uninterrupted immediately following a disaster (response phase) and how it expects to regain functionality or return to 'functioning as usual' in the quickest possible time afterwards (recovery phase) and evolve with enhanced level of resilience than before over a period of time.

Vulnerable Groups: Vulnerability is understood here as conditions arising from social, physical, economic and environmental factors that increase the susceptibility of individuals or communities to the impact of hazards. Children, women, older persons, pregnant and lactating mothers, People with Disabilities (PWD), people living with life threatening diseases, People Living with HIV and AIDS (PLHA), SC/ST, LGBT, and Minorities (socio-economic and religious) have been recognised as vulnerable groups in the Roadmap with the acknowledgement that vulnerable groups also possess capacities that must be considered while designing and implementing DRR actions.



Chapter 1

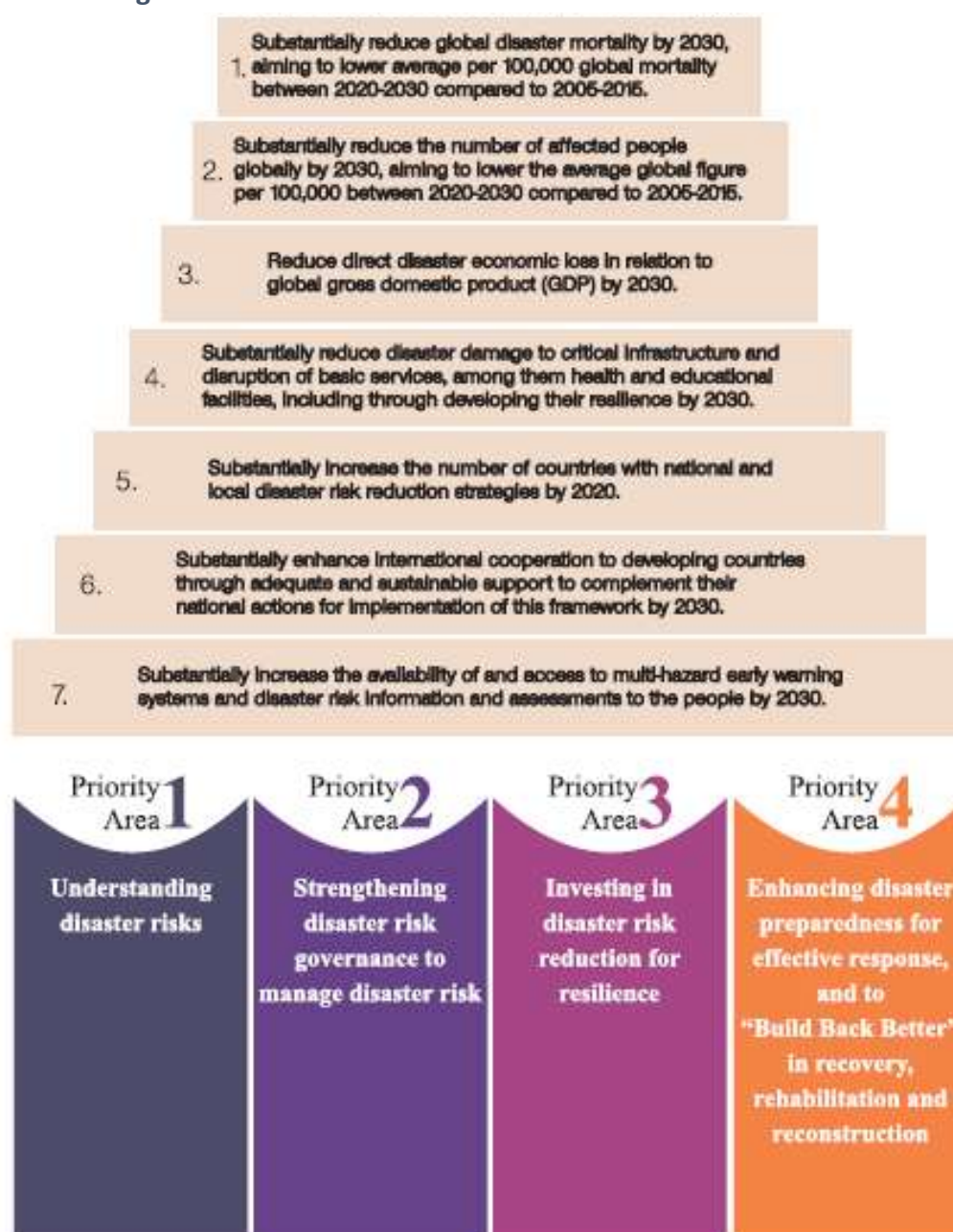
INTRODUCTION

1. Introduction

From Sendai to Patna

2015 emerged as a landmark year for ongoing efforts towards disaster risk reduction. The 3rd World Conference on Disaster Risk Reduction (3RDWCDRR) was held in March, 2015 in Sendai, Japan. The conference was attended by representatives from 187 countries who deliberated on the post-2015 agenda for disaster risk reduction and adopted the Sendai Framework for Disaster Risk Reduction (SFDRR)ⁱ. Building upon the experiences of implementing the Hyogo Framework for Action (2005), the International Strategy for Disaster Reduction (1999), the Yokohama Strategy for a Safer World (1994), and the International Framework for Action for the International Decade for Natural Disaster Reduction (1989), the SFDRR is a comprehensive 15 year (2015-30) framework with 7 global targets and 4 priority areas.

Figure 1: SEVEN TARGETS AND 4 PRIORITY AREAS OF SFDRR



Drawing from lessons since 1994, the SFDRR stresses the need for *“enhanced work to reduce exposure and vulnerability, thus preventing the creation of new disaster risks, and accountability for disaster risk creation are needed at all levels.”* It exhorts that *“more dedicated action needs to be focused on tackling underlying disaster risk drivers, such as the consequences of poverty and inequality, climate change and variability, unplanned and rapid urbanization, poor land management and compounding factors such as demographic change, weak institutional arrangements, non-risk-informed policies, lack of regulation and incentives for private disaster risk reduction investment, complex supply chains, limited availability of technology”*.

In light of the experiences, insights and inspiration from 3RDWCDRR, the Government of Bihar (GoB) decided to organise a conference in Bihar to formulate a **DRR Roadmap (F.Y. 2015-16 to F.Y. 2030-31) for the State**. Accordingly, the first Bihar Conference on Disaster Risk Reduction (1stBCDRR) was held on 13th-14th May 2015 in Patna, Bihar. This was the first organised attempt to prepare a DRR Roadmap for an Indian State after the 3RD WCDRR of March 2015 held in Sendai. BCDRR was conceptualized and organised around 18 themes drawn from the Sendai Framework for Disaster Risk Reduction, wherein SFDRR’s 4 Priority Areas and recommended action points were interpreted and contextualised¹ in accordance with local realities and priorities of Bihar. This contextualisation process accounted for (1) the progress already made towards disaster risk reduction in the State, (2) vulnerability of the State to multi hazards,(3) the disaster risk reduction needs emerging from differential risks State faces from multi hazardous situations, and (3) the priorities and expressed aspirations in this regard by the people and Government of Bihar (GoB).

The 1stBCDRR was inaugurated by Shri Nitish Kumar, Hon’ble Chief Minister of Bihar and saw the presence of senior national and State level officials, present and former NDMA members, delegates from GSDMA and UPSDMA, UN agencies, civil society representatives from across the State, District Magistrates of most vulnerable districts, district level officials dealing with disasters, PRI representatives, private sector representatives, national and state level media houses, and community members including children from disaster-prone areas of Bihar. At this conference,

- The Hon’ble Chief Minister released a ‘Status Paper’ of actions and achievements in disaster management in Bihar between 2005 and 2015.
- 84 panellists and 550 participants discussed the issues and specific actions that needed to inform Bihar’s DRR roadmap in 17 thematic sessions. 10 agencies (both government and civil society) from Bihar anchored these sessions and produced 2-pagers for each session to inform the roadmap development process.
- 18 papers were submitted on conference themes and compiled as compendium of papers.

¹For more details, see GoB (2015) Background Paper: Bihar Conference on Disaster Risk Reduction.



- Mrs Lesi Singh, the then Hon'ble Minister, Disaster Management Department, GoB released the 'Patna Declaration' at the end of the BCDRR, which has been presented below:



Patna Declaration – 14th May 2015

As endorsed by the delegates at the 1st Bihar Conference on Disaster Risk Reduction (BCDRR), Patna (13-14 May, 2015), the Government of Bihar adopts the Bihar Disaster Risk Reduction Framework (BDRRF) to achieve the **vision of a Disaster Resilient Bihar**. This framework for the period 2015 to 2030 comprises the following 10 commitments:

1. Disaster Risk Reduction will be institutionalised by launching a state-wide campaign in 2015 through collaborative partnerships by involving all stakeholders.
2. Disaster prone communities and regions will be guaranteed inalienable right to the state's resources for safety, prompt relief and protection.
3. Disaster Risk Reduction will be mainstreamed across Government of Bihar's planning processes addressing the requirements for strengthening preparedness, emergency response, rehabilitation, reconstruction and recovery.
4. All development planning initiatives will factor in risk avoidance, risk transfer, risk sharing and residual risk management.
5. Panchayati Raj Institutions (PRIs) and Urban Local Bodies (ULBs) will be empowered with financial and regulatory roles for Disaster Risk Reduction.
6. Community skills, knowledge and capacities will inform decision making about Disaster Risk Reduction at all levels through inclusive and participatory processes, with special emphasis on context-specific differential needs of social groups.
7. Resilience of critical infrastructure and delivery of essential services will be ensured, including restoration of functionality and continuity, in case of disruptions.
8. Mechanisms for gathering, analysing and disseminating targeted early warning information to key stakeholders will be established in line with the national framework.

9. Lives, livestock and livelihoods will be protected from disruption due to natural and human-induced disasters and extreme events.
10. Requisite financial and human resources will be committed for fulfilling the vision of Disaster Resilient Bihar through the creation of a corpus fund.

The Bihar Disaster Risk Reduction Framework will be operationalized by the Government of Bihar by formulating a DRR Roadmap. The framework will be the guiding principle for the DRR Roadmap, which will be implemented by the state's administrative machinery, upholding multi-stakeholder engagements (including media, civil society, private sector, and academia), partnerships, accountability, transparency and establishment of a robust monitoring system. This process will be strengthened with adequate investments in capacity building, knowledge management and public awareness.

Post-BCDRR: Roadmap Development Process

The deliberations and discussions held in the 1stBCDRR was one of the primary sources of input for the roadmap development process. In addition to the deliberations and discussions at the conference, the following processes informed the roadmap development (see *Annexure 1*)

1. A Roadmap Drafting Committee comprising members from the DMD, BSDMA, UN Agencies, and civil society representatives was constituted by the DMD in May 2015.
2. Multiple sittings (23) of the drafting committee to deliberate and discuss the nature, structure and components of the Roadmap.
3. 54 experts were invited to write papers on BCDRR themes with recommendations for actions in the roadmap.
4. Civil society organisations in Bihar from 21 districts, including members of the Disaster Risk Reduction Network and Mission DRR, were invited to contribute suggestions to the roadmap
5. Suggestions were sought from the Solutions Exchange Community, the BCDRR groups of panellists, domain experts, and citizens of Bihar.
6. Relevant literature and documents were reviewed, including but not limited to, the state's existing key policy documents like the Disaster Management Act (2005), Bihar State Disaster Management Policy (2007), Mission *Manav Vikas*, Agriculture Roadmap (2012-17), Health Roadmap, Bihar State Action Plan on Climate Change, SOPs on managing various disasters, Guidelines & directives issued by DMD from time to time, Status Paper on Disaster Management

in Bihar (2005-2015) as well as the HFA and SFDRR and other² policy documents on DRR. The State Disaster Management Plan was reviewed for ensuring coherence and linkages with the recommended actions in both the documents.

7. The contributions from multiple sources were consolidated into the first draft of the Roadmap, which was then reviewed through the following processes:
 - a. Shared with all 84 panellists of BCDRR, 27 pertinent departments of GoB, all Divisional Commissioner (9) offices and all District Magistrates (38) offices of Bihar, UN agencies and civil society organizations working in Bihar for feedback and suggestions.
 - b. Discussed in an intensive review meeting held in Patna in September 2015 with 40 participants from pertinent departments of GoB, BSDMA and local civil society experts.
 - c. Discussed in a review meeting at BSDMA in October 2015.
 - d. A one-day workshop was held in November 2015 with representatives from 27 pertinent departments of GoB for budget estimation followed by one-on-one consultations.

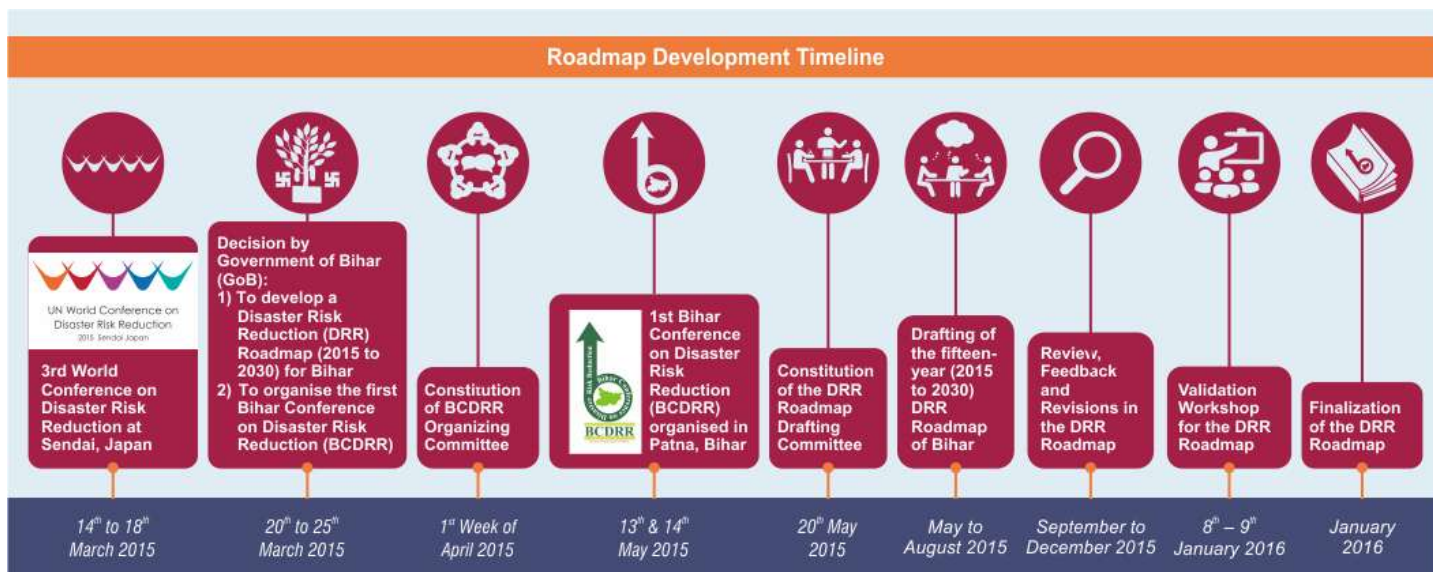
All these reviews and contributions were consolidated into the second draft of the Roadmap which was then reviewed and validated in a two-day validation workshop in January 2016, which has been detailed below.

8. A two-day workshop (8th – 9th January 2016) was organized in Patna to review and validate the DRR Roadmap. This workshop was inaugurated by Shri Nitish Kumar, Hon'ble Chief Minister of Bihar, with Prof. Chandrashekhar, Hon'ble Minister, Disaster Management Department, GoB as the chief guest. 125 experts, including 84 panellists from the first BCDRR - present and former NDMA members, senior bureaucrats, representatives pertinent departments of GoB, BSDMA, UN agencies (UNICEF, UNDP, UNFPA, and UN-Habitat), ADPC and other international NGOs, and local civil society organizations working in Bihar. Mix of plenary and parallel technical sessions were held over two days to validate the DRR Roadmap. Specific suggestions were received from experts in the form of track changes including video documentation of the workshop proceedings.

The inputs received from experts were duly considered by the drafting committee and a revised draft was prepared, the revised draft was shared with the key departments and other stakeholders and, thus, the final Roadmap document has taken shape.

²See Annex 1 for details.

Following visual depicts the timeline of the roadmap development process:





Chapter 2

EVOLUTION OF DISASTER MANAGEMENT LANDSCAPE IN BIHAR

2. Evolution of Disaster Management Landscape in Bihar

The disaster management landscape in Bihar has evolved considerably since the early 2000s in line with national and State level policy commitments, socio-political changes in the State as well as experiences gained in the process of managing small and large scale disasters affecting the State.

The year 2004 appears as a clear marker in the state's disaster management history in which state experienced one of the worst floods affecting 20 districts and 212.99 Lakh people followed by severe floods in 2007 affecting 22 districts and 244.42 Lakh people. This was followed immediately by a breach in the embankment at Kusaha (Nepal) on the Kosi river in 2008 when 33.29 Lakh people across 5 districts were affected causing vast damage to infrastructure and loss of lives and property, prompting the then Prime Minister of India, Shri Manmohan Singh to term it as a 'National Tragedy'. These disasters spurred a number of actions towards institution building and system strengthening for disaster management in Bihar. Sustained political will to combat disasters led to strengthening and renaming of the then Department of Relief and Rehabilitation into Department of Disaster Management (18th March, 2004), adoption of the National Disaster Management Act in 2005, and establishment of institutions like Bihar State Disaster Management Authority (BSDMA, vide notification no. 3449 dated 16.11.2007), District Disaster Management Authorities (DDMA, vide notification no. 1502 dated 03.06.2008), State Executive Committee (SEC, vide notification no. 1597 dated 25.06.2008), State Disaster Response Force (SDRF, vide notification no. 698 dated 16.03.2010) with clear mandates for disaster management. Apart from these initiatives, the Government of Bihar also persuaded the central government to locate one battalion of the National Disaster Response Force (NDRF) in Bihar for which 75 acres land (free of cost) was provided.

Lessons from the large-scale floods in 2004 triggered the formation of the Bihar Inter Agency Group³ (B-IAG) by the non-State agencies for strengthening coordinated responses to disasters. Also, the post-2004 years witnessed initiation of community-based disaster risk reduction (CBDRR) programmes by civil society organisations, which got a further impetus after the 2008 breach-induced floods. Similarly, the Standard Operating Procedures (SOPs) on Flood disaster/ Flood Control, Drought, Fire, Drinking Water Crisis, Fire Safety in Hospitals, and Schemes such as Bihar *Shatabdi Anna Kalash Yojana*, and the Bihar Scheme for Assistance to Farmers in Farm Distress were developed in the State. These developments were spurred by lessons learnt from the recurrent floods and fire disasters in the state, irregular/ erratic monsoon behaviour and consequent drinking water crisis, severity of winter witnessed due to climate change conditions, fire in AMRI Hospital in Kolkata, unfortunate incidents of hunger and the first farmer suicide in the State. Apart from these

³The Bihar Inter Agency Group: B-IAG, comprising civil society organizations and UN agencies, was formed in 2004 to better coordinate disaster response amongst member organizations as well as work along with Government of Bihar in effective disaster response.

initiatives the State learnt a bitter lesson from the stampede during the *Chhath* festival in 2012 and *Dussehra* celebrations in 2014 in Patna, which resulted into loss of precious human lives. As a consequence, the district and police administrations of several districts in Bihar have come out with meticulous SOPs for Crowd Management where large congregation of people on various festive occasions takes place. Also, plans like the Agriculture Roadmap, Health Roadmap, Mission *Manav Vikas*, Treatment Protocol for Acute Encephalitis Syndrome (AES) and the State Action Plan for Climate Change (SAPCC) guide action, inter- alia, towards addressing underlying disaster and climate change risks in the State. SDMP was prepared through an intensive participatory process and approved by the BSDMA on 14th March 2014. The formulation of DDMPs for all 38 districts of Bihar on the pattern of the ‘Madhubani Model’ has been entrusted to the BSDMA by the DMD. DDMPs are being prepared through a very intense participatory process and it is expected that the DDMPs will be finalised and approved in the calendar year 2016 itself.

The learning orientation and responsiveness of the disaster management system in Bihar becomes apparent upon an analysis of this progression (see, Figure 1 below). The Table 1 below provides a snapshot⁴ of the DRR Initiatives and Achievements in the state.

Table 1: DRR Initiatives and Achievements in Bihar

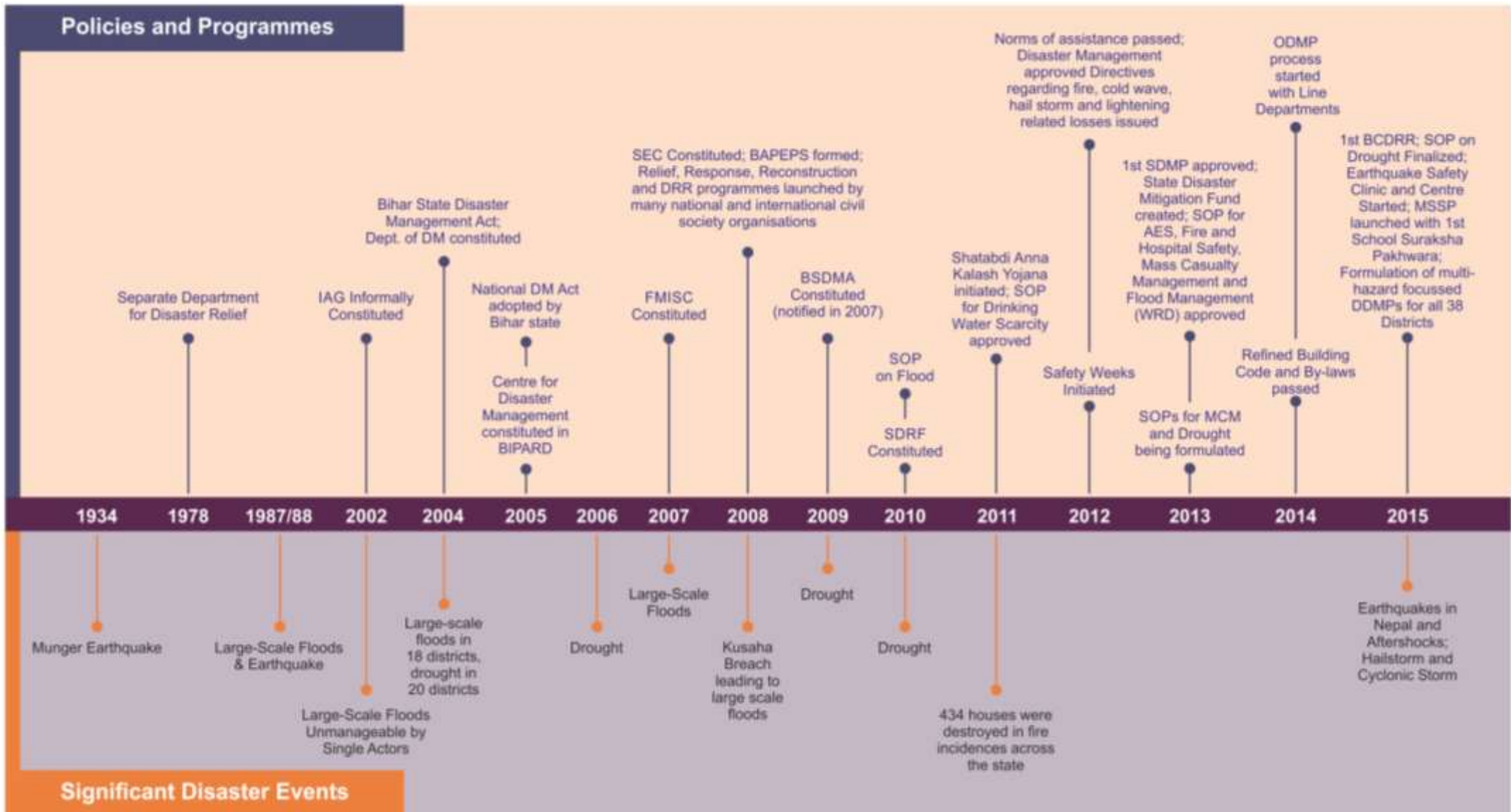
DRR Initiatives and Achievements in Bihar till 2015	
Policies	<ul style="list-style-type: none"> • Kosi Disaster: Rehabilitation and Reconstruction Policy • Bihar State Disaster Management Policy (2007) • Agricultural Roadmap • Bihar State Action Plan on Climate Change
Institutions	<ul style="list-style-type: none"> • Disaster Management Department (DMD) • Bihar State Disaster Management Authority (BSDMA) • Crisis Management Group (CMG) • State Executive Committee (SEC) • Bihar Institute for Public Administration and Rural Development (BIPARD) • National Disaster Response Force (NDRF) • State Disaster Response Force (SDRF) • District Disaster Management Authorities (DDMAs) • Flood Management Information System Centre (FMISC) • Bihar <i>Aapda Punarvas Evam Punarnirman</i> Society (BAPEPS) • Bihar Inter Agency Group (BIAG)
Plans, SOPs and Financial Management	<ul style="list-style-type: none"> • State Disaster Management Plan (SDMP) • State Disaster Response Fund • State Disaster Mitigation Fund • Building code and Bye-Laws

⁴For details about the initiatives and achievements in Disaster Management in Bihar, please see GoB (2015) *Disaster Management in Bihar: Status Paper 2005-15*, released during the 1st Bihar Conference on Disaster Risk Reduction.

	<ul style="list-style-type: none"> • Standard Operating Procedures (SOPs) for FloodDisasterManagement, Fire, Drought, Drinking Water Crisis, Fire safety in the Hospitals • Treatment Protocol for AES • Directives/ Guidelines • District Disaster Management Plans (DDMP) (<i>in formulation stage</i>) • Departmental DM Plans/ Office Disaster Management Plans (<i>in formulation stage</i>)
Infrastructure, materials and equipment	<ul style="list-style-type: none"> • State Emergency Operations Centre (SEOC) • District Emergency Operation Centres (DEOCs) • District-level Disaster Management Warehouses • Communications and transportation equipment • Search and rescue equipment • SDRF base at Bihta with search and rescue equipment • NDRF base at Bihta with search and rescue equipment • Flood Shelters
Capacity Building	<ul style="list-style-type: none"> • Search and Rescue • Community Training to combat disasters • Training of divers • Training of youth belonging to weaker sections • Training of community living in Diara areas • Building bye-laws for Safe Construction in urban areas • Mock Drills for earthquake safety in the Schools, Secretariat and villages • School Safety Programme • Advance trauma and life support through QMRT • Training of Engineers, Architects and Masons for Earthquake resistant construction • Rapid Visual Screening of Schools • Training of BAS & BPS and other officers
Public Awareness and Education	<ul style="list-style-type: none"> • Organization of Hazard-specific Safety Weeks (Flood, Earthquake, Fire, Road Safety) • School Safety Fortnight and Day • Bihar Diwas • Development and dissemination of IEC Materials • DM related Exhibitions
Risk Assessments	<ul style="list-style-type: none"> • Flood Hazard Atlas • Flood Management Information System • Risk Informed Development Planning – System (RIDP-S)
DRR Programs and Schemes	<ul style="list-style-type: none"> • Kosi Flood Recovery Project • School Safety Programmes • Community Based Disaster Risk Reduction Programmes • <i>Shatabdi Anna Kalash Yojana</i> (Scheme) • Bihar Scheme for Assistance to Farmers in Farm Distress

Even as efforts are ongoing towards capacity building, strengthening the functioning of district level institutions like the District Disaster Management Authorities or public awareness campaigns, there is an increasing realisation of the need to invest more in disaster risk reduction. Incidents like the recent earthquake in Nepal (April, 2015), with its impact in the state of Bihar, have further reinforced the need for risk-informed development planning; a commitment that was also made at the Third World Conference on Disaster Risk Reduction in Sendai in March 2015.

Figure 2: EVOLUTION OF DISASTER MANAGEMENT IN BIHAR





Chapter 3

DISASTER RISK PROFILE OF BIHAR: A SNAPSHOT

3. Disaster Risk Profile of Bihar: A Snapshot

Nature of disaster risks

Disaster risks in Bihar emanate from the interplay of multiple contributing factors. The state is prone to natural hazards including floods, earthquakes, drought, cyclonic storms, fire, hailstorms, lightning, heat wave, and cold wave (see maps below).

The prevalence, frequency and severity of these hazards vary across the 38 districts⁵.

Out of these 38 districts, 28 districts are flood prone with major flood events occurring in 2004, 2007, 2011, 2013, and a breach-induced flooding in 2008. Areas typically not experiencing floods hitherto in the state have also started experiencing occasional floods especially in areas lying in southern Bihar. A unique paradox is witnessed in Bihar wherein flood and drought events occur in the same year (2013) and sometimes in the same district. Though districts lying on the south of Ganges are considered drought prone, of late the incidence of drought has even spread to North Bihar as evidenced from drought being declared in 26 districts in 2009, all 38 districts

in 2010 and 33 districts in 2013. Further, the years 2012, 2014 and 2015 were no better than the drought years because Bihar experienced irregular and erratic rainfall during these years. In March 2015, extensive crop damage was caused due to unseasonal rainfall and hailstorm.

As regards earthquake, 8 districts fall in seismic zone V of which 2 districts (Madhubani and Supaul) fall entirely in seismic zone V; 30 districts fall in seismic zone IV and seismic zone III, with most districts falling under multiple seismic zones⁶. In the year 1934, 1988 and 2015 major earthquake events have occurred in Bihar resulting in severe destruction and loss of lives and property. Intermittent tremors are experienced in the northern part of the State with intensity and frequency of the same increasing since 2013. During the Nepal earthquakes of April-May 2015, Bihar experienced three major shocks and many tremors during the months of April and May 2015 resulting in 59 deaths and economic damage occurring mainly in rural parts of northern-Bihar.

List of Notified Disasters

The **Ministry of Home Affairs**, Government of India (GoI) has notified the following list of '**natural calamities**' - avalanche, cloud burst, cold wave, cyclone, drought, earthquake, fire, flood, hailstorm, landslide, tsunami, and pest-attack. The 12th Finance Commission recommended that 'man-made' disasters including chemical and industrial, as also air/railway accidents, may continue to be taken care of by the respective ministries and left out of the Disaster Relief Funds.

The 14th Finance Commission recognised the need for flexibility in regard to state-specific disasters, and recommended that up to 10 per cent of the funds available under the State Disaster Relief Fund (SDRF) can be used by a State for occurrences which it considers to be 'disasters' within its local context and which are not in the notified list of disasters of the Ministry of Home Affairs. In light of this, the Government of Bihar (GoB) has notified (vide notification no.1418 dated 17.04.2015) the following as **state specific local disasters**:

Lightning, Heat Wave, Excess Rainfall, Unseasonal Heavy Rain, Boat Tragedies, Drowning (rivers, ponds and ditches), Human Induced Group Accidents such as Road Accidents, Airplane Accidents, Rail Accidents, and Gas Leakage.

⁵See for example, the multi-hazard map of the state: Department of Disaster Management, Government of Bihar, <http://disastermgmt.bih.nic.in/Map/Maps.htm>

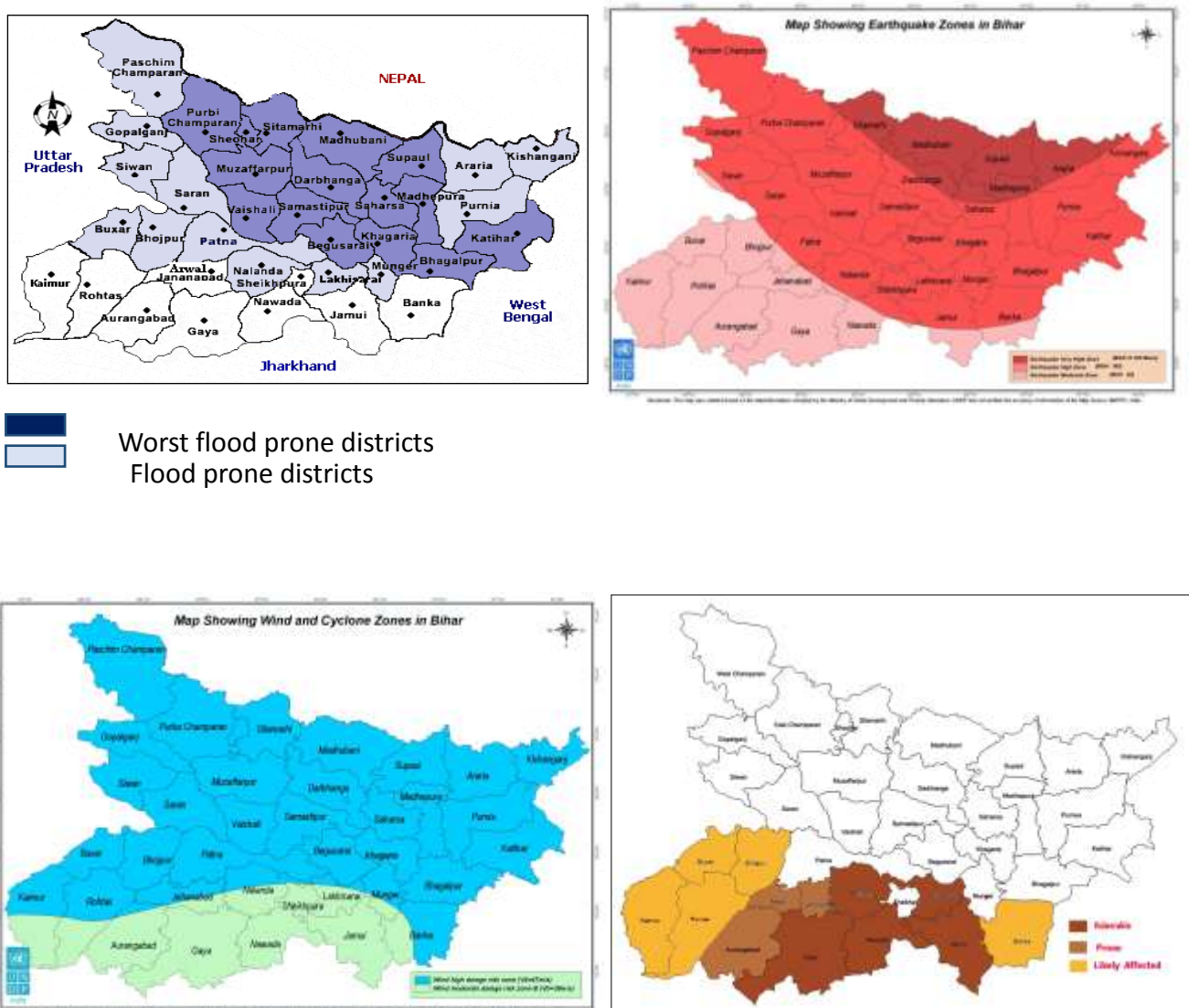
⁶GoB (2013) State Disaster Management Plan, Pp. 47 and 48

Apart from floods, drought and earthquake, the State, mostly the districts lying in the north-east part of the State, are prone to cyclonic storm. In the year more than 80 persons lost their lives and vast damage to infrastructure and property was caused due to cyclonic storm. Again in April, 2015, cyclonic storm hit the same part killing more than 50 people and destroying infrastructure and crops hugely. The other parts are also prone to severe storms during summer season.

The state of Bihar is also prone to fire incidents, primarily in rural areas, causing severe damage to lives and livelihoods. This is evidenced from the numerous fire incidents in Bihar from 2010-11 to 2015-16 wherein over 750 lives were lost. The State is also prone to hailstorms and cold and heat waves.

The following maps depict the hazard-wise disaster prone areas of Bihar:

Figure : 4



Apart from the natural hazards as aforesaid, boat capsizing, drowning, lightening, road/rail/aeroplane accidents, snake/dog bites, attack by animals and stampedes have emerged as

major causes of life loss in the recent past. As per data available, 948⁷ lives have been lost in the State because of lightening between 2010 and 2015; 2204⁸ because of boat capsizing incidents and 34,914⁹ because of road accidents between 2003 and 2013.

Figure 3: DISASTER MORTALITY IN BIHAR- 2003-13

Source: Disaster Management Department, GoB, Database

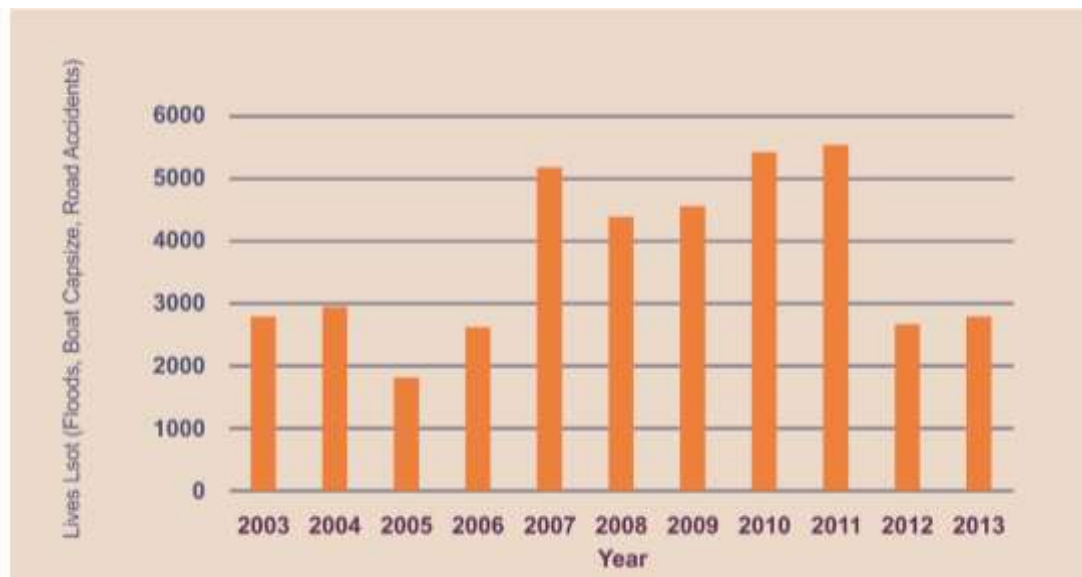
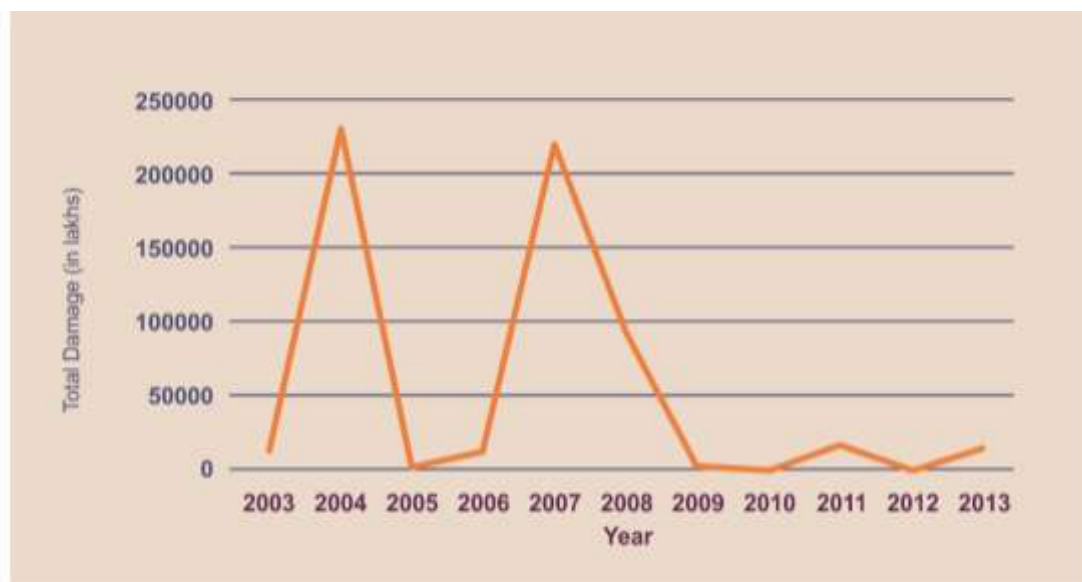


Figure 4: FLOOD RELATED FINANCIAL LOSSES (INR) IN BIHAR-2003-13



Source: Disaster Management Department, GoB, Database

⁷DMD; INR 770.49 lakhs were expended as ex-gratia from 2010 and 2015 for lightning related deaths. INR 1 Lakh was provided from 2010 to 2011-12 while INR 1.5 lakh was provided from 2012-13 to 2014-15 and INR 4 Lakh is provided from 2014-15 onwards to the families of the deceased in case of lightning related deaths.

⁸ National Crime Records Bureau, Accidental Deaths and Suicides in India (ADSI) Reports

⁹GoI, Ministry of Road Transport and Highways, Road Accidents in India (<http://morth.nic.in/index2.asp?slid=311&sublinkid=141&lang=1> Accessed on 01.07.15)

While the earlier cited hazards¹⁰ are the currently known hazards in Bihar, extreme weather events, changes in temperature and precipitation¹¹ and uncertain weather patterns are also increasingly being witnessed, with reported¹² adverse impacts on agricultural produce and increased incidents of localised droughts and floods. The State Action Plan for Climate Change lays down the analysis and strategies for addressing climate change impacts; yet, tracking these changes will remain critical for disaster risk reduction as well, especially from the perspective of emerging hazards in the future.

A detailed analysis of the existing hazards in Bihar has been presented in the State Disaster Management Plan (2013). This section presents a snapshot of the disaster risk profile of the state to guide and contextualise the actions in the DRR Roadmap. This has been done by grouping the 38 districts into three groups, with their hazard profiles as the primary criteria for grouping. Group A comprises 10 districts that are highly prone to floods and fall under Earthquake Seismic Zone V; Group B comprises 18 districts that are flood and fall under Earthquake Seismic Zone IV; Group C comprises the 10 predominantly drought prone districts. Additionally, Group A and Group B districts witness incidents of boat capsizing. **Proneness to fire, cyclonic storm, hail storm, heat wave, cold wave, lightning, road accidents and stampede is assumed for all three groups**, with the recognition that their frequency and severity may vary between districts but not as significantly that of floods, droughts and earthquakes. The group-wise districts are presented in the Table 2 below:

Table 2: District grouping as per hazard profile

Group	Profile	Constituent Districts
Group A Districts (10)	Mainly Flood Prone and Earthquake Zone V	Araria, Drabhanga, East Champaran, Kishanhanj, Madhepura, Madhubani, Saharsa, Sheohar, Sitamarhi, and Supaul
Group B Districts (18)	Mainly Flood Prone and Earthquake Zone IV	Banka, Begusarai, Bhagalpur, Bhojpur, Gopalganj, Katihar, Khagariya, Lakhisarai, Muzaffarpur, Nalanda, Patna, Purnia, Saran, Samastipur, Sheikhpura, Siwan, Vaishali, and West Champaran
Group C Districts (10)	Mainly Drought Prone and Earthquake Zone III	Arwal, Aurangabad, Buxar, Gaya, Jamui, Jehanabad, Kaimur, Munger, Nawada, and Rohtas
All Districts in Groups A, B and C prone to fire, hail storm, heat wave, cold wave, lightning, road accidents and stampede etc.		

¹⁰ Flood, Earthquake, Cyclonic Storm, Hail Storm, Drought, Heat Wave, Cold Wave, Lightning, Road Accidents, Boat Capsize, Fire, and Stampede

¹¹ GoB (2012) State Action Plan on Climate Change

¹² See for example, Impact of climate change on wheat and winter maize over a sub-humid climatic environment, A.V.A Haris et al., Current Science, Volume104, NO. 2, January 2013

In addition to hazard-proneness, disaster risks in the districts are a function of the existing vulnerabilities and capacities of communities and governance systems. For example, districts like Araria or Madhepura, with high flood and earthquake proneness as well as comparatively poorer performance on human development indicators (like high rates of malnutrition) face a very high level of disaster risk. Given this, a second layer of analysis was undertaken for the three groups to present a brief snapshot of the existing disaster risks. All the districts within Groups A, B and C were analysed for their performance on 14 selected¹³ human development indicators, as reflected in the state's ManavVikas Mission Roadmap¹⁴ as well as three additional indicators for housing, urbanisation and exposure to hazards. The districts' performance on these indicators was analysed in comparison with the state's average.

This preliminary¹⁵ analysis¹⁶ of disaster risks highlighted the following salient points about the three groups:

Group A

Exposed to high flood and earthquake proneness, Group A districts experience a range of other human development challenges. For more than half of the indicators selected (9 indicators), the poorest performing districts lie in Group A. For example, of the 10 districts with the highest IMR in the state, 6 lie in Group A. The two districts (Madhepura and Araria) with the highest prevalence of underweight children in the state lie in this group. Araria, Kishanganj and Supaul have the lowest access to sanitation facilities in the state (less than 10% of households in the district having latrines in their premises). Similarly, Sitamarhi, Madhepura and Saharsa have the lowest availability of toilets in schools.

Further, all 10 districts in Group A have less than 20% institutional births; all but one district have poor access to sanitation facilities; and 7 out of 10 districts in the Group have higher percentage of diarrhoeal cases than the state average, with Saharsa having the highest percentage in the state. All the 10 districts score lower than the state average on secondary school attendance, with Kishanganj having the lowest literacy rate in the state.

5 out of 10 districts in this group have been identified as having water source with iron contamination and 8 out of 10 districts in the group have vulnerable material of wall in houses.

¹³ Indicators for Health, Education, Nutrition, WASH were selected. For a list of all 17 indicators, *Annex 2*

¹⁴ GoB, Planning Department, Roadmap to Mission Manav Vikas (<http://planning.bih.nic.in/Documents/DOC-01-01-01-2014.pdf> Accessed 01.07.15)

¹⁵ As opposed to an exhaustive one, wherein many more indicators can be analysed, including mortality and damage trends about past disasters. Requiring both- consensus about the indicators as well availability of data- such an analysis is yet to be conducted in Bihar. A pilot initiative along these lines by UNICEF, called Risk Informed Development Planning System (RISP-S), is currently ongoing.

¹⁶ Data sources for the analysis have been provided in Annexure 2.

It emerges from this analysis that Araria, Sitamarhi, Supaul and Madhepura have the highest level of disaster risk in Group A, with Araria and Sitamarhi having high health related disaster risks (performing worse than the state average on all the chosen health indicators).

Group B

Group B districts not only face a medium level proneness to floods and earthquakes, but also emerge as performing better on the selected human development indicators than Group A. Siwan, Sheikhpura, Saran, and Nalanda emerge as the comparatively lower risk districts in this group, performing better than the state averages on many of the selected indicators. While Patna also performs better on the human development indices, its significantly high urban population density and unsafe urban landscape coupled with earthquake proneness (Zone IV) make Patna city a high disaster risk area.

Despite the comparatively lower level of risks, more than half of the districts in this group have IMR's higher than the state average, have less than 20% institutional deliveries, higher prevalence of underweight children, high percentage of anaemic adolescent girls and high percentage of households without access to latrines within their premises. 11 out of 18 districts have water sources with either arsenic, fluoride or iron contamination. Muzaffarpur district has emerged as the capital of AES where children below 15 years die every year on account of this dreaded disease.

It is also notable that the districts in this group perform comparatively better on the selected education indicators and that only 3 out of the 18 districts in this group have a high percentage of houses with vulnerable materials of walls.

Finally, Purnia, Katihar, East Champaran and Bhagalpur emerge as having the highest disaster risk in Group B, with Purnia having poorer performance than the state average on most of the indicators, increasing urban agglomerations, second highest percentage of houses with vulnerable material of walls in the state as well as recent history of experiencing cyclonic storms.

Group C

The nature of disaster risks in this group emerge as qualitatively different from those of Groups A and B. In comparison to the districts in the other groups, Group C has the maximum (58%) districts without access to improved drinking water sources. This is notable because, unlike other human development indicators, only 29% of the state's 38 districts have lesser access to improved drinking water sources than the state's average, and a large part of this is classified in Group C. Further, almost all districts in this group have habitats with either arsenic or fluoride contamination in the water sources.

The districts in Group C also display significantly lesser rates of immunization in comparison to the districts in the other groups. Gaya district is susceptible to the dreaded JE disease.

In contrast, this group also has some of the better performing districts in the state on institutional deliveries, prevalence of underweight children, percentage of anaemic adolescent girls, percentage of secondary school attendance as well as material of walls in houses.

Overall, Nawada, Aurangabad and Banka have the highest disaster risk in Group C, with Nawada scoring higher than the state average on all the chosen health indicators and the lowest percentage of immunization the state.

Figure 5 below, depicts the three groups along with the high risk districts within these groups.

Figure 5: DISASTER RISK BASED GROUPING OF DISTRICTS IN BIHAR





Chapter 4

FOUNDATIONAL ELEMENTS OF THE ROADMAP

4. Foundational Elements of the Roadmap

This section provides the foundational principles of the roadmap in the form of the guiding principles, approach to implementation and the framework for organising specific actions within the roadmap.

The Roadmap adopts a clear distinction between ‘disaster risk reduction’ and ‘disaster management’ with focussed attention on disaster risk reduction through strategies and actions aimed at addressing the causal factors of disaster risk. This marks a conscious shift from focus on implementation of disaster response, relief and recovery measures only. Despite the shift in focus, management of residual risks has been duly accounted for in the Roadmap through actions for ‘preparedness for effective response and recovery’. This is in line with the Priority 4 of the Sendai Framework for Disaster Risk Reduction: *Enhancing disaster preparedness for effective response and to “Build Back Better” in recovery, rehabilitation and reconstruction.*

Further, this Roadmap commits towards not only addressing the risks related to the disasters as recognised by GoI and GoB but also health emergencies like AES, Kala Azar and such as well as emerging risks in future.

4.1 GUIDING PRINCIPLES FOR THE DRR ROADMAP

Principles, by definition, implicitly emphasise fundamental truths or general rules to be adhered to. The DRR Roadmap will be grounded in the following fifteen principles as the ethical base for action. Offering a mix of the feasible and the desirable, these principles seek to provide direction to the interpreters and implementers of the DRR Roadmap for decision making and for guiding practical action for advancing DRR.

These draw from the spirit of the National Disaster Management Act (2005) and Policy (2009), the Sendai Framework for Disaster Risk Reduction (2015) and the enduring lessons from the practice of disaster risk reduction in Bihar as also reflected in the Patna Declaration (2015). In essence, they are based in the inherent social contract between the citizens of Bihar and the state government wherein the government’s actions are directed towards the well-being and safety of the citizens, and for which, the citizens agree to be governed. The fulfilment of this social contract means the realization of rights and the practice of responsibilities by both the right-holders and duty-holders. This not only includes the duties of the state and citizens to each other but also the duties of the citizens towards themselves and other citizens for ensuring disaster risk reduction.

The Principles have been delineated as below:

1. **Primacy of rights of at-risk people and communities:** Governance-related decision making processes including agenda setting, gathering information, opinion forming, taking and implementing decisions at all levels will prioritise the well-being, protection and safety of at-risk communities through risk-informed development action. This will be undertaken with the realisation that 'at-risk' is not a homogenous group and some communities and groups (including those who are not community members like travellers, migrants and temporary residents) are more at-risk than others.
2. **Participation of and action by at-risk communities:** At-risk Communities, including children, women and men, and other primary stakeholders will have the right to participate in decisions influencing the level of disaster risk to their lives, communities and regions.
3. **Risk Realisation:** Disaster risk reduction actions will be carried out with the recognition that disaster risks can be created because of development actions, and that risk reduction has to be done within the development paradigm through risk-informed policy formulation, development planning, resource allocation, targeting, implementation, monitoring-review, and communication.
4. **Polycentric Governance:** Disaster risk reduction is the primary responsibility of the government; yet, it will not rest with any one governance institution (like the DMD) alone. Given that DRR is multi-stakeholder and multi-level, the governance of the same will be undertaken by all the line departments as well as non-government institutions like civil society organisations, citizen's groups, village committees, farmers groups, and such who may sometimes be better poised to take decisions about localized risks. Multiple actors will be connected by the vision and direction agreed in this roadmap and will prioritise coordination, flexibility and responsiveness to achieve this.
5. **Partnerships:** Disaster risk reduction actions will be undertaken with the recognition that reduction of risk creation and management of created risks requires collective and inclusive action. The contribution of skills, resources and capacities by multiple stakeholders including government, UN Agencies, civil society organizations, private sector, and at-risk communities will be nurtured through collaborative actions.
6. **Coherence and consistency across policies, programs and plans:** Resource allocation and implementation of actions will be undertaken in coherence with other actions seeking to address underlying drivers of disaster risk like climate change adaptation and environmental sustainability, for e.g. the Bihar State Disaster Management Plan, District Disaster Management Plans, Agricultural Roadmap, Mission *ManavVikas*, State Action Plan for Climate Change, and such. Actions undertaken as part of the DRR Roadmap would be planned in such a way so as to

ensure coherence and consistency with the SDMP. The formulation of DDMPs would be guided and informed by the DRR Roadmap. Further, all the three documents would be regularly reviewed and revised for ensuring alignment, coherence and consistency and ensuring minimization of risks and disaster impacts as well as resilience.

7. **Transparency and Accountability:** The citizens of Bihar will have a right to timely information about disaster risks and the risk reduction actions being undertaken to address them. The actions in the roadmap will be undertaken against an agreed upon baseline against which progress will be measured, and citizens will have the right to information about this progress.
8. **Resilience in Development (*Vikasaisaho ho jo aafat se bachaye, vikasaisanaho jo aafat ban jaaye*¹⁷):** Disaster risk reduction actions will be undertaken towards resilience building within development (as opposed to resilience to disasters), with the recognition that resilience is not a fixed end state but a dynamic set of conditions and processes. Underpinning resilience is the need for better analysis of risk at different spatial and temporal levels and for this analysis to inform development planning processes and goals.
9. **Praxis:** Given that neither disaster risks nor the state of resilience is static, disaster risk reduction actions will be undertaken through continuous cycles of action, reflection, learning, and planned action.
10. **Inclusive DRR:** Disaster risk reduction actions will account for the fact that disaster risks are experienced differently by different sections of the population, including children, women, the elderly, people with disabilities, and other traditionally marginalised groups¹⁸. Additionally, in conjunction with the principle of partnership, disaster risk reduction actions will be inclusive of the different kinds of disaster risk reducers, including government, civil society, community institutions at all levels.
11. **Right to safe and secure environment:** All the citizens of Bihar have the right to inhabit in a safe and secure environment. This will not only entail the duty of the state to provide this right to the citizens of Bihar but also the duties of citizens towards ensuring a safe and secure environment for other citizens, with special attention to vulnerable groups.
12. **Do No Harm:** Risk reduction actions will be undertaken in such a way so as to not create environmental harm or exacerbate any existing or potential conflict.

¹⁷ Slogan coined by High Powered Committee on Disaster Management (1999-2001) and popularised by BSDMA, translated as: "Development should be such that it safeguards from disaster and not such becomes a disaster".

¹⁸ Vulnerability is understood here as conditions arising from social, physical, economic and environmental factors that increase the susceptibility of individuals or communities to the impact of hazards. Children, women, older persons, pregnant and lactating mothers, People with Disabilities (PWD), people living with life threatening diseases, People Living with HIV and AIDS (PLHA), SC/ST, LGBT, and Minorities (socio-economic and religious) have been recognised as vulnerable groups in the Roadmap with the acknowledgement that vulnerable groups also possess capacities that must be considered while designing and implementing DRR actions.

13. **Investing in the future through focus on schools:** Disaster risk reduction actions will be undertaken with the recognition that investing in children and young people not only reduces risk in the present but also secures the future by bringing about a culture of risk reduction. This will be done through an intensive focus on the schools of Bihar through the *Mukhya Mantri School Safety Programme*.
14. **Culture of preparedness (*Aapda Nahi Ho Bhaari Yadi Poori Ho Tayyari*¹⁹):** Disaster risk reduction actions will be undertaken with the recognition that there will always be a chance of residual risks translating into disasters, in which case, timely and adequate actions will be taken through the organised capacity of Government to alleviate suffering because of disasters. Actions in the roadmap will seek to strengthen preparedness for response and recovery such that these are undertaken within the development functions as carried out by the line departments.
15. **Build back better:** Post-disaster recovery and reconstruction will be undertaken as opportunities to rebuild infrastructure, capacities and systems in such a way that they reduce disaster risk in the long term.

4.2 APPROACH TO IMPLEMENTING THE ROADMAP

The implementation of the DRR Roadmap will be undertaken with the following approach.

In order to ensure that all future development initiatives in Bihar are risk informed and safeguarded from disaster and climate change induced losses, a synergistic approach would be adopted in the implementation of this Roadmap. As part of this, the operational leadership for the implementation of this Roadmap would proactively engage with the operational leadership of flagship initiatives in the state like the Bihar Development Mission (BDM) that has been initiated for fulfilment of the Chief Minister's "Seven Resolves" (Saat Nischay). Specifically, the implementation of this Roadmap would be aligned with the BDM through coordinated planning, implementation and review. Further, specific recommendations would be made to the BDM for risk (disaster and climate change induced) proofing of the actions undertaken as part of the BDM.

- **Multi-hazard focus:** Actions will account for multiple hazards affecting Bihar, including but not limited to, floods, droughts, earthquakes, fire, cyclonic storms, hailstorms, cold wave, heat wave, road accidents, boat capsizes, stampede and lightning. The multi-hazard approach will not only mean that different hazards will require hazard-specific actions to be

¹⁹ Slogan coined by High Powered Committee on Disaster Management (1999-2001) and popularised by BSDMA, translated as: "Disaster impact would be less if preparedness is apt".

undertaken, but also that any action should consider the impact of more than one hazard during planning and implementation.

- **Phasing and temporal implementation:** The 15 year roadmap will be implemented in three phases: short (5 years), medium (10 years) and long term (15 years). Some actions may be implemented in the short term only, while others may begin immediately but reach completion only in the medium or long term. Similarly, there may be actions that need to be undertaken throughout. This phasing will be informed by the following considerations:
 - **Feasibility:** The low-hanging fruits will be sought in the short term, including actions that already have buy-in, have been proven for efficacy through pilots and/ or have already been initiated.
 - **Emergency Support Functions:** The DRR roadmap will account for the possibility of disasters necessitating response and recovery actions. Towards this, strengthening of emergency support functions of the line departments for improved response and recovery planning will get adequate attention in the phasing of actions.
- **Geographical diversity:** Given that disaster risks manifest differently across different geographies, the same disaster risk reduction action may have different practical manifestations across different geographies.
- **Enabling policy environment will be essential but not conditional:** It would be sought that disaster risk reduction actions are rooted in a robust policy context. At the same time, with the recognition that policy changes take time, actions will not be conditional on the policy change. Whatever is doable will be undertaken as soon as possible.
- **Project-approach for few selected actions:** While most actions will be undertaken so as to be mainstreamed into ongoing development activities, some actions or group of actions in the roadmap will be undertaken as time and budget-bound projects or pilots to ensure that scaling up into development activities is informed by cycles of action-reflection-action.
- **Implementation arrangements:** Implementation of the roadmap will be backed by appropriate institutional arrangements. Partnerships with civil society organisations and UN Agencies will be critical element of the implementation arrangements, as is embodied in the roadmap development process as well. All actions will be supported by appropriate monitoring and evaluation mechanisms.

4.3 DRR ROADMAP FRAMEWORK

One of the guiding principles for this roadmap emphasises ‘resilience in development’. This principle has also been chosen as the organising principle for the actions within this roadmap. With conceptual origins in understanding the properties of building materials, and application in diverse fields like ecology and psychology in the 1970s, the concept of resilience has increasingly gained prominence within the disaster risk reduction discourse in the past decade. Despite this prominence, interpretations about its definition, manifestations and practical application continue to be diverse and varied.

What, then, is the space and utility of this concept in Bihar’s DRR roadmap?

Understood simply as, “the capacity of an individual, household, community or system to **anticipate, absorb (through effective preparedness, response and mitigation) and recover from** hazards and other shocks and stresses without compromising its existence and functioning in the long term”, resilience provides clarity about both the ‘end’ and the ‘means’ for disaster risk reduction actions in this roadmap. Providing the ‘desired state’ of communities and systems in Bihar, **resilience, becomes the goal** that the disaster risk reduction actions in this roadmap should lead Bihar towards...“A Resilient Bihar”. It will also underpin the targets and milestones that are set towards the fulfilment of this goal. As for the ‘means’, resilience is helpful as an organising principle by raising the question: what are the components of a resilient Bihar? This has been unpacked through five components or **building-blocks**:

1. Resilient Villages
2. Resilient Livelihoods
3. Resilient Critical infrastructure
4. Resilient Basic Services, and
5. Resilient Cities

The desired state of communities in Bihar is framed within ‘Resilient Villages’ and ‘Resilient Cities’ components, keeping in mind the two distinct demographic and governance profiles of Bihar (rural and urban) and to ensure that the DRR actions approach each one as a composite administrative unit of risk-informed planning.

The desired state of systems is reflected in ‘Resilient Livelihoods’, ‘Resilient Critical Infrastructure’ and ‘Resilient Basic Services’ in order to emphasize actions towards the three essential areas (critical infrastructure, basic services and livelihoods) that get hampered due to shocks and stressors and planning for which needs to be risk-informed.

Specific actions within this roadmap have been organised such that targets, milestones and hazard-specific action points have been identified for each one of the five components. Subsequently, the accountability, monitoring and evaluation aspects have also been developed within this framework.

The specific actions have been detailed with cognisance of the fact that these building-blocks or components are not mutually exclusive, and neither is there resilience.

In summation, the framework for this DRR roadmap is grounded in resilience because of the following key reasons:

- It has the potential to motivate and galvanise actions and energies towards a **collectively envisioned goal**,
- It widens the pitch of disaster risk reduction actions in the roadmap towards safeguarding development gains from **multiple shocks and stressors** (as opposed to only known hazards), while at the same time, retaining their hazard-specificity for clarity of action,
- It enables the framing of a seemingly intractable problem within **coherent** (albeit interconnected) **building blocks**, which unlike the earlier framing of sector-specific, department-specific or vulnerable group-specific actions, take a more holistic view of people’s lives, struggles and solutions.

The DRR Roadmap Framework is presented in Figure 6 below.



Chapter 5

TARGETS AND MILESTONES

5. Targets and Milestones

The Sendai Framework for Disaster Risk Reduction (2015) sets 7 global targets (See Annexure 4) to support the assessment of progress in achievement of the goal set by the framework for disaster risk reduction. Bihar’s Roadmap for Disaster Risk Reduction adapts three targets contextualised for Bihar to meet the goal of a ‘Disaster Resilient Bihar’. These targets have been set with the recognition that baselines for the same will be developed as an immediate next step in the implementation of this Roadmap. This has been detailed in Section 9: Monitoring and Evaluation Framework.

Milestones have also been identified towards the achievement of these targets for three time markers – 2020, 2025 and 2030. These are presented below:

Targets

1. Lives lost due to natural disasters in Bihar would be reduced by 75% of the baseline level by 2030.
2. Lives lost due to transportation related disasters (viz. road, rail and boat accidents) in Bihar would be substantially reduced over baseline level by 2030.
3. People affected²⁰ by disasters in Bihar would be reduced by 50% of the baseline level by 2030.
4. Economic loss due to disasters in Bihar would be reduced by 50% of the baseline level by 2030.

The baseline data values for each of these four targets would be computed and validated by the Disaster Management Department in early 2016 by using the 2005-06 to 2014-15 figures for the disaster affected (life loss, people affected and economic loss).

Milestones

Milestone	SFDRR Priority Area
BY 2020:	
1. Baseline status for each of the four targets is developed.	2
2. Capacities are created to assist Government and communities in safe construction of	3

²⁰ People affected defined Disaster affected persons are defined as those who have experienced either or all of the following due to disaster events - (i) suffered injury, illness or trauma, (ii) have lost members of family and / or livestock, (iii) damage to house, (iv) economic loss (for e.g. damage to property, agriculture (crop, seeds, inputs, land, stored harvest), animal husbandry (livestock-cattle, goats, poultry, sheds and related inputs), fishery, employment (daily-wage labour, sharecropping), and enterprises (small producers and vendors, cottage industries, small, medium and large industries), and (v) access to basic services (like water, sanitation, health, food and nutrition, education, and protection) is disrupted.

projects and buildings.(Training of Engineers, Architects, Masons etc for safe construction completed)	
3. Structural safety audits of all government offices and social infrastructure (such as Secretariat, Collectorates, SDO/Block/Anchal Offices, Police Offices and Stations, Schools, Hospitals, Panchayat Bhawans, Anganwadi centres etc) is completed and corrective measures initiated.	3
4. Safe construction of all major Government projects and building is initiated.	3
5. Emergency Support Functions are notified and made operational with fully-functional Emergency Operations Centers (EOCs) at state and district levels.	4
6. Structural resilience of all commercial buildings (such as malls, cinema halls and other public places of mass gathering) is ensured.	3
7. Annual plans and PIPs of all line departments and annual plans of local self-government (LSG) institutions (PRIs and ULBs) account for current and emerging disaster risks from a comprehensive multi-hazard risk analysis point of view through participation of stakeholders, such as, women, youth, adolescents, children, and men, particularly from the at-risk communities.	2
8. All the line departments mandated to provide basic services and critical infrastructure have operational Service Delivery Continuity Plans (SDCPs) and Infrastructure Continuity Plans (ICPs), and SDCPs / ICPs - (plans to ensure department functions return to 'business as usual' in the quickest time).	2
9. DDMA's are strengthened with resources, mandates and capacities for playing an integral role in disaster risk reduction decision making at the district level.	2
10. An effective Early Warning System (EWS) is established, wherein all villages and cities in Bihar have systems for early warning information reception, dissemination and taking up immediate good enough pertinent action.	4
11. Communities understand and practice 'do's and don'ts' during disaster situations as a result of a state-wide public awareness and education campaign launched at all levels.	1
12. Building bye-laws incorporating safe construction in all urban areas are approved.	3
13. Communities are encouraged and a policy regime is developed to enforce safe construction in rural areas.	3

BY 2025:	
14. Corrective measures, including retrofitting, for ensuring structural resilience of all government offices and social infrastructure are completed.	3
15. A system for Risk Informed Development Planning (RIDP) is adopted and operational in the state at all levels of planning.	1
16. All PRIs and ULBs are adequately empowered through funds, functions and functionaries to ensure resilience.	2
17. Communities in all villages and cities regularly monitor current and emerging disaster risks, including underlying risks, and assert for measures to be taken to address the same.	2
18. Platforms and mechanisms are institutionalized across Bihar for effective learning and sharing on DRR planning, implementing and drawing learning.	1
BY 2030:	
19. Policies and practices for livelihood related risk avoidance, transfer, sharing, and compensation are adopted by agriculture and small industry based livelihoods systems in Bihar.	3
20. Rural and urban habitat planning processes like land zoning, town and city development planning take into account existing and emerging disaster risks.	2
21. All existing and new public and private buildings in Bihar are structurally safe from a multi-hazard perspective.	3

Chapter 6

SPECIFIC ACTIONS

6. Specific Actions

Each one of the 5 identified components of resilience has been unpacked in this section. Additionally, specific actions have been listed towards achieving the identified state of resilience. As a part of the roadmap development process, detailed actions have been identified along with the responsible actors, level of action (State, District, Block, and Gram Panchayat or Urban area) and the timeline for each component. The five components are: 1) Resilient Villages, 2) Resilient Livelihood, 3) Resilient Basic Services, 4) Resilient Critical Infrastructure, and 5) Resilient Cities.

6.1 RESILIENT VILLAGES

What is a resilient village?

A resilient village, including habitations (tolas), is envisaged as a dynamic and proactive social unit wherein all individuals, households and the community as a whole are capable to:

- **Assess** the disaster and climate change induced risks and access the early warning systems,
- **Address** disasters including 'climate change induced disasters' through risk informed development planning. which includes preparedness, response and mitigation actions,
- **Preserve** ecosystem thorough environmental impact assessment and
- **Recover** from disaster(s) through building back better.

Characteristics of Resilient Village

1. Individuals, groups and communities are aware and recognize the risk/hazards and take appropriate action to prevent/mitigate disasters for a safe and secure environment.
2. Communities practice safe behaviours like construction of safe houses, safe cooking, timely relocation to safe spaces, construction and usage of toilets, safe hygiene practices, promote preventive health, safe handling and storage of drinking water, exercise sustainable livelihood choices, acquire life skills, imbibe civic sense and practice community cooperation.
3. The village is able to meet small-scale disasters (L-1) on its own.
4. DRR is mainstreamed in GP level plans by undertaking regular multi-hazard risk analysis.
5. Vibrant community institutions drive the process of risk analysis, risk communication, preparedness and risk reduction actions:
 - a. The village has a GP-level standing committee on DRR for supporting risk analysis and mainstreaming DRR in GP planning.

- b. The village has Community Emergency Response Teams (CERTs) for leading preparedness and response actions.
6. Communities have timely access to early warning information and emergency services like evacuation, safe spaces, search and rescue as well as other essential services.
 7. Continuity of basic services such as health, education, nutrition, WASH, and housing, fodder and critical infrastructure like power, bridges, roads, telecommunications and irrigation is ensured in the village, with either no disruptions or rapid regaining of functionality in case of disruptions.
 8. Community has easy access to essential items and life-saving equipment in the event of disasters.
 9. Risk analysis, planning, communication, preparedness and reduction measures are undertaken in an inclusive and participatory manner, accounting for differential needs and capacities of children, adolescents, women, men, differently -abled, and traditionally marginalized or minority groups.

Villages in Bihar

88.70%²¹ of the population in Bihar resides in rural areas with 8,874 Gram Panchayats and 44,935 revenue villages²². Villages in Bihar vary in their size, demographic composition and nature of disaster risks, and thus, so does their level of resilience. While the sizes of villages vary (see Table 2) considerably, as many as 18.43% villages have more than 10,000 population with multiple constituent hamlets. This diversity and scale has informed the nature of actions for resilient villages in Bihar.

Table 2: Population Size of Villages in Bihar

Population Size	Percentage of villages in Bihar
Less than 200	0.27 %
200-499	1.76 %
500-999	6.04 %
1000-1999	15.86 %
2000-4999	34.00 %
5000-9999	23.64 %
More than 10000	18.43 %

Actions for Resilient Villages

The above-mentioned characteristics of resilient villages will be achieved through focussed actions of different types, including targeted and planned capacity building of different actors, communication and awareness activities aimed at attitudinal and behaviour changes, and creating

²¹ Census of India, 2011 http://www.censusindia.gov.in/2011census/A-3_Vill/Statements%201-1.pdf (Accessed 10.07.15)

²² Socio Economic Caste Census 2011 (See, http://www.secc.gov.in/staticReportData?getReportId=S_1); These numbers are 8471 and 45103 respectively according to the Census of India, 2011 (See, <http://www.planning.bih.nic.in/>)

an enabling policy and risk governance environment. Additionally, actions to achieve the resilience of villages **will not be limited to actions at the village-level itself, but also include actions at the State, district and Panchayat / block levels.** The key nodal departments responsible for undertaking actions for resilient villages are DMD, Agriculture Department, Panchayati Raj, Health Department, Planning & Development Dept., WRD/Minor WRD, RDD, PHED, Rural Works Department and Fire Service. Mobilization and capacity building of community, Panchayats, Gram Sabhas, institutions and volunteer groups, such, as Anganwadi workers, Accredited Social Health Activists (ASHA), Red Cross volunteers, Youth Clubs/NYKs, SHGs, women groups, etc. will be one of the main strategies for enhanced resilience at the community levels.

Resilient Village Programme (RVP)

A 'Resilient Village Programme', on the lines of Community Based DRR Programmes (CBDRR), will be initiated in partnership with Panchayats and other civil society organizations including interested UN and other Agencies. This will be undertaken in a phased manner across all districts of Bihar over the course of fifteen years (2015-16 to 30-11), starting with an intensive pilot programme (2015-20) in all Group A districts and then scaled up (2020-2030) in all Group B and C districts. RVP will broadly focus on:

- Disaster risks recognition, understanding and analysis;
- Disaster risk informed Gram Panchayat level development planning, using participatory, comprehensive and scientific risk analysis;
- Risk reduction actions based on this planning, with a focus on vulnerable sections and areas
- Capacity building measures for risk analysis, risk-informed planning and risk reduction actions;
- Actions for targeted and planned communication for DRR.

Department-wise actions proposed for resilient villages

Nodal Department/Agencies: DDMAs/District Administration

#	Specific Actions	Implementing and/or Supportive Departments / Agencies	Implementation Level (State / District / Sub-District / GP)	Timeline		
				Short Term (2015 to 2020)	Medium Term (2021 to 2025)	Long Term (2026 to 2030)

#	Specific Actions	Implementing and/or Supportive Departments / Agencies	Implementation Level (State / District / Sub-District / GP)	Timeline		
				Short Term (2015 to 2020)	Medium Term (2021 to 2025)	Long Term (2026 to 2030)
1	<p>Develop and launch a 15-year “Resilient Village Programme²³” to cover all the villages in a phased manner. As part of this programme, undertake the following actions:</p> <ul style="list-style-type: none"> • Undertake disaster and climate change induced risk analysis at village level with participation of village level stakeholders including especially at-risk communities, consolidate the risk analyses at Gram Panchayat and Block levels. • Develop a "resilient village checklist" to guide efforts of all stakeholders towards resilient villages. • Assessment of all villages on the basis of this checklist to create a baseline status for the Resilient Village Programme. • Develop Village Disaster Management Plan (VDMP) based on the village level risk analysis and the assessment on resilient village checklist. • Integrate in Gram Panchayat plans, the emerging actions (for preparedness, response, recovery, and risk reduction and mitigation) from the VDMPs. • Monitoring the implementation of VDMPs • Taking effective action for prevention, mitigation, preparedness, response, relief and recovery in accordance with SOPs • Capacity building of PRIs, village level Frontline Workers of line departments, CSOs, and Volunteers on risk analysis, risk informed development planning, and implementing initiatives based on the resilient village checklist. 	BSDMA, DMD, RDD, All Related Depts., UNICEF, CSOs, & CBOs (Funds would be provided by DMD)	Block and Village			
2	Ensure that DDMPs (i) account for the GP & block level risk analyses, (ii) include the multi-hazard preparedness, response and recovery actions by respective line departments as well as the district - level emergency support function (ESF) systems and the Community Disaster Response Teams (CDRTs), (iii) are reviewed and updated on an annual basis, and (iv) are audited once in five years.	DMD, BSDMA and relevant all departments	District			
3	Undertake preparatory tasks like repairs of roads and related structures, bathing ghats, construction of	Home Departm	All vulnera			

²³ Actions to be undertaken as part of this Resilient Village Programme have been detailed out in the box provided above.

#	Specific Actions	Implementing and/or Supportive Departments / Agencies	Implementation Level (State / District / Sub-District / GP)	Timeline		
				Short Term (2015 to 2020)	Medium Term (2021 to 2025)	Long Term (2026 to 2030)
	temporary bridges, cleaning of drains, setting up of temporary barricades, identification of exit routes, signage, electricity provision, and such other arrangements at vulnerable areas before occasions having potential to cause stampedes.	ent, Rural Engineering Organization, RCD, PRIs, and Religious Trusts / Boards	ble areas and places of congregation			
4	Promote installation of lightning conductors in community and public buildings like temples, mosques, Gram Panchayats, community centres, schools, Anganwadi Centers (AWCs), mobile towers.	Bihar State Electricity Board, DMD and PRIs	GP			

Nodal Department: DMD

#	Specific Actions	Implementing and Supportive Departments / Agencies	Implementation Level (State / District / Sub-District / GP)	Timeline		
				Short Term (2015 to 2020)	Medium Term (2021 to 2025)	Long Term (2026 to 2030)
1	<p>As part of the Resilient Village Programme, undertake the following measures:</p> <ul style="list-style-type: none"> • Capacity Building of village level Community Disaster Response Teams (CDRT) for preparedness and response actions. • Conduct regular mock drills for preparedness. • Update/Develop SOPs and guidelines for management of flood, fire, drought, earthquake, cyclonic storm and other natural and man-made disasters. And, ensure the effective implementation of the various SOPs and guidelines through: <ul style="list-style-type: none"> ✓ Conducting regular mock drills; ✓ Developing a real-time and online monitoring system; 	BSDMA, NDRF, SDRF, Panchayati Raj Dept., IPRD, DM-DDMA PRIs, CSOs	State, District, Block and GP			

#	Specific Actions	Implementing and Supportive Departments / Agencies	Implementation Level (State / District / Sub-District / GP)	Timeline		
				Short Term (2015 to 2020)	Medium Term (2021 to 2025)	Long Term (2026 to 2030)
	<ul style="list-style-type: none"> ✓ Reviewing the SOPs and guidelines based on the usage till date. • Rehabilitate people rendered homeless and landless due to erosion caused by rivers. • Launch special awareness campaigns • Coordinate with the Central Government for taking appropriate measures to combat Nuclear, Biological and Chemical disasters in the state 					
2	<ul style="list-style-type: none"> • Organise motivational training for all the nodal officers of the line departments. • Creation of Capacity for safe construction: Training of Engineers, Architects, Masons etc for safe construction and conducting Rapid Visual Survey (RVS) of public and community buildings. • Capacity building of divers and search and rescuers. • Equip the districts with sufficient material and human resources for preparedness, response and recovery. • Strengthen SDRF and Civil Defence Organization for preparedness, response and recovery • With support from Health and Home Departments, build capacity of Quick Medical Response Teams (QMRT) comprising of doctors, paramedics and police personnel at the PHC level. • Provide assistance to Health Department to equip districts and important hospitals with Advanced Life Saving (ALS) Ambulances to provide quick medical support in case of road accidents 	BSDMA, NDRF, SDRF, BIPARD, Health Dept, Home Dept. DM-DDMA, Transport Dept, PRIs, UN Agencies, and CSOs	State, District Block, and GP			
3	<ul style="list-style-type: none"> • Develop policy guidelines for DRR • Regular updation of SDMP based on the review by BSDMA 	BSDMA, NDMA, NIRD	State			

#	Specific Actions	Implementing and Supportive Departments / Agencies	Implementation Level (State / District / Sub-District / GP)	Timeline		
				Short Term (2015 to 2020)	Medium Term (2021 to 2025)	Long Term (2026 to 2030)
4	<ul style="list-style-type: none"> Finalize Early Warning protocols and mechanisms for the State and develop a SOP for the early warning information flow from EOCs to the villages (including Tolas) level stakeholders and last mile connectivity and for taking up actions based on the received early warning in coordination with the CERT members and PRI functionaries. 	DM-DDMAs, WRD, IMD, NDMA	State			

Nodal Department/ Agency: BSDMA

#	Specific Actions	Implementing and Supportive Departments / Agencies	Implementation Level (State / District / Sub-District / GP)	Timeline		
				Short Term (2015 to 2020)	Medium Term (2021 to 2025)	Long Term (2026 to 2030)
1	<ul style="list-style-type: none"> Undertake bi-annual review of Resilient Village Programme at the Block and annual review at the District level. Undertake Annual review of the implementation of SDMP and DDMPs Conduct School Safety Program: Mock-drill in the schools Capacity building of the members of Bihar Citizen Council upto Police Station level for preparedness and response <ul style="list-style-type: none"> Awareness among community members including <i>Diara</i> communities, youth club members, college students, teachers, shop keepers, police personnel on (i) first aid, (ii) traffic rules, (iii) safe driving in all conditions 	DMD, DM-DDMA, YAC, Related all Depts., PRIs, UN Agencies, and CSOs	State, District Block, and GP			

#	Specific Actions	Implementing and Supportive Departments / Agencies	Implementation Level (State / District / Sub-District / GP)	Timeline		
				Short Term (2015 to 2020)	Medium Term (2021 to 2025)	Long Term (2026 to 2030)
	<p>including wet and foggy, (iv) maintaining vehicle fitness, (v) communication to trauma and police centres in case of accident events.</p> <p>Public awareness and education campaign on all hazards across the state including:</p> <ul style="list-style-type: none"> • Safety Weeks, demonstrations and edutainment for citizens on preparedness, evacuation, Do's and Don'ts, first-aid etc. • Develop awareness programmes on newspapers, TV, Radio, and social media • Undertake intensive drive/ campaign to promote insurance seeking by community members for life, health, assets (house, tools/ implements etc.), crops, livestock etc. cover. • Develop and/or finalize do's and don'ts pertaining to fire, heat-wave, cold-wave, hailstorm, and cyclonic storms. 					
2	Develop pre-agreed 'communication plans' for disaster preparedness and emergency response with media agencies and civil society organisations as well as develop a basket of communication tools to support the Resilient Village Programme in the short, medium and long term using different media like TV, Radio, Newspapers, <i>Nukkad Nataks</i> , <i>Vichaar Sangosthi / Sabhas</i> , and Demonstration Exercises.	IPRD	State, District, Block, and GP			
3	Promote 'Community Radio' for enhancing resilience of villages, including targeted programmes for different social groups including women, children, and the elderly amongst others.	IPRD, RDD and CSOs	Block and GP			

Nodal Department: Building Construction Department

#	Specific Actions	Supportive Departments / Agencies	Implementation Level (State / District / Sub-District / GP)	Timeline		
				Short Term (2015 to 2020)	Medium Term (2021 to 2025)	Long Term (2026 to 2030)
1	Put in place a system to ensure all new public buildings being constructed henceforth are green, disabled-friendly and resilient to floods (plinth above HFL) in flood prone , and, earthquake, fire, cyclonic storms, stampede in other areas with water-harvesting facility and universal design ²⁴ including specifications for the <i>Diara and Chaur</i> contexts.	RDD, PRD, Home, DMD, BSDMA, Education, Health, SWD, PRIs	Block and Gram Panchayat			
2	Conduct Rapid Visual Survey (RVS) and Safety Audit of old/ existing public and community buildings from multi-hazard perspective (including earthquake, floods and fire) in all the villages of Bihar.	DMD, BSDMA, PRIs, CSOs, CBOs	Block and GP			
3	Retrofitting of all old/ existing public and community buildings based on RVS and Safety Audit findings in a phased manner. In the first phase, retrofitting of all hospitals, medical colleges, schools and other important government establishments would be completed.	DMD, BSDMA, Health, MWRD, Education, PRIs	Block and Gram Panchayat			
4	Operationalising and strengthening “Technical Support Teams” at the district level to provide technical assistance to the community for building hazard resistant houses	DMD, BSDMA	District			
5	Create 'Safe Construction Resource Centres' (in line with the 'Earthquake Safety Clinics' developed by BSDMA) in partnership with IIT, NIT and Polytechnics as a single window access to advice on construction technologies, costing and quality monitoring.	DMD, BSDMA	District			
6	Identify safe places at Gram Panchayat and village levels in all Group A and B districts for providing temporary shelters to affected communities during disasters, and wherever possible / land available construct multi-hazard shelters in Gram Panchayats of Group A and B districts.	DMD, DM-DDMA, PWD, and RDD	Block and Gram Panchayat			

²⁴ Universal design is a design that adheres to the existing building bye-laws and codes as well as ensures ease of access for PWDs.

Nodal Department: Water Resources Department

#	Specific Actions	Supportive Departments / Agencies	Implementation Level (State / District / Sub-District / GP)	Timeline		
				Short Term (2015 to 2020)	Medium Term (2021 to 2025)	Long Term (2026 to 2030)
1	<ul style="list-style-type: none"> Identify and prioritize high flood risk prone villages and develop scenario based inundation maps for planning, preparedness and response etc. Undertake flood protection measures well in advance to prevent floods and mitigate the adverse impacts thereof 	FMIS, DMD, BSDMA, DM-DDMA, Science and Technology, and PRIs	State, District and Gram Panchayat			
2	Undertake construction of embankments where necessary as well as maintenance and repair of existing embankments including Zamindari embankments.	RDD, PRIs	District, Block and GP			
3	Identify the areas and villages wherein land is getting eroded due to river waters and undertake land protection through 'RCC Porcupine Technique' as well as undertake regular de-silting of riverbeds.	DM-DDMA, PRIs, CSOs and CBOs	District, Block and GP			
4	Augmentation of the existing Irrigation potential by more than 100% to mitigate the adverse impacts of deficient precipitation due to climate change and other natural causes.	Minor WRD	District, Block and GP			

Nodal Department: Rural Development Department

#	Specific Actions	Supportive Departments / Agencies	Implementation Level (State / District / Sub-District / GP)	Timeline		
				Short Term (2015 to 2020)	Medium Term (2021 to 2025)	Long Term (2026 to 2030)
1	The beneficiaries of Government housing projects, such as, Indira Aawas Yojana (IAY), should be encouraged to construct hazard resistant houses in	BSDMA, DMD, PRIs	Block and Gram			

#	Specific Actions	Supportive Departments / Agencies	Implementation Level (State / District / Sub-District / GP)	Timeline		
				Short Term (2015 to 2020)	Medium Term (2021 to 2025)	Long Term (2026 to 2030)
	line with the guidelines for house construction under Bihar Kosi Flood Recovery Project.		Panchayat			
2	<ul style="list-style-type: none"> • Ensure construction of water conservation and water harvesting structures in the villages especially in drought prone villages and districts under MGNREGA. • Undertake tree plantation in flood prone districts- Group A and B. 	DMD, PRIs	Block and GP			

Nodal Department: Panchayati Raj Department

#	Specific Actions	Supportive Departments / Agencies	Implementation Level (State / District / Sub-District / GP)	Timeline		
				Short Term (2015 to 2020)	Medium Term (2021 to 2025)	Long Term (2026 to 2030)
1	<p>1) Put in place a policy regime to encourage safe house construction including retrofitting of the old houses in the villages in line with the guidelines for housing construction developed by Bihar Kosi Flood Recovery Project.</p> <p>2) Awareness Building in the community to build safe houses in accordance with the policy regime.</p>	DMD, BSDMA	Village, GP			

Nodal Department: Agriculture Department

#	Specific Actions	Supportive Departments / Agencies	Implementation Level (State / District / Sub-District / GP)	Timeline		
				Short Term (2015 to 2020)	Medium Term (2021 to 2025)	Long Term (2026 to 2030)
1	Promote measures for rain water harvesting in drought prone districts from Group B & C.	RDD, Minor WRD., Forest & Environment, PRIs, CSOs	Block and Gram Panchayat			
2	Promote soil and water conservation through techniques like in-situ water conservation, check dams, and such in drought prone districts from Group B & C under water shed program.					
3	Undertake restoration of ponds, wells and canals as well as ahar, pynes and other traditional water sources in drought prone districts from Group B & C.					
4	Promotion of horticulture activities in line with the Krishi Road Map of the State	Environment and Forest Department, RDD				
4	<ul style="list-style-type: none"> Undertake R & D activities to develop water resistant seeds and plants for flood prone districts, and, develop seeds and plants for water deficient areas. Undertake lab to land programs to disseminate the knowledge and reach of such seeds and plants to the farmers. 	Agriculture Universities, KVKs				

Nodal Department: Home Department including Fire Services

#	Specific Actions	Supportive Departments / Agencies	Implementation Level (State / District / Sub-District / GP)	Timeline		
				Short Term (2015 to 2020)	Medium Term (2021 to 2025)	Long Term (2026 to 2030)
1	Set up a Road Safety Committee including women and	BSDMA,	Block			

#	Specific Actions	Supportive Departments / Agencies	Implementation Level (State / District / Sub-District / GP)	Timeline		
				Short Term (2015 to 2020)	Medium Term (2021 to 2025)	Long Term (2026 to 2030)
	youth at village level to promote road safety related behaviour amongst the residents of village and road safety related actions at the village level with special attention to the safety and security of girls and women, children, elderly and PWDs.	Panchayati Raj, Transport, Youth, Art & Culture, Education, PRIs, CSOs, and CERT	and Gram Panchayat			
2	<p>Ensure appropriate preparedness actions for controlling fire events through the following:</p> <ul style="list-style-type: none"> • Availability of water supply through identification of points for water extraction and making stand-by arrangements for motor pumps at appropriate decentralized locations at village / GP level. • Undertake a fire-preparedness drive at the village level before the fire season in summer based on the fire-preparedness related checklist²⁵. • Purchase and deployment of appropriate fire-fighting equipment and fire tenders at <i>Thana</i> level in the high fire prone blocks. 	Minor Irrigation Department, RDD, PHED, and PRIs	Thana-Police Station and Gram Panchayat			

Nodal Department: Road Construction Department/Rural Works Department

#	Specific Actions	Supportive Departments / Agencies	Implementation Level (State / District / Sub-District / GP)	Timeline		
				Short Term (2015 to 2020)	Medium Term (2021 to 2025)	Long Term (2026 to 2030)
1	<ul style="list-style-type: none"> • Conduct road safety audit in terms of floods and ensure that all village and major district roads constructed henceforth are flood resistant in flood prone districts. • Conduct safety audit of all bridges and ensure that all bridges are earthquake resistant. • Ensure that all MDRs and NHs passing through 	WRD, Transport, Home, DMD and PRIs	District, Block and GP			

²⁵Developed as part of the CBDRR programme initiated by UNICEF in north-Bihar

#	Specific Actions	Supportive Departments / Agencies	Implementation Level (State / District / Sub-District / GP)	Timeline		
				Short Term (2015 to 2020)	Medium Term (2021 to 2025)	Long Term (2026 to 2030)
	<p>habitations are pedestrian- and slow moving vehicle-friendly to prevent accidents.</p> <ul style="list-style-type: none"> • Ensure proper and standard signage are put on road side for safe travel. 					
2	<p>Undertake following measures to ensure safety at unmanned railway crossings:</p> <ul style="list-style-type: none"> • Identify all the unmanned railway crossings in the State. • Establish mechanisms with all the Gram Panchayats, wherein there is an unmanned railway crossing, for provisioning of signage, lighting arrangement, display board and such other actions. • Evolve a joint-plan of action with Railways Zone / Region Office to ensure safety at these crossings. 	Indian Railways Zone / Region Office, PRIs	Zone and Gram Panchayat			

Nodal Department: Transport Department

#	Specific Actions	Supportive Departments / Agencies	Implementation Level (State / District / Sub-District / GP)	Timeline		
				Short Term (2015 to 2020)	Medium Term (2021 to 2025)	Long Term (2026 to 2030)
1	<p>Ensure Boat safety through</p> <ul style="list-style-type: none"> • boat registration, • training of boat drivers, • fitness checking of boats and its equipment, • ensure all boats have load-line marked, • availability of safety equipment (like life jacket, lifebuoy, first-aid etc.) on the boats as well as at the <i>Ghats</i>, for ensuring compliance of boat safety rules -2011 and Flood SOP, especially in the monsoon months. 	Home, DMD, PRIs, Boat Owners Association, SHGs, and CSOs	District, Block, and GP			
2	<ul style="list-style-type: none"> • Sensitize boat drivers and community members on the model boat safety rules, norms, load line, search and rescue, and first aid. 	DMD, PRIs, Boat Owners Association, SHGs, and CSOs	District, Block, and GP			

Nodal Department: Social Welfare Department

#	Specific Actions	Supportive Departments / Agencies	Implementation Level (State / District / Sub-District / GP)	Timeline		
				Short Term (2015 to 2020)	Medium Term (2021 to 2025)	Long Term (2026 to 2030)
1	Ensure regular availability, at the Anganwadi centre, of first aid kits including ORS packets and other material for hygiene, sanitation and preventive health from a multi-hazard point of view.	Health Department, DM-DDMA, Jeevika, and PRIs	District, Block and GP			
2	Maintain and update list of children, infirm, old, pregnant and lactating mothers for taking their proper care during disasters.	DMD, DDMA-DM	Village, GP			

6.2 Resilient Livelihoods

What is a resilient livelihood?

Resilient livelihood in the Bihar context is envisaged as interplay of means, activities and entitlements by which people making a living are able to:

- **Anticipate and Cope** from shocks and stresses through risk analysis, early warning, risk reduction, risk transfer/sharing and compensation,
- **Recover** with enhanced capabilities, assets and opportunities through effective planning for building back better,
- **Adapt** to climate change and disaster risks through modifying production practices, processing and mitigation,
- **Develop** capabilities and assets without creating disaster risks for other people's current or future livelihood options.

Characteristics of resilient livelihoods

1. People make sustainable, risk-informed livelihood choices and adopt context-specific production practices in the agriculture and allied sectors.
2. Livelihood practitioners have diverse sources of income coming from a wider livelihood basket so as to ensure minimal impact of disasters.
3. Livelihood practitioners have the capacities and opportunities to access various livelihood options, production and processing practices, financial products, and markets to recover from shocks and stresses.
4. Relevant departments have a plan for ensuring the continuity of markets, supply chains, pertinent financial products, and temporary sources of income in case of disasters.
5. Policies and programmes support timely availability and access to raw materials/inputs, technologies, financial inclusion, backward and forward linkages, and means for processing and marketing for quick recovery of livelihoods after disasters.
6. Migration is only by choice, is safe and not forced.
7. Safe-guarding the livelihood of marginalised groups such as women-headed households, the landless, SCs and STs, and persons with disabilities (PWDs) is prioritised.

Actions

The above-mentioned characteristics of resilient livelihood will be achieved through focussed actions of different types, including targeted and planned capacity building of different actors, creating an enabling policy and risk governance environment, and communication and awareness activities aimed at attitudinal and behaviour changes. Additionally, **actions to achieve resilience of livelihood will not be limited to actions at the livelihood practitioner level itself, but also include actions at the state, district, block and ULBs-PRIs levels.** Key nodal departments responsible for undertaking actions for resilient livelihoods are Agriculture, Cooperative, Animal Husbandry, Fishery, Water Resources, Rural Development, Rural works, Panchayati Raj, Urban Development, Labour, Forest, and Small and Medium Industries Departments.

SPECIFIC ACTIONS FOR RESILIENT LIVELIHOODS

Nodal Department: Agriculture Department						
#	Specific Actions	Supportive Departments / Agencies	Implementation Level (State / District / Sub-District / GP)	Timeline		
				Short Term (2015 to 2020)	Medium Term (2021 to 2025)	Long Term (2026 to 2030)
1	Integrate measures for undertaking disaster risks' recognition, understanding and analysis as well as disaster resilient agricultural practices in the Agriculture Roadmap (2012-17) of Bihar.	DMD, BSRLM and CSOs	State			
2	<ul style="list-style-type: none"> Undertake analysis of the disaster risks to certain existing and potential livelihood clusters (like Litchi, Cotton, Silk, Agarbatti, Vegetable, Maize, <i>Makhana</i>, Dairy, Madhubani Painting, Leather, Fishery, Poultry, and such) within Bihar with participation of community level stakeholders including especially at-risk communities. Develop reports of the risk analyses including suggested measures to enhance resilience in these livelihood clusters 	Related Boards, Missions and Corporations, PRIs, ULBs, Private Sector, and CSOs	State and Districts			
3	<p>Research and promotion of hazard and climate change resilient agriculture (crop varieties and cultivation techniques) through following actions:</p> <ul style="list-style-type: none"> Develop short duration / stress resilient seed varieties taking into consideration the disaster and climate change induced risks (flood, drought, erratic / unseasonal rainfall, heat and cold waves, and hailstorms). Undertake widespread promotion and distribution of 	Agriculture Universities, ATMA, KVK, IPRD, PRIs, Farmer Producer Groups, media houses and CSOs	State, District, Block, and Gram Panchayat			

#	Specific Actions	Supportive Departments / Agencies	Implementation Level (State / District / Sub-District / GP)	Timeline		
				Short Term (2015 to 2020)	Medium Term (2021 to 2025)	Long Term (2026 to 2030)
	<p>these short duration / stress resilient seed varieties in all villages of Group A, B and C districts.</p> <ul style="list-style-type: none"> • Support research and development in developing disaster context specific cropping package and techniques which may be demonstrated at farmer's land and not just in 5x5 meter piece of land (experimental land) of Universities. • Establish mechanisms to take on board “progressive farmers” from the state for extension of hazard and climate change resilient agriculture. • Set up 'Field Schools' for various primary sector related demonstration of innovations and extension training (for Agriculture, Dairy, Fishery, Poultry, Horticulture and Livestock). • Strengthen ATMA and <i>Krishi Vigyan Kendras</i> (KVK) to undertake extension of successful flood and drought resilient cropping techniques in Group A and B and Group C districts respectively. • Develop research and extension related plans with ATMA and KVK to integrate hazard and climate change resilient agriculture in their routine functioning. • Build the capacities of the GP level <i>Kisan Salahkars</i> on disaster risks analysis and disaster resilient cropping techniques. • Emphasise more on extending the research from “laboratory to land”. • Include in the annual district plan of Agriculture Dept, measures for promotion of disaster resilient cropping varieties and techniques and undertaking disaster risk analysis. • Widespread dissemination of research and development through publications like booklets, pamphlets, posters, calendars, and hoardings as well as wall paintings, newspaper, radio and television programmes / messages. 					
4	Ensure timely provision of inputs and extension services for the high flood prone 15 districts (Group A) and drought prone 13 districts (Group C) so as to reduce the impact of the flood and drought events.	Agriculture Universities				
5	<p>Forward linkage related:</p> <ul style="list-style-type: none"> • Monitor construction of warehouses for storage of agricultural produce as per Agriculture Road map. 	Related All Departments, Building and	Block and Gram			

#	Specific Actions	Supportive Departments / Agencies	Implementation Level (State / District / Sub-District / GP)	Timeline		
				Short Term (2015 to 2020)	Medium Term (2021 to 2025)	Long Term (2026 to 2030)
	<ul style="list-style-type: none"> Promote establishment of cold storages as per Agriculture Road map. Promote setting up of processing plants for the varied primary produce by supporting producers' organizations. 	Construction, Private Sector, and CSOs	Panchayat			
6	Provision of agriculture implements and artisan / trade specific tools and equipment as part of recovery measures.	DMD, DM-DDMAs, PRIs	District and Gram Panchayat			
7	Modify the planning procedure guidelines/ directives to include disaster and climate risk analysis as a mandatory step in the development of annual plans of department.	Planning Dept.	State			

Nodal Department: Animal Husbandry and Fisheries Department

#	Specific Actions	Supportive Departments / Agencies	Implementation Level (State / District / Sub-District / GP)	Timeline		
				Short Term (2015 to 2020)	Medium Term (2021 to 2025)	Long Term (2026 to 2030)
1	<p>Enhance the livelihood options in all disaster prone districts through:</p> <ul style="list-style-type: none"> Promotion of fishery, goatry and poultry as additional livelihood practices in rural areas. Undertake livestock breed improvement programme. Ensure vaccination all cattle before onset of Monsoon to prevent cattle diseases during floods/extreme rainfall. Promote value added fodder practices for small farmers. Promote widespread adoption of measures for risk avoidance. Maintain livestock related database at the GP level and regularly update the same. 	IPRD, PRIs, and CSOs	District, Block and Gram Panchayat			
2	<p>Modify the planning procedure guidelines/ directives to include disaster and climate risk analysis as a mandatory step in the development of annual plans of department.</p>	Planning Dept.	State			
4	<p>Undertake following specific actions to ensure focus on livestock management from a disaster and climate change induced risks' point of view:</p> <ul style="list-style-type: none"> Establish emergency services in Veterinary Hospitals (livestock and other domesticated and wild animals). Set up a mobile veterinary emergency response unit. Develop a "State Animal DM plan" on the lines of National DM plan. Preparedness for taking measures (fodder camps, sourcing fodder from neighbouring states, promoting cultivation of fast maturing fodder varieties, and such) to ensure green fodder for livestock in times of disasters, such as, flood, drought, fire etc. in the State. 	DMD, BSDMA, Health Department, DM-DDMAs	State, District and Sites			

Nodal Department: Cooperative Department/Food and Consumer Affairs Department

#	Specific Actions	Supportive Departments / Agencies	Implementation Level (State / District / Sub-District / GP)	Timeline		
				Short Term (2015 to 2020)	Medium Term (2021 to 2025)	Long Term (2026 to 2030)
1	Modify the planning procedure guidelines/ directives to include disaster and climate risk analysis as a mandatory step in the development of annual plans of department.	Planning Dept.	State			
2	Sensitize (and promote new formation wherever required) the existing cooperative community institutions / groups (like SHGs, Farmers Groups, Farmer Producer Organizations, Cluster Groups e.g. Poultry Groups, Fishery Collectives, Dairy Collectives, and such livelihood groups' collectives) on disaster risk analysis and measures for risk avoidance (alternative livelihood practices and / or design, relocation, structural strengthening), transfer (insurance), sharing (group activities), and claiming compensation.	DMD, Agriculture, Related Boards, Missions and Corporations, PRIs, Private Sector, and CSOs	District, Block and GP			
3	<ul style="list-style-type: none"> Ensure timely procurement of agricultural produce at Panchayat level. Augment and create more capacities at the PACS/Panchayat level for storage of agricultural produce. Assess the need for cold storages based on the existing and potential livelihood clusters and set up the same. 	Food and Consumer Affairs, Agriculture Departments				
4	<ul style="list-style-type: none"> Increase the coverage of crop insurance. Ensure timely processing of insurance claims by Insurance Providers. 	Insurance Providers, Agriculture Department				

Nodal Department: Rural Development Department including Jeevika

#	Specific Actions	Supportive Departments / Agencies	Implementation Level (State / District / Sub-District / GP)	Timeline		
				Short Term (2015 to 2020)	Medium Term (2021 to 2025)	Long Term (2026 to 2030)
1	Integrate measures for undertaking disaster risks' recognition, understanding and analysis as well as disaster resilient agricultural practices in the Bihar State	DMD, Agriculture Dept.,	State			

#	Specific Actions	Supportive Department s / Agencies	Implement ation Level (State / District / Sub-District / GP)	Timeline		
				Short Term (2015 to 2020)	Mediu m Term (2021 to 2025)	Long Term (2026 to 2030)
	Rural Livelihood Mission (<i>Jeevika</i>).	BSRLM and CSOs				
2	Develop shelf of projects under MGNREGA or other such wage labour based programmes to ensure availability of work to the disaster affected populace close to their homes/ temporary shelters / camps and mega camps.	DMD, DM-DDMAs, PRIs	State, District, Block and Camps			
3	Carry out restoration of agricultural lands (e.g. through de-siltation etc) and promotion of appropriate crops under MGNREGA.	Agriculture Dept. And PRIs	Block and GP			
4	Undertake urgent repairs and restoration of public infrastructure and community assets within norms under MGNREGA.	DMD and PRIs	District, Block, GP			
5	Modify the planning procedure guidelines/ directives to include disaster and climate risk analysis as a mandatory step in the development of annual plans of department.	Planning Dept.	State			
6	Widen the scope of the <i>Jeevika</i> block office as a 'Resilient Livelihood Resource Centre' to provide technical support to local bodies in taking up actions on analysis of disaster risks to livelihoods, designing risk avoidance, risk reduction, sharing, transfer, and compensation measures, risk informed planning of livelihood initiatives, implementation, and monitoring.	BSDMA, Related All Departments, PRIs, and CSOs	State and Block			
7	JEEVIKA to undertake following measures: <ul style="list-style-type: none"> Develop annual status report on livelihood clusters and measures taken for risk management. Create a Livelihood related database including risk management measures at district and State level. Document and share good practices / case studies related to resilient livelihoods. 	BSDMA and IPRD, Economic and Statistics Directorate	State			
8	JEEVIKA to <ul style="list-style-type: none"> Form SHGs of rural women engaged in fruit and vegetables growing/ selling and train such groups for equipping them with better agricultural practices. Arrange financial support to such train women groups to start fruit and vegetable preservation and canning business. Establish assured marketing network for such groups. 	Agriculture, RDD	State and District			

Nodal Department: Department of Environment and Forest

#	Specific Actions	Supportive Departments / Agencies	Implementation Level (State / District / Sub-District / GP)	Timeline		
				Short Term (2015 to 2020)	Medium Term (2021 to 2025)	Long Term (2026 to 2030)
1	Promote wasteland development, fodder development, pasture development, social forestry, and wetland development etc.	Agriculture, RDD, PRIs, and CSOs	District, Block and GP			
2	<ul style="list-style-type: none"> Undertake tree plantation in flood prone districts-Group A and B. Undertake anti-erosion works along embankments/roadside through soil binder/leguminous grasses. 		Block and GP			
3	Modify the planning procedure guidelines/ directives to include disaster and climate risk analysis as a mandatory step in the development of annual plans of department.	Planning Dept.	State			

Nodal Department: Water Resources Department

#	Specific Actions	Supportive Departments / Agencies	Implementation Level (State / District / Sub-District / GP)	Timeline		
				Short Term (2015 to 2020)	Medium Term (2021 to 2025)	Long Term (2026 to 2030)
1	Initiate measures for repairs and de-siltation of canals and water bodies for resilient livelihoods and increase the irrigation coverage especially in the 13 drought-prone districts (Group C).	Agriculture, RDD, Minor WRD, PRIs, and CSOs	District, Block and GP			
2	Undertake drainage development plans to reduce the risk of flash floods.	Agriculture, RDD, PRIs.	District, Block and GP			

Nodal Department: Labour Resources Department

#	Specific Actions	Supportive Departments / Agencies	Implementation Level (State / District / Sub-District / GP)	Timeline		
				Short Term (2015 to 2020)	Medium Term (2021 to 2025)	Long Term (2026 to 2030)

#	Specific Actions	Supportive Department s / Agencies	Implementation Level (State / District / Sub-District / GP)	Timeline		
				Short Term (2015 to 2020)	Medium Term (2021 to 2025)	Long Term (2026 to 2030)
1	<ul style="list-style-type: none"> Through <i>State Skill Development Mission</i> undertake skilling programs with a focus on skill building and entrepreneurship development of youth and women. Undertake modernization of Industrial Training Institutes (ITIs) and establish partnerships with the private sector for this purpose. Encourage private sector to undertake and/or focus their CSR initiatives on skill development. 	All related Department s, Private Sector, and CSOs	State, District and Block			
2	Modify the planning procedure guidelines/ directives to include disaster and climate risk analysis as a mandatory step in the development of annual plans of department.	Planning Dept.	State			

Nodal Department: Urban Development and Housing Department

#	Specific Actions	Supportive Department s / Agencies	Implementation Level (State / District / Sub-District / GP)	Timeline		
				Short Term (2015 to 2020)	Medium Term (2021 to 2025)	Long Term (2026 to 2030)
1	Initiate a Bihar State Urban Livelihood Programme (BSULP) as part of the 'National Urban Livelihood Mission', to focus on enhancing resilience of urban livelihoods through measures for undertaking urban disaster risks' recognition, understanding and analysis as well as disaster resilient urban livelihood practices	DMD, BSRLM and CSOs	State			
2	Modify the planning procedure guidelines/ directives to include disaster and climate risk analysis as a mandatory step in the development of annual plans of department.	Planning Dept.	State			

#	Specific Actions	Supportive Departments / Agencies	Implementation Level (State / District / Sub-District / GP)	Timeline		
				Short Term (2015 to 2020)	Medium Term (2021 to 2025)	Long Term (2026 to 2030)
3	<p>Actions for safeguarding livelihoods of unregistered small producers, vendors and traders as well as migrant labourers in the peri-urban and urban areas:</p> <ul style="list-style-type: none"> • Map (identify and list) the unregistered small producers, vendors and traders in the peri-urban and urban areas as well as develop mechanisms for registering these livelihood practitioners. • Undertake analysis of disaster risks to their livelihoods. • Initiate effective measures for risk mitigation (structural strengthening, relocation and alternative livelihood practice), risk transfer (insurance, group ownership) and compensation based actions for these livelihoods. • Map the peri-urban and urban areas typically witnessing in-migration in the state and plan measures for linking the in-migrants to disaster and climate change induced risks resilient skill building and livelihood initiatives in partnership with employment exchanges and private sector. 	Jeevika, Skills Mission, Planning Department, Employment Exchanges, CII, FICCI, Rotary, and CSOs	State, District and ULB			

Nodal Department: Disaster Management Department

#	Specific Actions	Supportive Departments / Agencies	Implementation Level (State / District / Sub-District / GP)	Timeline		
				Short Term (2015 to 2020)	Medium Term (2021 to 2025)	Long Term (2026 to 2030)
1	Develop guidelines for damage assessment of crops, livestock, small ruminants, poultry and fisheries and other means of livelihoods for which input subsidy/relief is admissible under SDRF/NDRF norms.	SEC, Related Depts. and CSOs	State			
2	Establish a system of expeditious disbursement of input-subsidy to farmers, artisans, and others as part of recovery measures.	SEC, District Administration	State, District and GP			
3	Develop a livelihood recovery policy taking into account the multi-hazard profile and the Build-Back-Better principle.	BSDMA, Planning Dept., SEC and RDD	State			

#	Specific Actions	Supportive Departments / Agencies	Implementation Level (State / District / Sub-District / GP)	Timeline		
				Short Term (2015 to 2020)	Medium Term (2021 to 2025)	Long Term (2026 to 2030)
4	Build capacity of community to know the risk, monitor the risk, disseminate the information with enhanced response capacity on the relevant hazard types for the agriculture and allied sectors.	Agriculture, IPRD, DM-DDMAs and PRIs	State, District and Gram Panchayat			

Nodal Department: Finance Department

#	Specific Actions	Supportive Departments / Agencies	Implementation Level (State / District / Sub-District / GP)	Timeline		
				Short Term (2015 to 2020)	Medium Term (2021 to 2025)	Long Term (2026 to 2030)
1	Formulate an action plan to enhance financial inclusion in the state by focusing on: 1) Widen the coverage of KCC in the state 2) Encourage banks to reach the hitherto unreached populace 3) Develop different types of credit products as per the livelihood systems and requirements of the primary producers 4) Develop various saving and deposit products catering to the varied user profiles 5) Evolve insurance products for the primary and secondary sectors - 6) Encourage private sector banks and NBFCs to take up the above-mentioned actions 7) Advocacy for easier and farmer friendly process for availing insurance benefits	State Level Bankers Committee (SLBC), Industry, Agriculture, Cooperative, Animal Husbandry and Fisheries Depts., Related Boards and Missions, Insurance Providers, NBFCs, Producer Groups, and CSOs	State, District and Block			
2	Develop menu of products for provision of soft loans, loan waivers, working capital, and capital costs to primary producers as well as traders and secondary sector producers so as to rebuild their assets and restart livelihood activities after a disaster events. And, Establish the procedures for provision of soft loans / loan waivers / working capital / capital costs to them		State, District and Block			

Nodal Agency: BSDMA

#	Specific Actions	Supportive Department s / Agencies	Implementation Level (State / District / Sub-District / GP)	Timeline		
				Short Term (2015 to 2020)	Medium Term (2021 to 2025)	Long Term (2026 to 2030)
1	Undertake a study on the impact of climate change on agriculture and allied sectors (including land water management) and the requisite adaptive measures to be taken.	DMD, BSRLM and CSOs	State			
2	Develop guidelines for concerned line departments on how to conduct disaster risk analysis and integrate it into their annual plans.	DMD, Planning Dept.	State			
3	Widespread dissemination of livelihood related relief and recovery entitlements	DMD, IPRD and CSOs	State, District, PRI and ULB			

Nodal Agency: BIPARD/SIDM

#	Specific Actions	Supportive Department s / Agencies	Implementation Level (State / District / Sub-District / GP)	Timeline		
				Short Term (2015 to 2020)	Medium Term (2021 to 2025)	Long Term (2026 to 2030)
1	Assess the capacities of Local Bodies' members, PRD, UDD, RDD, and related all departments' officials on analyses of disaster and climate risks to livelihood systems and integrating this analysis in planning and implementing initiatives based on the same & design a comprehensive capacity enhancement plan based on this assessment.	BSDMA, DMD, Jeevika, RDD, Agriculture and Related All Depts., PRIs and CSOs	State			
2	Build capacities of Local Bodies' members and related depts' officials, based on the above plan, through ToT, Training Workshops, Demonstrations, Learning Visits, Handholding support etc. on: 1) Annual planning and sharing it with stakeholders which entail integration of analysis of disaster risks to livelihood systems in the planning. 2) Damage assessments to various livelihood systems.	DMD, NIDM, BSDMA, Agriculture Dept, PRIs and CSOs	State, District and Block			
3	Build the capacities of community level stakeholders (<i>Kisan Salahkars</i> , producers in primary and secondary sectors as well as traders, processors and supply chain managers), based on the above plan, through ToT, Training Workshops, Demonstrations, Learning Visits, Handholding support, Decision-Support Tools, mock drills, IVRT, VC, and such on: 1) Analysis of disaster risks to livelihood systems		State, District and Block			

#	Specific Actions	Supportive Department s / Agencies	Implementation Level (State / District / Sub-District / GP)	Timeline		
				Short Term (2015 to 2020)	Medium Term (2021 to 2025)	Long Term (2026 to 2030)
	analysis . 2) Risk proofing production practices and refining the same in present day contexts.					
4	Build the capacities of civil society organizations and other community based institutions / livelihoods on Farm Field Schools, Context specific cropping packages, risk analysis, and livelihood basket diversification.	DMD, NIDM, BSDMA, Jeevika, RDD, Agriculture and Related All Depts.	District and Block			
5	Capacity building of GPs and ULBs in assessment of livelihoods opportunities, implementation and monitoring of livelihood assessments and compensation provision.	DMD, NIDM, BSDMA, DM-DDMA, RDD and Related Departments	State, District and Block			

Nodal Department: Information and Public Relations Department

#	Specific Actions	Supportive Department s / Agencies	Implementation Level (State / District / Sub-District / GP)	Timeline		
				Short Term (2015 to 2020)	Medium Term (2021 to 2025)	Long Term (2026 to 2030)
1	Design hazard-specific communication materials, initiatives and events focusing on: 1) Hazard-resilient production practices 2) Hazard-specific livelihood systems related shock proofing measures (storage of inputs and produce, disaster-resilient asset building, disaster-resilient supply chains, and such) 3) Hazard-specific livelihood systems related risk transfer measures 4) Hazard-specific livelihood systems related compensation measures 5) Hazard-specific livelihood systems related alternative income generation models during temporary disruptions and for long term 6) Financial inclusion and hazard-specific livelihood systems related financial products	BSDMA, DMD, Jeevika, RDD, Agriculture, Cooperative, Animal Husbandry and Fisheries, Small and Medium Industries Depts., PRIs and CSOs	State, District and Block			
2	Undertake regular communication for public awareness, education and action based on the above.		State, District and Block			

#	Specific Actions	Supportive Department s / Agencies	Implementation Level (State / District / Sub-District / GP)	Timeline		
				Short Term (2015 to 2020)	Medium Term (2021 to 2025)	Long Term (2026 to 2030)
3	Develop awareness programmes on TV, Radio, and social media based on the critical times and hazard-specific actions pertaining to various livelihood systems in the state.	BSDMA	State			
4	Create awareness about DRR through nukkar natak, folk songs and other mediums of information in the state	BSDMA/DM D	District/ block			

Nodal Agency: Civil Society Organisations (CSOs)

#	Specific Actions	Supportive Departments / Agencies	Implementation Level (State / District / Sub-District / GP-Village)	Timeline		
				Short Term (2015 to 2020)	Medium Term (2021 to 2025)	Long Term (2026 to 2030)
1	Promote community based grain banks, seed banks and revive traditional seed varieties in partnership with PRIs.	RDD, Agriculture, PRIs	District, Block and GP			

6.3 Resilient Basic Services

What are basic services?

Basic services in the context of this roadmap have been considered as the following seven essential services which are critical for survival, sustenance of basic quality of life, protection and well-being of individuals and communities. GoB is committed to protecting rights and entitlements of disaster affected communities. Functional continuity and timely restoration of basic services in the aftermath of exposure to a hazard event forms the cornerstone of a resilient society. Ensuring this entails **both structural and non-structural measures** like building better from the start to withstand hazards through proper design and construction, retrofitting and rebuilding, a culture of maintenance, taking into account impact assessments, operational clarity, risk awareness/competence and culture of safety within staff. The seven basic services are as under:

1. **WASH (Water, Sanitation and Hygiene) and Waste Management:** This sector covers water, sanitation, hygiene and waste management that includes provision of drinking water and toilets, hygiene promotion and practices for management of solid and liquid waste.
2. **Food and Nutrition:** This sector includes food and nutrition services as provided through the Public Distribution System (PDS) and Integrated Child Development Services (ICDS), Mid-Day Meal, *Shatabdi Anna Kalash Yojana* as well as through people's own efforts.
3. **Health:** This sector covers provision of emergency medical services, promotive, preventive, curative and rehabilitative health services as provided through the primary, secondary and tertiary health care facilities of both government and non-government in the state.
4. **Education:** This sector covers provision of primary, secondary, higher education through formal and non-formal means as well as the professional, technical and vocational facilities in the state.
5. **Housing:** This sector includes provision of safe housing and temporary shelters through central and state govt flagship programmes and Urban Housing Programme as well as through people's own efforts.
6. **Safety, Security & Protection:** This sector includes the group of actions undertaken by the state for ensuring the safety, security and protection of at-risk population groups like children, adolescents, and women, transgender, People With Disabilities (PWD), and the elderly.
7. **Emergency Support Functions (ESF):** This sector includes the group of actions undertaken by the state as preparedness and response measures to save lives (Evacuation, Search and Rescue and Needs Assessment), restore essential services and critical infrastructure (Emergency Operation Centres, Early Warning System and Warehouses), protect property and the environment (Debris

Clearance, identification and dignified dead body management and disposal of carcasses), and help victims and communities return to normal following disaster incidents.

Infrastructural aspects pertaining to each of the social sectors in these basic services such as Anganwadi Centres, primary-secondary-tertiary medical facilities, Nutrition Rehabilitation Centres, schools, waste processing plants, EOCs, and Warehouses have been included as part of the basic services since these infrastructural aspects are not only an integral part of the service delivery system but also are the responsibility of the respective mandated departments of GoB.

What are resilient basic services?

Resilient basic services in the context of Bihar are envisaged as a set of above-mentioned seven services which are capable to ensure:

- **Pre-disaster: Efficacy** in the access to and delivery of services to all the intended target groups during non-disaster times through effective risk informed planning, coverage and implementation,
- **During disasters: Timely access and effective service delivery** to all the intended target groups during disasters through functional continuity at the earliest,
- **After disasters: Recovery** from disasters through effective planning for building back better and enhanced service delivery after disasters

Characteristics of resilient basic services

1. Line departments and all members of communities recognise and act upon their rights and duties for ensuring continuity of basic services at all times.
2. Annual plans of line departments for provision of basic services are risk-informed, factor in and address disruptions in service delivery during disaster situations.
3. Line departments undertake disaster risk analysis before annual planning.
4. Line departments are equipped with Service Delivery Continuity Plans (SDCPs) for ensuring continuity and early regaining of functionality in provision of basic services during disasters.
5. Essential items and equipment are pre-positioned at district, block and Panchayat/ village levels as well as facilities levels as a part of the SDCPs.
6. Departmental staff at state, district, block levels and front-line workers have competence and capacities for risk-informed planning, including risk analysis and delivery of emergency services.
7. The policies and programmes supporting annual planning of line department are flexible enough to allow differential planning for geographies, populations groups (special emphasis on vulnerable groups like women, pregnant and lactating mothers, children < 5yrs,

adolescents,elderly, PWD, people with communicable and non-communicable diseases, minorities, prisoners and PLHA) and situations.

Actions

The above-mentioned characteristics of resilient basic services will be achieved through focussed actions of different types, including targeted as well as planned operational and structural enhancements, modifications and/or creation anew of systems and procedures, capacity building of different actors, communication and awareness activities aimed at attitudinal and behaviour changes, and creating an enabling policy and risk governance environment. Additionally, **actions to achieve the resilience of basic services will not be limited to actions at the line department-level itself, but also include actions at the state, district and Gram Panchayat levels.** Eight line departments viz. PHED, Health, Education, Food and Consumer Protection, RDD, UDD, Social Welfare, and DMD have been identified as responsible for ensuring resilience in basic services. Mobilization of community based institutions and volunteer groups such as Anganwadi workers, Accredited Social Health Activists (ASHA), parent and teachers associations, Red Cross / Crescent Volunteers, Youth Club, women’s groups, etc. will be the key to ensure the outreach and continuity of critical basic services. The actions have been organised and presented below in two parts viz. common actions (applicable for all eight line departments to undertake) and department specific actions.

SPECIFIC ACTIONS FOR RESILIENT BASIC SERVICES

HEALTH SERVICES						
Nodal Department: Health Department						
#	Specific Actions	Supportive Departments / Agencies	Implementation Level (State / District / Sub-District / GP)	Timeline		
				Short Term (2015 to 2020)	Medium Term (2021 to 2025)	Long Term (2026 to 2030)
1	Develop a resilience index for resilient health facilities and services in partnership with civil society.	DMD, BSDMA, NIDM,	State			
2	Assess the health facilities and services in the State to determine the current status based on this resilience index.	WHO, UN Agencies and CSOs	State, District, Block			
3	Based on this exercise, undertake corrective measures for enhancing the resilience of the infrastructure facilities (retrofitting, relocation) and	BMSICL/B uilding Construct	State, District, Block			

#	Specific Actions	Supportive Departments / Agencies	Implementation Level (State / District / Sub-District / GP)	Timeline		
				Short Term (2015 to 2020)	Medium Term (2021 to 2025)	Long Term (2026 to 2030)
	service delivery systems (additional resources, personnel, supplies, stockpiling, supply chain, and such) especially in Group A and Group B districts.	ion Dept.				
4	Ensure that all new constructions of the primary, secondary and tertiary health facilities in the State are green, disabled-friendly and earthquake and fire resistant.	BMSICL/B CD	State, District, Block			
5	Based on the risk analysis exercise: <ul style="list-style-type: none"> Identify and list the "Critical and Inaccessible Areas" i.e. areas having least health services coverage or most frequent disruptions and are prone to epidemics. Plan for appropriate additional measures (like budget allocation, personnel, supplies, and resources) to be taken for provision of health services in Group A and Group B districts, especially in the Critical and Inaccessible Areas. Create a mechanism to monitor and adapt service delivery plans for these Critical and Inaccessible Areas. 	BSDMA, UN Agencies and CSOs	District, Sub-division and block			
6	Implement the Guidelines for Seismic Safety for Non-Structural Components in Hospitals developed by Gol (2007) at all the health facilities.	BMSICL/B CD, PHED&Energy Dept.	State, District and Block			
7	Develop DM plans, including SOPs for mass casualty management, for all the primary, secondary and tertiary health facilities in the state.	DMD, BSDMA, NDMA, NIDM	State, District and Block			
8	Identify and list the private, charitable and public health care facilities as per categories (maternity, orthopaedics, non-communicable diseases, geriatric health, child health, diagnostics, and any other specialized health provider / facilities), create an open-source database of the same and establish arrangements with private and charitable hospitals for provision of these services in case of a disaster event.	IMA-Bihar, Red Cross Society, Hospital Asscn., & CSOs	State, District and block			
9	Ensure that an annual disaster risk analysis exercise is conducted as part of the planning cycle (PIP development) for targeting, resource allocation and additional measures for specific vulnerabilities.	Panchayati Raj/Urban	State			

#	Specific Actions	Supportive Departments / Agencies	Implementation Level (State / District / Sub-District / GP)	Timeline		
				Short Term (2015 to 2020)	Medium Term (2021 to 2025)	Long Term (2026 to 2030)
10	Orient the service providers to work with PRIs and ULBs so that they identify risks related to health services and plan for addressing the same through participation of service providers in PRI and ULB planning.	Development/Planning Dept., State and District Health Societies (NHM), PRIs & ULBs	District, Block, PRIs & ULBs			
11	Develop a SOP for managing biological hazard including Vector-borne and Water-borne diseases.	DMD, BSDMA, Health Societies, WHO, UN Agencies, IMA-Bihar, Hospital Assocn., & CSOs	State			
12	Develop norms for health service delivery during and post disasters; Based on these norms develop preparedness plans and undertake actions (like deployment of resources, supplies, personnel, and such) for implementation of these preparedness plans.	DMD, Home, concerned institutions of Health Dept.	State			
13	Formulate, train and develop a deployment plan of Quick Medical Response Teams (QMRTs), and along with that each QMRT has access to Advanced Trauma Life Saving (ATLS) / Basic Life Support (BLS) ambulances.	DM-DDMAs, UN Agencies, CSOs & NHM	State and District			
14	Prepare contingency plans (including equipment, personnel as well as identification and transportation of pregnant women) for setting up maternity huts as well as continuation of provision of immunization, supplementary nutrition and national programmes as part of all temporary shelters/camps/mega camps for disaster events.	DMD, WHO, UN Agencies, NHM, Health Societies,	District			
15	Develop service delivery continuity plans for ensuring effective preparedness, back up and regaining prompt functionality of the health services in case of disaster events. As part of these service delivery continuity plans: <ul style="list-style-type: none"> Develop a deployment plan for medical and 		State, District and Block			

#	Specific Actions	Supportive Departments / Agencies	Implementation Level (State / District / Sub-District / GP)	Timeline		
				Short Term (2015 to 2020)	Medium Term (2021 to 2025)	Long Term (2026 to 2030)
	<p>para-medical personnel for preparedness and response actions.</p> <ul style="list-style-type: none"> • Deploy Boat ambulances with adequate medical staff and medicines during floods to provide medical assistance to the marooned population. • Pre-position essential equipment and materials and personnel as per the hazard-specific relevant SOPs and / or guidelines before the onset of predictable hazard events. • Ensure effective implementation of the pertinent SOPs and treatment protocols through mock drills and reviewing the SOP based on lessons learnt from drills and actual disaster events. • Review the performance of these service delivery continuity plans after each disaster event. 	Private and Charitable DMD, DM-DDMP, Hospitals, and CSOs				
16	Conduct a 'Scenario-Based Analysis' for L2 and L3 events and develop a template for damage assessment and costing for recovery planning to be included as part of the annual plan of the department.	DMD, BSDMA and Technical agencies	State			
17	Undertake digitization of services' related office records, files, case papers and other documents of government offices and storage of the same on servers and back up of the same.	IT Dept. & Technical agencies	State, District and Block			
18	<p>Capacity Building:</p> <ul style="list-style-type: none"> • State, district and block levels' officials on risk analysis and applying the risk analysis in planning of resilient health services. • Conduct hands-on training of the ASHAs, ANMs, and AWWs on application of 'Guideline for ASHAs, ANMs, and AWWs' and implementation of norms, guidelines and / or SOPs on delivering services during disasters. • Orientation / Continuous Medical Education of Medical Officers and other health functionaries on SOPs and guidelines (Mass Casualty Management, Fire Safety in Hospital, Minimum Information Service Package, Flood, Drought, Earthquake, AES, Vector-borne, Water-borne, and Biological hazards). 	DMD, BSDMA, State Health Society, UN Agencies, Technical experts, and CSOs	State, District and block			

#	Specific Actions	Supportive Departments / Agencies	Implementation Level (State / District / Sub-District / GP)	Timeline		
				Short Term (2015 to 2020)	Medium Term (2021 to 2025)	Long Term (2026 to 2030)
	<ul style="list-style-type: none"> State and district level officials on construction of 'safe facilities'. Disaster response related training of Secondary and Tertiary Facilities' Superintendents, Curriculum refinement (modules on emergency health response) for Front Line Workers (FLWs) and medical service providers on disaster response. Conduct orientation sessions with private unregistered health practitioners and traditional birth attendants on their roles in disasters. Training of youth as volunteers for provision of first aid and public health. Develop pocket handbooks for ASHA workers with disaster preparedness checklists. Include a disaster-related option/ module in the 'Mobile Kunji' (initiative of Health Department in partnership with BMGF) for ASHA workers. 					
19	<p>Communication and Knowledge building:</p> <ul style="list-style-type: none"> Develop and widely disseminate IEC material for Front Line Workers related to specific actions to be taken for preparedness and response for various hazards. IEC material for supporting construction of resilient infrastructure as part of service delivery. Popularize the emergency helpline numbers along with enhancing public awareness on the purpose of its use. 	IPRD, DMD, BSDMA, NHM, Health Societies, PRIs, ULBs, & CSOs				

Water, Sanitation and Hygiene (WASH) SERVICES

Nodal Department: Public Health Engineering Department

#	Specific Actions	Supportive	Implement	Timeline
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		ve Departm ents / Agencies	ation Level (State / District / Sub-District / GP)	Short Term (2015 to 2020)	Med ium Ter m (202 1 to 202 5)	Lon g Ter m (20 26 to 203 0)
1	Develop a resilience index for resilient WASH facilities and services in partnership with civil society.	DMD, BSDMA, NDMA, NIDM, UN Agencies and CSOs	State			
2	Assess the WASH facilities and services in the state to determine the current status based on this resilience index.		State, District, Block			
3	Based on this exercise, undertake corrective measures for enhancing the resilience of the infrastructure facilities (retrofitting, relocation) and service delivery systems (additional resources, personnel, supplies, stockpiling, supply chain, and such) especially in Group A and Group B districts.	Building Construct ion Dept.	State, District, Block			
4	Based on the risk analysis exercise: <ul style="list-style-type: none"> Identify and list the “Critical and Inaccessible Areas” i.e. areas having least WASH services coverage or most frequent disruptions and are prone to epidemics. Plan for appropriate additional measures (like budget allocation, personnel, supplies, and resources) to be taken for provision of WASH services in Group A and Group B districts, especially in the Critical and Inaccessible Areas. Create a mechanism to monitor and adapt service delivery plans for these Critical and Inaccessible Areas. 	DMD, BSDMA,U N Agencies and CSOs	District, Sub- division and block			
5.	Construct flood resistant (keeping in view HFL), disabled and children friendly, platforms after installation of Hand Pumps in temporary/permanent flood shelters	District administr ation				
6.	Ensure that potable water is available to the affected population during disasters. If considered appropriate and feasible water purifiers can also be made available during any kind of disaster situation.		District			
7.	Ensure that the “Nishchay” initiatives of the State Government, such as, “piped water supply to every house” (har ghar mein nal ka jal) and “Toilet in all houses” (har ghar mein shauchalaya) are disabled friendly, senior citizen friendly, and, earthquake and fire resistant.	BCD, BSDMA, DMD	Villages, GP and Cities			
8	Develop DM plans for all the WASH related facilities in the state.	DMD, BSDMA & UN	State, District and Block			

#	Specific Actions	Supportive Departments / Agencies	Implementation Level (State / District / Sub-District / GP)	Timeline		
				Short Term (2015 to 2020)	Medium Term (2021 to 2025)	Long Term (2026 to 2030)
		agencies				
9	Ensure that an annual disaster risk analysis exercise is conducted as part of the planning cycle (PIP development) for targeting, resource allocation and additional measures for specific vulnerabilities.	Planning Dept., PRIs & ULBs	State			
10	Orient the service providers to work with PRIs and ULBs so that they identify risks related to WASH services and plan for addressing the same through participation of service providers in PRI and ULB planning.	Panchayati Raj/Urban Development/Planning Dept., PRIs & ULBs	District, Block, PRIs & ULBs			
11	Include the WASH and waste management related actions in the GP planning through the Standing Committee, Village Health Nutrition and Sanitation Committee and partnership with civil society organizations.	Panchayati Raj Dept., Health, PRIs, CSOs	Gram Panchayat			
12	Develop norms for provision of drinking water, sanitation and hygiene services during disaster events, including provision of hygiene items during disasters and a hazard-wise list of items to be issued along with their quantities. These norms should also include a list of equipment and materials pertaining to WASH and waste management that need to be pre-positioned for impending disasters.	DMD, Panchayati Raj Dept., UDHD, UN Agencies and CSOs	State and district			
13	Include the following in the 'Guideline for Camp (temporary and mega) Management' and make a plan to undertake the same: <ul style="list-style-type: none"> • Availability of adequate potable water as per the norms. • Setting up temporary toilets catering to needs of special groups (PWD and children), ensuring their functioning and maintenance. • Separate bathing spaces and toilets for men and women. • Effective solid & liquid waste management. 	DMD, PRIs, ULBs, UN Agencies, and CSOs	State			
14	Undertake water testing and purification especially	PRIs &	At camp			

#	Specific Actions	Supportive Departments / Agencies	Implementation Level (State / District / Sub-District / GP)	Timeline		
				Short Term (2015 to 2020)	Medium Term (2021 to 2025)	Long Term (2026 to 2030)
	before and during floods in Group A and B districts and Group C during drought times.	CSOs	sites			
15	Conduct hygiene promotion activities at community level on regular basis and intensively during disaster events, including those in camps, in partnership with civil society organizations and coordination with the ANMs, ASHAs, AWWs, and GP.	PRIs and CSOs	Gram Panchayat			
16	Ensure the construction of raised toilets and public drinking water facilities in Group A and B districts as well as preposition and provision of mobile toilets during emergencies.	Panchayati Raj, Education, Health Depts., PRIs and CSOs	Gram Panchayat			
17	Develop service delivery continuity plans for ensuring effective preparedness, back up and regaining prompt functionality of the WASH services in case of disaster events. As part of these service delivery continuity plans: <ul style="list-style-type: none"> • Develop a deployment plan for personnel for preparedness and response actions. • Pre-position essential equipment and materials and personnel as per the hazard-specific relevant SOPs and / or guidelines before the onset of predictable hazard events. • Ensure effective implementation of the pertinent SOPs and guidelines through mock drills and reviewing the SOP based on lessons learnt from drills and actual disaster events. • Review the performance of these service delivery continuity plans after disaster events. 	DMD, UN Agencies, and CSOs	State, District and Block			
18	Conduct a 'Scenario-Based Analysis' for L2 and L3 events and develop a template for damage assessment and costing for recovery planning to be included as part of the annual plan of the department.	DMD, BSDMA and Technical agencies	State			
19	Undertake digitization of services' related office records, files, and other documents of government offices and storage of the same on servers and back up of the same.	IT Dept. & Technical agencies	State, District and Block			
20	Inclusion of the recovery and reconstruction of drinking water sources in department's annual plans.		State			

#	Specific Actions	Supportive Departments / Agencies	Implementation Level (State / District / Sub-District / GP)	Timeline		
				Short Term (2015 to 2020)	Medium Term (2021 to 2025)	Long Term (2026 to 2030)
21	<p>Capacity Building:</p> <ul style="list-style-type: none"> • State, district and block levels' officials on risk analysis and applying the risk analysis in planning of resilient health services. • Conduct hands-on training of the service providers and technicians on implementation of norms, guidelines and / or SOPs on delivering services during disasters. • Orientation of state, division, district and block levels' functionaries on SOPs and guidelines pertaining WASH. • State and district level officials on construction of 'safe facilities'. • Build the capacities of service providers and functionaries of PRIs & ULBs and members of SHGs and other CBOs to carry out hygiene promotion activities. • Train the engineers of PHED on resilient toilet designs. • Train stakeholders from PHED, Civil Defence, citizen councils and civil society organizations on Public Health in Emergencies. • Develop Hygiene Promotion kits (IEC materials) to be deployed during disasters, including hazard specific guidelines. 	BSDMA, DMD, UN Agencies and CSOs	District and Block			
22	<p>Communication and Knowledge building:</p> <ul style="list-style-type: none"> • Develop Hygiene Promotion kits (IEC materials) to be deployed during disasters, including hazard specific guidelines. • Develop and disseminate posters for Do's and Don'ts for before, during and after various hazard events • Develop and widely disseminate IEC material for Front Line Workers related to specific actions to be taken for preparedness and response for various hazards. • IEC material for supporting construction of resilient infrastructure as part of service delivery. • Popularize the emergency helpline numbers along with enhancing public awareness on the purpose of its use. 	IPRD, DMD, BSDMA, UN agencies, PRIs, ULBs, & CSOs				

EDUCATION SERVICES

Nodal Department: Education Department

#	Specific Actions	Supportive Departments / Agencies	Implementation Level (State / District / Sub-District / GP)	Timeline		
				Short Term (2015 to 2020)	Medium Term (2021 to 2025)	Long Term (2026 to 2030)
1	Develop a resilience index for resilient education facilities and services in partnership with civil society.	DMD, UN Agencies and CSOs	State			
2	Assess the education facilities and services in the state to determine the current status based on this resilience index.		State, District, Block			
3	<ul style="list-style-type: none"> Review school building guidelines/ designs and include structural safety elements from a multi-hazard point of view including provisions for local context-specific adaptations within the state. Ensure that all new constructions of educational institutions are green, disabled friendly, equipped with water harvesting techniques, and, earthquake and fire resistant with adequate escape routes for safe escape during disasters. 	DMD, BSDMA, Bihar State Edu. Infra. Corp. Ltd.	State and District			
4	Provide licenses for private schools only after due compliance with all the school building guidelines.	Bihar State Edu. Infra. Corp. Ltd.	State and District			
5	Based on this resilience index assessment and structural safety guidelines, undertake corrective measures for enhancing the resilience of the infrastructure facilities (retrofitting, relocation) and service delivery systems (additional resources, personnel, supplies, and such) especially in Group A and Group B districts.	Bihar State Edu. Infra. Corp. Ltd./ Building Construction Dept.	State, District, Block			
6	<p>Based on the risk analysis exercise:</p> <ul style="list-style-type: none"> Identify and list the “Critical and Inaccessible Areas” i.e. areas having least education services coverage or most frequent disruptions. Plan for appropriate additional measures (like budget allocation, personnel, supplies, and resources) to be taken for provision of health services in Group A and Group B districts, especially in the Critical and Inaccessible Areas. 	UN Agencies and CSOs	District, Sub-division and block			

#	Specific Actions	Supportive Departments / Agencies	Implementation Level (State / District / Sub-District / GP)	Timeline		
				Short Term (2015 to 2020)	Medium Term (2021 to 2025)	Long Term (2026 to 2030)
	<ul style="list-style-type: none"> Create a mechanism to monitor and adapt service delivery plans for these Critical and Inaccessible Areas. 					
7	Develop a template for School & College Disaster Management Plan (School / College-DM Plan), Orient School Management Committee (SMC) members on development of School-DM Plan and Ensure that all schools and colleges (including private schools and colleges) develop a School / College-DM Plan and update it on annual basis.	DMD, BSDMA, UN Agencies and CSOs	State, District, Schools, and Colleges			
8	Ensure that an annual disaster risk analysis exercise is conducted as part of the planning cycle (PIP development) for targeting, resource allocation and additional measures for specific vulnerabilities.	Planning Dept., PRIs & ULBs	State			
9	Issue guideline to practice mock drills, educational and awareness sessions on each Saturday in every schools (government and private)	BSDMA	District/schools			
10	Conduct an annual review of the performance of schools as per resilience index / school safety norms and release a 'Resilient Schools' report card on annual basis.	BSDMA, UN Agencies and CSOs	District and Schools			
11	Form a school safety advisory committee at the state level to advise the education department on the subject with regard to infrastructure, curriculum and pedagogy.		State			
12	Develop and incorporate curriculum on Disaster Risk Reduction (DRR), Climate Change Adaptation (CCA) and ecosystem for classes 5 th to 8 th .	DMD, BSDMA, Technical experts	State			
13	Modify monitoring indicators under <i>Sarva Shiksha Abhiyan</i> (SSA) / <i>Rashtriya Madhyamik Shiksha Abhiyan</i> (RMSA) to include monitoring of disaster risks to children and schools.	PRIs and ULBs	State, District and Schools			
14	Map schools wherein school functioning gets affected (for e.g. classes closed due to inundated or access gets cut-off during monsoon months, heat wave and cold wave) and accordingly modify the annual lesson planning / timetable for these schools through changed timing or additional hours.	BSDMA, UN Agencies and CSOs	District and Schools			
15	Preparedness planning related: <ul style="list-style-type: none"> Develop a deployment plan of teachers for 	BSDMA, UN	District, block,			

#	Specific Actions	Supportive Departments / Agencies	Implementation Level (State / District / Sub-District / GP)	Timeline		
				Short Term (2015 to 2020)	Medium Term (2021 to 2025)	Long Term (2026 to 2030)
	<p>continuation of education / classes in case of a disaster event.</p> <ul style="list-style-type: none"> • Pre-position and provide teaching learning material in case of disaster event. • Develop a contingency plan to ensure that there are child friendly spaces²⁶ in camps and mega camps in case of a disaster event. • Design and implement a curriculum for the child friendly spaces at camp sites. • Develop a plan for continuation of mid-day meals during disaster times. • Ensure that all schools have emergency response elements in their School-DM Plans. • Ensure that all schools have a plan for continuing the school's functioning from an alternate location in case the school is used as a temporary shelter / camp during disaster events. • Ensure that all schools in Group A and B districts develop a plan for safe storage of education materials during flood events. 	Agencies and CSOs	Camps / Mega camps, and Schools			
16	Undertake steps (like welcoming, village campaigns, provisioning of education materials / uniforms) to bring back children to school after disaster events		Schools			
17	Conduct a 'Scenario-Based Analysis' for L2 and L3 events and develop a template for damage assessment and costing for recovery planning to be included as part of the annual plan of the department.	DMD and Technical agencies	State			
18	Undertake digitization of services' related office records, files, case papers and other documents of government offices and storage of the same on servers and back up of the same.	IT Dept. & Technical agencies	State, District and Block			
19	<p>Capacity Building:</p> <ul style="list-style-type: none"> • State, district and block levels' officials on risk analysis and applying the risk analysis in planning of resilient school services. • Orientation of state, division, district and block levels' functionaries on norms, guidelines and / or SOPs delivering services during disasters. 	DMD, BSDMA, Technical experts, Bihar State Edu.	State, District, Block and School level			

²⁶ Child friendly space is a designated space wherein learning and recreational materials for children are provided along with ease of access to children.

#	Specific Actions	Supportive Departments / Agencies	Implementation Level (State / District / Sub-District / GP)	Timeline		
				Short Term (2015 to 2020)	Medium Term (2021 to 2025)	Long Term (2026 to 2030)
	<ul style="list-style-type: none"> • State and district level officials on construction of 'safe facilities'. • Develop a plan at state level for capacity building of teachers on disaster management and school safety to be undertaken in a cascade mode by the SCERT and DIETs. • Training of teachers on disaster management aspects as part of their pre-service and in-service training programmes. • Train school safety focal point teachers on school safety concept and actions including psycho-social support for children affected by disasters. • Orientation of BEOs, BRCCs, CRCCs, school principals and School Safety focal teacher and ToT of selective BRCCs and CRCCs as master trainers. • Train the engineers and masons of the BSEIDC Ltd. on safe school building construction as per the revised guidelines and norms. • Technical training to School Safety focal teachers on first-aid and life-saving skills. • Develop age-specific 'Teaching Learning Materials' pertaining to Disaster Management, Do's and Don'ts, Mock drills and Shake-outs for school students. • Develop a school safety kit with appropriate material for students, teachers, and education officials. • Conduct mock drills in the schools and colleges as a preparedness measure against earthquakes, fire and other disasters. 	<p>Infra. Corp. Ltd., UN Agencies, CSOs, NDRF / St. John Ambulance, Red Cross</p>				

FOOD & NUTRITION SERVICES

Nodal Department: Social Welfare Department & Food and Consumer Protection Department

#	Specific Actions	Supportive Departments / Agencies	Implementation Level (State / District / Sub-District / GP)	Timeline		
				Short Term (2015 to 2020)	Medium Term (2021 to 2025)	Long Term (2026 to 2030)
1	Develop a resilience index for resilient food & nutrition facilities (Anganwadi Centre, PDS shops, warehouses, Nutrition Rehabilitation Centres) and services in partnership with civil society.	DMD, BSDMA Health, UN	State			
2	Assess the food and nutrition facilities and services in the state to determine the current status based on this resilience index.	Agencies and CSOs	State, District Block			
3	Based on this resilience index assessment and structural safety guidelines, undertake corrective measures for enhancing the resilience of the infrastructure facilities (retrofitting, relocation) and service delivery systems (additional resources, personnel, supplies, and such) especially in Group A and Group B districts.	Building Construction Dept.	State, District, Block			
4	Based on the risk analysis exercise: <ul style="list-style-type: none"> Identify and list the "Critical and Inaccessible Areas" i.e. areas having least coverage of food and nutrition services or most frequent disruptions. Plan for appropriate additional measures (like budget allocation, personnel, supplies, and resources) to be taken for provision of health services in Group A and Group B districts, especially in the Critical and Inaccessible Areas. Create a mechanism to monitor and adapt service delivery plans for these Critical and Inaccessible Areas. 	UN Agencies and CSOs	District, Sub-division and block			
5	Ensure that an annual disaster risk analysis exercise is conducted as part of the planning cycle (PIP development) for targeting, resource allocation and additional measures for specific vulnerabilities.	Planning Dept., PRIs & ULBs	State			
6	Undertake a campaign to promote traditional food varieties, habits and practices for enhancing nutrition as well as coping mechanisms and food security during disaster situations.	DMD, BSDMA, CSOs	Village and urban areas			
7	Develop a list of essential components of a nutrition-rich food basket (especially <i>dal</i>) for families and ensure the inclusion of this in the PDS.	Technical experts	State			

#	Specific Actions	Supportive Departments / Agencies	Implementation Level (State / District / Sub-District / GP)	Timeline		
				Short Term (2015 to 2020)	Medium Term (2021 to 2025)	Long Term (2026 to 2030)
8	Develop a directive for ensuring provision as per differential nutrition requirements of pregnant and nursing mothers through increased (double) quantity of THR provision or a pre-identified basket of nutritious food and by including the same in SDRF norms and / or integrating it in the annual planning of Social Welfare Department.	Health Department and PRIs	State, District, GP and urban areas			
9	<p>Effective preparedness measures:</p> <ul style="list-style-type: none"> Promote adequate (at least 3 months) stocking of PDS items in FCI as well as state warehouses for the flood season and the distribution of the same to the PDS dealers before the onset of floods in the Group A and B districts. In light of this, undertake a capacity assessment of the FCI and state warehouses for their capacity to stock 3 months' food stocks and build new warehouses. Pre-position food supplies at PDS shops and AWCs, including transportation arrangements for supplies in Group A and B districts. Develop plans for undertaking market assessments and corrective actions against hoarding and black-marketing. Develop a plan for continuation of Mid-day Meal Scheme and separate provision (timing and food items) of food for children in the mega camps as per children's requirements. Develop a plan to promote running community kitchens during disasters. Develop a plan for running AWCs in mega-camps. Develop a plan to ensure continuation of the provision of nutrient materials to Moderate Acute Malnourished (MAM) and Severe Acute Malnourished (SAM) children at the AWC during disaster times and monitoring of the same. Develop a plan to ensure continuation of existing and setting up new Nutrition Rehabilitation Centres (NRCs) during disaster events and at mega camps, wherever needed. Timely distribution of THR / adequate nutrition to adolescent girls, pregnant and lactating women especially during disaster events. Prepare a deployment plan to involve MAMTAs in supporting the functioning of AWC during disasters. 	Education, Health Depts., UN Agencies and CSOs	District, Block and GP			

#	Specific Actions	Supportive Departments / Agencies	Implementation Level (State / District / Sub-District / GP)	Timeline		
				Short Term (2015 to 2020)	Medium Term (2021 to 2025)	Long Term (2026 to 2030)
10	Conduct a 'Scenario-Based Analysis' for L2 and L3 events and develop a template for damage assessment and costing for recovery planning to be included as part of the annual plan of the dept.	DMD, BSDMA, Technical agencies	State			
11	Undertake digitization of services' related office records, files, case papers and other documents of government offices and storage of the same on servers and back up of the same.	IT Dept. & Technical agencies	State, District and Block			
12	Ensure that the AWC is made part of the soon to be constructed <i>Panchayat Bhawans</i> and ensure that these AWCs as well as <i>Panchayat Bhawans</i> are structurally resilient from a multi-hazard context.	Building Const. Dept., PRIs	State and GP			
13	<p>Capacity Building:</p> <ul style="list-style-type: none"> State, district and block levels' officials on risk analysis and applying the risk analysis in planning of resilient health services. Orientation of state, division, district and block levels' functionaries on norms, guidelines and / or SOPs delivering services during disasters. State and district level officials on construction of 'safe facilities'. Practice-based training on application of 'Guideline for ASHAs, ANMs and AWWs'. Promote the practice of kitchen gardens amongst community members through service providers. Training of PRI members on food and nutrition promotion. Develop pocket handbooks for AWW workers with disaster preparedness checklists. 	DMD, BSDMA, UN Agencies and CSOs	District and Block			

HOUSING SERVICES

Nodal Department: Panchayati Raj/Rural Development / Urban Development and Housing Department

#	Specific Actions	Support	Impleme	Timeline
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		ive Depart ments / Agencie s	ntation Level (State / District / Sub- District / GP)	Short Term (2015 to 2020)	Medi um Term (2021 to 2025)	Long Term (2026 to 2030)
1	Panchayati Raj Department to develop a multi-hazard based checklist to assess the resilience of a house for human habitation as well as livestock for the rural context of Bihar and encourage Panchayats to undertake a drive to assess all houses in Bihar using a mix of Rapid Visual Survey, Self Assessment, as a part of Masons' Training, GP level risk analysis, and participatory exercises in partnership with Civil Society Organizations to determine the current status.	DMD, BSDMA, Building Const. Dept., Technic al experts, and CSOs	State, District and Gram Panchay at			
2	Encourage inhabitants to undertake appropriate corrective measures as per the assessment above.		GP			
3	Urban Development to do the same as given in 1 and 2 above for cities.					
4	<ul style="list-style-type: none"> Panchayati Raj Department to develop a menu of designs and manuals thereof with varying cost slabs for different economic strata for rural housing and homestead from different geo-climatic zones and multi-hazard context for Group A and B districts. Urban Development Department to do the above for urban housing. Both Departments to disseminate information about these design options to people. 		State, District and Gram Panchay at			
5	Urban Development Department to identify and provide incentives/awards to builders who have created models of resilient urban housing as per building bye-laws.	DMD, BSDMA, ULBs, Builder Assn.	Cities and Towns			
6	<ul style="list-style-type: none"> Rural Development Department to modify the <i>Indira Awas Yojana</i> (IAY) and <i>Rajiv Awas Yojana</i> (RAY) guidelines for 2 things viz. (1) house designs under the IAY (through representation to GoI) should be such as to make them disaster-resilient house designs / models from a multi-hazard and geo-climatic contexts' point of view and (2) accordingly modify the cost-allocations norms. Urban Development Department to do the same for DDU Urban Awas Yojana. Ensure the construction of IAY and DDUAY as per above guidelines. Ensure that in the cyclonic storms prone areas, IAY also incorporates the features of cyclonic storm resistant house design formulated by 	BSDMA, DM- DDMA, ULBs	State, village and urban areas			

#	Specific Actions	Supportive Departments / Agencies	Implementation Level (State / District / Sub-District / GP)	Timeline		
				Short Term (2015 to 2020)	Medium Term (2021 to 2025)	Long Term (2026 to 2030)
	BSDMA in rural areas.					
7	Urban Development Department to create mechanisms and procedures for strict monitoring of adherence to the building codes and safety norms during building construction, and take punitive actions for violations.	ULBs, Fire Services	Cities and Towns			
8	<p>Capacity building:</p> <ul style="list-style-type: none"> • Community on disaster resilient construction related choices. • Engineers, architects, masons, contractors, builders, and building artisans on disaster-resilient house construction designs and manuals. • <i>Panchayats and Vikas Mitras</i> for promoting resilient IAY / housing related decisions. • ULBs on building codes. 	DMD, BSDMA, CSOs, Citizen Councils	Cities and Towns			
9	<p>Communications and Knowledge Building:</p> <ul style="list-style-type: none"> • Sensitize the citizens through citizen councils and civil society organizations for insisting on resilient housing designs and construction. • Public awareness on disaster-resilient housing through IEC materials, tagging / branding localities, advertisements, street plays, and such in partnership with civil society organizations. • Develop and widely disseminate the Do's and Don'ts related to be measures taken for disaster-resilient houses and housing colonies. • Develop guidance material for homeowners on area, house design, technology choice and construction specification, quantities of different materials. 	DMD, BSDMA, BCD, Technical experts, Builder Associations and Citizen Councils	District and Block			

SAFETY, SECURITY AND PROTECTION SERVICES

Nodal Department: Social Welfare Department and Disaster Management Department

#	Specific Actions	Supportive Departments / Agencies	Implementation Level (State / District / Sub-District / GP)	Timeline		
				Short Term (2015 to 2020)	Medium Term (2021 to 2025)	Long Term (2026 to 2030)
1	Social Welfare Department to develop SOPs for child protection in emergencies for the state addressing the differential needs of girls and boys for actions at various levels, such as, community, Child Protection Committees (CPCs), Police, Child Welfare Committee (CWC),CCIs, Railway Police and SCPCR etc.	DMD, BSDMA, Home, UN Agencies and CSOs	State			
2	Social Welfare Department to set up a database for data about child and human trafficking at the state level, with clear guidelines for intensified action during disasters	UN Agencies and CSOs	State			
3	Social Welfare Department to develop SOP for health system's response to gender based violence during disasters	Health Dept.	State			
4	Disaster Management Department to commission a study on disaster induced displacement, migration and trafficking of children and women in Bihar and based on the findings initiate measures for reducing the same	Social Welfare, BSDMA, Technical experts	State			
5	Social Welfare Department to enhance resilience of institutions (residential or short-duration) existing within a district for provision of care to at-risk groups viz. District Disability Rehabilitation Centres (DDRCs), Shelter Homes, CCIs (Child Care Institutions including Orphanages, Foster Homes), Old-age homes, institutions housing PWDs, Hostels (working women, SC boys, girls, ST), KGBVs, residential schools, mental health institutions, prisons, and such through: <ul style="list-style-type: none"> • Mapping these various institutions. • Undertaking structural and operational resilience related audits of these institutions. • Taking up corrective measures based on these audits. • Development of a disaster management plan for each of these institutions, including arrangements to ensure functioning or back-up facilities of these institutions in case of flood, earthquake, fire, and other hazard events. 	DMD, BSDMA, Related all depts., BCD, UN Agencies and CSOs	District and Block			

#	Specific Actions	Supportive Departments / Agencies	Implementation Level (State / District / Sub-District / GP)	Timeline		
				Short Term (2015 to 2020)	Medium Term (2021 to 2025)	Long Term (2026 to 2030)
	<ul style="list-style-type: none"> Capacity building of the institution managers and care providers therein on the disaster management plan. 					
6	<p>Social Welfare Department to train care-givers and managers of these institutions on:</p> <p>(1) preparedness actions for flood, earthquake, fire, and other hazard events</p> <p>(2) response actions in case of flood, earthquake, fire, & other hazard events</p> <p>(3) arrangements to ensure functioning or back-up facilities of these institutions in case of flood, earthquake, fire, and other hazard events</p>	DMD, BSDMA, UN Agencies and CSOs	District			

EMERGENCY SUPPORT FUNCTIONS (ESF)

Nodal Department: Disaster Management Department

#	Specific Actions	Supportive Departments / Agencies	Implementation Level (State / District / Sub-District / GP-Village)	Timeline		
				Short Term (2015 to 2020)	Medium Term (2021 to 2025)	Long Term (2026 to 2030)
ESF.1.1	Notify the Emergency Support Functions (ESF) during disasters.	All related Departments	State			
ESF.1.2	Develop guidelines for ESF services including benchmarks for delivery of these services and monitoring protocols for the same.	BSDMA, NDMA, UN Agencies and CSOs	State			
ESF.2	Early Warning					
ESF.2.1	Establish an Early Warning System in the State for predictable hazards like floods, droughts, cyclonic storms / twisters, heat waves and cold waves.	IMD, BSDMA, DM-DDMAs, WRD, Earth & Statistics Directorate, Science & Technology, IT Depts.	State			
ESF.2.2	Finalize the Early Warning protocols and mechanism for dissemination of early warnings (last mile)	DM-DDMAs and PRIs	State			

#	Specific Actions	Supportive Departments / Agencies	Implementation Level (State / District / Sub-District / GP-Village)	Timeline		
				Short Term (2015 to 2020)	Medium Term (2021 to 2025)	Long Term (2026 to 2030)
	connectivity) along with information on actions to be taken by community members and officials.					
ESF.3	Evacuation					
ESF 3.1	Develop Evacuation Protocols for the State, including linkages with the early warning system.	DM-DDMAs and Experts	State			
ESF 3.2	Develop a pre-positioning and deployment plan for key search and rescue stakeholders like NDRF, SDRF, Police, Civil Defence, Medical Teams, CDRTs, Divers etc during predictable hazard events.	Home Dept., DM-DDMAs, PRIs	State			
ESF 3.3	Undertake regular mock drills in Group A and B districts through multi-stakeholder participation for practice of these protocols in different (L1, L2, L3) scenarios.	DM-DDMAs, PRIs & CSOs	District and Block			
ESF.4	Search and Rescue					
ESF4.1	Decentralized positioning of SDRF personnel in Group A districts all round the year		District			
ESF4.2	Create and maintain an online database of trained divers at state, district and block level Display the numbers of trained divers for a particular area on <i>Ghats</i> , GP and other strategic locations.	DM-DDMAs, PRIs, CSOs	State, District, Block, and Gram Panchayat			
ESF4.3	Assess SDRF's need of equipments and materials and well equip them.		State			
ESF4.4	<ul style="list-style-type: none"> • Create a system for registration of all persons at the evacuation points, temporary shelters, and camps. • Ensure that this registration data is 	DM-DDMAs, PRIs, UN Agencies and CSOs	State, District, Camps, and Gram Panchayat			

#	Specific Actions	Supportive Departments / Agencies	Implementation Level (State / District / Sub-District / GP-Village)	Timeline		
				Short Term (2015 to 2020)	Medium Term (2021 to 2025)	Long Term (2026 to 2030)
	<p>collated in one centralized database.</p> <ul style="list-style-type: none"> • Display the data of rescued persons at all the search & rescue points as well as evacuation points, BDO and DM offices, prominent places and online. • Develop a MIS for the same. 					
ESF.5	Shelter and Camps					
ESF5.1	Develop Guidelines for Camp & Mega-Camp Management for the state.	UN Agencies and CSOs	State			
ESF5.2	Develop a deployment plan for camp managers on a full-time basis for entire duration of the camp.	DMs & PRIs	State and District			
ESF5.3	Establish a communication mechanism at the camp.	DMs	District and camps			
ESF.6	Debris Clearance and Disposal of dead bodies and animal carcasses					
ESF.6.1	Develop an SOP for debris clearance, dignified disposal of dead bodies (including identification of dead) and animal carcasses and maintenance of records for the same.	Home, Health, AHD, & experts	State			
ESF.6.2	Ensure procurement and/ or availability of necessary equipment for debris clearance.	Related All Departments	State			
ESF.6.3	Train SDRF, Fire Department, Civil Defence, and Home-Guard personnel as well as Community volunteers on debris clearance and dignified disposal of dead bodies and animal carcasses.	BIPARD and Related All Departments	District and Block			
ESF.7	Emergency Operations Centre Management					
ESF.7.1	Develop a SOP for the functioning of the State and District EOCs.		State			

#	Specific Actions	Supportive Departments / Agencies	Implementation Level (State / District / Sub-District / GP-Village)	Timeline		
				Short Term (2015 to 2020)	Medium Term (2021 to 2025)	Long Term (2026 to 2030)
ESF.7.2	Ensure that the state and district EOCs are fully functional with state of the art technology and having: 1) Operational Plan including 24*7 functioning during emergencies 2) Necessary equipment and materials 3) Human Resource and deployment plans at EOC as well as for ESF 4) Appropriate maps, movement plans, databases related to ESF 5) Database of earthmovers / JCBs, trucks, lorries, dumpers, and other vehicles and equipments for earthmoving	Home Department, UN Agencies, Private Sector and CSOs	State and District			
ESF.7.3	Capacity Building of: <ul style="list-style-type: none"> EOC personnel on EOC functioning and handling emergency help lines Nodal officers deployed for ESF on undertaking ESF 	Technical experts	State and District			
ESF.7.4	Data management within the EOC pertaining to the ESF.	IT Dept.	State and District			
ESF.7.5	Develop and equip an alternate EOC at state level.	Home Department	State			
ESF.7.7	Popularize the emergency helpline numbers along with enhancing public awareness on the purpose of its use.	IPRD, PRIs and CSOs	District and Block			
ESF.8	Warehouses					
ESF.8.1	Develop guidelines for management of the warehouses.	Food and Consumer Protection Dept. and FCI	State			
ESF.8.2	Equip existing warehouses with necessary materials and equipments for effective storage and handling of goods to be stored there.		State and District			

#	Specific Actions	Supportive Departments / Agencies	Implementation Level (State / District / Sub-District / GP-Village)	Timeline		
				Short Term (2015 to 2020)	Medium Term (2021 to 2025)	Long Term (2026 to 2030)
ESF.8.3	Undertake a capacity assessment of existing warehouses for their capacities to store goods and materials for L2 & L3 events.					
ESF.8.4	Map additional private and public warehouses that may need to be used in case of an L3 event and enter into MoUs with the same.	DM-DDMAs, Private Sector	State and District			
ESF.9	Needs Assessments and Data Synthesis					
ESF.9.1	Develop a damage and needs assessment format for Bihar including the procedures for data collection focusing on sector-specific disaggregated data as per hazard type, sex, age, caste, tribe, religion, and such which do not get covered in Form IX.	UN Agencies and CSOs	State			
ESF.9.2	Develop an IT enabled Disaster Database Management System with disaggregated data collection, analysis, and open sharing of the same.	Science and Technology & IT Dept.	State			
ESF.9.3	Digitization of office records, files and other documents of government offices and storage of the same on servers and back up servers.	Related All Depts.	State and District			
ESF.10	Capacity Building					
ESF.10.1	Assess the human resource requirements (technical as well as quantum) for fulfilling these ESF services.	Technical experts	State			
ESF.10.2	Based on the assessment, recruit new / assign from other departments / create volunteers to fulfil these ESF services.	Cabinet	State			
ESF.10.3	Undertake induction, orientation and training of these human resources for these ESF services.	Technical experts	State and District			
ESF.10.4	Train Civil Defence personnel	Technical	District			

#	Specific Actions	Supportive Departments / Agencies	Implementation Level (State / District / Sub-District / GP-Village)	Timeline		
				Short Term (2015 to 2020)	Medium Term (2021 to 2025)	Long Term (2026 to 2030)
	and Community volunteers in supporting the fulfilment of the ESF services.	experts				

6.4 Resilient Critical Infrastructure

Critical Infrastructure in Bihar

Certain public infrastructures (for e.g. roads, bridges) and physical assets (for e.g. dams, telecommunications, electricity, transmission towers, and such) are vital in the functioning of the society, especially during disasters. These have been considered as critical infrastructure. In addition, facilities integral for delivery of critical services (for e.g. hospitals, schools, and Anganwadis) are also critical infrastructure.

Functional continuity and timely restoration of critical infrastructure in the aftermath of exposure to a hazard event forms the cornerstone of a resilient society. Ensuring this entails **both structural and non-structural measures** like building better from the start to withstand hazards through proper design and construction, retrofitting and rebuilding, a culture of maintenance, taking into account impact assessments, operational clarity, risk awareness/competence and culture of safety within staff.

Critical infrastructure in the context of this roadmap has been grouped into following six clusters of infrastructure available in the State:

1. **Roads and Bridges:** This cluster covers the highways, major district roads, village roads, link roads and bridge network in the State.
2. **Telecommunications:** This cluster covers the wireless, phones, mobiles, radio (including FM, Community Radio), HAM, Sat Phones towers, television, and internet network or any other mode of communication as provided by the public and private sector in the State.
3. **Power:** This cluster covers the generation, transmission and supply of electricity through thermal/hydro/nuclear, solar, wind, bio-fuel, and other means of generation by the public and private sector organisations in the state.
4. **Dams, Embankments and Reservoirs:** This cluster covers all the large and small dams, canal networks, check-dams, related reservoirs (existing and artificial) and embankments existing in the state.
5. **Transport system:** This cluster covers public transport comprising road, rail (including metro), air and waterway networks including the hubs and installations (airports, rail and bus stations and Ghats), vehicles and depots in the state.
6. **Industries:** This cluster covers small, medium and large scale chemical factories, refineries, gas-pipelines, power plants, oil reserve tanks, and such which may cause hazardous effects.

7. **Natural ecosystem:** Natural ecosystems like wetlands, natural-traditional water-bodies, (e.g. *aahar, pynes*), open spaces, flood plains of rivers, forest, watershed etc. are recognised as **un-compromizable critical infrastructure** as they provide protection to human settlements from flash floods, droughts, heat waves etc. Depletion or destruction of natural ecosystems has proven to be hugely disastrous; Mumbai floods'2005, J&K floods'2014, Chennai floods'2015 to name a few. **Identification, demarcation and notification** of mapping of these critical natural assets, particularly that fall within cities can help provide sustained ecosystem services that are critical to our survival and wellbeing.

Service delivery aspects pertaining to each of these critical infrastructure (for e.g. maintenance and upkeep, information-communication, human resource management, and such) have been included as part of the critical infrastructure since these service delivery aspects are not only an integral part of the critical infrastructure system but also are the responsibility of the respective mandated departments.

What is resilient critical infrastructure?

Resilient critical infrastructure in the context of Bihar is envisaged as a bundle of assets and systems thereof which are capable to ensure:

- **Efficacy** in access to critical infrastructure for all the intended users during non-disaster times through effective risk informed planning, robust design, and uninterrupted coverage and implementation,
- **Effective** access to critical infrastructure to all the intended target groups during disasters through infrastructure continuity plans - ICPs - for back-up and regaining functionality at the earliest,
- **Recovery** from disasters (through effective planning, and design for building back better and enhanced functioning.

Characteristics of resilient critical infrastructure

1. Departments, private service providers and users recognise and act upon their rights and duties for ensuring safe critical infrastructure and continuity of related services at all times.
2. Planning and construction of critical infrastructure is risk-informed and accounts for potential disruptions during disasters.
3. Construction of critical infrastructure does not create new or worsen existing disaster risks and contributes to sustainable development.

4. Departments responsible for critical infrastructure are equipped with Infrastructure Continuity Plans²⁷(ICPs) for ensuring continuity and early regaining of functionality in disaster events of varying magnitudes.
5. Departmental staff at state, district, block levels and front-line workers and members of PRIs and ULBs have capacities for risk-informed planning, including risk analysis and their roles and responsibilities for responding in emergencies.

²⁷Infrastructure Continuity Plans: plans that identify how the functions / services of the infrastructure will operate following a disaster and how it expects to regain functionality or return to 'functioning as usual' in the quickest possible time afterwards and evolve with enhanced level of resilience than before over a period of time.

SPECIFIC ACTIONS FOR RESILIENT CRITICAL INFRASTRUCTURE

TELECOMMUNICATIONS

Nodal Department: Information & Public Relations Department (IPRD) along with IT & BSNL Bihar

#	Specific Actions	Supportive Departments / Agencies	Implementation Level (State / District / Sub-District / GP)	Timeline		
				Short Term (2015 to 2020)	Medium Term (2021 to 2025)	Long Term (2026 to 2030)
1	BSNL Bihar to develop a resilience index and / or quality standards pertaining to telecommunications.		State			
2	Map the existing telecommunications related infrastructure and human resources and systems including their GIS mapping to assess their current level of resilience.	Technical Experts from State (DMD etc) & Private Service Providers	State and sites			
3	Based on this exercise, undertake corrective measures (retrofitting, strengthening, relocation, reconstruction, underground, and such) for enhancing the resilience of the infrastructure, especially for Group A and B districts.		Sites			
4	Ensure that an annual disaster risk analysis exercise is conducted as part of the annual planning cycle for targeting, resource allocation and additional measures for specific vulnerabilities.	Concerned departments/agency	State			
5	Ensure that a 'Risk Impact Analysis' of a proposed installation/construction activity is carried out before execution.	Concerned departments/agency	State and sites			
6	BSNL to refine (or develop, if they don't exist) guidelines for construction of mobile towers according to geo-climatic locations including regulation for installing mobile towers in residential areas.		State			
7	BSNL to undertake regular testing and mock drills for the operational readiness of the telecommunication and wireless network across the state.	DMD, BSNL, Technical Experts, & Private Service Providers	State			
8	Develop a joint contingency plan for the telecom and internet provision sector in partnership with private companies.		State			
9	Pre-position signal boosters in strategic locations by both private and public service providers.		District			
10	BSNL to develop Infrastructure continuity plan for ensuring back-up and regaining functionality of the infrastructure. The plan should have the following: (1) Mapping of strategic locations. (2) Assessing multi-hazards risk to infrastructure (offices, DDMA's,	DMD, Home Department, DM-DDMA's,	State, District and Sites			

#	Specific Actions	Supportive Departments / Agencies	Implementation Level (State / District / Sub-District / GP)	Timeline		
				Short Term (2015 to 2020)	Medium Term (2021 to 2025)	Long Term (2026 to 2030)
	towers), human resources & systems. (3) Scenario based analysis of the impact of various hazards of L2 & L3 events on the infrastructure, human resources and systems. (4) Identifying the workable / good enough measures to serve as back up to the infrastructure, human resources and systems in case of failure / disruption. (5) Develop a plan to put in place the identified workable / good enough measures to serve as back up. (6) Allocate commensurate resources on priority basis for putting in place the identified workable / good enough measures to serve as back up. (7) Prepositioning of key materials and equipments for quick repairs or replacements. (8) Negotiating contracts with vendors and suppliers for quick supply of spare parts and / or replacements. (9) Negotiating contracts with human resources for surge requirements' sourcing and / or extended working. (10) Developing protocols for quick repair, replacement, establishing new infrastructure, human resources as well as systems for earliest regaining of functionality. (11) Developing decision-making support tools like gap analysis, resource need analysis, critical assets' status mapping, strategic locations' infrastructure functioning mapping, information dissemination / communication flow trees and templates.	Technical Experts from Private Service Providers, PRIs, and ULBs				
1 1	BSNL to conduct a 'Scenario-Based Analysis' for L2 and L3 events and develop a template for damage assessment and costing for recovery planning to be included as part of the annual plan of the department.	DMD, Technical Experts				

POWER

Nodal Department: Energy Department

#	Specific Actions	Supportive Departments / Agencies	Implementation Level (State / District / Sub-District / GP)	Timeline		
				Short Term (2015 to 2020)	Medium Term (2021 to 2025)	Long Term (2026 to 2030)
1	Develop a resilience index and / or quality standards	Technical	State			

#	Specific Actions	Supportive Departments / Agencies	Implementation Level (State / District / Sub-District / GP)	Timeline		
				Short Term (2015 to 2020)	Medium Term (2021 to 2025)	Long Term (2026 to 2030)
	pertaining power as a critical infrastructure.	Experts				
2	Map the existing power infrastructure (in the case of Bihar mainly grids and a few thermal power plants) including their GIS mapping and determine their resilience.	from State (DMD etc) & Private Service Providers	State and sites			
3	On the basis of this exercise, undertake corrective actions, including strengthening or relocation of power generation units, sub-stations, transformers, transmission towers, installation of towers in selected areas, reinforcing through specialized materials, underground cabling, and such especially for Group A and B districts.		Sites			
4	Ensure that an annual disaster risk analysis exercise is conducted as part of the annual planning cycle for targeting, resource allocation and additional measures for specific vulnerabilities.	Bihar Power (Holding) Company	State			
5	Make it mandatory to carry out a 'Risk Impact Analysis' of a proposed installation/construction activity before execution in Group A and B districts.	Bihar Power (Holding) Company	State and sites			
6	Provisioning of separate feeder and transmission lines for agriculture operation in line with Agriculture Roadmap	Bihar Power (Holding) Company				
7	Develop Infrastructure continuity plan for ensuring back-up and regaining functionality of the infrastructure. The plan should have the following: (1) Mapping of strategic locations. (2) Assessing multi-hazards risk to infrastructure (offices, towers), human resources & systems. (3) Scenario based analysis of the impact of various hazards of L2 & L3 events on the infrastructure, human resources and systems. (4) Identifying the workable / good enough measures to serve as back up to the infrastructure, human resources and systems in case of failure / disruption. (5) Develop a plan to put in place the identified workable / good enough measures to serve as back up. (6) Allocate commensurate resources on priority basis for putting in place the identified workable / good enough measures to serve as back up.	DMD, Home Department, DM-DDMAs, Technical Experts from Private Service Providers, PRIs, and ULBs	State, District and Sites			

#	Specific Actions	Supportive Departments / Agencies	Implementation Level (State / District / Sub-District / GP)	Timeline		
				Short Term (2015 to 2020)	Medium Term (2021 to 2025)	Long Term (2026 to 2030)
	(7) Prepositioning of key materials and equipments for quick repairs or replacements. (8) Negotiating contracts with vendors and suppliers for quick supply of spare parts and / or replacements. (9) Negotiating contracts with human resources for surge requirements' sourcing and / or extended working. (10) Developing protocols for quick repair, replacement, establishing new infrastructure, human resources as well as systems for earliest regaining of functionality. (11) Developing decision-making support tools like gap analysis, resource need analysis, critical assets' status mapping, strategic locations' infrastructure functioning mapping, information dissemination / communication flow trees and templates.					
8	Conduct a 'Scenario-Based Analysis' for L2 and L3 events and develop a template for damage assessment and costing for recovery planning to be included as part of the annual plan of the department.	DMD, DM-DDMAs, Technical Experts				
9	Conduct mock drill exercises on the basis of the Infrastructure Continuity Plan.	Experts	State			
10	Awareness generation amongst rural and urban communities regarding High-Tension Transmission Cables and risks associated with the same.	PRIs, ULBs & Experts	State and Town GP			

TRANSPORT SYSTEM

Nodal Department: Transport Department and BSRTC

#	Specific Actions	Supportive Departments / Agencies	Implementation Level (State / District / Sub-District / GP)	Timeline		
				Short Term (2015 to 2020)	Medium Term (2021 to 2025)	Long Term (2026 to 2030)
1	Develop a resilience index and / or quality standards pertaining to transport system (comprising road, rail, air, and water) as a critical infrastructure.	DMD, BSDMA, Home,	State			
2	<ul style="list-style-type: none"> Map the existing road, rail and airways infrastructure, and coordinate with relevant agencies to determine their resilience. Map the existing helipads and other suitable helicopter landing sites in the State to determine 	RCD,BCD, RWD, Airports Authority, Railways, &	State and sites			

#	Specific Actions	Supportive Departments / Agencies	Implementation Level (State / District / Sub-District / GP)	Timeline		
				Short Term (2015 to 2020)	Medium Term (2021 to 2025)	Long Term (2026 to 2030)
	their resilience.	DM-DDMAs				
3	On the basis of this exercise, coordinate with the relevant agencies to ensure that they undertake corrective actions, especially for Group A and B districts.		Sites			
4	Issue a directive to ensure that an annual disaster risk analysis exercise is conducted as part of the annual planning cycle for targeting, resource allocation and additional measures for specific vulnerabilities.		State			
5	Develop a contingency plan for the all Airports, including evacuation routes and back-up options along with Airports Authority of India (AAI).	Home, DM-DDMA and AAI	State and airports			
6	Coordinate with concerned departments to map existing road network within state along with alternate routes' reckoner for ensuring access to disaster affected areas for L1 & L2 category of disaster events and develop a Web-based Application for people to have access to this information.	DMD, RCD, RWD, Home and DMs	State and District			
7	Coordinate with concerned departments to map the critical gateway routes to the state, and take steps to ensure their functioning in case of an L3 event.	Home, RCD, RWD and DMs	State			
8	Map the existing Buses, trucks, lorries and JCBs / Earthmovers and related equipments available in the state along with agreements with selected vendors for quick deployment in case of a disaster events and link with IDRN.	DMD, BSRTC, DMs and Private sector providers	State and District			
9	Capacity Building: <ul style="list-style-type: none"> Conduct simulation exercises of all the transport service providers. Conduct orientation of railway staff on emergencies. Train transport workers on usage of 'Google Crisis Maps' or some such application. 	DMD, BSDMA, Home, CISF, airlines, SDRF, AAI (Patna), Railway (Bihar Zonal Office)	State and District			

ROADS and BRIDGES

Nodal Department: Road Construction Department and Rural Works Department

#	Specific Actions	Supportive Departments / Agencies	Implementation Level (State / District / Sub-District / GP)	Timeline		
				Short Term (2015 to 2020)	Medium Term (2021 to 2025)	Long Term (2026 to 2030)
1	Develop a resilience index and / or quality standards pertaining to roads and bridges as critical infrastructure.		State			
2	Map the existing roads and small and large bridges, including their GIS mapping and determine their resilience.	DMD, Home, Bihar Rajya	State and sites			
3	On the basis of this exercise, undertake corrective actions, including strengthening or rerouting in selected areas, reinforcing through specialized materials or design changes, and such especially for Group A and B districts.	Pul Nirman Nigam & DM-DDMAs	Sites			
4	Ensure that an annual disaster risk analysis exercise is conducted as part of the annual planning cycle for targeting, resource allocation and additional measures for specific vulnerabilities.	Bihar Rajya Pul Nirman Nigam	State			
5	Make it mandatory to include disaster risk analysis as part of the designing of a proposed road and bridge construction activity before approval for construction is given.	Department of Environment and Forestry	State and sites			
6	Arrange "Road Ambulances" or 'Quick Response Teams' with availability of adequate resources, equipments and skills to be deployed for debris clearance and immediate restoration of and / or creation of temporary alternatives to damaged roads and bridges in case of disaster events.	DMD, Home, DM-DDMAs, and Private sector providers	State and District			
7	Develop coordination plans with the engineering division of the armed forces for support in restoration, and / or temporary alternative arrangements for the damaged roads and / or bridges in case of disaster events.	DMD, Home, DMs and Armed Forces	State			
8	Map existing road network within state along with alternate routes' reckoner for ensuring access to disaster affected areas for L1 & L2 category of disaster events, disseminate it widely and develop a mobile-based and/or Web-based Application for people to have access to this information.	DMD, BSDMA, Home and DMs	District, State			
9	Map the critical gateway Road routes to the State, and take steps to ensure their functioning in case of an L3 event.	Home and DMs	District, State			
10	Capacity Building of departmental Engineering staff in risk resilience designing and implementation of roads	DMD, BSDMA,	State			

#	Specific Actions	Supportive Departments / Agencies	Implementation Level (State / District / Sub-District / GP)	Timeline		
				Short Term (2015 to 2020)	Medium Term (2021 to 2025)	Long Term (2026 to 2030)
	and bridges	BIPARD				

DAMS, EMBANKMENTS AND RESERVOIRS

Nodal Department: Water Resources Department and Minor Water Resources Department

#	Specific Actions	Supportive Departments / Agencies	Implementation Level (State / District / Sub-District / GP)	Timeline		
				Short Term (2015 to 2020)	Medium Term (2021 to 2025)	Long Term (2026 to 2030)
1	Make it mandatory to carry out a 'risk impact' analysis of a proposed dam, embankment, aahar and reservoir related construction activity before approval for construction/repair is given.	Technical experts	State			
2	Ensure consultation with GPs of the likely to be affected villages in the decision making processes regarding construction of dams, embankments, aahars and reservoirs.	PRIs	State and GP			
3	Ensure effective implementation of the Flood Control SOP and Embankment Management Guidelines of WRD.	DMD, DMs and PRIs	State, District, GP			
4	Undertake a scenario based analysis of the impact of L2 & L3 scale of disaster events on the dams, embankments and reservoirs and based on this scenario analysis develop a contingency plan.	DMD, DMs and technical experts	State			
5	Training of PRI members and community volunteers on embankment protection related watch (for breach signs), communication and immediate actions.	PRI and technical experts	District, Block and GP			
6	Engage with neighbouring states to undertake risk impact analysis of dams located in these States on Bihar.	Home, DMD, Nodal depts. of other states	State			
7	Capacity building of departmental Engineering staff in risk resilience designing and implementation of dams, embankments and reservoirs					

Industries (*causing hazardous effects*)

Nodal Department: Industries Department

#	Specific Actions	Supportive Departments / Agencies	Implementation Level (State / District / Sub-District / GP)	Timeline		
				Short Term (2015 to 2020)	Medium Term (2021 to 2025)	Long Term (2026 to 2030)
1	Develop a resilience index and / or quality standards	Factory	State and			

#	Specific Actions	Supportive Department / Agencies	Implementation Level (State / District / Sub-District / GP)	Timeline		
				Short Term (2015 to 2020)	Medium Term (2021 to 2025)	Long Term (2026 to 2030)
	pertaining hazardous industries.	Inspectorate, Technical Experts, DMD, BSDMA & Occupiers of Industries	sites			
2	Encourage industries to develop Infrastructure continuity plan for ensuring back-up and regaining functionality of the infrastructure.	DMD, Home Department, DM-DDMAs, Technical Experts from Private Service Providers, PRIs, and ULBs	State, District and Sites			

Nodal Department: Labour Resources Department

#	Specific Actions	Supportive Department / Agencies	Implementation Level (State / District / Sub-District / GP)	Timeline		
				Short Term (2015 to 2020)	Medium Term (2021 to 2025)	Long Term (2026 to 2030)
1	Map the existing hazardous industries, related infrastructure and human resources and systems including their GIS mapping to assess their current level of resilience. Labour	Factory Inspectorate, Technical Experts, DMD, BSDMA & Occupiers of Industries	State and sites			
2	Based on this exercise, issue instructions to undertake corrective measures (retrofitting, strengthening, relocation, reconstruction, underground, and such) for enhancing the resilience of the infrastructure, especially for Group A and B districts. Labour	Factory Inspectorate, Technical Experts, DMD, BSDMA & Occupiers of Industries	Sites			
3	Issue a directive to ensure that an annual disaster risk analysis exercise is conducted by such industries as part of the annual planning cycle for targeting, resource allocation and additional measures for specific vulnerabilities. Labour	Private and Public sector, Industry Associations	State			
4	Make it mandatory to carry out a 'Risk Impact Analysis' of a proposed hazardous industry before approval for the same is given in Group A and B districts. Labour	Private and Public sector,	State and sites			

#	Specific Actions	Supportive Departments / Agencies	Implementation Level (State / District / Sub-District / GP)	Timeline		
				Short Term (2015 to 2020)	Medium Term (2021 to 2025)	Long Term (2026 to 2030)
		Industry Associations				
5	Ensure that all hazardous industries develop “On-Site” and “Off-Site” Disaster Management Plans (as per the provisions of the Factories Establishment Act) the same are approved by competent authorities, and are practiced by duty bearers in these industries. Labour	Factory Inspectorates, DMs, Occupiers of Industries	District and industry sites			
6	Ensure linkages of the “On-Site” and “Off-Site” Disaster Management Plans, as developed by the hazardous industries, with the CDMPs and DDMPs. Labour	Factory Inspectorate, DMD, BSDMA,	State and District			
7	Undertake regular testing and mock drills for the operational readiness of these plans. Labour	DM-DDMAs, and Occupiers of Industries	State and industry sites			

NATURAL ECOSYSTEMS

Nodal Department: Department of Environment and Forest

#	Specific Actions	Supportive Departments / Agencies	Implementation Level (State / District / Sub-District / GP)	Timeline		
				Short Term (2015 to 2020)	Medium Term (2021 to 2025)	Long Term (2026 to 2030)
1	Identification, demarcation, mapping, and notification of various ecosystems by PRI/ULB feed into conservation and protection plans to derive sustained ecological services for the wider benefit of population of Bihar.	Related Departments, PRIs, ULBs, CSOs	State, District and GP and ULB			
2	Cities to provide mandatory annual environmental status report under the 74 th constitutional amendment.	ULBs	ULB			
3	Identification and sustainable management of common property natural resources is added to the responsibilities of the PRIs through appropriate Government order.	PRI and RDD	State and GP			
4	Make local plans and take local policy action to regain lost capacity of local ‘natural resilience infrastructure’ and integrate the green benefits in local land-use.	PRIs, ULBs, CSOs	State and GP and ULB			
6	Evidence building, through studies, for the importance of ecological functions and benefits brought in by natural ecosystems.	CSOs, Academic Institutions	State			

6.5 RESILIENT CITIES

What is a resilient city?

A resilient city is envisaged as a dynamic and proactive social unit wherein all individuals, households and the community as a whole is capable to:

- **Assess** the disaster and climate change induced risks and access the early warning systems,
- **Address** disasters including 'climate change induced disasters' through risk informed development planning. which includes preparedness, response and mitigation actions,
- **Preserve** ecosystem thorough environmental impact assessment and
- **Recover** from disaster(s) through building back better.

Characteristics of resilient cities

1. People are aware and recognize the risk/hazards and take appropriate action to prevent/mitigate disasters for a safe and secure environment.
2. Land zoning and urban planning is in sync with the ecosystem as well as with the natural drainage and geo-morphological patterns.
3. Communities practice safe behaviours like constructing safe houses, timely relocation to safe spaces, dispelling prevalent myth related to disaster, safe hygiene practices, promote preventive health, safe handling and storage of drinking water, acquire life skills, imbibe civic sense and practice community cooperation exercise sustainable livelihood choices, and life practices.
4. The city is able to meet small-scale disasters (L1) on its own.
5. Urban communities have timely access to early warning information and emergency services like evacuation, safe spaces, search and rescue as well as emergency health care and other essential services.
6. DRR is mainstreamed in ULB level plans by undertaking regular multi-hazard risk analysis.
7. Vibrant community institutions drive the process of risk analysis, risk communication, preparedness and risk reduction actions:
 - a. There are ward-level standing committees on DRR for supporting risk analysis and mainstreaming DRR in annual planning.
 - b. There are ward-level Community Emergency Response Teams (CERT) comprising citizen council members, civil defence personnel, service providers and select community members for preparedness and response actions.

8. Risk analysis, planning, communication, preparedness and reduction measures are undertaken in an inclusive and participatory manner, accounting for differential needs and capacities of children, adolescents, elderly, women, men, PWD, and traditionally marginalized or minority groups and through appropriate use of technology such as GIS mapping, mobile applications etc.
9. Communities have easy access to pre-positioned essential items and life-saving equipment.
10. Continuity of basic services like health, education, nutrition, WASH, and housing and critical infrastructure like power, bridges, roads, and telecommunications is ensured in the city, with either no disruptions or rapid regaining of functionality in case of disruptions.
11. Communities can build back faster through risk transfer initiative such as insurance.

Cities in Bihar

The term 'city' has been used in the context of all urban areas which currently include the existing 140 ULBs viz. 11 Municipal Corporations, 42 *Nagar Parishads* and 87 *Nagar Panchayats* all of which technically come under the jurisdiction of the ULBs in Bihar. The number may increase further with the increasing pace of urbanisation.

Actions for resilient cities

The above-mentioned characteristics of resilient cities will be achieved through focussed actions of different types, including targeted and planned capacity building of different actors, communication and awareness activities aimed at attitudinal and behaviour changes, and creating an enabling policy and risk governance environment. Additionally, actions to achieve the resilience of cities will not be limited to actions at the city itself, but also include actions at the state, district and ULB levels.

Resilient City Programme (RCP)

A 'Resilient City Programme' focussing on policy and practice level changes aiming for resilience in urban areas of Bihar would be initiated in partnership with civil society organizations and UN Agencies. The programme will be undertaken in a phased manner across all urban areas of Bihar over the course of fifteen years (2015-16 to 2030-31) starting with an intensive pilot programme (2015-16 to 2020-21) in one city from each of Group A (Darbhanga), Group B (Muzaffarpur) and Group C (Gaya) districts as well as 30% wards of Patna city (State Capital). Additionally, Bihar Sharif and Bhagalpur from Group B districts shall also be included in the first phase in convergence with the 'Smart Cities Project' of Gol. In phase two and three (2021-22 to 2030-31), it will be scaled up in all the remaining 134 urban areas of Group B and C districts and remaining 70% of wards of Patna city. RCP will broadly focus on:

- Disaster risks recognition, understanding and analysis;

- Disaster risk informed ward level development planning, using participatory, comprehensive and scientific risk analysis;
- Risk reduction actions based on this planning;
- Capacity building measures for risk analysis, risk-informed planning and risk reduction actions;
- Actions for targeted and planned communication for DRR.

Department-wise actions proposed for resilient cities

Nodal Department: Urban Development and Housing Department

#	Specific Actions	Supportive Departments / Agencies	Implementation Level (State / District / ULB)	Timeline		
				Short Term (2015 to 2020)	Medium Term (2021 to 2025)	Long Term (2026 to 2030)
1	<p>Develop and launch a 15-year “Resilient Cities Programme²⁸”, to cover all the ULBs in a phased manner. As part of this programme, undertake the following actions:</p> <ul style="list-style-type: none"> • Undertake disaster and climate change induced risk analysis at city / urban level with participation of urban level stakeholders including especially at-risk communities and consolidate this risk analyses at ULB and District levels. • Develop a "resilient city checklist" to guide efforts of all stakeholders towards resilient cities. • Assessment of cities on the basis of this checklist to create a baseline status for the Resilient Cities Programme. • Review and refine land zoning, town planning, city development plan, and urban settlement planning related procedures for ensuring planning in urban areas is risk informed and preserves ecosystems. • Identify key elements of an ecosystem in urban area like all natural water bodies (like ponds, lakes, canals, streams, nullahs, pokharas, rivers, and such), plantations / forests, mangroves, wetlands, and hilly areas and ensure that the same are not encroached or constructed upon as well as actions are taken for the restoration and revival of those which are encroached / degenerated / dead. • Identify all hazardous industries coming under the urban area and ensure that “On-Site” and “Off-Site” Disaster Management Plans (as per the provisions of the Factories Establishment Act) are developed, approved and practiced for them and ensure linkages of the same with the CDMP. • Make provisions for additional allocation under Grant-in-Aid to the ULBs for initiating resilience related structural and non-structural measures. 	<p>BSDMA, DMD, Environment and Forest, DM-DDMA, UN Agencies, CSOs, & CBOs</p>	<p>District and ULB</p>			
2	Put in place a system to ensure all new public buildings being constructed henceforth are green buildings and	BCD, DMD, Finance,	ULB			

²⁸ Actions to be undertaken as part of this Resilient Cities Programme have been detailed out in the box provided above.

#	Specific Actions	Supportive Departments / Agencies	Implementation Level (State / District / ULB)	Timeline		
				Short Term (2015 to 2020)	Medium Term (2021 to 2025)	Long Term (2026 to 2030)
	resilient to earthquake, floods (plinth above HFL), fire, cyclonic storms, and stampede with universal design ²⁹ in all urban areas of Bihar, including fiscal support like financial incentives like tax rebates / stamp duty concessions for such construction	BSDMA, ULBs, Fire Services, CSOs, UN Agencies				
3	Conduct Rapid Visual Survey (RVS) and Safety Audit of old/ existing public and community buildings from multi-hazard perspective (including earthquake, floods, cyclonic storms and fire) in all the urban areas of Bihar in partnerships with builders associations, hoteliers associations, citizen councils, resident welfare associations and housing cooperative societies.	BCD, DMD, BSDMA, ULBs, Builder Assocns. CSOs, CBOs	ULB			
4	Retrofitting of all old/ existing public and community buildings based on RVS and Safety Audit findings in a phased manner. In the first phase, retrofitting of all hospitals, medical colleges, schools and other important government establishments would be completed.	BSDMA, DMD, ULBs BCD, Health, Education, related all depts.,	State, District and ULB			
5	Undertake comprehensive analysis of flooding and water logging risks to urban areas, land-use patterns in these urban areas and existing water and drainage management systems as well as the natural drainage patterns in the urban areas of Bihar and their impacts on urban flooding and water logging.	WRD, FMISC, CWC, PWD, ULBs, town planners, Geologists, at-risk communities	City and all ULBs			
6	Identify and prioritize high flood risk prone areas and develop scenario based inundation maps for planning preparedness and response etc.	WRD, FMIS, DM-DDMA, DMD, ULB	State, District, ULB			
7	Based on the flooding and water logging risk analysis, <ul style="list-style-type: none"> Assess the need for water pumps and pumping stations in all urban areas of Bihar & procure and install / deploy the same at vulnerable and strategic locations. Identify and / or construct safe spaces / flood shelters at appropriate places in all urban areas. Develop a deputation plan for the pre-monsoon clearance of drainage / sewage systems in all urban areas. 	WRD and ULBs	City			

#	Specific Actions	Supportive Departments / Agencies	Implementation Level (State / District / ULB)	Timeline		
				Short Term (2015 to 2020)	Medium Term (2021 to 2025)	Long Term (2026 to 2030)
8	Set up waste water and sewage treatment and / or recycling plants at appropriate places within all urban areas and integrate with natural drainage systems.	Planning and Development, Concerned technical depts.	ULB			
9	Set up a vigilance cell within the UDHD specifically for strict monitoring and prevention of any construction of private and public buildings inside the flood-line and / or flood-protection walls. Develop and implement a rehabilitation and resettlement policy for existing houses inside the flood plains and flood protection walls of urban areas of Bihar.	DMD, Revenue and Land Reforms and WRD	State and ULB			
10	Undertake comprehensive capacity enhancement of ULB members and UDHD officials on risk analyses, risk informed planning and implementing initiatives based on the resilient checklist.	DMD, BSDMA, ULBs				
11	Capacity building through ToT, Training Workshops, Demonstrations, Learning Visits, Handholding support, Decision-Support Tools, etc. of: <ul style="list-style-type: none"> • ULBs, UDHD, Frontline Workers, CSOs, and Volunteers on risk analysis, risk informed development planning, and implementing initiatives based on the resilient cities checklist. • CDRTs on relevant SOPs, preparedness and response actions. • Architects, builders, engineers, supervisors, and masons on retrofitting and seismic-zone wise building codes and construction norms. Citizen councils, youth club members, college students, teachers, shop keepers, police personnel on (i) first aid, (ii) traffic rules, (iii) safe driving in all conditions including wet and foggy, (iv) maintaining vehicle fitness, (v) communication to trauma and police centres in case of accident events.					
12	Develop a basket of communication tools to support the Resilient Cities Programme in the short, medium and long term using different media like TV, Radio, Newspapers, Street Plays in Malls, Grounds, Schools, Colleges, and Demonstration Exercises.	DMD, BSDMA				
13	Develop an annual report card based on the resilience checklist for all ULBs to monitor and review their	IPRD, DMD,				

#	Specific Actions	Supportive Departments / Agencies	Implementation Level (State / District / ULB)	Timeline		
				Short Term (2015 to 2020)	Medium Term (2021 to 2025)	Long Term (2026 to 2030)
	performance on resilience related initiatives as well as plan for next year.	BSDMA				

Nodal Department: Disaster Management Department

#	Specific Actions	Supportive Departments / Agencies	Implementation Level (State / District / ULB)	Timeline		
				Short Term (2015 to 2020)	Medium Term (2021 to 2025)	Long Term (2026 to 2030)
1	Put in place a contingency plan for deployment of boats in cities for transportation and evacuation during urban flooding.	ULBs, DMs, Resident Welfare Associations	City			
2	Develop and/or finalize SOPs for earthquake, drought, cyclonic storm, stampede, management of traffic movement, and early warning. And, ensure the effective implementation of the various SOPs and guidelines through: <ul style="list-style-type: none"> • Conducting regular mock drills; • Developing a real-time and online monitoring system, data of which is openly available; • Reviewing the SOPs and guidelines based on the usage till date. 	BSDMA, DM-DDMAs, Transport Department, ULBs, UN Agencies, & CSOs	State, District and ULB			
3	Develop guidelines for the early warning information flow from EOC to the urban areas' (including wards) level stakeholders for last mile connectivity and for taking up actions based on the received early warning in coordination with the Citizen Council members and ULB functionaries.	DM-DDMAs, UDHD, WRD, IMD, NDMA,	State, District and ULBs			
4	Form ward level Community Disaster Response Team (CDRT) comprising citizen council members, civil defence personnel, resident welfare associations, service providers, and select community members for preparedness and response actions.	Civil Defence, Citizen Councils, and Resident Welfare Associations	State, Cities			
5	Re-activate the civil defence volunteers for participation in the "Resilient City Programme", especially towards community formation in ULBs more so in Patna city.	UDHD, ULBs	State, Cities			
6	Develop pre-agreed 'communication plans' for disaster preparedness and emergency response with media agencies and civil society organisations.	UDHD, ULBs	State, Cities			

Nodal Department: Home Department including Fire Services

#	Specific Actions	Supportive Departments / Agencies	Implementation Level (State / District / ULB)	Timeline		
				Short Term (2015 to 2020)	Medium Term (2021 to 2025)	Long Term (2026 to 2030)
1	<p>Ensure appropriate preparedness actions for controlling fire events through the following:</p> <ul style="list-style-type: none"> • Develop a fire safety and evacuation plan for all public and private buildings, especially in critical institutions like Health care facilities. • Purchase and deployment of appropriate firefighting equipment and fire tenders in all urban areas. • Ensure availability of water supply and other firefighting materials like sand and chemicals in all public and private buildings. • Undertake fire safety drills, twice a year, related to preparedness measures, evacuation and initial response actions in case of fire. • Undertake the current 'Fire Safety Week' twice a year. 	UDHD, BSDMA, Related All Departments, Civil Defence, Citizen Councils, and Resident Welfare Associations	State and ULBs			

Nodal Agency: BSDMA

#	Specific Actions	Supportive Departments / Agencies	Implementation Level (State / District / ULB)	Timeline		
				Short Term (2015 to 2020)	Medium Term (2021 to 2025)	Long Term (2026 to 2030)
1	Develop City Disaster Management Plans (CDMP) for all ULBs and Office Disaster Management Plans (ODMP) for all public and private offices based on the model ODMP developed by BSDMA.	DMD, UDHD, Health, All related Depts., Industry Associations	State and ULB			
2	<p>Ensure effective preparedness for earthquakes by:</p> <ul style="list-style-type: none"> • Undertaking detailed GIS based mapping of all the roads, lanes, bye-lanes, and public assets in all the urban areas and have these maps ready for effective response during earthquakes. • Identification of public parks and open spaces for 	DMD, Home, Science and Technology, Experts,	State and ULBs			

#	Specific Actions	Supportive Departments / Agencies	Implementation Level (State / District / ULB)	Timeline		
				Short Term (2015 to 2020)	Medium Term (2021 to 2025)	Long Term (2026 to 2030)
	<p>people to assemble during evacuations and alternative temporary accommodation as well as provision of basic services at these sites during disaster events.</p> <ul style="list-style-type: none"> • Identification of areas / spots in all urban areas for disposal of human and animal dead bodies as well as disposal of the infrastructural debris after an earthquake event. 	Civil Defence, Citizen Councils, and Resident Welfare Associations				
3	Take steps to ensure participation of vulnerable and hazard-exposed groups in the design, planning, targeting, implementation, and monitoring-review of resilience related policies and initiatives like citizen council interactions at ward level, soliciting suggestions on plans online and engagement with citizen forums.	DMD, Civil Defence, Citizen Councils, and Resident Welfare Associations	ULB and Ward			
4	Hold an annual "Resilient City" contest (based on the resilient city checklist) and link the same to providing fiscal incentives to the ULBs as well as service-promotion incentives to the UDHD and ULBs officials.	UDHD and ULBs	State and ULB			
5	Hold an annual "Resilient City Ambassador" contest for the promotion of citizens' initiatives towards resilient cities.	UDHD, ULBs,	State			
6	Conduct emergency management exercises in all urban areas addressing multiple hazards.	DMD, UDHD and all related Departments	ULB			
7	<p>Take following actions for information dissemination, knowledge building and public awareness raising from a multi-hazard and urban context point of view so as to ensure effective public action for resilience in urban areas of Bihar:</p> <ul style="list-style-type: none"> • Safety Weeks, demonstrations and edutainment for citizens on preparedness, evacuation, Do's and Don'ts, first-aid etc. • Develop awareness programmes on newspapers, TV, Radio, and social media • Undertake intensive drive/ campaign to promote insurance seeking by community members for life, health, assets (house, vehicle, and such), small 	DMD, DM-DDMA, Related all Departments, ULBs, UN Agencies, and CSOs	State, District, and ULB			

#	Specific Actions	Supportive Departments / Agencies	Implementation Level (State / District / ULB)	Timeline		
				Short Term (2015 to 2020)	Medium Term (2021 to 2025)	Long Term (2026 to 2030)
	<p>commercial establishments, etc. cover.</p> <ul style="list-style-type: none"> Develop and/or finalize do's and don'ts pertaining to fire, heat-wave, cold-wave, hailstorm, and cyclonic storms. Involve school and college students in promotion of the resilient city programme through linkages with the Mukhya Mantri School Safety Programme. 					

Nodal Department: Building Construction Department

#	Specific Actions	Supportive Departments / Agencies	Implementation Level (State / District / ULB)	Timeline		
				Short Term (2015 to 2020)	Medium Term (2021 to 2025)	Long Term (2026 to 2030)
1	Set up 'Earthquake Safety Clinic' in all urban areas of Bihar to provide solutions on structural measures and non-structural aspects related to earthquake safety.	DMD, BSDMA, UDHD, and Technical Institutions	State, City			

Nodal Department: Transport Department

#	Specific Actions	Supportive Departments / Agencies	Implementation Level (State / District / ULB)	Timeline		
				Short Term (2015 to 2020)	Medium Term (2021 to 2025)	Long Term (2026 to 2030)
1	Ensure effective implementation of Traffic Legislations and Enforcement of Traffic Laws through increasing number of signals, signage, setting up CCTVs, using breath-analyzers, uniform vehicle numbering system, and digitizing traffic violation marking system and enforcing strict adherence of vehicle fitness and safety testing.	Home, Dept. of Economic and Statistics, IT, DM-DDMA, & experts	ULBs			

Nodal Department: Health Department

#	Specific Actions	Supportive Departments / Agencies	Implementation Level (State / District / ULB)	Timeline		
				Short Term (2015 to 2020)	Medium Term (2021 to 2025)	Long Term (2026 to 2030)
1	Provide emergency medical assistance to accident victims through deployment of ambulances equipped with Advanced Life Saving (ALS) and tagging of private hospitals with police stations for admitting of accident victims.	DMD, DM-DDMA, Citizen Councils, Red Cross, & Private Hospitals	State and ULBs			

Nodal Department: District Magistrate and DDMA

#	Specific Actions	Supportive Departments / Agencies	Implementation Level (State / District / ULB)	Timeline		
				Short Term (2015 to 2020)	Medium Term (2021 to 2025)	Long Term (2026 to 2030)
1	Undertake through concerned departments and agencies preparatory tasks like repairs of roads and related structures (Ghats), construction of Pontoon bridges, cleaning of drains, setting up of temporary barricades, exit routes identification and signage, electricity provision at vulnerable areas before occasions having potential to cause stampede.	Home, Tourism Dept., RCD, ULBs, Religious Trusts / Boards	Vulnerable locations			



Chapter 7

ENABLING POLICY ARCHITECTURE

7. Enabling policy architecture

Overview of disaster management related policy architecture in Bihar

The policy architecture pertaining to disaster management in Bihar has progressively evolved since the early 2000's in line with national and state level policy commitments, socio-political changes as well as frequent experiences of small and large scale disasters. This is evidenced from the sustained political will to combat disasters that led to strengthening and renaming of the then Department of Relief and Rehabilitation into Department of Disaster Management (18th March, 2004), adoption of the National Disaster Management Act in 2005, Bihar State Disaster Management Policy in 2007, Kosi Disaster: Rehabilitation and Reconstruction Policy in 2009, refinements in the Building code and Bye-Laws from seismic zones' point of view, periodic issuance of pertinent directives and guidelines for disaster management including risk reduction, and, establishment of institutions like Bihar State Disaster Management Authority²⁹, District Disaster Management Authorities³⁰, State Executive Committee³¹, Crisis Management Group, State Disaster Response Force³², Flood Management Information System, Bihar *Aapda Punarvas Evam Punarnirman* Society (BAPEPS), State Disaster Response Fund, and State Disaster Mitigation Fund with clear mandates for disaster management. Government of Bihar has notified eight disasters as state specific local disasters³³ over and above the twelve 'natural calamities' recognised by Government of India.

To ensure preparedness for effective response GoB has developed Standard Operating Procedures (SOPs) on Flood Control and Management, Drought, Fire, Drinking Water Crisis, Fire Safety in Hospitals, Crowd Management, and Schemes such as Bihar *Shatabdi Anna Kalash Yojana*, and Bihar Scheme for Assistance to Farmers in Farm Distress in the past five years. In order to guide action, inter- alia, for addressing disaster and climate change induced risks in the state, GoB has taken up plans like the Agriculture Roadmap, Health Roadmap, Mission *Manav Vikas*, Treatment Protocol for Acute Encephalitis Syndrome (AES), and the Bihar-State Action Plan for Climate Change (SAPCC)³⁴, as well as initiatives like the Flood Hazard Atlas, Flood Management Information, Risk Informed Development Planning – System (RIDP-S), School Safety Programmes, and the Community Based Disaster Risk Reduction (CBDRR) Programmes. The State Disaster Management Plan (SDMP) was approved by the BSDMA on 14th March 2014 and formulation of District Disaster Management Plans (DDMP) for all 38 districts of Bihar has been initiated by the BSDMA at the instance of DMD on the pattern of the 'Madhubani Model'. The DDMPs will be finalised and approved in the calendar year

²⁹ BSDMA, vide notification no. 3449 dated 16.11.2007.

³⁰ DDMA, vide notification no. 1502 dated 03.06.2008.

³¹ SEC, vide notification no. 1597 dated 25.06.2008.

³² SDRF, vide notification no. 698 dated 16.03.2010.

³³ vide notification no.1418 dated 17.04.2015.

³⁴ The SAPCC provides the analysis and strategies for addressing climate change impacts in Bihar.

2016 itself while the Departmental DM Plans and Office Disaster Management Plans are in the formulation stage.

It is quite evident from the overview that in the last decade GoB has established comprehensive policy architecture from disaster management point of view with clear policy directions not only for preparedness, relief, response, and capacity enhancement for the same but also for the institutional landscape ranging from the state to the district and PRIs / ULBs levels with clear mandates and roles pertaining disaster management. Even as efforts are ongoing towards preparedness related capacity building, strengthening the functioning of district level institutions (DDMAs) and public awareness campaigns in the state; there is an increasing realisation of the need to invest more in disaster risk reduction (viz. on mitigation, prevention and preparedness as well as incorporating the build back better approach in recovery and rehabilitation).

Recognising and appreciating the progression of the state from being relief and response oriented to preparedness centred with movement towards DRR in the recent years, this DRR Roadmap aims to steer the policy architecture of the state further towards strengthening DRR by creating an enabling environment of funds, functions and functionaries for DRR as well as mainstreaming DRR in development related functioning of the line departments and elected bodies, which is also reflected in the first and second priority areas of SFDRR. Accordingly, this section provides amendments in the *Panchayati Raj* Institutions (PRI) and Urban Local Bodies (ULB) Acts, development and / or revision of policies, guidelines, norms, SOPs and issuance of directives which need to be revised or developed in order to create an enabling policy architecture for implementing the roadmap and ultimately achieving the DRR goals. Policy aspects pertaining to the new programmes proposed in the earlier sections have also been mentioned in this section. Further, actions to bring about policy level synergy for fulfilment of the Chief Minister's "Seven Resolves" (*Saat Nischay*) and the recently initiated Bihar Development Mission with this DRR Roadmap have also been included in this section.

(A) Legal Amendments

- 1) **Amend the PRI Act (by Panchayati Raj Department)** to incorporate the following provisions:
 - a) Widen the scope of the current GP level Standing Committee on Relief Monitoring to a Resilience Committee focussing on planning for and monitoring actions to address disaster and climate change induced risks within the GP.
 - b) Provide funds to GPs to undertake DRR related initiatives as sanctioned by the *Gram Sabha* / Resilience Committee, including for taking immediate care of families affected by fire incidents, particularly from the marginalized sections (till grants are provided under SDRF). The quantum of these funds should be periodically revised based on the GP disaster risk

profile including hazard context, event history, vulnerabilities, exposure, capacities especially for budget management, and track record of funds management.

c) Include DRR, over and above the current response related planning function, in the list of functions to be done by PRIs in sync with the departmental and district planning.

2) **Amend the ULB Act (by Urban Development and Housing Department)** to incorporate the following provisions:

a) Create a response and resilience standing committee at the ULB level for focussing on planning for and monitoring actions to address disaster and climate change induced risks within the ULB.

b) Provide funds to the ULBs to undertake DRR related initiatives as sanctioned in the ULB annual planning meeting. The quantum of these funds should be periodically revised based on the ULB disaster risk profile including hazard context, event history, vulnerabilities, exposure, capacities especially for budget management, and track record of funds management.

c) Include DRR related planning in the list of functions to be done by ULBs in sync with the departmental and district planning.

(B) Development of Policies

1) Develop a **Disaster Recovery Policy (by Planning and Development along with Disaster Management and Finance Departments)** for the state for L3 disaster event and department wise recovery plans based on the principle of 'Build Back Better'.

2) Develop a **Livelihood Recovery Policy (by Planning and Development along with Agriculture, Animal Husbandry and Fisheries, Cooperative, Small and Medium Industries, and Finance Departments)** taking into account the multi-hazard profile, agrarian context, and unregistered small producers, traders, vendors and migrants as well as the Build-Back-Better principle.

3) Finalize the **Water Management Policy (by Water Resources Development Department)** with emphasis on promoting rain water harvesting in all buildings.

4) Formulate a **Waste (Solid and Liquid) Management Policy (by Public Health and Engineering Department)** with a special attention on waste management during hazard events.

5) Develop a **Climate Change Adaptation Policy (by Agriculture and Environment and Forest Departments)** taking into consideration the climate change induced risks, agrarian context and increasing urbanization in the state.

6) Develop a **Compensation Policy (by Planning and Development along with Agriculture, Disaster Management, Cooperative, Small and Medium Industries, and Finance Departments)** for

sharecroppers and artisans as well as unregistered small producers, traders, vendors and migrants in case of damage to their livelihoods due to disasters and climate change impacts.

- 7) Notify the **Emergency Support Functions (ESF) (by Disaster Management Department)** of the state.

(C) Directives

(C.1) Directives regarding planning

- 1) Every department should undertake disaster risk analysis, incorporate this analysis in annual planning (PIP development), for targeting of actions and budget allocation **(by Planning and Development and all Departments)**.
- 2) All departments mandated to provide basic services and critical infrastructure should develop a 'Service Delivery Continuity Plan and Infrastructure Continuity Plan' respectively as part of annual planning, by including actions for back-up and regaining prompt functionality of infrastructure (facilities), personnel and operating systems to ensure uninterrupted provision of basic services and critical infrastructure **(by Health, PHED, Education, Food and Consumer Protection, RDD, UDHD, Social Welfare, DMD, IPRD, Energy, Transport, RCD, WRD, Minor Irrigation, Industries, and Environment and Forest Departments)**.
- 3) Include disaster risk analysis and congruity with natural drainage patterns in the development of the Master Plan' as well as the town / city development plans of all 140 ULBs in Bihar **(by Urban Development and Housing Department)**.
- 4) Make it mandatory to carry out a 'Risk Impact Analysis' of any proposed construction activity pertaining to critical infrastructure before approval for the same is given **(by concerned departments)**.

(C.2) Directives regarding resource allocation

- 1) Provision for the adaptive use of national and state missions, flagship and other schemes as per the disaster and climate change induced risk profile and periodic shocks and stresses **(by Planning and Development along with DMD and Finance Department)**.
- 2) Provision for additional allocation of funds, as part of annual planning, to those districts which have high disaster and climate change induced risks **(by Planning and Development along with DMD and Finance Department)**.
- 3) Provision additional funds for construction of public assets (for e.g. school building, AWC, hospitals) as well as house construction under *Indira Awas Yojana* (IAY) and *Rajiv Awas Yojana* (RAY) as per the multi-hazard context **(by Planning and Development along with RDD, UDHD and Finance Department)**.

- 4) Increase the allocation under the State Disaster Mitigation Fund to INR 10 Crore for mitigation and disaster risk reduction actions **(by DMD and Finance Department)**.
- 5) Provide fiscal support in the form of financial incentives like tax rebate / stamp duty concession for earthquake resilient retrofitting and new construction **(by Finance Department with UDHD)**.
- 6) Enhance the wages for MGNREGA for the repairs and restoration works undertaken as part of disaster recovery **(by Rural Development Department)**.
- 7) Modify procedures for PDS related procurement and provision to dealer through prepositioning for known hazard events and for conducting market analysis during disasters and making real-time adjustments to essential (especially food) supplies **(by Food and Consumer Protection Department)**.
- 8) Broaden the scope of the *Shatabdi Anna Kalash Yojana* to include households affected by fire incidents **(by Food and Consumer Protection Department)**.

(D) Guidelines and Manuals

- 1) Develop guidelines for line departments on how to conduct disaster risk analysis and integrate the same into their annual planning **(by Disaster Management Department along with BSDMA)**.
- 2) Develop guidelines for PRIs and ULBs on how to conduct disaster risk analysis and integrate the same into their annual planning **(by Disaster Management Department along with BSDMA)**.
- 3) Develop guidelines for non-structural mitigation related to earthquakes **(by BSDMA along with UDHD)**.
- 4) Develop guidelines for provision of psychosocial care in disasters **(by Health Department)**.
- 5) Adapt the Minimum Initial Service Package (MISP) guidelines for reproductive health and protection of girls and women for the Bihar context **(by Health Department)**.
- 6) Develop the State's School Safety Policy Guidelines on lines of the National School Safety Policy Guidelines **(by Education Department along with BSDMA)**.
- 7) Develop a template for School and College Disaster Management Plans **(by Education Department along with BSDMA)**.
- 8) Develop guidelines for toilet construction based on disaster risks in the Group A and Group B districts **(by PHED)**.
- 9) Modify the building plan and completion certification guidelines so as to make it mandatory for builders to provide a 'House Resilience Plan' to the house-owner that includes testing and upgrading on requirements from 5-10-20 years' point of view, maintenance guidelines and potential risks **(by UDHD)**.

- 10) Develop guidelines for damage assessment of livestock, small ruminants, poultry and fisheries **(by Disaster Management Department along with Animal Husbandry and Fisheries Department).**
- 11) Develop guidelines for assessing the livelihood damages of sharecroppers as well as artisans due to disasters and climate change impacts **(by Disaster Management Department along with Agriculture Department).**
- 12) Create decentralized database related to disaster management including risk profile, event history, disaster impacts, and preparedness-response-recovery-DRR actions **(by Disaster Management Department).**
- 13) Develop a manual for provision of Emergency Support Functions (to be housed at and implemented from the EOC) including guidelines for the following **(by Disaster Management Department):**
 - a) Dissemination of early warning
 - b) Conducting mock drills on earthquakes and fire
 - c) Operations and management of EOCs,
 - d) Camp and mega camp management,
 - e) Management of warehouses stocking disaster response equipment and materials.
- 14) Develop evacuation protocols including linkages to the early warning system in the state **(by Disaster Management Department).**

(E) Norms

- 1) Develop norms for health service delivery during and post disasters **(by Health Department).**
- 2) Develop norms for provision of drinking water, sanitation and hygiene services in disasters **(by PHED).**
- 3) Develop norms for provision of nutrition services during disasters, including doubling of THR for households with pregnant and lactating women and malnourished children and inclusion of 'sattu' in the SDRF norms **(by Food and Consumer Protection Department).**
- 4) Revise the IAY and RAY norms for inclusion of disaster resilient housing design **(by RDD and UDHD).**

(F) Standard Operating Procedures (SOP)

Develop SOPs (through a multi-stakeholder consultative process and make provisions for regular mock drills and simulations, review and refinement of the SOPs) for (by Disaster Management Department along with pertinent line departments and BSDMA):

- 1) Earthquakes
- 2) Cyclonic Storms
- 3) Crowd Management
- 4) Management of traffic movement during disaster events
- 5) Child protection in Disasters
- 6) Biological hazard including Vector-borne and Water-borne diseases
- 7) Management of Gender Based Violence in Disasters
- 8) Debris clearance, dignified disposal of dead bodies and animal carcasses
- 9) Air, Rail and Industrial Accidents
- 10) Early Warning System (Receipt and dissemination of information)
- 11) Functioning of the State and District Emergency Operation Centres (EOCs)

(G) Programmes

- 1) Resilient Village Programme: This programme will be designed on the lines of Community Based DRR Programmes (CBDRR), initiated in partnership with civil society organizations and UN Agencies and will be undertaken in a phased manner across all districts of Bihar over the course of fifteen years (2015-16 to 2030-31) starting with an intensive pilot programme (2015-16 to 2020-21) in all Group A districts and then scaled up (2020-21 to 2030-31) in all Group B and C districts.
- 2) 'Resilient City Programme': This programme focussing on policy and practice level changes aiming for resilience in urban areas of Bihar would be initiated in partnership with civil society organizations and UN Agencies, in a phased manner across all urban areas of Bihar over the course of fifteen years (2015-16 to 2030-31) starting with an intensive pilot programme (2015-16 to 2020-21) in one city from each of Group A (Darbhanga), Group B (Muzaffarpur) and Group C (Gaya) as well as 30% wards of Patna (State Capital). Additionally, Bihar Sharif and Bhagalpur from Group B districts may also be included in the first phase in convergence with the 'Smart Cities Project' of GoI. This programme would then be scaled up (2020-21 to 2030-31) in all the remaining 134 urban areas of Group B and C districts and remaining 70% of wards of Patna city.
- 3) *Mukhya Mantri School Safety Programme (MSSP)*: Already ongoing; intensified implementation as a part of the roadmap.



Chapter 8

ROADMAP IMPLEMENTATION ARRANGEMENTS

8. Roadmap Implementation Arrangements

Overview of disaster management institutional framework in Bihar

The institutional framework pertaining disaster management in Bihar has progressively evolved since the early 2000's in line with national and state level policy commitments, socio-political changes as well as frequent experiences of small and large scale disasters. This is evidenced from the well established institutions ranging from state to district and PRI / ULB levels with clearly allocated mandates, roles, personnel, and resources. The Department of Disaster Management (DMD) is the nodal department of GoB mandated for disaster management while the Bihar State Disaster Management Authority (BSDMA) is mandated to inform policy and focus on DRR. Further, the Crisis Management Group (CMG), State Executive Committee (SEC), State Disaster Response Force (SDRF), and Bihar *Aapda Punarvas Evam Punarnirman* Society (BAPEPS) have specific mandates pertaining disaster management at the state level while the District Disaster Management Authority (DDMA) has been created at district level specifically for disaster management. The state level Bihar Inter Agency Group (B-IAG), comprising UN Agencies and civil society organizations, has been formed for strengthening coordinated responses to disasters.

This institutional framework has managed quite a few large and small scale disasters over the last decade in the state and has accordingly evolved its preparedness and response capacities through well-defined mandates, plans, procedures, and guidelines as well as human, financial and technical resources. There is however a growing realisation within the state of the need to invest more in strengthening the existing institutions' capacities towards disaster risk reduction (viz. on mitigation, prevention and preparedness as well as incorporating the build back better approach in recovery and rehabilitation) as also reflected in the first and second priority areas of SFDRR. Recognising and appreciating the evolved capacities of GoB for relief, response and preparedness, this DRR Roadmap aims to enhance the institutional framework of the state further towards DRR by sharpening the focus, functions and functionaries of these institutions. Given that Bihar already has a strong institutional framework for disaster management, the implementation of the roadmap is largely based within this framework. Accordingly, this section presents the arrangements for the implementation of this 15 year roadmap including institutions, human resources and mechanisms for implementation. The existence of a vibrant civil society with an established precedent for joint actions by government departments and civil society organisations has also informed the implementation arrangements. Finally, a new institution in the form of a Roadmap Implementation Support Unit (RISU) has been strongly proposed. These are detailed below:

(A.1) Institutions - EXISTING

- (1) **Crisis Management Group (CMG):** The CMG is the State Government's apex institution mandated to direct the management of any crisis in the state. It is headed by the Chief Secretary and includes Principal Secretaries of the concerned Departments. The CMG may take the shape of DRR Monitoring Group (DMG) in consultation with the SEC will oversee the strategic planning, coordination and monitoring of the roadmap implementation. Further, the CMG may invite pertinent experts, agencies and other stakeholders for participation in the CMG's meetings related to roadmap implementation.
- (2) **State Executive Committee (SEC):** The SEC is mandated to sanction plans and expending of funds (non-plan expenditure) by the DMD, monitor disasters, review progress, and is empowered to authorize DMD to withdraw funds from State Disaster Response Fund for various undertaking relief works under the norms. The SEC is headed by Chief Secretary with Development Commissioner, and, Principal Secretaries of DMD, WRD and Finance Department as members. The SEC will participate in overseeing the strategic planning, coordination and monitoring of the roadmap implementation. The SEC will also oversee the expending of funds towards implementation of this roadmap, especially by the RISU. Further, the SEC may invite pertinent experts, agencies and other stakeholders for participation in the SEC's meetings related to roadmap implementation.
- (3) **Disaster Management Department (DMD):** The DMD, headed by Principal Secretary, is the nodal department of GoB for disaster management. It will guide, support and facilitate concerned line departments for:
 - (i) Implementation and monitoring of the roadmap,
 - (ii) Provision of need-based technical support to concerned line departments in multi-hazard risk analysis and risk informed planning,
 - (iii) Development of pertinent policies and instruments (SOPs, guidelines, directives),
 - (iv) Management of disaster data-base, information system and other appropriate instruments / tools, and
 - (v) Guide and provide support to the District Task Force.

Being the nodal department for disaster management, DMD will take up roles and responsibilities especially pertaining providing strategic direction, resource provision, facilitating implementation processes, establishing partnerships, operational monitoring, and periodic review and evaluation of the roadmap implementation over and above the department-specific actions as envisaged in this roadmap.

- (4) **Concerned Line Departments:** The Nodal Departments with support from other departments and agencies have been assigned well defined roles and responsibilities under the Roadmap. The roles and responsibilities may look new in nature but these are merely a way to do the work which the concerned department is currently doing as per the Rules of Executive Business. What this roadmap envisages is that the line departments would revisit everything which they do in a risk informed way and undertake Risk Informed Planning before execution of a scheme. The line departments ably supported by defined partners would perform most of the roles under this roadmap.
- (5) **Bihar State Disaster Management Authority (BSDMA):** BSDMA was constituted in 2007 as per the DM Act of 2005 and is headed by the Chief Minister as the Chairperson with one of the members nominated as the Vice-Chairperson. In line with the DM Act and BSDMA's Constitution, BSDMA will take up the roles, responsibilities and facilitate the processes for implementation of this roadmap especially pertaining to disaster and climate change induced risk analyses, formulation of disaster management plans, capacity enhancement, and strengthening public awareness and communication of disaster and climate change induced risks.
- (6) **District Disaster Management Authorities (DDMA):** Headed by the District Magistrate as the Chairperson and comprising district-level heads of the line departments, the DDMA is mandated to play a central role in disaster management at the district level. The Roadmap envisages that the District Magistrates and DDMA's will play an integral role in disaster risk reduction and the implementation of this roadmap as per the DM Act and inter-alia will take up the roles and responsibilities especially that of providing operational direction, targeting and prioritization, undertaking risk analyses, formulation of district disaster management plans, facilitating implementation processes, establishing partnerships, periodic monitoring and review of the roadmap implementation over and above the specific actions as envisaged in this roadmap.
- (7) **Bihar Institute for Public Administration and Rural Development (BIPARD):** BIPARD is the nodal administrative training institute of the state with a centre for disaster management. BIPARD may take up roles and responsibilities for the implementation of this roadmap pertaining capacity building as per their institutional capacities.
- (8) Other institutions from the government (like NDRF, SDRF, departmental training institutes, universities, and such), private sector, civil society organizations, experts, and technical agencies would also be engaged for capacity building for the implementation of this roadmap.

- (9) **UN Agencies, Civil Society Organisations (CSOs), Public / Private Sector, and other stakeholders:** It is envisioned that UN Agencies, CSOs and other stakeholders will play a critical role in supporting DMD and other line departments, BSDMA and other stakeholders for facilitating the implementation of actions within this Roadmap as per their mandates, capacities and interests. As a concrete step towards achieving this, it is recommended that the UN Agencies and CSOs conduct consultations, awareness generation and capacity building at various levels on the roadmap implementation.

(A.2) Institutions / Mechanisms – PROPOSED

- (1) **State Level Task Force (STF)** will be constituted, headed by the PS-DMD or the Secretary-DMD and comprising members from GoB (concerned line departments), BSDMA, CSOs, experts and UN Agencies for coordination between and support to the stakeholders (intra-government and non-government), and stocktaking of the implementation of the Roadmap.
- (2) **Department level Task Forces** will be constituted, headed by the PS/Secretary in every line department to which specific roles have been assigned and comprising of the concerned officials to whom the department would allocate the specific tasks and the representatives of supporting agencies/departments, CSOs, experts and UN agencies for implementation of the specific tasks assigned to that department.
- (3) **Roadmap Implementation Support Unit (RISU)** will be established in DMD, with a dedicated full-time team of technical experts and appropriate supportive staff. The RISU will support the planning, implementation and monitoring functions of the DRR Roadmap.
- (4) **State Institute for Disaster Management (SIDM)** will be established to function as the nodal state level capacity building, research, study cum resource centre on disaster management and risk reduction.
- (5) **State Platform for DRR (SPDRR)** will be initiated for cooperation and coordination with neighbouring states and trans-border focussing on ecosystem protection, early warning communication, preparedness, response, and risk reduction measures as well as stocktaking on the implementation of the DRR Roadmap. The platform shall be constituted on the lines of National Platform in Bihar's context.
- (6) **District Task Forces (DTF)** will be constituted, headed by the DM and comprising members from the DDMA, PRIs / ULBs, CSOs, and local experts for coordination between stakeholders (intra-government and non-government) and monitoring the implementation of the Roadmap.

(B) Personnel

(1) The **District Collectorate** will be strengthened by:

- a. Ensuring that every district has a full-time ADM-Disaster with appropriate supportive staff, especially in the Group A and Group B districts.
- b. Appropriate human resources for disaster management and implementation of this roadmap would be provided at the district level.
- c. Creation of a disaster management cell at state level in the line departments and technical cell at district level in the Building Construction Department.

(C) Programmes and Systems

A **Disaster Management Information System** will be established in the DMD at state and district levels with decentralised data entry, collation, analysis and reporting. The development and periodic updating of the baseline status of the DRR Roadmap will be undertaken through this system. This system will be housed within the RISU of the DMD. Once the system is established, disaster risk reduction related outlays should be published in the Annual Economic Surveys. This system would further develop GIS based and / or IT enabled applications pertaining disaster management and risk reduction in the state.

Implementation Strategy

The above-mentioned institutions, human resources and mechanisms will guide the implementation of the Roadmap. As mentioned in *Section 3.2 (see, [page 33](#))*, partnerships will be a key feature of the implementation arrangements. The immediate next steps towards implementation will include:

- In order to bring about operational synergy in fulfilment of the Chief Minister's "Seven Resolves" (*Saat Nischay*) and the recently initiated Bihar Development Mission with this DRR Roadmap, the operational leadership of RISU would hold joint planning, coordination and review meetings with the operational leadership of Bihar Development Mission. Further, specific recommendations would be made by the RISU towards disaster and climate change induced risks' proofing of the actions undertaken in the Bihar Development Mission as well as the prioritization of the roadmap implementation would be synchronised with that of the Bihar Development Mission.
- Consultations with multiple stakeholders to share the Roadmap components and further define the roles of different stakeholders in the implementation of the Roadmap. Mixed and actor-specific consultations will be undertaken with concerned departments of GoB, civil society organisations, corporate bodies, academic institutions, media as well as other citizen groups.

- The components and actions in the Roadmap will be widely disseminated to the citizens of Bihar through different media, including print, electronic and radio.
- The State Level Task Force will be constituted and Roadmap Implementation Support Unit (RISU) will be established on priority.
- State Level Task Force will coordinate with the concerned line departments and ensure the development of department action plans towards implementation of the DRR Roadmap.
- The RISU will support and facilitate DMs/DDMAs and Urban Development and Housing Department to undertake baselines and planning exercises of the Resilient Village and Cities Programmes.



Chapter 9

MONITORING AND EVALUATION ASPECTS

9. Monitoring and Evaluation Aspects

Monitoring and evaluation are one of the critical functions that support and enhance the quality of implementation of any programme especially critical initiatives like this roadmap. The robust monitoring framework including the Global Assessment Reports (GAR) developed by UNISDR for HFA have created a global benchmark for monitoring and evaluation of DRR programmes implemented at a scale. Ongoing efforts to evolve a monitoring and evaluation framework for the SFDRR also provide direction for national and provincial governments on the nature and focus of how the same needs to be approached and undertaken. In line with this, monitoring and evaluation of this DRR Roadmap will be undertaken at multiple levels with differential focus and frequency. Monitoring, review and evaluation will be aimed at tracking both the implementation of the designed actions as well as progress on achievement of the envisioned targets and milestones. Accordingly, review and reporting mechanisms would be built in at multiple levels. A monitoring and evaluation framework that provides outcomes with inclusive and equity based indicators would be developed by the RISU as one of the first steps once the roadmap is approved by GoB. This would be developed by drawing upon the lessons from the monitoring, review and evaluation mechanisms particularly the framework and indicators as well as reporting templates and procedures developed by UNISDR not only for monitoring the implementation of HFA but also those currently being developed for SFDRR. Specifically, the following would be developed by RISU within the first three-four months of its constitution:

- A monitoring and evaluation framework for this DRR Roadmap would be developed. This framework would clearly delineate the outcomes, indicators, phase and actor wise targets, responsibilities for monitoring, review and evaluation, and the methods for the same. Further, the indicators would be so designed as to be inclusive and equity based as well as capturing qualitative and quantitative changes.
- Procedures (periodicity, responsibility, method, and such) and templates for reporting on the outcomes, indicators and targets would be developed and shared with all the stakeholders tasked with implementation of this roadmap.
- A detailed work-plan for the implementation of this roadmap would be developed. This work-plan would comprise activities, responsible departments / agencies, timing-duration, location(s), resource requirements, and method(s) along with the monitoring and reporting procedures for the same.
- Baseline status related to the envisaged outcomes and the milestones would be developed with as much disaggregation as possible.

- Guideline for partnering with experts and organizations experienced in monitoring, review and evaluation and in the Bihar context would be developed so as to bring them on board for periodic monitoring, review and evaluation of this roadmap.

This monitoring and evaluation framework will ensure effective multi-stakeholder monitoring and evaluation of the roadmap as well as foster transparency and accountability in the use of resources for the roadmap implementation. Presented below is an annual break-up of the milestones. It is expected that the RISU will refine the indicators as part of the monitoring and evaluation framework.

Milestones	Indicators
1. Baseline status for each of the three targets is developed.	<ul style="list-style-type: none"> • Nature (qualitative and quantitative) and type of disaggregated (sex, location, age, disability, caste-community) data with clear periodicity is analysed by 2016.
2. Structural safety audits of all government offices and social infrastructure (such as Anganwadi Centers, Schools, Hospitals, Panchayat Bhawans) is completed and corrective measures initiated. (2.1) All government offices and social infrastructure is identified and listed in a common central registry. (2.2) Rapid Visual Survey of all government offices and social infrastructure is undertaken. (2.3) Appropriate structural safety related corrective measures are initiated.	<ul style="list-style-type: none"> • Number of government offices and social infrastructure and the type of structural safety measures initiated by 2020. • Number and type of government offices and social infrastructure listed and prioritization plan developed by 2016. • Number and type of government offices and social infrastructure audited for structural safety by 2017. • Number of government offices and social infrastructure having structural safety and the nature of corrective measures undertaken by 2020.
3. Emergency Support Functions (ESFs) are notified and made operational with fully-	<ul style="list-style-type: none"> • Nature of ESFs and number of EOCs made fully operational by 2018.

Milestones	Indicators
<p>functional Emergency Operations Centres (EOCs) at state and district levels.</p> <p>(3.1) ESFs are finalised and notified by GoB.</p> <p>(3.2) EOCs are established at state and district levels.</p>	<ul style="list-style-type: none"> • Nature (diversity) of ESFs with level of clarity for fulfilling notified by 2016. • Number of EOCs established and nature of systems established for operational clarity by 2018.
<p>4. Structural resilience of all commercial buildings (such as malls, cinema halls and other public places of mass gathering) is ensured.</p> <p>(4.1) All commercial buildings are identified and listed in a common central registry.</p> <p>(4.2) Appropriate structural safety related corrective measures are undertaken.</p>	<ul style="list-style-type: none"> • Number of commercial buildings identified and the type of structural safety measures undertaken by 2020. • Number and type of commercial buildings listed and nature of plans developed for corrective measures by 2017. • Number of commercial buildings having structural resilience and the nature of corrective measures undertaken for structural resilience by 2020.
<p>5. Annual plans and PIPs of all line departments and annual plans of local self government (LSG) institutions (PRIs and ULBs) account for current and emerging disaster risks from a comprehensive multi-hazard risk analysis point of view through participation of women, youth, adolescents, children, and men, particularly from the at-risk communities.</p>	<ul style="list-style-type: none"> • Percentage of line departments and LSG institutions having guidelines for undertaking comprehensive multi-hazard risk analysis by 2016. • Percentage of line departments and LSG institutions having guidelines for integrating risk analysis in their annual plans by 2016. • Nature of the guidelines for undertaking comprehensive multi-hazard risk analysis and integrating risk analysis in annual plans. • Percentage of line departments' and LSG institutions' annual plans and PIPs based on risk analyses and addressing differential risks from 2018-19 onwards.

Milestones	Indicators
<p>6. All the line departments mandated to provide basic services and critical infrastructure have operational Service Delivery / Infrastructure Continuity Plans –SDCP / ICP.</p>	<ul style="list-style-type: none"> • Percentage of line departments’ having SDCPs / ICPs and the nature of these SDCPs / ICPs (continuation of service delivery / critical infrastructure, type of back-up and stand-by arrangements made) developed from 2016-17 onwards.
<p>7. DDMA’s are notified and strengthened with resources, mandates and capacities for playing an integral role in disaster risk reduction decision making at the district level.</p>	<ul style="list-style-type: none"> • Percentage of DDMA’s notified and active by 2016-17. • Percentage of DDMA’s with quantum of resources allocated and nature of capacities strengthened by 2017-18. • Nature of role played by percentage of DDMA’s in disaster risk reduction decision making at the district level from 2017-18 onwards.
<p>8. An effective Early Warning System (EWS) is established, wherein all villages and cities in Bihar have systems for early warning information reception, dissemination and taking up immediate good enough pertinent action.</p>	<ul style="list-style-type: none"> • Nature of the Early Warning System (EWS) established in the state by 2018-19. • Percentage of villages and urban bodies connected with the EWS by 2018-19. • Percentage of PRIs’ and ULBs’ functionaries using the guidelines / protocols pertaining early warning information receipt and action from 2018-19 onwards.
<p>9. Communities understand and practice ‘do’s and don’ts’ during disaster situations as a result of a state-wide public awareness and education campaign launched at all levels.</p>	<ul style="list-style-type: none"> • Nature of the public-awareness and education campaign initiated in the state by 2016-17. • Percentage of rural and urban communities made aware on the ‘do’s and don’ts’ during disaster situations by 2018-19. • Percentage of rural and urban communities practice the ‘do’s and don’ts’ during disaster

Milestones	Indicators
	situations from 2019-20 onwards.
10. Corrective measures, including retrofitting, for ensuring structural resilience of all government offices and social infrastructure are completed.	<ul style="list-style-type: none"> Percentage of government offices and social infrastructure having structural resilience and the nature of corrective measures undertaken by 2025-26.
11. A system for Risk Informed Development Planning (RIDP-S) is adopted and operational in the state at all levels of planning.	<ul style="list-style-type: none"> Percentage of line departments' trained on using RIDP-S by 2021-22. Percentage of line departments' using RIDP-S and the purpose for which this RIDP-S is used by these line departments from 2022-23 onwards.
12. All PRIs and ULBs are adequately empowered through funds, functions and functionaries to ensure resilience.	<ul style="list-style-type: none"> Nature of amendments made to the PRI and ULB Acts of GoB by 2016-17. Percentage of PRIs & ULBs adequately trained on the legal amendments by 2019-20. Percentage of PRIs & ULBs having requisite funds and functionaries by 2021-22.
13. Communities in all villages and cities regularly monitor current and emerging disaster risks, including underlying risks, and assert for measures to be taken to address the same.	<ul style="list-style-type: none"> Percentage of village and urban communities trained on disaster and climate change induced risks' analysis, monitoring and management by 2021-22. Percentage of village and urban communities undertaking disaster and climate change induced risks' analysis, monitoring and management from 2022-23.
14. Platforms and mechanisms are institutionalized across Bihar for effective learning and sharing on DRR planning, implementing and drawing	<ul style="list-style-type: none"> Number and nature of platforms and mechanisms established for disaster risk reduction platforms along with the levels (state, district and block) by 2020-21. Nature of the mandates and operational foci

Milestones	Indicators
learning.	of these platforms and mechanisms.
<p>15. Policies and practices for livelihood related risk avoidance, transfer, sharing, and compensation are adopted by agriculture and small industry based livelihoods systems in Bihar.</p> <p>(15.1) Livelihood risk management policies adopted by GoB.</p> <p>(15.2) Diverse livelihood practitioners trained on the livelihood risk management policies and measures.</p> <p>(15.3) Trained livelihood practitioners practice the livelihood risk management policies and measures.</p>	<ul style="list-style-type: none"> • Number and nature of livelihood risk management related policies adopted by GoB by 2016-17. • Percentage of diverse livelihood practitioners trained on the various livelihood risk management related policies and measures by 2020-21. • Percentage of diverse livelihood practitioners trained on the various livelihood risk management related measures practicing the same by 2025-26.
<p>16. Rural and urban habitat planning processes like land zoning, town and city development planning take into account existing and emerging disaster risks.</p>	<ul style="list-style-type: none"> • Percentage of PRIs' and ULBs' land zoning, town and city development planning accounting for analyses of disaster and climate change induced existing and emerging risks from 2022-23 onwards.
<p>17. All existing and new public and private buildings in Bihar are structurally safe from a multi-hazard perspective.</p>	<ul style="list-style-type: none"> • Percentage of public and private buildings structural safe from multi-hazard point of view by 2027-28.

Presented below is a suggestive framework for indicating the institution, focus, means, levels, and frequency of monitoring, review and evaluation of this DRR Roadmap. It is expected that the RISU will synchronise this framework with the monitoring and evaluation framework once it is developed.

Institution	Focus and means of monitoring	Frequency
BSDMA (in annual meetings headed by Hon'ble CM)	<ul style="list-style-type: none"> Strategic Review (Presentation by DMD) 	Annual
CMG/SEC	<ul style="list-style-type: none"> Strategic Review (Line Departments' presentations) 	6 monthly
State Task Force, headed by Hon'ble Minister DMD	<ul style="list-style-type: none"> Strategic Review (Line Departments' presentations) Coordination between line departments and other agencies Support to line departments and agencies Stocktaking of implementation of Roadmap In depth review of specific tasks assigned to DMD (Presentations by the concerned) 	Quarterly
Line Departments, headed by respective PS'	<ul style="list-style-type: none"> Strategic planning for implementation Internal Review of the Status of the implementation of Specific tasks assigned to them 	Bi-monthly
Divisional Commissioners	<ul style="list-style-type: none"> Review of plans of departments for risk analysis, risk-informed actions and actions taken to perform the specific tasks at the district level (All DMs and divisional level heads of line departments to participate. Chairmen of District Boards and Mayors of ULBs shall be special invitees) 	Bi-Monthly in Group A and B districts, Quarterly in Group C districts
DDMA, headed by DMs	<ul style="list-style-type: none"> Review of district plans of departments for risk analysis, risk-informed actions and actions taken to perform the specific tasks at the district level Review of DDMP/VDMP Review of Resilient Village and City Programmes 	Monthly in Group A and B districts, Bi-monthly

	(All district level officials of line depts./Municipal commissioner and or Executive officers of municipal bodies, SDOs/BDOs/Cos/Pramukhs of Panchayat Samitis/ Ward Commissioners of ULBs and CSOs shall participate. Chairman of District Board and Mayor/Nagar Adhyaksh of ULB shall be special invitee)	in Group C districts
SDOs	Review of Resilient Village and City Programmes/DDMP/VDMP (All sub-divisional level officials of line depts., executive officers of municipal bodies, BDOs/COs and CSOs shall participate)	Monthly in Group A and B districts, Bi-monthly in Group C districts
BDC (Headed by Pramukh)	Review of Resilient Village and City Programmes/DDMP/VDMP (BDO/CO/ CSOs and all BDC members including Mukhiyas, executive officers of municipal bodies, block level officials of line depts. Including officer in-charge police station shall participate) Chairman 20 points programme will be special invitee	Monthly in Group A and B districts, Bi-monthly in Group C districts

The suggested actions here in this framework will be over and above the routine monitoring and evaluation done by the line departments.



Chapter 10
Budgetary Implications of the Roadmap

10. Budgetary implications of Roadmap

At this stage it would not be realistic to calculate budgetary implication of the Roadmap for 15 years. However, most of the expenditure shall be borne by the respective line departments and agencies for which they have to make provisions in their annual plans. So far as the expenditure on preparing Village Disaster Management Plans, District Disaster Management Plans, City Disaster Management Plans and capacity building is concerned, sufficient budgetary provisions have to be made in the annual budget of Disaster Management Department. Support to the DDMA's and expenditure on the establishment of Early Warning System and related capacity building activities shall be borne out of State Disaster Response Fund (SDRF).



Chapter 11
ANNEXURES

Resilient Bihar



Resilient Villages



Resilient Livelihoods



Resilient Basic Services



Resilient Critical Infrastructure



Resilient Cities

