



Government of Bihar
Disaster Management Department

The State Disaster Management Plan

Part One: DISASTER RISK MANAGEMENT

Section — I : **Perspective**

Section — II : **Disaster Prevention, Mitigation,
Preparedness & Capacity Building**

Part Two: DISASTER CRISIS MANAGEMENT

Section — III : **Disaster Response**

Section — IV : **"Build Back Better"**

Section — V : **The Roles & Responsibilities of &
Guidelines for Govt. Depts. &
Other Stakeholders**

Section — VI : **Pre-Requisites**

Section — VII : **Enclosures**

In Association with
The State Government Departments & Other Stakeholders

Prepared by



GPSCDMRD

Prof. G. P. Sinha Centre
for
Disaster Management & Rural Development

FOREWORD

After the paradigm shift from relief distribution to disaster management, the whole exercise of saving life and property and insulating developmental initiatives with disaster mitigation measures has become integrative and inclusive. It is not any more a state subject. It has now become an issue for all concerned.

Being the repository of all responsibilities concerning safety of life and property, it is a call for the State to share and prepare stakeholders to participate in the disaster management related exercise. They have to be provided space to have appropriate roles and responsibilities in minimizing loss of life and property due to disaster.

The Disaster Management Department on behalf of the State Executive Committee and the State Disaster Management Authority, after following due process, assigned the job of preparing the State Disaster Management Plan to Prof. G.P. Sinha Centre for Disaster Management & Rural Development. The Centre prepared the Plan as per NDMA Guidelines and in the process covered 18 of the 38 districts to interact with district administration, local bodies and communities.

Prof. G.P. Sinha Centre has prepared the State Disaster Management Plan in close association with the Disaster Management Department and has made a commendable attempt to include some innovative inputs within the framework given in the NDMA Guidelines.

The Plan is horizontally community centred and vertically local body based. And, since, multi-lateral Agencies, International NGOs, Business Associations, Corporate Houses and Trade Associations play major role in disaster response, an attempt has been made to provide them space to partner in disaster management from the disaster risk-management stage itself.

It is hoped that with the implementation of the Plan, the system will help in making disaster management a well orchestrated exercise reducing loss of life and property to the minimum and enhancing gain from prevention, mitigation and preparedness to the maximum.

I congratulate the Disaster Management Department, Prof. G.P. Sinha Centre and its team of experts and professionals involved in the preparation of the Plan for a commendable job done.

Chief Secretary
Govt. of Bihar

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P R E F A C E

It has been a privilege for Prof. G. P. Sinha Centre for Disaster Management and Rural Development to work on the State Disaster Management Plan, Bihar. It has given the Centre an opportunity to have, on the one hand, a look at the whole gamut of things in the State from the disaster point of view and, on the other, to view them as a whole from the State point of view.

The project provided Prof. G. P. Sinha Centre a platform and a perspective to interact with government functionaries at the State, district & block level and to learn from the functionaries of local bodies and other stakeholders at the state, district and community level, about the disasters suffered and management efforts made in the past.

The task gave us a reason to know the ground-level realities, to learn from the disasters suffered by the communities and to realize that the key to disaster response lied in mitigation and preparedness measures.

Putting all these together, the edifice of the State Disaster Management Plan has been made and placed on four pillars : the Disaster Management Act, 2005 & NDMA Guidelines, the State & Govt. Departments and other Stakeholders, Disaster Management related Specialized Institutions & other Organizations, and local bodies like Municipal Corporation, Nagar Panchayat, Panchayati Raj & the communities.

The point of view taken to build the edifice of the Plan may be stated as :

Life is endurance. Endurance lies in patience and perseverance which, in turn, requires trust and confidence. Disaster Management too needs trust and confidence to be operational to reduce risk and save life. Disaster Management, in a way, is endurance management.

Life needs a form to express itself. A form is a specific structure which, in turn, conditions the expression of life. For example, life in the form of a bird would fly; in the form of a lion, would prey; in the form of a goat, would get preyed and in the form of a human being, would be the 'paragon of all animals'. Disaster management, too, needs a form, a structure to act and its action is conditioned by the structure it is being given to operate through.

This Disaster Management Plan may create an impression as if disaster management was all that mattered. It is really so. Because the whole cosmos is dissolution centric. Life is death centric. The very existence derives its meaning from its termination. So does development. Its sustainability derives its extent from disaster management which is, to resist hazards inspite of all inevitability and to manage ecology and environment to keep life worth living. Here, resilience is all.

Initially the preparation of the State Disaster Management Plan seemed so complicated and complex. But the help and support, guidance and suggestions from well-wishing

functionaries, professionals and experts enabled us to complete the task with confidence and satisfaction. We owe a lot to them and would love to acknowledge that with gratitude. At the outset, we thank Principal Secretary, Disaster Management Department, Govt. of Bihar, Sri Vyasji, IAS for providing a platform to interact with experts from Delhi as well as Inter Agency Group of national level NGOs and fine tune the methodology for working out the Plan and for extending required support in getting various details from different sources. Our thanks to Sri Sunil Kumar, Special Secretary, DMD who, as Head of the Monitoring Committee, gave valuable suggestions about human resource development and support in getting statistical details from districts.

The valuable guidance and suggestions about the structure of the Plan and how it had to be made implementable provided by Sri Anil Sinha, Hon'ble Vice-Chairman, BSDMA, need special mention. His presence during 4-day interaction meet with functionaries of different govt. departments helped us in drawing the line on which the Plan had to be worked out. Apart from these, making himself available to help and guide and ensuring our participation in interactive meets organized by BSDMA proved a boon for us in structuring the Plan.

In preparing the Plan, the team members consisting of Dr.(Prof.) T. Prasad, Ex. Principal, NIT, Patna, Capt. (Ex.) S.S.Singh, Water Resource and River Basin Expert, Col. R. K. Sinha, Well versed in Disaster Response, Dr.(Col.) A.K.Singh (Retd.), Health & Trauma Expert, Dr. R. P. Sinha, Agriculture Expert, Mr. Sanjay Kumar and Mr. Rabindra Kumar, Remote Sensing and GIS mapping specialists, Mr. Sanjeev Kumar, Agriculture & Rural livelihood expert, Dr. K.P. Singh (Retd.), Bihar College of Engg. Structural Engineer. Shri. Sudhakar Jha, Media & IEC expert, helped in preparing write-up and inputs for the Plan.

The fact and figure rich contributions of the team members covering each one's area of specialization were jelled together in the shape of a plan integrated with disaster management oriented system engineering by the Team Leader, Ashok Kumar Sinha, the Founder Executive Director of the Institute of Entrepreneurship Development, Bihar and Ex. Managing Director of the Bihar Industrial and Technical Consultancy Organization (BITCO). He was ably helped by Sri Sudhakar Jha, Formerly Senior Correspondent, and Times of India in coordinating with team members, on the one hand and govt. departments, on the other.

In the process of drafting the Plan the inputs and suggestions provided by Sri Jyoti Kumar Sinha, IPS (Retd), Hon'ble Member, NDMA, Sri Amit Jha, IAS, Jt. Secy. NDMA, Delhi, Prof. Santosh Kumar, faculty, NIDM; Sri Krishna Vats, UNDP, Prof. S. K. Singh, Director, CIRDAP, Bangladesh; Mr. S. S. Guleria, Commandant NDRF, Bihar; Sri Banku Bihari Sarkar, UNICEF, Patna, Sri L.B.Roy, Faculty, Civil Engineering, NIT, Patna; Prof, Rasbihari Prasad Singh, Faculty of Geography, P.U., Mr. Sanjay Srivastava, IFS, GTZ- Delhi, Mr. Gautam Chatterjee, General Manager, Times of India, Patna, Sri Vikrant, Coordinator, Sphere India; Sri R. N. Pandey, Ex-Director-in-Chief, Health Services, Bihar, Prof. N. K. Chaudhary, Faculty, Economics Department, Patna

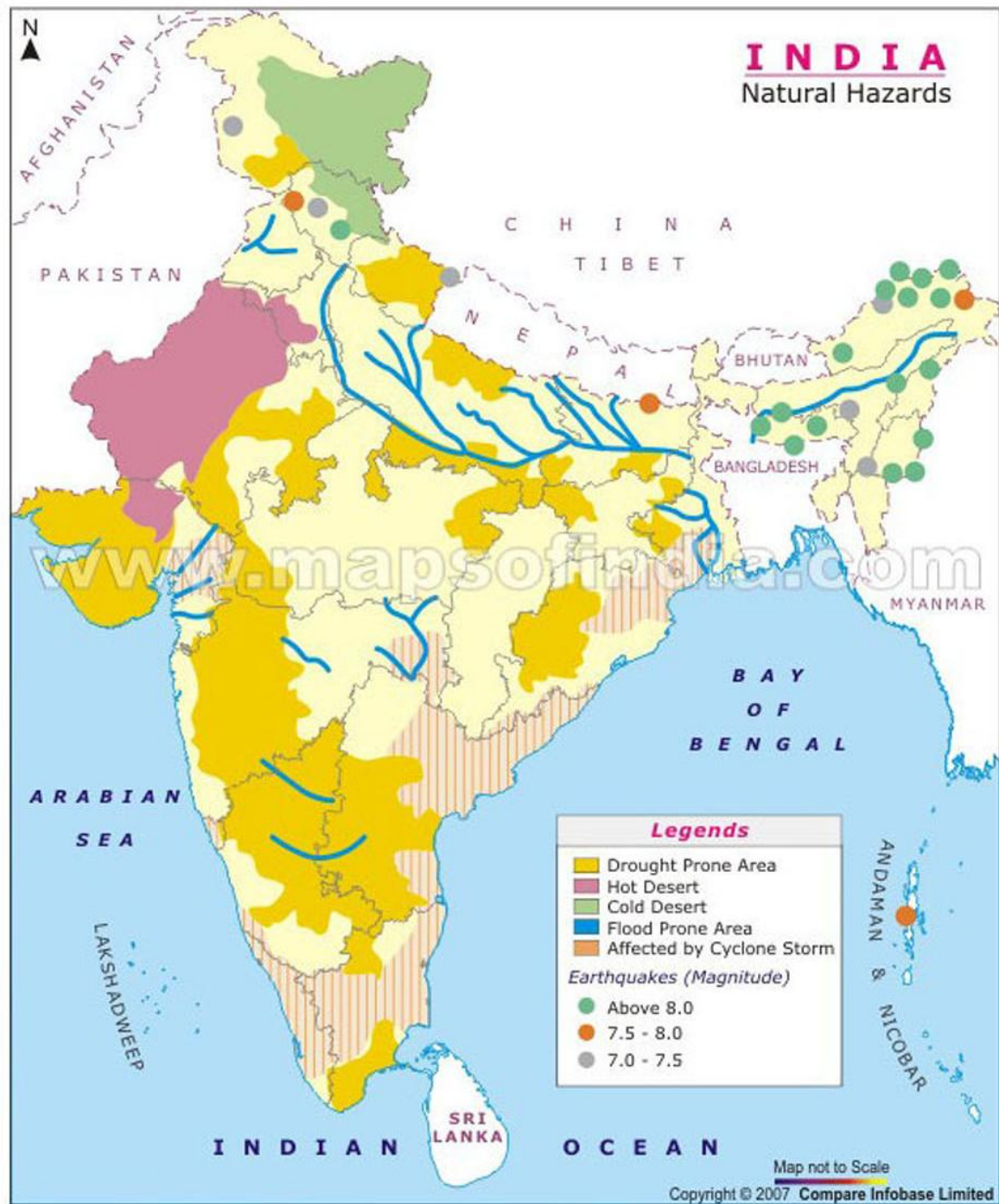
University and others require special mention. They helped us in making the whole Plan compact and workable. We also thank ITC Management, Munger for organizing the visit of the team members to the factory and for the brief given on the functioning of security system in the plant.

The district level interactions at the Headquarter level with functionaries of government departments led by respective DM and ADMs and at the Panchayat level with PRI representatives, local NGOs, elders of the communities and government functionaries like BDOs & COs in the districts of Gaya, Jehanabad, Saran, Ara, Muzaffarpur, Sitamarhi, Darbhanga, Madhubani, Saharsa, Madhepura, Purnia, Katihar, Bhagalpur, Banka, Munger & Jamui helped us in making the plan participatory & people centred and in creating space for stakeholders other than the government to play their roles. We thank all of the functionaries and participants for sharing their experience and making valuable suggestions.

Prof. (Dr.) S.M. Raza
Former Vice-Chancellor (VKSU)
& Chairman
Prof. G.P.Sinha Centre...,
Patna

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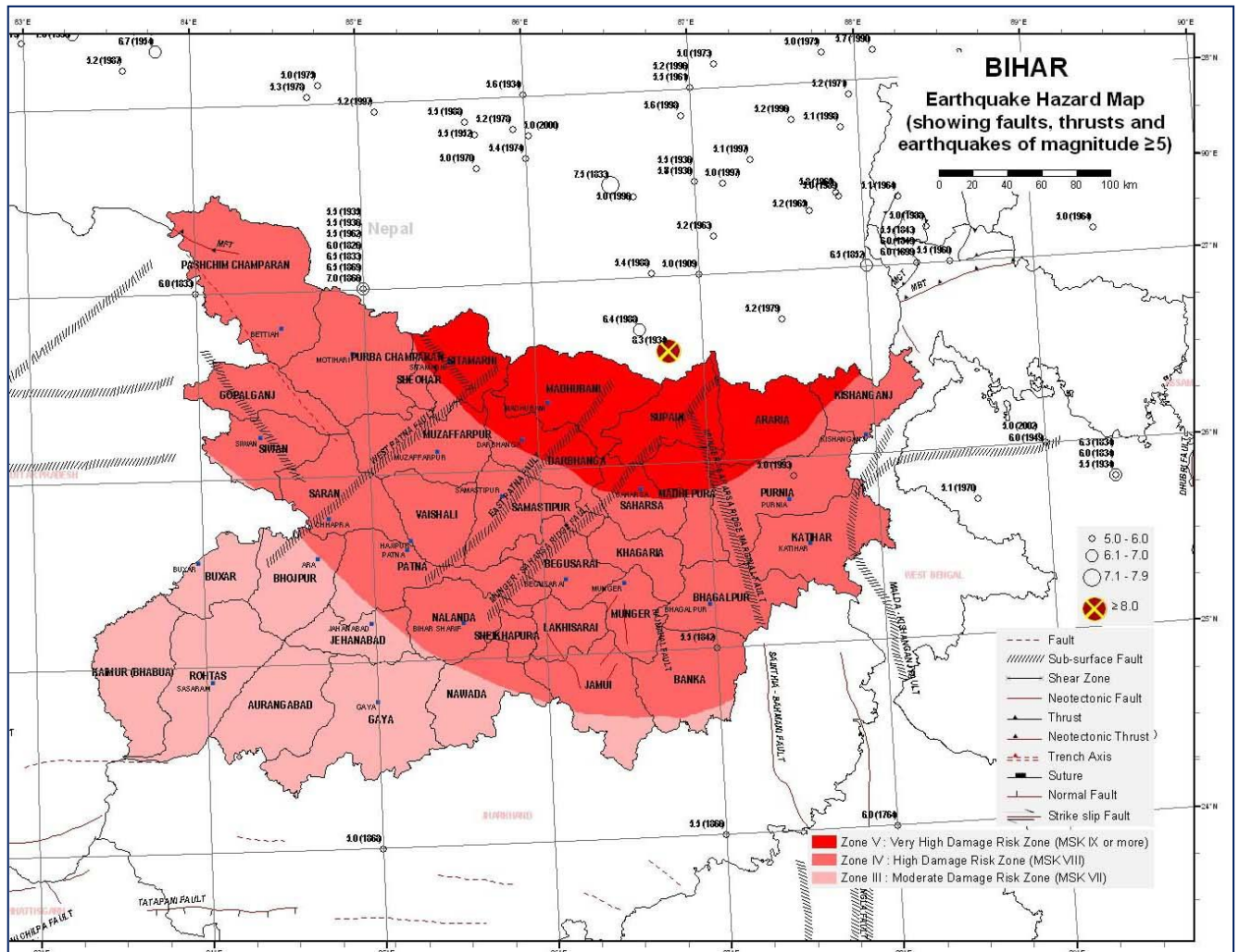
Map: 1- Natural Hazards prone areas in the country



(Source: Vulnerability Atlas of India)

EQ Zone V- 10.9%	Wind Velocity m/s 55 & 50 - 5%	Flood Prone Area in % - 7.9%
IV- 17.3%	47- 40.2%	
III- 30.4%	44&39- 48%	
II- 41.4%	33- 6.7%	

**Map: 2- Natural Hazard Prone areas in Bihar
Earthquake Prone Areas**



Source: Vulnerability Atlas of India

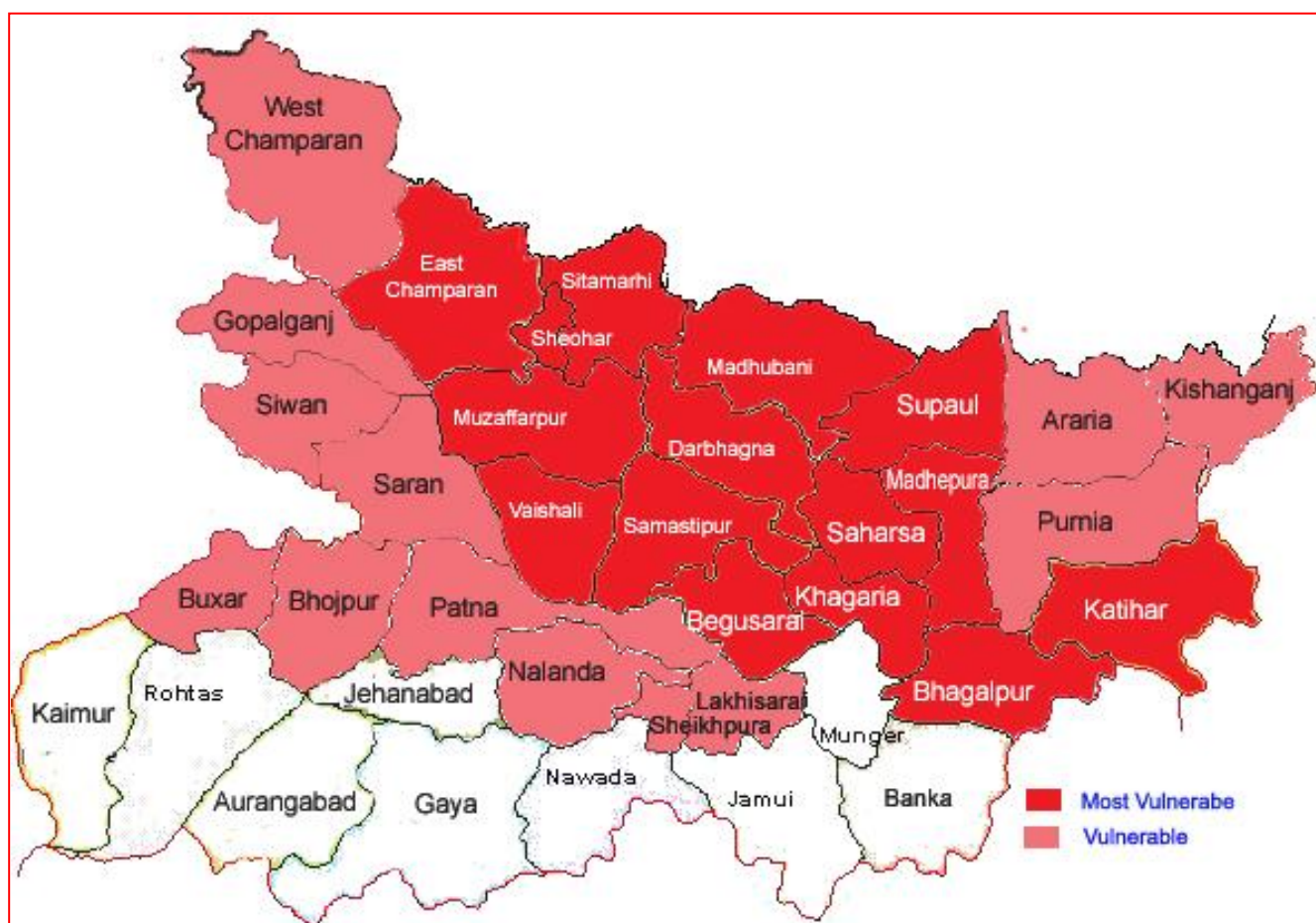
1. Earthquake

Total 15.2% area of Bihar Covered in Zone V

Total 63.7% area of Bihar Covered in Zone IV

Total 21.1% area of Bihar Covered in Zone III

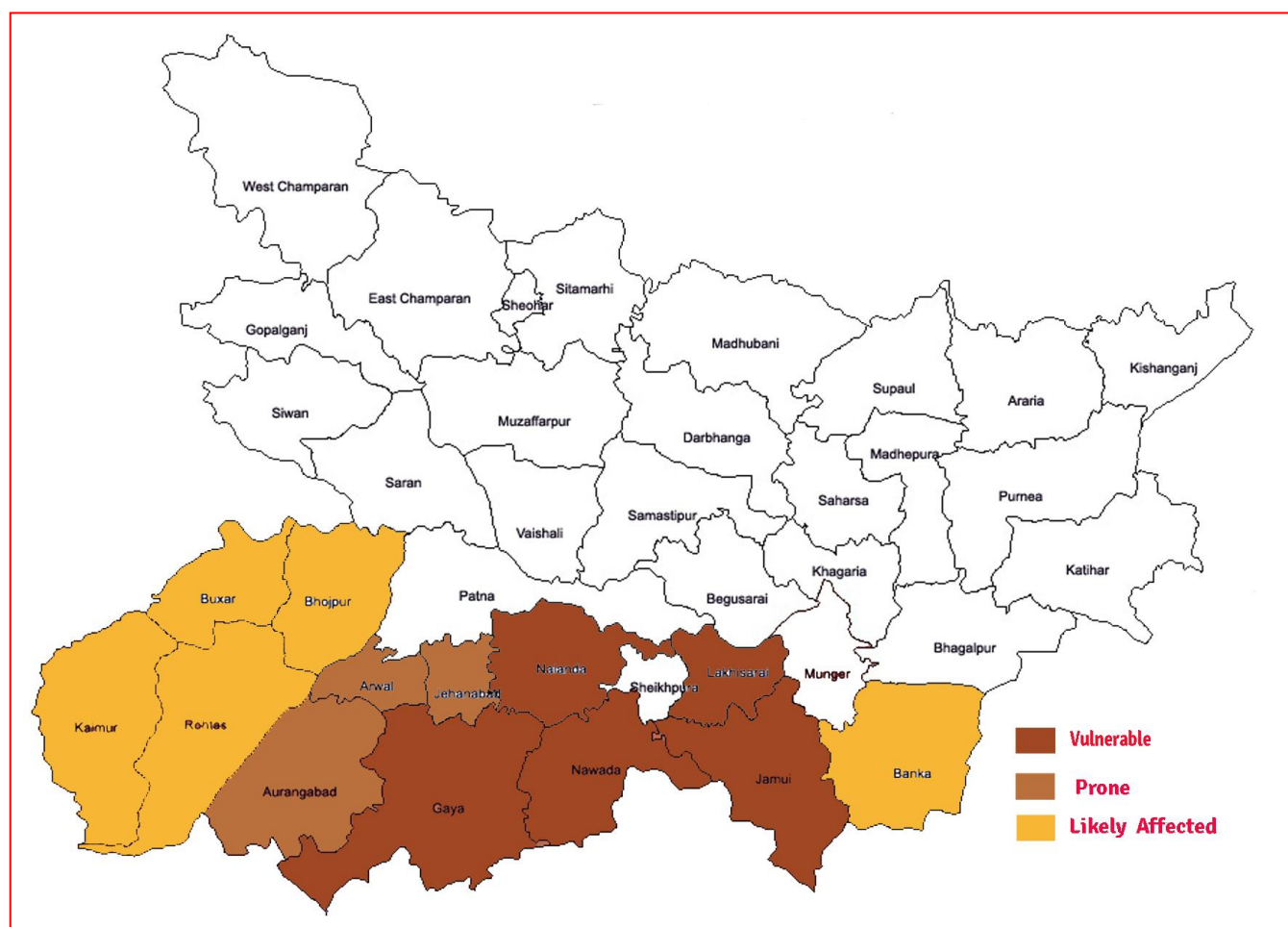
Map: 3-Flood Prone Areas



Source: Developed on Inputs from DMD, GoB

2. Flood—	Most Vulnerable	:	East Champaran, Sheohar, Sitamarhi, Katihar, Madhubani, Vaishali, Muzaffarpur, Darbhanga, Samastipur, Madhepra, Supaul, Saharsa, Khagaria, Begusarai, Bhagalpur.
	Vulnerable	:	West Champaran, Gopalganj, Siwan, Saran, Buxar, Bhojpur, Patna, Nalanda, Lakhisarai, Sheikhpura, Purnia, Araria, Kishanganj

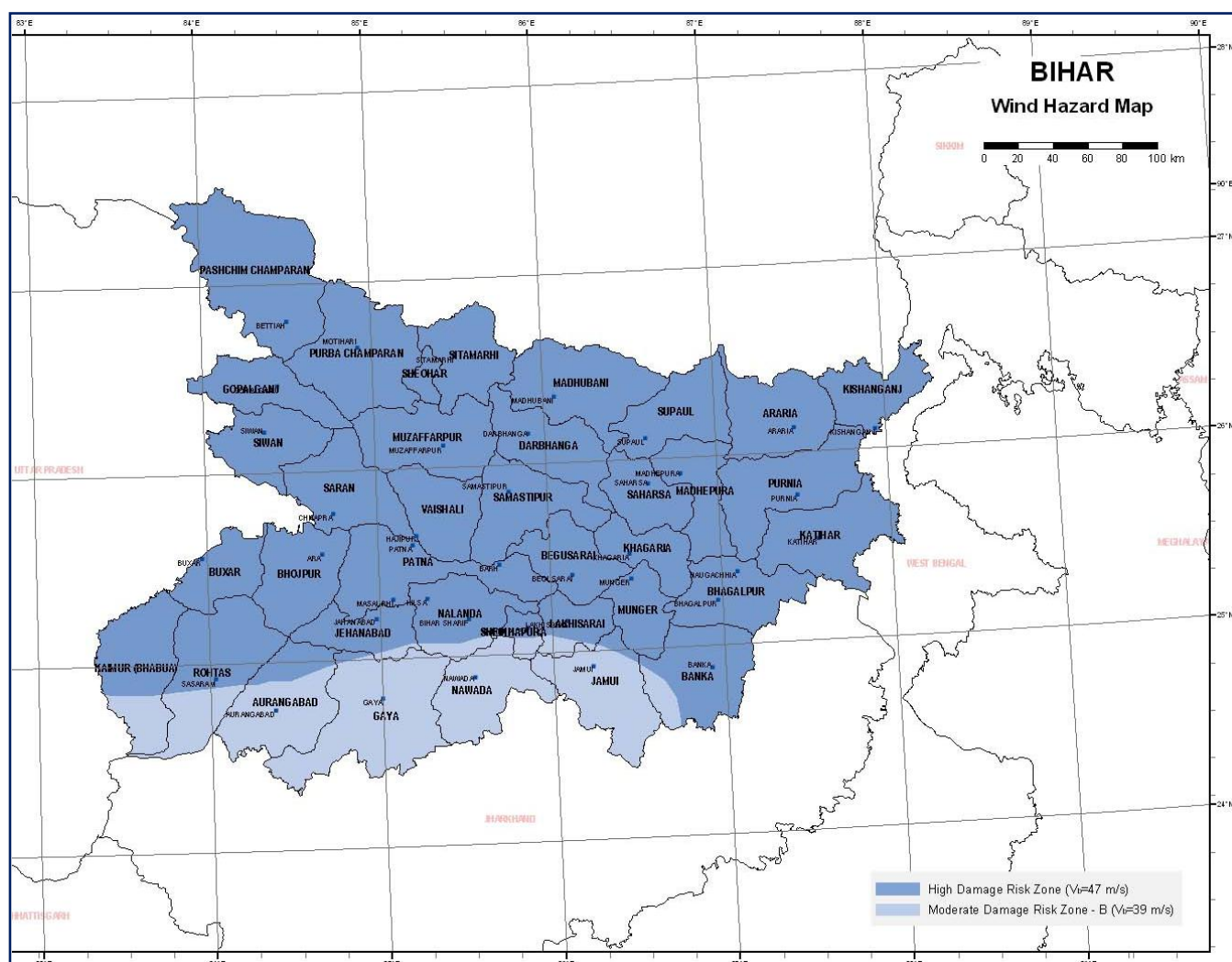
Map: 4- Drought Prone Areas



Source: Developed on Inputs from DMD, GoB

3. Drought — Vulnerable District	:	Gaya, Nawada Jamui, Nalanda, Lakhisarai
Prone District	:	Jahanabad, Arwal, Aurangabad
Likely District	:	Kaimur, Bhojpur, Buxar, Rohtas, Banka

Map: 5-High Speed Wind/Gale /Hail Storm Prone Areas



Source: Vulnerability Atlas of India

- 4. High Speed Wind /Gale /Hail Storm**
- Around 86% of area of Bihar prone to cyclone of 47 m/s intensity
 - Around 14% of area of Bihar prone to Cyclone of lesser intensity

The State at a Glance

Map: 6 –District Map of Bihar



1. **Location** : 24°—20°—10" to 27°—31'—15" north latitude
: 82° —19'—50" to 88°—17'—40" east longitude
2. **Height** : 173 feet above Sea level (52.73 meter)
3. **Total Area** : 94,163.00 Sq.kms
Rural (97.97%) : 92,251.49 Sq.kms
Urban (02.03%) : 01,911.51 Sq.kms
 - Area Under cultivation : 56,05,798 (ha)
 - Barren Land : 05,03,381 (ha)
 - Forest Land : 06,47,300 (ha)
 - Area under Non-Agri Use : 13.95,340 (ha)
 - Flood Prone Area : 68,80,000 (ha)
 - Water Logged area : 9,41,630 (ha)
4. **Population** : Persons : 10,38,04,637
(2011 Census) : Female : 4,96,19,290
Male : 5,41,85,347
 - 0-6yrs. Age Children : 1,85,82,229
Girls : 89,66,949
Boys : 96,15,280
 - Decadal Population growth (2001-2011) : Absolute : 2,08,06,126
Percentage : 25.07
 - Density : 1,102

• Sex Ratio	:	916/1000
• Literacy	Total	: 63.82%
	Female	: 53.33%
	Male	: 73.39
5. Administrative Setup		
• Division	:	9
• District	:	38
• Sub-Division	:	101
• C.D. Block	:	534
• Police District	:	40
• Police Station	:	853
• Urban Clusters	:	14
• Statutory Town	:	139
• Non-Statutory	:	60
• Revenue Village	:	44874
• Average Population of a district	:	27,31,701
6. Local Bodies	:	* Nagar Nigam – 10
		* Nagar Parishad – 42
		* Nagar Panchayat – 87
		* Gram Panchayat- 8471
7. Annual Rainfall (Normal)	:	1120 mm/ann
8. Natural Resources	:	Fertile land
	:	Water resource – surface & ground
	:	Limestone
	:	Silica Sand
9. Livestock	:	Cows, Buffalo, Goat, Poultry, Pigs, Sheep.) (3,13,67,900)
10. Fisheries	:	Fresh water product 2.58 lakh tonnes.
11. Annual Growth Rate (2004-05 to 2010-11)	:	11.36%
12. Total GSDP (at 2004-05 prices)	:	Rs. 1,44,472.0 Crore
13. Per Capita Income	:	Rs. 14,865.0
14. Total GSDP (at current prices)	:	Rs. 2,17,814.0 Crore
15. Per Capita Income	:	Rs. 22,411.0
* 16. Agriculture & Horticulture	:	Foodgrain – 144.10 lack tonnes
		Cereals – 96.86 lack tonnes
		Pulses – 47.24 lack tonnes
		Vegetables – 173.14 lack tonnes
		Fruits – 131.96 lack tonnes
		Flowers – 00.60 lack tonnes

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1. High Powered Committee Report on Disaster Management
2. National Disaster Response Plan
3. National Disaster Management Guidelines by *NDMA, Delhi on-Flood, Drought, Earthquake & Role of NGOs*
4. Census of India, 2001 & 2011
5. Disaster Management Act, 2005
6. Bihar Panchayati Raj Act, 2006
7. Economic Survey, Bihar 2010-11
8. Planning Atlas , Bihar 2010
9. State of Health in Bihar by Population Foundation of India
10. Second Irrigation Commission Report, 1994
11. Vulnerability Atlas of India, BMPTC, Govt. of India
12. GIS, a Decision Tool for Forestry
13. South Asia Disaster Report, 2007 (SAARC Centre for DM)
14. Manual for Drought Management, Deptt. of Agriculture , Govt. of India 2007
15. Disaster Management in India (India Red Cross Society)
16. Journal of South Asia Disaster Studies
17. Management of Rural Health Care, NIRD, Hyderabad
18. Disaster – Lesson Drawn & Future Strategies, IIPA, Delhi
19. Accountability Overdue, Praxis
20. GIS, A Decision Tool for Forestry
21. Gender Factor in Disaster Management, Sri Lanka
22. Stories of Kosi Rivers, *Mr. Dinesh Kr. Mishra*
23. The Kutch Earthquake, Recollections & Lessons
24. Drought -2002 : A Report, Deptt. of Agriculture , Govt. of India
25. Sustainable Rural Development for Disaster Management,
Dr. Satendra, IFS & Prof. V. K. Sharma
26. Bihar Ka Adhunik Bhoogal, *Bihar Hindi Granth Academy*

27. Bihar Ki Nadiyan by *Hawaladar Tripathi, Bihar Hindi Granth Academy*
28. Bihar GIS by *Manushi Lahiri*
29. 2nd Asian Ministerial Conference on DRR, 2007, Ministry of Home Affairs
30. Incident Command System
31. Guidelines for Earthquake Resistant, Non-Engineered Constructions, 2003 & 2004 by National Information Centre of Earthquake Engineering
32. All you wanted to Know About Disasters by Birg (Dr.) B.K. Khanna
33. Panchayati Raj Vyavastha by *Tej Narain Singh*
34. Bihar Municipal Act, 2005 With Building bye- laws
35. The Civil Defence Act, 1968
36. The Motor Vehicles Act, 1988
37. Encyclopedia of Disaster Management (Vol- I to III) by *S.L. Goel*
38. Fundamentals of Seismic Protection for Bridges by *Mark Yashinsky & M.J. Karshens*
39. Incident Command System, Lal Bahadur Shastri Academy
40. Disaster Management in India- A States Report, Ministry of Home Affairs, GOI
41. Trainer's Guide for Training in Hazard Resistant Construction , UNDP
42. CBSE Text Book on Disaster Management
43. SOP for Flood Disaster Management , DMD, Govt. of Bihar
44. District Gazetteer Munger by L.S.S.O' Malley
45. Centre for Monitoring Indian Economy (CMIE), Agricultural & National Income, 2010
46. History of Kosi Project (Vol- I & II) WRD, Govt. of Bihar
47. Disaster Management Innovative Response to Governance by *Mohit Bhattacharya*
48. Bharat Ka Prakritik Bhoo-Vigyan by *Shankar Mohan Mathur*
49. Hamara Paryavaran, NBT, Delhi
50. Manual on Basics of Ductile Detailing, BMPTC
51. Atlas- India & the world, *Dr. Anshu, Prem Singh Meena, Ajit Kumar*
52. Community Emergency Response Team (Handbook)
53. IGNOU course on Disaster Management
54. National Wetland Atlas , Bihar
55. Guidelines for Provincial DM Plan (2006) Afghanistan

56. Good Practices in Community Based Disaster Risk Management, UNDP
57. Compendium of Orders, Circulars etc, Deptt. of Relief & Rehabilitation (2002)
58. Compendium on Disaster Risk Management (2002-2007), UNDP
59. Training on Flood Risk Mitigation & Management ,2007 NIDM & Nepal
60. 15th Report of 2nd Admn. Reforms Commission, 2009
61. Drafts of State Disaster Management Plan of :
 - a. State of Karnataka
 - b. State of Andhra Pradesh
 - c. State of Tamil Nadu
 - d. State of West Bengal

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Abbreviations

BESC	Block Emergency Support Centre
BSIDM	Bihar State Institute Disaster Management
CBOs	Community Based Organisations
CD	Civil Defence
CEZ	Chief Engineer Zones
CVC Room	Command & Video Conferencing Room
DDMA	District Disaster Management Authority
DEOC	District Emergency Operation Centre
DMD	Disaster Management Department
ESF	Emergency Support Functions
FMIS	Flood Management Information System
GIS	Geographical Information System
GWh	Gigawatt hours
HDI	Human Development Index
IC	Information Collection
IMR	Infant Mortality Rate
IMT	Incident Management Team
MNREGA	Mahatma Gandhi National Rural Employment Guarantee Scheme
NDMA	National Disaster Management Authority
NGOs	Non-Government Organizations
NIDM	National Institute of Disaster Management
PCDE	Per-Capita Development Expenditure
PAPK	Panchayat Apada Prabandhan Kendra
SDMA	State Disaster Management Authority
SDMS	State Disaster Management System
SDRF	State Disaster Response Force
SEC	State Executive Committee
SEOC	State Emergency Operation Centre
SGSY	Swarnajayanti Grameen Swarozgar Yojana
SOP	Standard Operating Procedure
SPA	Special Purpose Area

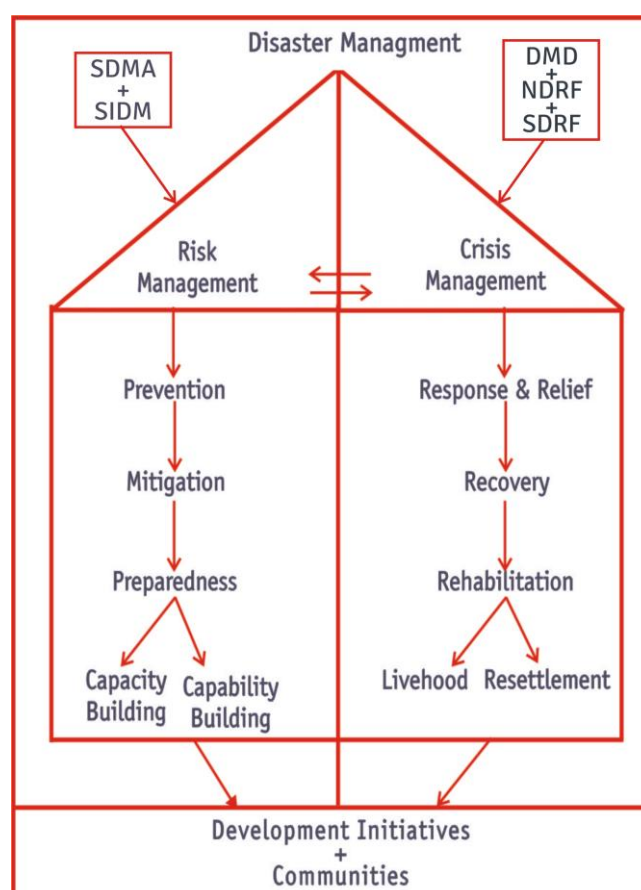
Structure of the State Disaster Management Plan

"To plan is to produce a scheme for future action, about specified results, at specified cost in a specified period of time. It is a deliberate attempt to influence, exploit, bring about and control the nature, direction, extent, speed and effects of change. It may even attempt deliberately to create change. It is a carefully, controlled and coordinated activity."

— Cyril L. Hudson

The State Disaster Management Plan is in two parts: *Disaster Risk Management & Disaster Crisis Management*. **Disaster Risk Management** part consists of sections on the Perspective and on Prevention, Mitigation and Preparedness. The **Disaster Crisis Management** part consists of sections on Response & Relief, 'Built Back Better' dealing with reconstruction and resettlement, Roles and Responsibilities of Govt. Depts. and other stakeholders and Pre-Requisites for the implementation of the Plan.

The Risk Management and Crisis Management parts have been wedded through Institutional Mechanism and made community and development centric



Note: Organisational role wise SDMA & SIDM shall be in lead in the Risk Management areas and DMD, NDRF & SDRF in crisis management area.

Executive Summary

- i. The point of view on which the State Disaster Management Plan has been based is :

Disasters are inevitable. Life is endurance. Disaster Management, in a way, is endurance management.

- ii. The edifice of the Plan has been placed on four pillars:
 - The Disaster Management Act, 2005 and NDMA Guidelines.
 - The State and Government Departments & other Stakeholders.
 - Disaster Management related specialized institutions & other organisations and
 - Local bodies like Panchayati Raj, Institutions & the communities.
- iii. The edifice of the plan has been structured in two parts : Disaster Risk Management and Disaster Crisis Management, both converging as being community and development centric.
- iv. The Disaster Risk Management part consists of
 - The perspective containing the State, Hazard and Vulnerability profiles,
 - Hazard wise prevention, mitigation and preparedness measures,
 - Setting up a two way early warning system so that information about localized disaster like fire, major road and boat accidents, industrial disaster, on the one hand, may reach the state authorities and about impending disaster like flood, earthquake , High Speed Wind and Drought may reach the communities, on the other.
 - The Sankalp Kendra a concept in community based disaster management where community and development support and sustain each other to the extent possible, against all odds.
 - The shadow state level emergency operation centre at Gaya to function in the SEOC at Patna becomes dysfunctional
- v. The State Profile has been drawn from geography, history, people, resources and environment points of view:

- from Geography point of the state has been seen as divided in seven river zones:
 - Ghaghara – Gandak Zone
 - Gandak – Bagmati Zone
 - Bagmati – Kosi Zone
 - Kosi – Mahananda Zone
 - Karmnasa – Sone Zone
 - Sone – Punpun Zone, and
 - Punpun – Sakri Zone
- These broadly divided river zones also roughly correspond to specific cultural zones such as – Bhojpur, Tirhut, Mithila, Magadh, Anga etc.
- These areas, also known for water harvesting method of their own, suffer from water syndrome: four of them on the northern side of the Ganges suffer from flood and three on the southern side, from drought.
- from History point of view the state has been a seat of political and religious innovations – from the first Republic to Buddhism, Jainism and Sikhism— took birth here and flourished all over the world.

Shershah Suri of the state gave three vital systems on which the edifice of modern governance rests – revenue based administrative system, infrastructure as the bed-rock of development and annual budget as the basis for taxation.

- From the People point of view, right from the battle of Buxar in 1764 till the year when Lord Cornwallis proclaimed the permanent settlement, from 1850 to 1947 and beyond, the people have seen and suffered more dissensions, exploitations and narrowing of boundaries than the people of any other state.

As a result, people of the state have become excessively dependent on the system, have developed double faced personality – one native and the other migrant. Problems of life and living get multiplied by the density of population, excessive dependence on disaster prone agriculture leading to poverty, malnutrition and sickness.

- From Natural Resources point of view the State is blessed with highly fertile land, abundant water resources, silica sand and livestock.

Apart from agriculture and horticulture, the state is blessed with sericulture, jute and other aqua-products.

Being rich in natural resources, the state also suffers owing to the excess of it. Being excessively dependent on rain, the state suffers due to paucity of water, as well.

- vi. The hazard profile of the state makes it literally the House of Hazards – the whole of state is earthquake prone, over 70% of the area flood prone, over 30% of the area drought prone and again the whole of state cyclonic storm prone and fire prone.
- vii. The vulnerability profile of the state is highly disarming. A population of 1,57,78,305; kachacha house 7,65,591; brick walled house 13,95,927; house of other materials 11,18,464 and 43,67,012 livestock are liable to be destroyed by earthquake in Zone-V; a population of 6,60,99,997; 30,10,383 kutchha house, 54,88,923 brick walled houses and 43,97,911 house of other materialious and 1,71,71,525 livestock in Zone-IV and a population 2,18,94,969 living in 9,97,159 kutchha house, 18,98,151 brick walled houses and 14,56,765 of other materials and 56,87,899 livestock in Zone-III are liable to be destroyed by earthquake.
- viii. In 28 flood affected districts (15 districts most vulnerable & 13 vulnerable), around 7,99,82,950 persons out of which 3,97,23,905 women, 1,50,14,935 children of 0–6 yrs., 93,75,555 BPL families, 1,26,32,914 dwellings of all sorts, 31,467 thousand livestock and 27,974.47 hectre of irrigated area are liable to be affected and more than half of the net sown area liable to be fully or partially destroyed by flood.
- ix. Of the thirteen districts in the Southern Bihar , 5 are highly vulnerable, 3 prone and 5 likely to be affected by drought. In all a population of 2,76,60,966 out of which 1,32,18,343 are women, 47,60,427 children of 0-6yrs. age group, BPL families 26,36,018 and livestock totaling 12,224 thousand remain vulnerable to drought. Around 11,720.14 hectre of irrigated areas remain liable of suffer due to paucity of water.
- x. Since the High Speed wind sweeps, more or less the whole of the state causing death, destruction and devastations, the vulnerability is total but highly vulnerable are the districts nearer to the Bay of Bengal &

Bangladesh like Kishanganj, Katihar, Purnia and other districts in the Kosi-Mahananda region. The total population affected is 2,42,36,957 out of which 1,15,90,935 are women, 46,13,392 children of 0-6yrs., 27,79,812 BPL families and 15473 thousand live stock. In the whole of state out of a total of 1,36,16,527 building, 63,76,428 building having light-weight sloping roof are highly vulnerable to High Speed Winds.

- xi. All the 38 districts of the state are fire hazard prone; specifically 1,13,40,990 BPL families living in 37,58,206 houses of mud and unburnt bricks and having straw thatched, lightweight sloping roofs.
- xii. The prevention, mitigation and preparedness measures have been planned hazard-wise and zone- wise. For Earthquake it is primarily construction centric and awareness and preparedness of the people, based.
- xiii. Retrofitting in old buildings, earthquake resistant construction of the new-ones, formulation of building codes and training of architects, engineers and mason to implement that and introduction of construction certification measures in order to ascertain that the prescribed rules and regulations have been observed.
- xiv. Out of 38,28 districts are vulnerable to flood 15 of which highly vulnerable and 13 partially affected. In percentage terms around 74% of the geographical area of North Bihar get affected by inundating rivers & 36% of the total area of South Bihar gets affected by inundating tals. Thus, 56% of the total geographical area of Bihar get affected by inundating rives and tals.
- xv. The causes of flood in North Bihar Consist of three factors: first the rivers have a large catchment area having higher precipitation, second, the rivers have steeper gradients adding velocity to the flow of water and third, the meandering nature of rivers through the soft soil of the plains.
- xvi. The flooding in South Bihar caused by inundating tals has also three causes: first, height of the southern embankment of the Ganges; second, slope of the surface from South to North and third, accumulation of rain water.
- xvii. The end- results of the three factors are also three: inundation, erosion, and siltation. Basically all our flood mitigation and preparedness measures have been inundation and erosion centric. There has hardly been any measures taken to deal with siltation, which, in so many ways, is one of the key factors causing inundation as well as erosion.

- xviii. Flood mitigation and preparedness measures have been treated in view of drought conditions in the South Bihar. The revival of ponds and reservoirs in the North Bihar and Ahur and Pynes in the South supplement as water conservation measures and provide a perfect foil to the flood in the North and drought in South Bihar if strategically supported by interlinking of rivers for the smooth flow of flood water on the one hand and holding of water in the tributaries on the other.
- xix. Apart from these, rain water harvesting by the people in the South Bihar and creation of small hydroelectricity generating facilities shall be of great help in water preservation in the North Bihar. Providing boats at Gram Panchayat level, training locals in search and rescue, evacuation and settlements, relief distribution etc add on to the risk mitigation measures.
- xx. The roles of the government departments, specialized institutions, multilateral organisations, international NGOs, district administration and local bodies assume special significance for, be it the pre-disaster phase or during or post disaster phase the orchestration of the roles of these stakeholders becomes essential for effective disaster management.
- xxi. The role of the state government is partly that of a doer, partly that of a provider and partly that of a facilitator and partly that of a monitor. The Government Department through its Disaster Management Cell shall through specialized institutions like NDMA, NIDM, NDRF, SDMA, SDRF and SIDM, DDMA prepare finalize and implement disaster prevention mitigation and preparedness as well as response measures.
- xxii. The measures shall be implemented, monitored and evaluated through the Emergency Operation Centre at the State, District and Gram Panchayat level. The EOC shall also process data, disseminate information and provide early warning of impending disaster. During the disaster period the EOCs get converted into Command Centres for the incident commander to operate with the help of Incident Management Team.
- xxiii. The Early Warning System has been designed to have two-way communication system upto Panchayat Apada Prabandhan Kendra (PAPK) and PAPK connected with communities with Public Address System. The system is so telescopic that if so desired, Hon'ble chief Minister may address the people of the whole State from SEOC.
- xxiv. For community based disaster management system, a new concept in the name of "Sankalp Kendra " has been evolved. The Kendra Shall be

activity centre during Pre-disaster period and a well equipped shelter for people during disaster days.

- xxv. The State Emergency Operation Centre has been named as “The Glass House” denoting transparency and eye to eye contact between the people and the system. The SEOC shall also house Disaster Management Department (DM) during Pre as well as During and Post Disaster periods. DMD itself shall have to restructure organizationally to perform its designated roles. For, at present it is structured to draw not to disburse disaster management inputs among the stakeholders.
- xxvi. The Response mechanism has been based on worst case scenario and orchestrated hazard wise lead or support roles of the government department with DMD's presence in all the cases. The Response has been coupled with the Relief distribution and 14 support services to be rendered through NDRF, SDRF, and other stakeholders and local bodies
- xxvii. Rehabilitation, with a view to Build Back Better, has been presented in the form of a policy framework to be followed on case to case basis. The policy framework includes the hazards vulnerability of the area and locally available resource / market based livelihood promotional activities as well.
- xxviii. The implementation of the plan requires some pre-requisites-such as framing and implementation of policies and rules, creation of new organizational setups, restructuring of some existing ones and strategizing monitoring and evaluation mechanism.
- xxix. For all theses the financial commitments shall be required which could be a certain percentage of the Annual Budget. Funds allocated by the Central, State Government Departments, Multilateral, International NGOs, Corporate houses shall also be available to meet Disaster Management related expenses, right from pre-disaster to Post-Disaster period.
- xxx. Among the cross-cutting issues, co-ordination, implementation, monitoring, review and updating are of the paramount importance. For the Plan is not a one-time exercise but shall require adjustments, additions and alterations from year to year, may be from disaster to disaster. Because disaster management is, in a way, endurance management and endurance, that way, is all.