

# DISTRICT DISASTER MANAGEMENT PLAN



**District Disaster Management Plan**

**Begusarai**

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**Submitted by**

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## Abbreviations Used

Abbreviation	Expanded Form
AMRUT	Atal Mission for Rejuvenation and Urban Transformation
ASHA	Accredited Social Health Activist
AYUSH	Ayurveda, Yoga and Naturopathy, Unani, Siddha and Homoeopathy
BDO	Block Development Officer
BDRRF	Bihar Disaster Risk Reduction Framework
BMTPC	Building Materials and Technology Promotion Council
BSDMA	Bihar State Disaster Management Authority
CBO	Community Based Organizations
CCS	Cabinet Committee on Security
CHCS	Community Health Centre
CSR	Corporate Social Responsibility
CSS	Centrally Sponsored Schemes
CWC	Central Water Commission
DAO	District Agriculture Officer
DDC	District Development Commissioner
DDMA	District Disaster Management Authority
DDMP	District Disaster Management Plan
DEOC	District Emergency Operations Centre
DG	Director General
DIO	District Information Officer
DM	Disaster Management
DRR	Disaster Risk Reduction
DSO	District Supply Officer
DTO	District Transport Officer
Dy	Deputy
EB	Electricity Board
ERC	Emergency Response Centre
ESF	Emergency Support function
EWS	Early Warning System
GP	Gram Panchayat
GSI	Geological Survey of India
HVCA/HRVCA	Hazard Risk Vulnerability Capacity Analysis
HYV	High Yield Variety
IAG	Inter Agency Group
IAP	Incident Action Plan
IAP/ICP	Incident Action Plan/Incident Command Plan
IC	Incident Commander
IMD	India Meteorological Department
INCOIS	Indian National Centre for Ocean Information Services
IPRD	Department of Information and Public Relations
IRS/ICS	Incident Response System/Incident Command System

IUCN	International Union for Conservation of Nature
MHA	Ministry of Home Affairs
MoAFW	Ministry of Agriculture and Farmer's Welfare
MoHFW	Ministry of Health and Family Welfare
NCC	National Cadet Corps
NCMC	National Crisis Management Committee
NDMA	National Disaster Management Authority
NDMF	National Disaster Mitigation Fund
NDMP	National Disaster Management Plan
NDRF	National Disaster Response Force
NDRF	National Disaster Response Fund
NEOC	National Emergency Operations Centre
NGO	Non-Government Organization
NIDM	National Institute of Disaster Management
NSS	National Service Scheme
NYKS	Nehru Yuva Kendra Sangathan
OSC	Operation Section Commander
PDNA	Post Disaster Needs Assessment
PHC	Primary Health Centre
PMAY	Pradhan Mantri Awas Yojana
PMKSY	Pradhan Mantri Krishi Sinchai Yojana
PPPP	Public Private Partnership Projects
PRI	Panchayat Raj Institutions
RO	Responsible Officer
RSSY	Rashtriya Swasthya Bima Yojana
SASE	Snow and Avalanche Study Establishment
SBI	Sukhi Baliraja Initiative
SBM	Swachh Bharat Mission
SDMA	State Disaster Management Authority
SDMP	State Disaster Management Plan
SDRF	State Disaster Response Force
SDRF	State Disaster Response Fund
SEOC	State Emergency Operations Centre
SFDRR	Sendai Framework for Disaster Risk Reduction
SHG	Self Help Group
SOP	Standard Operating Procedure
SP	Superintendent of Police
SPMRM	Shyama Prasad Mukherji Rurban Mission
TV	Television
ULB	Urban Local Bodies
UNISDR	United Nations International Strategy for Disaster Reduction

## Executive Summary

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The DM Act 2005 has mandated a disaster management plan at district level. Furthermore, the Roadmap for Disaster Risk Reduction (2015-30), Government of Bihar has provided envisioning guidelines to disaster managers to understand and act on disaster risk reduction taking Sendai Framework for Disaster Risk Reduction (SFDRR) into consideration.

As Bihar is one of the most multi-hazard prone states in the country, the Government of Bihar adopted the Bihar Disaster Risk Reduction Framework (BDRRF) to achieve the vision of a “Disaster Resilient Bihar”. As per DM Act 2005, the District Disaster Management Authority (DDMA), Begusarai has the authority and responsibility of developing, implementing and regular updating of the DDMP.

Taking into consideration the SFDRR and BDRRF, the scope of the DDMP extends not only to the management of response and relief efforts during disaster events, but in the larger aspirations of risk-informed development in Begusarai district. Thus, this DDMP is applicable across all the phases of disaster risk management for a “*whole-of-government*” and “*all-of-society*” approach towards disaster risk management. The DDMP will direct a multi-disciplinary, multi-sectoral, multi-stakeholder and multi-level coordinated set of actions, facilitated by the District Authority, for robust disaster risk management practices, in the district of Begusarai.

Begusarai district is located in the northern part of the state of Bihar and lies on the northern bank of River Ganga. It occupies a central position in North Bihar. In 1870, it was established as a sub-division of the Munger district. It became a separate district in 1972. Historically, **flood** is a prominent hazard in Begusarai, which disrupts life and property of the people of this district. Earthquake is also a potential hazard in the district as Begusarai district lies in Seismic zone IV (High damage risk zone). The district is also susceptible to other hazards like **fire, drought, heat wave, cold wave** and several other small-localized hazards. Therefore, the District Disaster Management Authority (DDMA) of Begusarai needs to take up Disaster Risk Reduction (DRR) and Disaster Response actions effectively to mitigate the adverse impacts of any probable event in the district.

The DDMP is organized to facilitate the DDMA in undertaking DRR and disaster response measures to mitigate adverse impacts of the hazards that Begusarai district is prone to. The DDMP is segregated into the following chapters:

Chapter	Brief outline
Introduction	This chapter provides an overview towards the necessity of DDMP, and the objectives, scope, plan development methodology and the implementation, review and update of DDMP.



District Profile	This chapter provides an overview of the district including key components such as the geographical location, features such as soil and rivers, the climatic and weather profile of the district, the culturally and historically important locations, and the natural resources including forest, land and flora and fauna in Begusaraidistrict. The chapter also includes a brief of the demographic details of Begusarai district with graphs and tables representing key characteristics of the demography for developing a quick understanding of the district.
Hazard,Risk, Vulnerability and	This chapter provides a detailed account of the hazards thatBegusarai district is susceptible to, and provides block wise

Chapter	Brief outline
Capacity Analysis	<i>nazari naksha</i> for quick understanding of the hazards and vulnerability profile of Begusarai district. The chapter provides valuable information to the district administration for undertaking preparedness and mitigation measures to tackle important hazards such as heat wave, cold wave, and floods based on spatial-temporal qualitative and quantitative analysis.  The chapter also includes a snapshot view of multi-hazard risk at a block-level and the capacities (or resources) available for emergency response.
Institutional Arrangement	This chapter provides information on the institutional arrangement available at the national, state and district level and the powers, roles and responsibilities of key stakeholders. The key stakeholders include the DDMA, PRIs, CBOs, and the DEOC. Coordination mechanisms prior to, during and post disaster events are enlisted to help the DDMA enhance preparedness levels.
Prevention, Mitigation and Preparedness Measures	This chapter provides a detailed description of the key prevention, mitigation and preparedness measures expected of the key stakeholders including the hazard/disaster-wise functions of departments/agencies in the district administration under the broad categories of prevention & mitigation, and preparedness.
Capacity building through training and awareness generation	This chapter deals with the capacity building measures identified by Begusarai district administration including the training needs identified by the district for its key stakeholders such as district departments, CBOs, PRIs and ULBs, Professionals, NGOs and the important training centers and training capacities available in the district or the State of Bihar.  A detailed section of awareness generation, including specific measures to be undertaken by concerned departments/agencies of the state and other organizations/CBOs/NGOs for awareness

	generation to assist in enhanced preparedness and prevention of adverse impacts of disasters, is provided in this chapter.
Response Planning	This chapter deals with emergency response and illustrates the Incident Response Functions and the roles and responsibilities of the emergency support functions in Incident Response.
Reconstruction, Rehabilitation and Recovery	This chapter deals with the post-disaster measures identified by key stakeholders for build back better post disaster events. One section of the chapter deals with the relief norms identified by the NDMA, and the State of Bihar as per the NDRF/SDRF norms to help district administration as a ready reckoner for emergency relief.
Budget and Financial Resources	This chapter deals with the financing for DRR measures including the preparation (and maintenance) of the DDMP. The schemes and programmes at the national and state levels supporting DRR, along with the Centrally Sponsored Schemes and other options such as risk insurance, mutual aid and CSR, are dealt in

Chapter	Brief outline
	this chapter to assist the district administration to mobilize funding for DRR measures.
Monitoring, Evaluation and Update of DDMP	The guidelines for monitoring and evaluation and for regular update of the DDMP are dealt in this chapter to assist the district administration to address vulnerabilities and channelize DRR efforts.
Annexure	Annexure consists of sections such as maps, important contact numbers, detailed capacity analysis, checklists, and model certificates. These sections are included in the annexure for assisting the district administration to undertake a systematic effort towards implementation of the DDMP and help in the development of a resilient Begusarai and thereby a resilient Bihar.

# 1 Introduction

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

Disaster risk is recognized as the consequence of the interaction between a (or multiple) hazard, and the characteristics that make people, places and assets vulnerable and exposed. Mathematically,

$$\text{Disaster Risk} = \text{Hazard}^1 \times \text{Exposure}^2 \times \text{Vulnerability}^3$$

The State of Bihar is multi-hazard prone and requires a multi-disciplinary approach to deal with these hazards. This also demands active participation of various stakeholders. It requires a continuous and integrated process of planning, organizing, coordinating, and implementing measures that are necessary for the different phases of disaster risk management (prevention, mitigation, and preparation to face any disaster event and to respond, rehabilitate and reconstruct in post-disaster scenarios) (Figure 1).



*Figure 1: Phases of Disaster Risk Management*

The disaster risk management process in Bihar has been evolving considerably since early 2000's and it further received strengthening after national and state level policies. Furthermore, the Roadmap for Disaster Risk Reduction (2015-30), Government of Bihar has provided envisioning guidelines to disaster managers to understand and act on disaster risk reduction taking Sendai Framework for Disaster Risk Reduction (SFDRR) into consideration. As Bihar is one of the most multi-hazard prone states in the country, the Government of Bihar adopted the Bihar Disaster Risk Reduction Framework (BDRRF) to achieve the vision of a “Disaster Resilient Bihar”.

Section 31 of the **DM Act 2005** has mandated a disaster management plan for every district of the State. The Act specifies that the district disaster management plan (DDMP) shall be prepared by the District Authority (further details in section 4.1), after due consultation with the local authorities and with due consideration of the national and state disaster management plans. It is mandatory on the part of the District Authority to adopt a continuous and integrated DDMP and to ensure that the DDMP is implemented in best spirit.

<sup>1</sup> The likelihood, probability, or chance of a potentially destructive phenomenon

<sup>2</sup> The location, attributes, and values of assets that are important to communities

<sup>3</sup> The likelihood that the assets will be damaged or destroyed when exposed to a hazard event

The District administration is the closest to the community and thereby has significant responsibilities in ensuring a disaster-resilient district, Bihar and India.

## 1.1 Objectives of DDMP

Along with the mandate given in the DM Act 2005, this district disaster management plan (DDMP) has incorporated the national and state commitment towards the Sendai Framework and Bihar Disaster Risk Reduction Roadmap. Accordingly, the broad objectives of the DDMP are:

- Improve the understanding of disaster risk, hazards, and vulnerabilities of the district
- Emphasize on pre-disaster phase by promoting a culture of prevention, mitigation and preparedness at all levels in the district
- Strengthen disaster risk governance at all levels from local to district
- Emphasize on different tasks and responsibilities of the Stakeholders and line departments in the district during the pre-disaster and post-disaster phases of disaster
- Invest in disaster risk reduction for resilience through structural, non-structural and financial measures, as well as comprehensive capacity development at district level
- Enhance disaster preparedness for effective response to disaster in the district
- Promote “Build Back Better” in recovery, rehabilitation and reconstruction
- Prevent hazards turning into disasters and achieve substantial reduction of disaster risk and losses in lives, livelihoods, health, and assets (economic, physical, social, cultural and environmental) in the district
- Increase resilience and prevent the emergence of new disaster risks and reduce the existing risks
- Emphasize on putting in place institutional arrangements and techno-legal framework
- Empower both local authorities and communities as partners to reduce and manage disaster risks
- Strengthen scientific and technical capabilities in all aspects of disaster management
- Capacity development at all levels to effectively respond to multiple hazards and for community-based disaster management
- Provide clarity on roles and responsibilities of various Departments and agencies involved in different aspects of disaster management
- Facilitate the mainstreaming of DRR concerns into the developmental planning and processes.
- Emphasize on developing the standardized mechanism to respond to disaster situation to manage the disaster efficiently.

The DDMP is a guide for achieving the objectives of the disaster management phases i.e. prevention, preparedness, mitigation, response, and recovery. This plan will also help the stakeholders to remain prepared to respond to disasters with a sense of urgency in a planned way to minimize human, property and environmental loss.

## 1.2 Scope of the DDMP

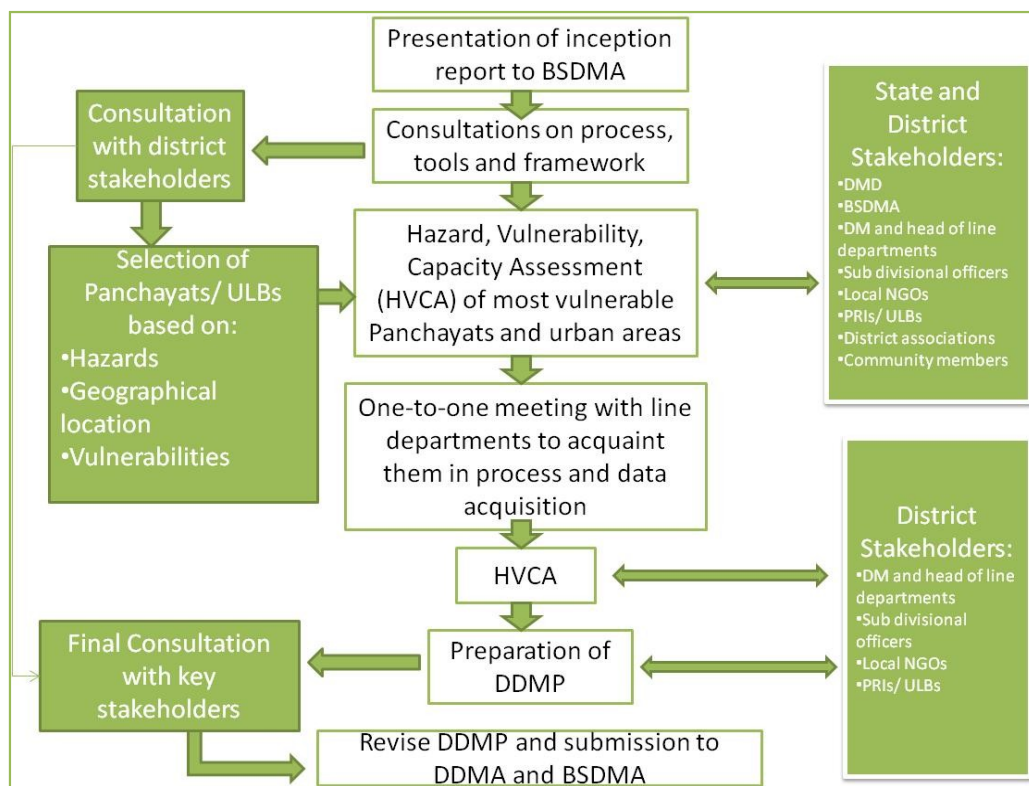
Taking into consideration the SFDRR and BDRRF, the scope of the DDMP extends not only to the management of response and relief efforts during disaster events, but in the larger aspirations of risk-informed development in Begusarai district. Thus, this DDMP is applicable across all the phases of disaster risk management for a “*whole-of-government*” and “*all-of-society*” approach towards disaster risk management. The DDMP will direct a multi-disciplinary, multi-sectoral, multi-stakeholder and multi-level coordinated set of actions,

facilitated by the District Authority, for robust disaster risk management practices, in the district of Begusarai.

Specifically this DDMP is for the district administration to act as a central figure for coordinating the activities of the following stakeholders for a disaster resilient Begusarai: various departments of the state, agencies, Panchayats and urban local bodies, for profit and civil society, faith based organizations, political parties, and the community.

### 1.3 Plan Development Methodology

The Plan development methodology is depicted in Figure 2.



*Figure 2: DDMP Development Methodology*

### 1.4 Implementing DDMP: Main stakeholders and their responsibilities

As per DM Act 2005, the District Disaster Management Authority (DDMA/District Authority), Begusarai, has the authority and responsibility of developing, implementing and regular updating of the DDMP. However, the ownership of the DDMP and its processes lie with all concerned stakeholders in the district collectively. The DDMA shall act as the fulcrum for the implementation of the DDMP. The District Magistrate (DM) as the chairperson of the DDMA is a central figure for ensuring successful implementation of the DDMP. Under the guidance of the DM, the DDMA will coordinate with the line departments, private and public sector, Panchayats, urban local bodies, community based organizations and the community to implement the plan and achieve a disaster-resilient Begusarai.

### 1.5 Plan review and update

**Training-** After developing a plan, it must be disseminated and District Authority must train

their personnel so that they have the knowledge, skills and abilities needed to perform the tasks identified in the plan. Personnel should also be trained on the organization-specific procedures necessary to support those plan tasks.

**Exercise the Plan** - Evaluating the effectiveness of plan involves a combination of training events, exercises and real-world incidents to determine whether the goals, objectives, decisions, actions and timing outlined in the plan led to a successful response. The purpose of an exercise is to promote preparedness by testing polices plans and training personnel.

**Revise and Maintain** - Planning teams should establish a process for reviewing and revising the plan. Reviews should be a recurring activity (under clause 31 of the DM Act 2005). Review on an annual basis is considered minimum. It should be mandatory to consider reviewing and updating the plan after the following events:

- A major incident
- A change in operational resources (e.g., policy, personnel, organizational structures, Management processes, facilities, equipment)
- A formal update of planning guidance or standards
- Each activation
- Major exercises
- A change in the district's demographics or hazard or threat profile
- The enactment of new or amended laws or ordinances

The responsibility for the coordination of the development and revision of the basic plan, annexes, appendices and implementing instructions must be assigned to the appropriate person(s).

The District Authority of Begusarai district shall compile its learning and propose new mechanisms for improvement of the capacity to deal with disasters. The review and update (Plan Maintenance) certificate is provided in section 12.4 in the annexure. Section 31 (7) of the DM Act 2005 states that the District Authority shall review,periodically, the implementation of the DDMP and issue instructions to different departments of the Government in the district *as it may deem necessary* for the implementation thereof.

*Section 31 (4) of the DM Act 2005, mandates that the DDMP be reviewed and updated annually. It is recommended that the DDMP be internally reviewed on a yearly basis and either be updated or reaffirmed. The updates or reaffirmed document may also be used to summarize the accomplishments of the past year and help the administration to prioritize mitigation goals for the next year.*

## 2 District Profile

Begusarai district is located in the northern part of the state of Bihar and lies on the northern bank of River Ganga. It occupies a central position in North Bihar. In 1870, it was established as a sub-division of the Munger district. It became a separate district in 1972. Historically, **flood** is a prominent hazard in Begusarai, which disrupts life and property of the people of this district. Earthquake is also a potential hazard in the district as Begusarai district lies in Seismic zone IV (High damage risk zone). The district is also susceptible to other hazards like **fire, drought, heat wave, cold wave** and several other small-localized hazards. Therefore, the District Disaster Management Authority (DDMA) of Begusarai needs to take up Disaster Risk Reduction (DRR) and Disaster Response actions effectively to mitigate the adverse impacts of any probable event in the district.

### 2.1 Geographical Location and Features

Begusarai district occupies a total area of 1,918 sq km. It is bound on the north by Samastipur, on the south by the Ganga and the Lakhisarai district, on the east by Khagaria and Munger, and on the west by the Samastipur and Patna district. Begusarai town is the administrative headquarter of the district. Following are the administrative divisions of the district (Table 1):

*Table 1: Administrative divisions of Begusarai district*

Administrative Division	Number
No. of Sub-Division	05
No. of Blocks	18
No. of Panchayats	229
No. of Revenue Villages	1,229
No. of Statutory Towns	03



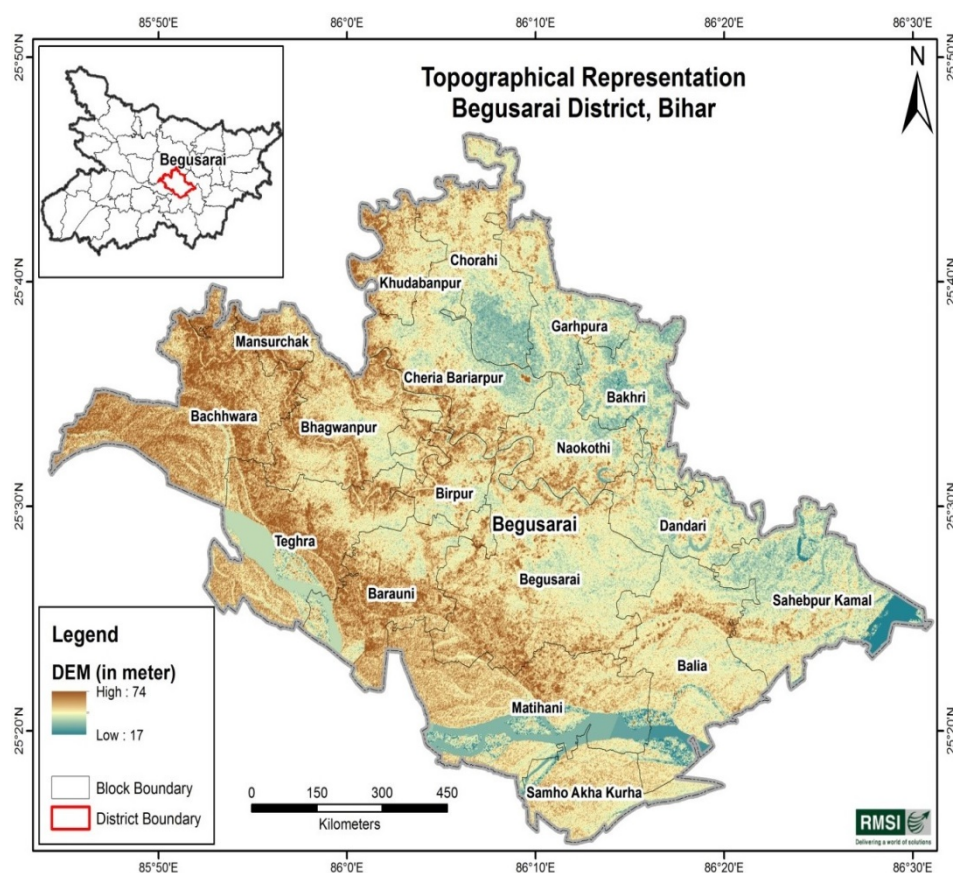
*Figure 3 : Begusarai district - administrative map*



The district is located at a Longitude of 85°45'E to 86°36'E east and the Latitude is 25°15' N to 25°45' N north. It is situated at a height of 32-45 meters above Mean Sea Level (Figure 3)

Begusarai lies in the middle part of Gangetic plain, which is a low-lying flat terrain. Its terrain slopes from the western and southern sides to the south-eastern side. Geomorphologically, Begusarai district is part of Gandak-Kosi confluence. Southern part of this district appears to be an elevated landmass and serves as a safe haven during floods. The district is divided into three major flood plains viz. Kereha-old Bagmati flood plains, Burhi Gandak flood plains, and Ganga flood plains (Figure 4).

Out of these three areas, Kereha-old Bagmati flood plains and Burhi Gandak flood plains are very low-lying areas, which comprise the south-eastern part of the district. This area of Begusarai district is generally prone to floods. All the streams that flow in this region have a general shifting tendency. Due to the shifting tendency of these streams and the physiographic characteristics of this area, the south-eastern part of the district is full of wetlands, ox-bow lakes, and swamps. On the other hand, the Ganga flood plains are least prone to flood in the southern part of the district.



*Figure 4: Topographical map of Begusarai district*

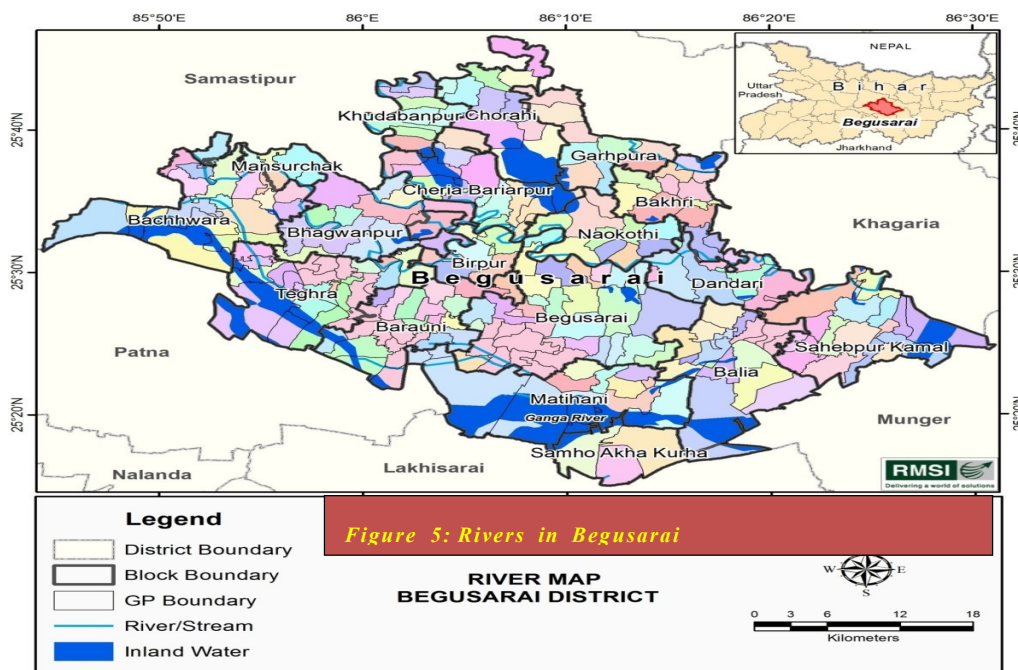


## 2.1.1 RIVERS

Being located in the middle Ganga plains, Begusarai district has several rivers flowing through its area. Main rivers are Ganga, Burhi Gandak, Balan, Baintia, Baya and Chandrabhaga. Apart from that, Kosi, Kereha, Channa, Kachna, and Monrya are some other rivers flowing in this district. Many rivulets are also present in this district. The River Ganga enters into the southwest part draining the Chamtha village of Bachhwara block in the district. This river, along with its flood plains - “Chauras” and “Tals”, determines the boundary of the district in the southern part.

The Burhi Gandak, the second most important river of the district, also known as “Sirkahana” in its upper reaches, enters the district near Parihar about 10 km upstream of its confluence with the River Balan. It forms the boundary with Samastipur district in Khudabandpur and Cheriabariyarpur blocks. This river shows very high sinuosity and has characteristically low silt content than other Himalayan rivers. After traversing a distance of approximately 100 km, it drains into River Ganga near Khagaria. The river causes periodic floods in the western part of the district. River Balan enters the district in Bachhwara block. After taking a course of approximately 30 km, it drains into River Burhi Gandak 5 km west of Manjhaul. This is also a highly sinuous stream. River Baghmata in North Bihar plains drains only the north-eastern corner of district. It enters into the district near Bakhri and is well known for its unstable nature and spill channels. After traversing the low-lying areas, it meets the Kosi near Sankosh outside the territories of the district. It is responsible for floods in the northern part of the district. River Baintia is a plain-fed stream originating in the adjoining district of Samastipur and enters in Bhagwanpur block of the district. This drains into Burhi Gandak after joining the Balan River. It is a perennial stream. Baya River drains the Teghra,

Bachhwara, and Barauni blocks. It merges with the River Ganga at Roopnagar near Barauni fertilizer factory. This perennial stream does not show any sinuosity in the district. Kavar Lake, situated near Manjhaul village in Cheria Bariarpur block and having elevation of 37-39m AMSL, is a large fresh water lake located in this district spanning over 63 sq km area. This lake is a huge wetland and is counted as a major physiographic feature of the district. Kavar Lake is also known as “Kabar jheel” and is famous for being Asia’s largest ox-bow lake. It is the largest freshwater lake in Northern Bihar and is home to rare migratory birds. It lies between Burhi Gandak, old Bagmati, and Kereha rivers. The lake is formed by the meandering action of Gandak River and is now a residual ox-bow lake, one of several



thousands in Bihar flood plains. It gets its water either due to rains or due to near-by overflowing rivers such as the Burhi Gandak and Bagmati.

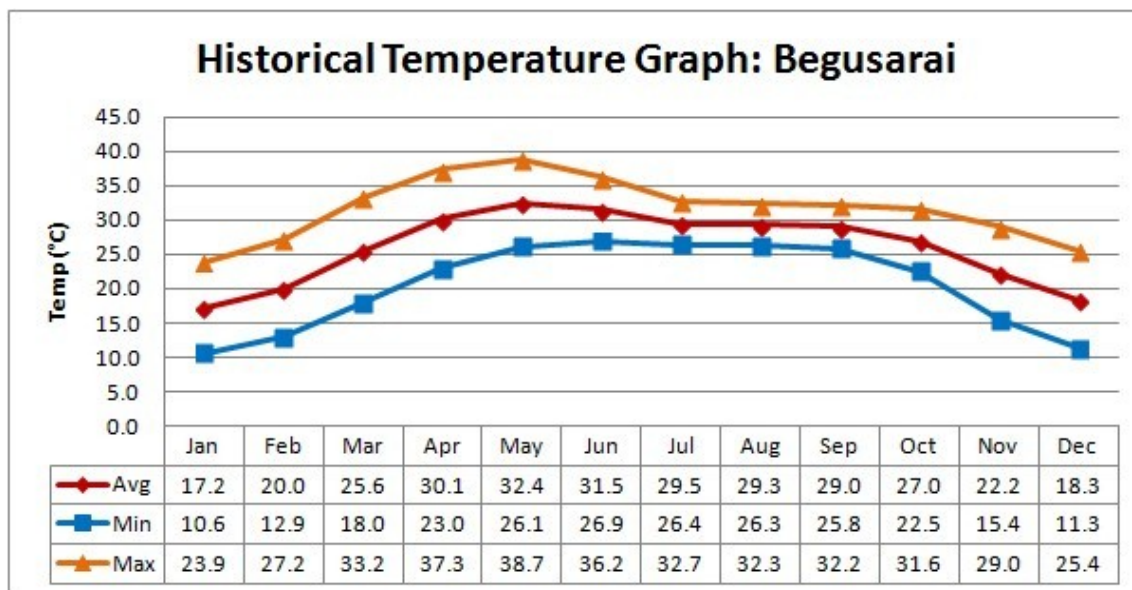
## **2.2 Climate and Weather Profile**

Climate of Begusarai is humid sub-tropical and is generally healthy. However, the early onset of monsoon and heavy rainfall always causes havoc in the district by damaging the standing crops. Further, heat waves during summer and severe cold waves during winter mostly affect the poor posing a challenge for the district and local administrations to mitigate the adverse effect of such seasonal hazards in the district.

## 2.2.1 TEMPERATURE

Average annual temperature of this region remains around 26°C. The summers are very hot. Day temperature in summer in Begusarai District remains in between 29°C to 45°C. There is gradual increase in average temperature from January (16°C) to May (36°C).

During summer, due to high temperature, this becomes an area of low pressure. Owing to this, the plains of Begusarai and associated areas attract cyclonic winds during this period from the Bay of Bengal where cyclonic disturbances form regularly. This leads to dust storms. These dry, hot, dusty storms are locally called as “loo” which is prevalent in the



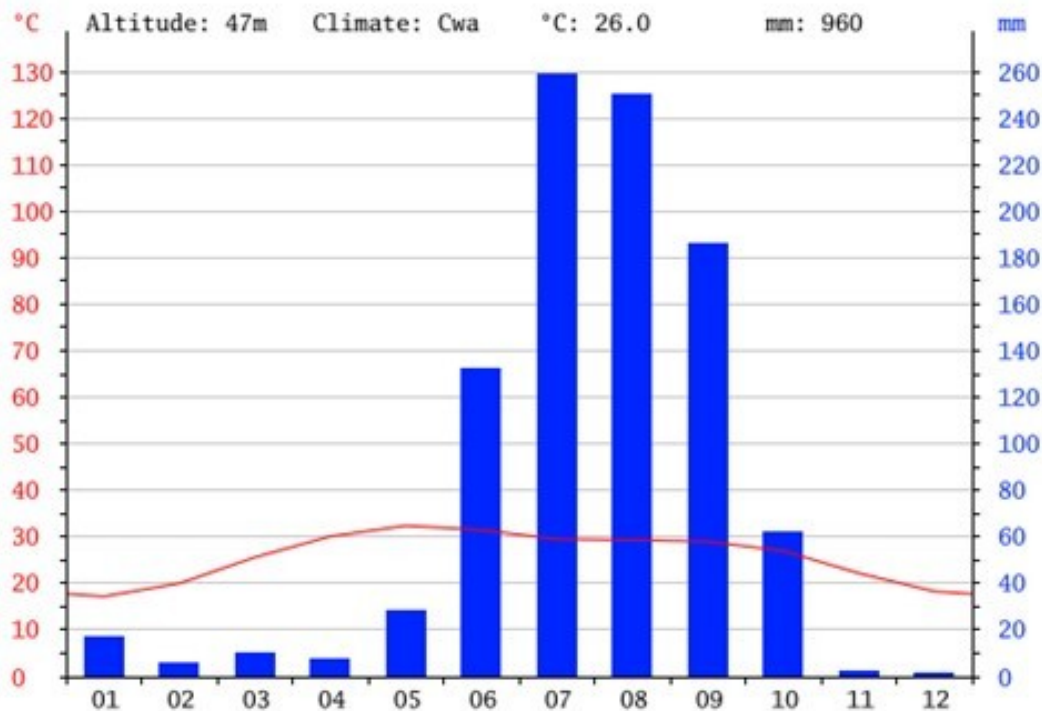
months of May-June.

*Figure 6: Historical temperature: Begusarai*

As Begusarai is part of the Gangetic plains, it experiences three main seasons. Summer season starts from March and remains until mid-June. May is the hottest month when average temperature remains around 32.4°C. The monsoon season breaks in mid-June and lasts until mid-October. Most precipitation falls in month of July with an average of 259 mm in the district. Winter season starts from mid-October and last until February. January is the coldest month with an average temperature of 17.2°C. The months of February and March, when temperature begins rising, are considered the transitional spring season or “Basant Ritu”. The months of September and October are described as “Shishir” when the weather transitions from monsoon season to winter season.

### 2.2.2 RAINFALL

The average annual rainfall in the district of Ganga-Burhi Gandak rivers is 1,384 mm of which around 83% falls between mid-June and mid-October. Monsoon normally starts in June and lasts until October. The early monsoon currents, channeled to the NW are the principal source of rainfall of the region. Seventeen percent of the pre-monsoonal rains, spreading in different months of the year (especially during the months of November-January), is due to the Norwester effect. Heavy rains, supplemented by physiographic



features, lead to heavy flood. Most part of the winter is dry except for some sporadic rains.

*Figure 7: Historical average rainfall pattern: Begusarai*

It is observed from the rainfall trend for last 15 years, the district has been facing 'disturbed monsoon'. Though we cannot directly correlate this with climate change, the impact of climate change is very much felt in monsoon season in the district. Bihar is observing increased climatic variability leading to increased occurrence of extreme climatic events such as intense heat waves across the area and more intense precipitation of shorter duration. Such large amount of rainfall for the shorter duration increases the run-off and hampers the natural ground water recharge process without getting enough time for water to get percolated. In longer run, this may affect ground water table in the region. Climate change impact in the region may thus become a reality.

### 2.2.3 EXTREME WEATHER CONDITIONS

Based on soil characterization, rainfall, temperature, and terrain, four main agro-climatic zones in Bihar have been identified each with its own unique characteristics. Begusarai District falls under Agro-Climatic Zone I (Northern West) which is located north of the river Ganges. Zones I and II are flood prone. Further details pertaining to extreme temperature events are explained in sections 3.1.5 and 3.1.6.

## 2.3 Cultural and Historical Perspective

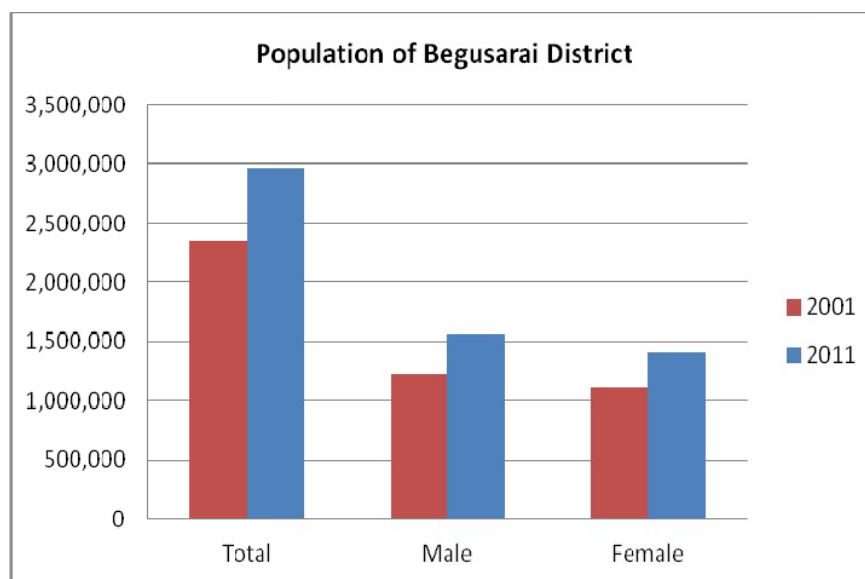
Begusarai has several important cultural and historical heritage sites. Following are the important sites:

1. **Radheshyam Temple:** It is situated at Ulao about 6 km westward from Begusarai town. It was made by Shyam Kumari (Ulao estate) in 1857. The temple is a superb piece of Indo-Western architecture. The temple has several murals that seem to narrate some classical stories of the region. Themes narrating the mythological stories of Ramayan, Mahabharat, Swarg-Narak and decoration of flower and fruits are beautifully painted on the inside walls of the Temple. A brief script in Devanagari is also painted to narrate the stories. Everywhere, the terms related to Mithila, can be seen. The temple is in an advance stage of decay.
2. **Basaha Asthan Mound and Temple:** It is situated at Baraipura about 14 km from Begusarai town. The mound has a remarkable landscape having two ponds - one each towards its northern and western ends. The eastern part of the mound has a deep cut throughout meant for levelling the agricultural land. Remains of an old dig well can be seen in this part. There used to be a small hut like temple almost 5 m from the present structure around 125 to 150 years ago. During the construction of the present western fencing of the newly built temple in or around 1990, the remains of a structure was found almost 1 m deep in the foundation, which was ultimately covered by the villagers. It is possible that the structure could be the remains of the old temple complex, icons of which were later found from the tank, west to the temple. The mound might be associated with a group of temples. The sculptures of Vishnu, Sun, Basaha, Chamunda and Shiva Ling, found from or around this mound suggest that it had been a worship centre of Brahma, Shiva, and Shakti followers. Most of the parts of it have been encroached and it is in advance stage of decay.
3. **Birpur Mound:** It is situated in Birpur about 12 km north of Begusarai town. It is a big mound. The top is intact to some extent. The middle part of the mound is inhabited with a market and habitation. It is one of the richest mounds of the district. The excavation of this site conducted in 2004 by A.I.H. and Archaeological Department of G.D. College, Begusarai, with the permission granted by A.S.I., brought to light the existence of six cultural sequences. The archaeological remains collected from this site seem to point to the possibility of this place being a famous trading centre right from Kushanas to the Turk Afghan.
4. **Naulagarh:** It is situated in Birpur block. The remains of a fort have been excavated. An enormous intact mound remarkable for its landscape with natural and man-made water channels has been found here. Various types of pottery have been excavated. A black stone broken sculpture with inscription of Pala period has also been found.
5. **Jaimangalpur/ Jaimangalgarh:** It is situated in Manjhaul sub-division and on the southern flank of Kavar Lake; it has religious, archaeological and scenic importance. The topology and the height of the Harsai Stupa found in Jaimangalgarh mounds are archaeologically remarkable. A variety of potsherds such as Northern Black Pottery, Black slipped, burnt, Red ware in the form of heavy storage vessels, water jar, dish, cookware, plate, bowl, pan, etc., have been found here. There is an ancient temple of Goddess Jaimangala- Goddess of power here. It is believed that during the Maurya period it was an elevated tomb where Lord Buddha got a shelter built and spent some time here. This is one of the famous religious places of Bihar.

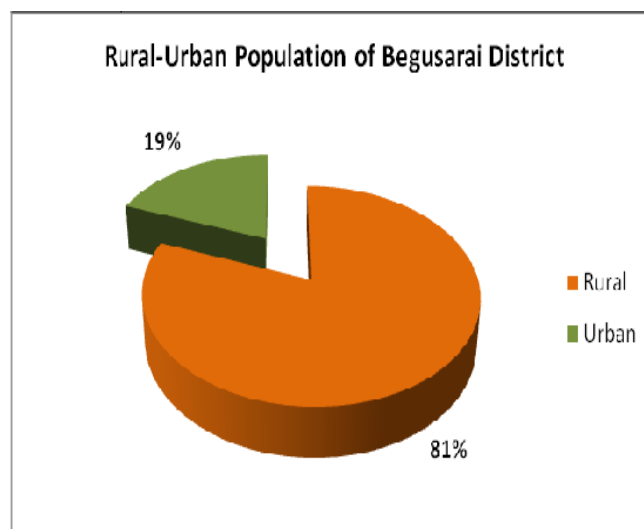
6. **Masuriyadih:** This Chauras region created by distributaries of river Ganga such as Deoki, Koyal, etc., has a remarkable landscape and topology. A variety of potsherds, some representing Neolithic culture, have been found here.
7. **Naulakha Temple:** It is a sacred Hindu shrine that is located in the midst of Begusarai City centre. This is an ancient temple with beautiful carvings that can be found its walls and all over. The idol of the presiding deity is gracefully adorned and forms to be the centre of attraction. It is believed that the name Naulakha was derived from the phrase Nau-lakh, which literally translates to nine lakh rupees. It was the construction of the sacred temple. Other important mounds are Bari Balia Mound (Baliala, Begusarai), Sahurideeh (Sahuri, Begusarai), Chanandeeh (Sahuri, Begusarai), Auredeeh (Cheriabariarpur, Begusarai), Maniappa Mound (Chandrika Asthan, Maniappa, Begusarai), etc.

## 2.4 Demography

According to the Census 2011, Begusarai district has a population of 2,970,541.80.82 % population of Begusarai district lives in rural areas. ). The total population living in rural areas is 2,400,718 of which males and females are 1,266,308 and 1,134,410 respectively. The district has a population density of 1,540 inhabitants per square kilometer (Census 2011). Its population growth rate over the decade 2001-2011 was 26.44%. Begusarai has a sex ratio of 895 females for every 1,000 males.



*Figure 8: Population of Begusarai district*



*Figure 9: Rural-Urban population of Begusarai district*



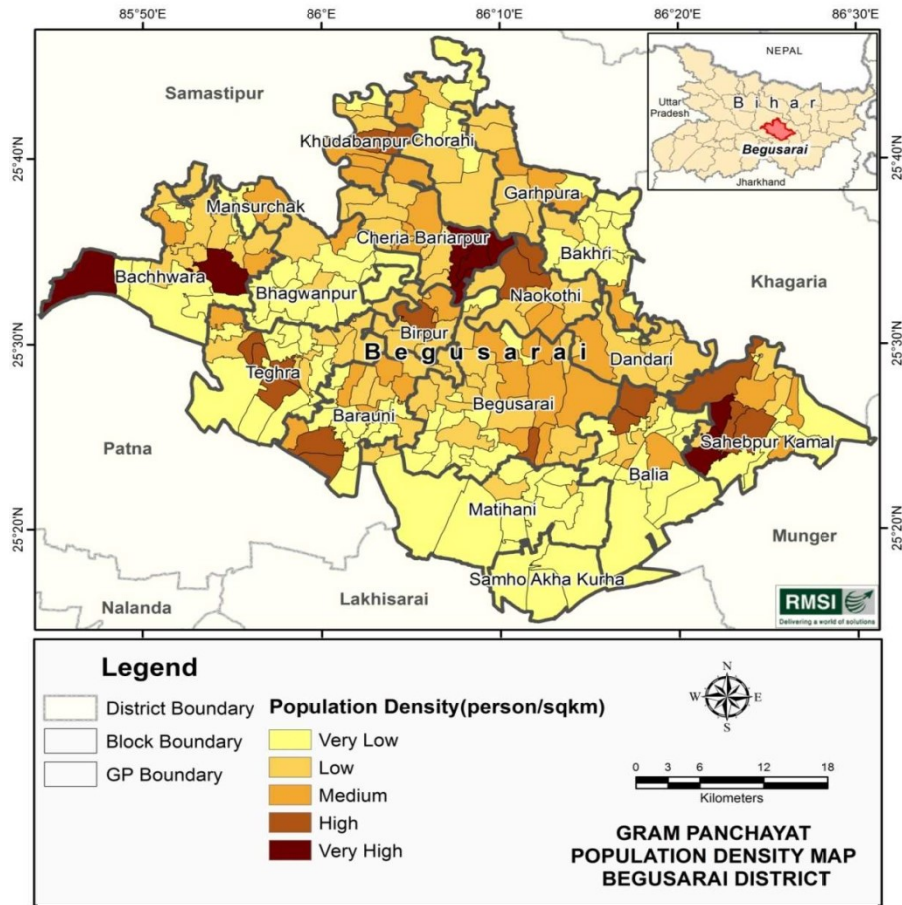


Figure 10: Population density distribution Begusarai district (Source: Census 2011)

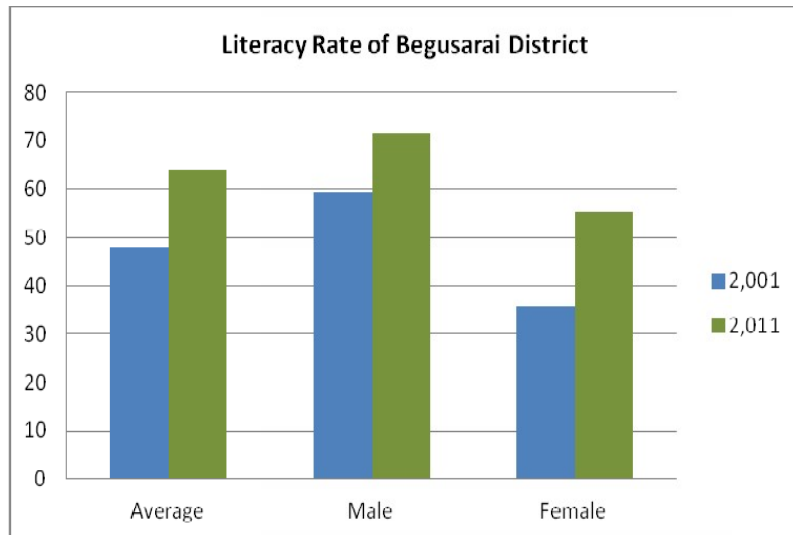


Figure 11: Literacy rate of Begusarai district



## 2.5 Administrative Structure

The organization structure of Begusarai district administration is presented in Figure 12.

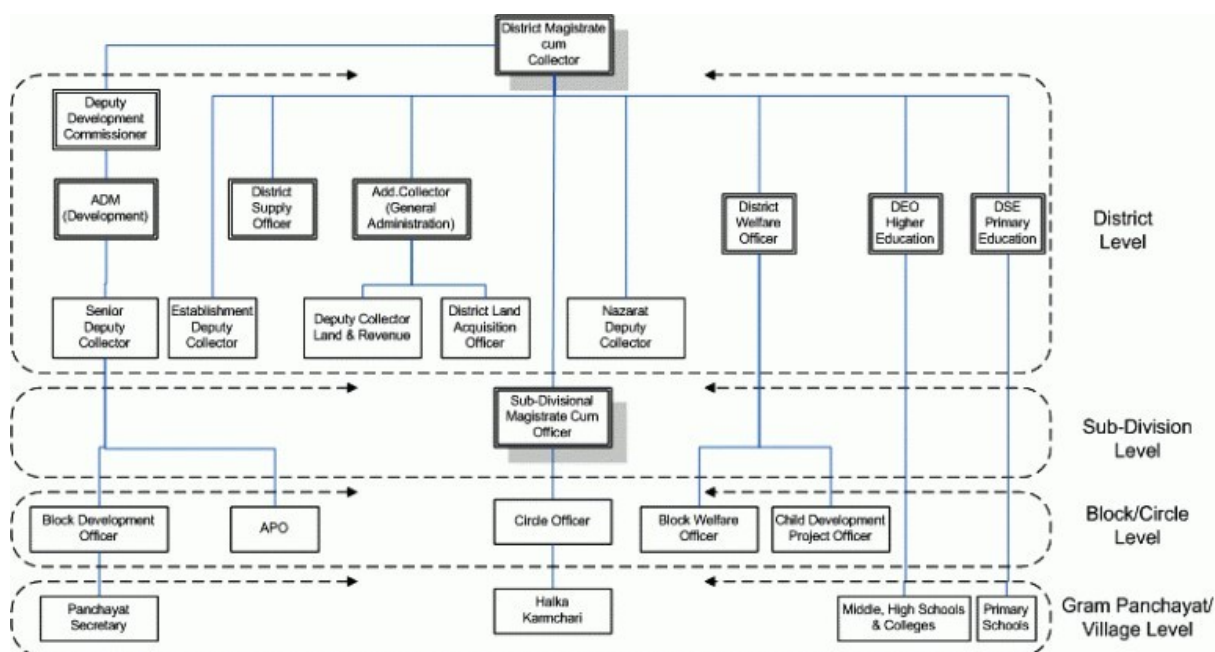


Figure 12: Organization structure of Begusarai district

Division	Block	Households	Total Population	Male Population	Female Population
Bakhari	Bakhri	28917	140097	73403	66694
Bakhari	Garhpura	23901	111108	58422	52686
Bakhari	Naokothi	22655	103357	53739	49618
Balia	Balia	33812	182178	96869	85309
Balia	Dandari	14982	77256	40526	36730
Balia	Sahebpur Kamal	37469	194172	103675	90497
Begusarai	Barauni	52069	273414	144697	128717
Begusarai	Begusarai	102790	540009	286621	253388
Begusarai	Birpur	18832	97467	51630	45837
Begusarai	Matihani	30937	152725	81287	71438
Begusarai	Shamho Akha Kurha	5747	30777	16158	14619
Manjhaul	Cheria Bariarpur	31044	146680	76665	70015
Manjhaul	Chhorahi	26004	124191	64686	59505
Manjhaul	Khudabandpur	19150	90358	47074	43284
Teghra	Bachhwara	39641	195815	103183	92632
Teghra	Bhagwanpur	35035	172676	91222	81454
Teghra	Mansurchak	16733	80510	41690	38820
Teghra	Teghra	49949	257751	136113	121638

Table 2: Block wise households and population - Begusarai district

## 2.6 Natural Resources

### 2.6.1 SOIL

Soil of Begusarai is mainly unaltered alluvial and is a mixture of clay and sand in varying proportion. Soil texture varies from sandy loam to loam in meander scroll and levee (the upland which bounds the flood plains of the river) areas, to silt, and silty loam in the flood basin areas of the Himalayan rivers. Loam is found in the levees of Ganga while clay and clayey loam is generally present in the basin of Burhi Gandak and Bagmati Rivers. Soil of this district is sandy loam with humus and is very fertile and good for agriculture.

## 2.7 Main Occupation

Main occupation of the people of the district is agriculture and agri-based industries. People are also engaged in the secondary and tertiary sectors. The traditional occupation in this area has been the rearing of milch cattle. Animals are used in agricultural work even today. People in the district are enterprising in terms of dairy industry, as a huge quantity of milk is made available to the Barauni Milk Composite Dairy Industry. This gives lucrative income and employment to the people of Begusarai.

### Agriculture

Being a predominantly agrarian economy, the source of livelihood in the district primarily depends on agricultural products. Almost 88% people depend upon agriculture. Paddy, sugar cane and staple crops like cereals and vegetables are the main crops grown in the district. Main cash crops of the district are oilseeds, tobacco, jute, potato, red chillies, tomato, and andi.

As agriculture depends mainly on rainfall, the failure or premature cessation of rainfall can lead to crop failure mainly in the winter. Besides that, the district is highly vulnerable to flood, which damages standing crops.

### Animal Husbandry

Apart from agriculture, animal husbandry is one of the key sectors, which play an important role in employment and income opportunities for the rural masses of Bihar. This sector contributes about one-fifth of the total rural income, and provides large-scale employment to women, and workers belonging to the marginalized sections of society. Further, since many households are either landless or land-poor in rural Bihar, this sector supplements their low income from agricultural occupation. Begusarai district had around 7.02 lakhs livestock population and 2.55 lakhs poultry population. Livestock population includes cattle, buffalo, sheep, goat, pig, horses & ponies, mules, donkeys, etc. while poultry includes total birds in the poultry farms and hatcheries. Taking note of the importance of the sector, the state government has taken several important steps for its development. These include breed upgradation, health and nutrition, insurance scheme for milch animals, and marketing of the products of the sectors. Further, training programmes have been arranged for rural workers to enhance their skill in animal husbandry.

In urban areas of the district cow rearing of hybrid quality is increasing. After domestic consumption of milk, a huge quantity of milk is sold to the Barauni Milk Composite Dairy Industry. This gives the people of Begusarai district not only lucrative source of income but also a sustainable employment.

**Industry**

Begusarai is known for its industries. Major industrial units are Indian Oil Refinery - Barauni, and Hindustan Fertilizer Limited - Barauni, Thermal power station – Barauni, as well as hundreds of smaller industrial units in the private sector. However, Hindustan Fertilizer Limited - Barauni is on the verge of closure.

This district has remarkable potential for agro- based industries because of the large production of maize and oilseeds, etc. Industries include sugar industry, jute industry, oilseed industry, paper industry, soap industry, wax industry, agriculture machinery industry, etc.

**Tourism**

In Begusarai, district tourism is mainly related to religious festivities. The famous Simaria Ghats attracts good number of people to come and dip into the Ganges. The famous Kavar Lake, a notified Birds sanctuary, and Naulakha temple is also place of tourism attraction. People from every part of the country come to Simaria Rajkiya Kalpwas Mela and stay for a month and take part in religious activities. Jaimangla garh, a well-known Shakti peeth is also of place of tourist attraction.

**Services**

Beside agriculture and industries there are other services like painting, fisheries, handicrafts, and weaving, etc. which are the primary source of income for many families and also a vital source for the economic growth of the district.

### **3 Hazard, Risk, Vulnerability, and Capacity Analysis**

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The HRVCA in Begusarai district is a systematic analysis that involves the following steps:

- i. Hazard identification and profiling of the potential hazards in Begusarai
- ii. Vulnerability assessment of the potential population and assets exposed to the identified hazards
- iii. Capacity analysis to identify the ability of the district to cope with the hazards and reduce negative impacts.

The HRVCA is an important step in disaster risk management. The first priority of the SFDRR is to develop an understanding of the potential disaster risk that the district faces. The BDRRF and the Bihar DRR roadmap also envisages resilient villages, livelihood, critical infra, basic services, and cities. But in order to plan for resilience, there must be a systematic study of the pertinent hazards, vulnerabilities and capacities. This understanding would help in prevention by reducing the incidences of hazards, mitigating losses during hazard events by focusing on preparedness, response and relief, and build back better post any disaster event to reduce future risk. The HRVCA helps in developing disaster risk plans and in disaster risk governance by helping the districts develop an objective analysis of the disaster risks.

Begusarai is a flood-prone district. Flood is the most frequently occurring and impacting hazard of the district. Almost every year Begusarai is affected by floods causing a great damage to crops, buildings, roads, human lives, and animals. The district is vulnerable to the following hazards (Table 3) at varying levels of intensity and hazard specific details are presented in the subsequent sections.

*Table 3: List of hazards in Begusarai district*

Natural Hazards	Man-made Hazards
<ul style="list-style-type: none"> <li>• Flood</li> <li>• Earthquake</li> <li>• Drought</li> <li>• Wind</li> <li>• Cold Waves</li> <li>• Heat Waves</li> <li>• Fire</li> <li>• Lightning</li> <li>• Incessant rains/untimely rains</li> </ul>	<ul style="list-style-type: none"> <li>• Road/Rail accidents</li> <li>• Industrial/Chemical accidents</li> <li>• Stampede</li> <li>• Drowning in river, pond, dams</li> <li>• Epidemics</li> <li>• Snakebite</li> </ul>

*Table 4: Hazard seasonality - Begusarai district*

[illegible]

*Table 5: Block wise Prevalence of hazards by, Begusarai District*

Hazard	Blocks prone to hazard
<b>Flood</b>	<ul style="list-style-type: none"> <li>• Sahebpur Kamal,</li> <li>• Ballia,</li> <li>• Samoh,</li> <li>• Barauni,</li> <li>• Begusarai,</li> <li>• Teghra,</li> <li>• Bachhwara</li> </ul>
Lightning	All blocks
Earthquake	All blocks
Drought	All blocks
Cold Wave	All blocks
Heat Waves	All blocks
Drowning	All blocks
Epidemic	All blocks
Snake Bite	All blocks
Road Accident	All blocks
Chemical Hazards :	Barauni, Begusarai, Teghra,

### 3.1 Hazards Profile of Begusarai

#### 3.1.1 FLOOD.

*Table 6: High flood water level areas*

Ganga at Hathidah:	Budhi Gandak at Siuri:
<ul style="list-style-type: none"> <li>▪ Maximum Water Level: 43.15m</li> <li>▪ Danger Level: 41.76m</li> </ul>	<ul style="list-style-type: none"> <li>▪ Maximum Water Level: 42.42m</li> <li>▪ Danger Level: 40.67m</li> <li>▪ Water Level on dated 20-09-2015:</li> </ul>
<ul style="list-style-type: none"> <li>▪ Water Level on dated 25-08-2015: 41.495</li> </ul>	39.73

### 3.1.2 EARTH QUAKE.

Some of the historical earthquake disaster in an around Bihar-Nepal boarder is provided in the Table 8 below.

*Table 8: Significant historical earthquake around Bihar-Nepal border*

Event date	Description	Magnitude
Jan15,1934	One of the most devastating earthquakes in Nepal's history, known as the Bihar-Nepal earthquake, killed more than 16,000 people from Nepal and India	8.0
July 29,1980	In the western region of Nepal killed more than a hundred people and destroyed thousands of buildings	6.5

Event date	Description	Magnitude
Aug 20,1988	Occurred near the Nepal-India border and killed more than a thousand people.	6.8
Sept18, 2011	This earthquake killed 16 people in Nepal and India	6.9
April, 2015	Over 9,000 people were killed and injured more than 23,000 particularly in Nepal. It was the worst natural disaster to strike Nepal since the 1934 Nepal–Bihar earthquake.	8.1

Based on analysis of published historical and instrumental catalogues and research papers such as from IMD, Survey of India, various research institutes in the country, the seismic map of Begusarai district is mapped in Figure 14.

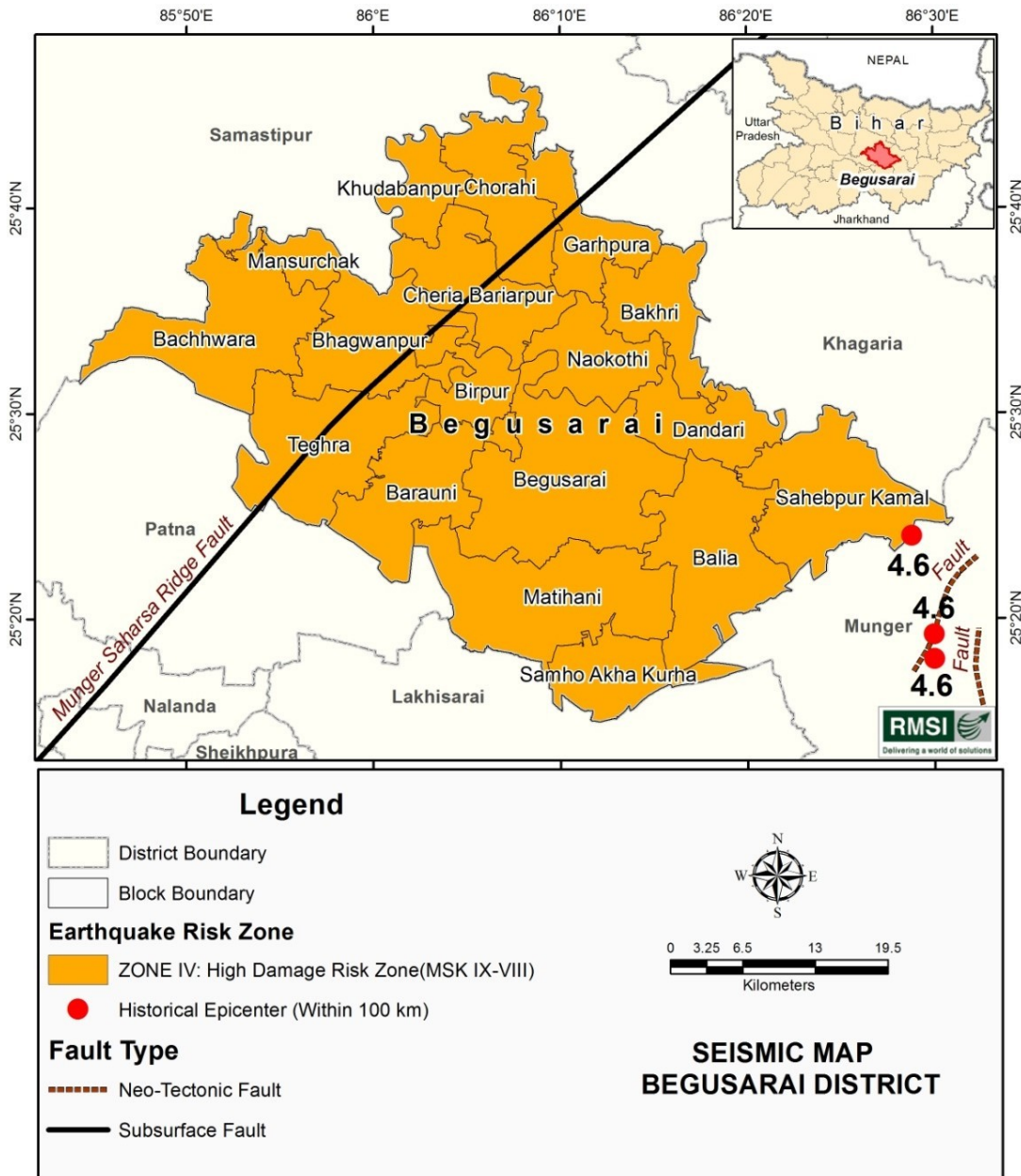


Figure 14: Seismic map - Begusarai district

### 3.1.3 DROUGHT

### 3.1.4 COLD WAVE HAZARD

### 3.1.5 HEAT WAVE

### 3.1.6 FIRE HAZARD

### 3.1.7 LIGHTNING HAZARD

### 3.1.8 INCESSANT RAINS AND UNTIMELY RAINFALL

### 3.1.9 EPIDEMICS / PANDEMICS



### 3.1.10 ROAD / RAIL Accidents

### 3.1.11 BOAT ACCIDENTS & DROWNING

### 3.1.12 Snakebite

## 3.2 Vulnerability and Risk Analysis

As per the UNISDR definition - vulnerability is the characteristics and circumstances of a community, system or asset that make it susceptible to the damaging effects of a hazard. Vulnerability indicates the degree to which a hazard can impact the people or area.

### 3.2.1 FLOOD

Being located in the flood plain of Ganges River and its tributaries *Balan, Budhi Gandak and Baintia* the district is highly prone to flood hazard. The topography, heavy rain and proximity to the river contributed to flood hazards of the district.

Based on the flood hazard, the blocks vulnerable to flooding are represented as follows :

*Table 10: Block level flood vulnerability - Begusarai*

S No.	Block names	Flood vulnerability
1	Khudabandpur	Low
2	Chaurahi	Low
3	Garhpura	Low
4	Cheria Bariarpur	Low
5	Bhagwanpur	Low
6	Mansurchak	Low
7	Bachhwara	High
8	Teghra	High
9	Barauni	High
10	Birpur	Low
11	Begusarai	High
12	Naokothi	Low
13	Bakhri	Low
14	Dandari	Low
15	Sahebpur Kamal	High
16	Balia	High
17	Matihani	High
18	Shamho Akha Kurha	High

### 3.2.2 EARTHQUAKE

As per the earthquake hazard map of BMTPC the district falls under the Zone IV (high damaging risk zone) and the Munger-Saharsa ridge fault, a prominent sub surface fault, passes through the district. In addition to this, the eastern Patna fault also passes just along the northern border and the earthquake zone V is couple of kilometers north of the district. The district has experienced the shock of some of the major earthquakes in the past in the Himalaya, particularly the 1934 and the recent one in 2015. However, there is no significant historical loss recorded.

Seismologically, the entire Bihar State is vulnerable as the State has a history of moderate to severe earthquakes. Other factors such as poor building construction, increased demographic pressure, deteriorating environmental conditions, poor living conditions, unplanned urbanization in urban areas with narrow lanes and crucial traffic congestion problems, etc. contribute to increased earthquake vulnerability. However, in general the construction quality of the residential buildings, particularly the traditional semi pucca houses and kuchcha houses do not follow engineering standards and are vulnerable to earthquake. Bihar State has recently taken proactive steps towards mitigation of earthquake hazards in many districts, provides training for engineers, and is carrying out field-based investigation with the support of concerned government agencies. Following figure (Figure 24) represents the seismic vulnerability of Begusarai district.

### 3.2.3 DROUGHT

Even though drought is not a severe hazard for the district, the historical data shows that district has been declared drought affected district at 12 instances during the 50 years period from 1966-2016 (1966, 70, 71, 72, 79, 82, 92, 01, 09, 10, 13, 16). In addition to this, the change in rainfall pattern can affect the crops yield in the district. The district has developed an agricultural contingency plans which focuses on flood and drought. The deviation in the rainfall pattern particularly less rainfall during Rabi season impact the district as the soil of the district is highly permeable and is poor to retain moisture. The State was declared as drought year during 2013 as it received 25% deficit rain and 33 districts including Begusarai was declared as drought-affected district. Recently, in 2016, Begusarai was declared drought hit among 26 districts.

Almost all blocks of the districts are vulnerable to drought hazards. Begusarai block is highly vulnerable, and Khudabanpur, Chorahi, Cheria Bariarpur, Teghra and Barauni are other blocks vulnerable to drought.

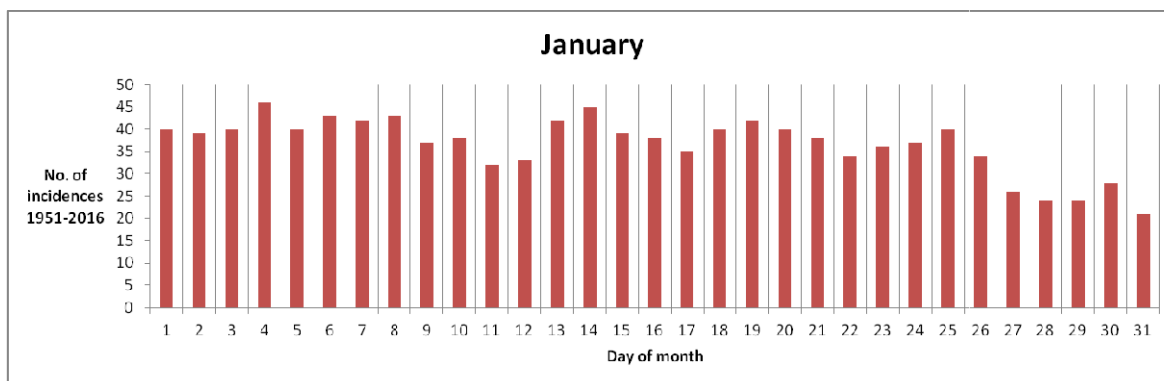
Sr.No.	Month	General Rainfall Report	2020	2021	2022
01	January	11.80	4.50	0.00	10.40
02	February	12.30	8.00	0.00	29.60
03	March	10.70	21.70	0.00	00.00
04	April	17.30	84.80	0.00	00.00
05	May	41.50	77.50	272.50	44.30
06	June	144.20	269.70	381.80	137.00

07	July	256.80	145.20	166.00	131.90
08	August	289.20	144.80	184.70	117.20
09	September	198.80	309.7	95.30	Till 25-08-2022
10	October	79.10	17.80	21.50	
11	November	40.80	00.00	00.00	
12	December	2.20	00.00	00.00	470.40
Average Rainfall			1083.70	1311.80	39.20

### 3.2.4 COLD WAVE

*Figure 16: Incidence of sub 10 degree Celsius temperature in December - Begusarai*

The coldest day in December was observed on 25<sup>th</sup> December, 1961 when temperatures dropped to 5.1 degree Celsius. The district administration would have to be prepared for cold waves in the 3<sup>rd</sup> and 4<sup>th</sup> week of December. In January, minimum temperatures remain below 10 degree Celsius almost throughout the month (Figure 17). The first, second and third week of January are the harshest with the lowest temperature ever



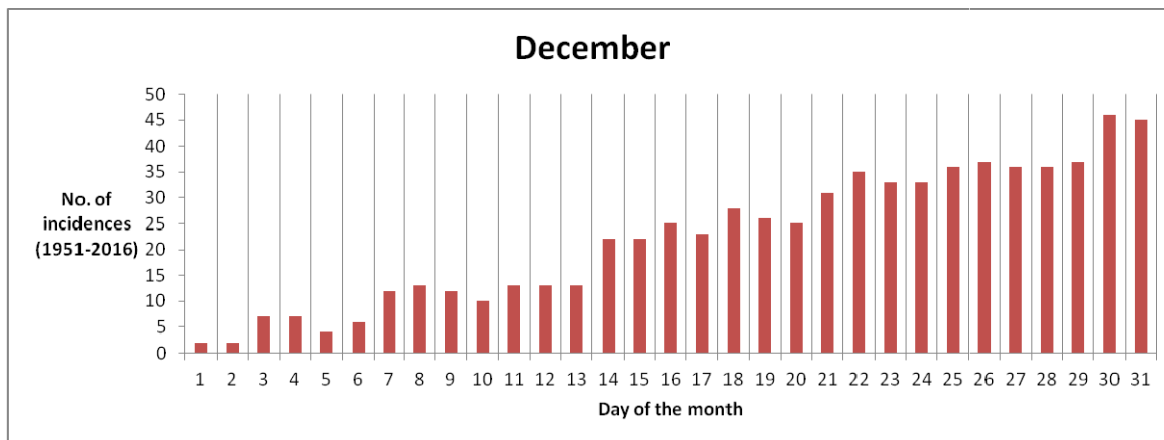
recorded in January on 5<sup>th</sup> January 1955 (2.3 degree Celsius). The district administration would have to be prepared to tackle cold waves in the first, second and third week of January

The district experiences severe cold waves conditions during the months of December and January. The average temperature during these months is around 13-15 degree Celsius.

Severe cold waves conditions in the district puts casualty toll rising. Severe cold waves conditions reported in 2008, 2011 and 2012 in the district in the recent past with one death reported in the district in 2012. Mostly poor people living in kuchcha houses who are less protected used to get affected often in the cold waves.

In November month, Begusarai has registered sub 10 degree Celsius temperatures on 9 occasions towards the last week of the month (23<sup>rd</sup>, 26<sup>th</sup>, 28<sup>th</sup>, 29<sup>th</sup> and 30<sup>th</sup>). The coldest November day was observed on 29<sup>th</sup> November, 1970 when the temperature dropped to 9.1 degree Celsius.

In December month, Begusarai has registered sub 10 degree Celsius temperatures on multiple occasions (690 occasions between 1951-2016), majorly in the third and fourth week of December as observed in following figure ( ).



Teghra, Barauni and Begusarai blocks have high susceptibility to cold waves whereas Bachhwara, Khudabandpur, Chaurahi, Garhpura, Bakhri, Dandari, Balia, Sahebpur Kamal, Matihani, and Samho blocks have relatively lower vulnerability to cold waves.

### 3.2.5 HEAT WAVE

Heat Wave is considered if maximum temperature of a station reaches at least 40°C or more for plains regions.

#### I. Based on departure from normal

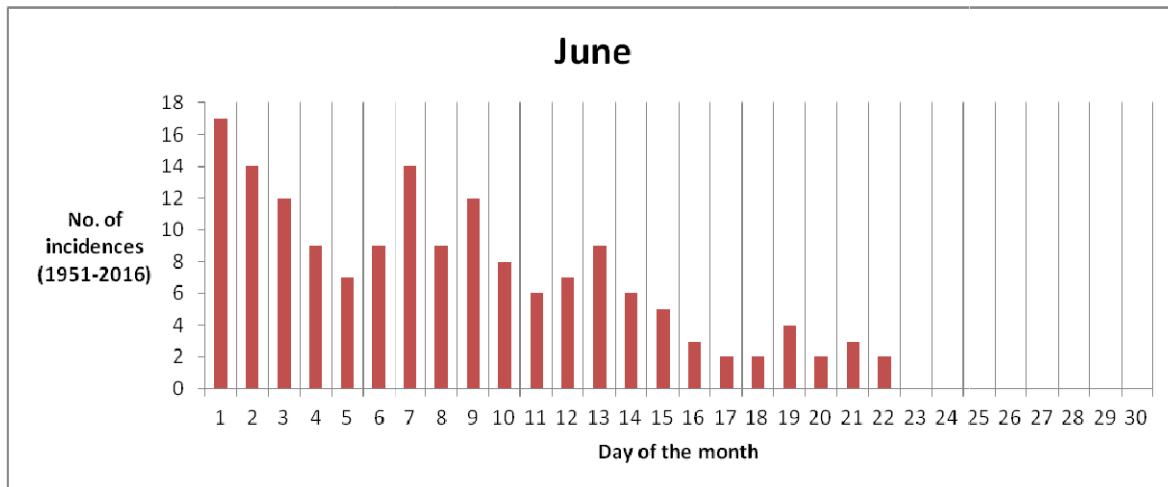
- Heat Wave:** Departure from normal is 4.5°C to 6.4 °C
- Severe Heat Wave:** Departure from normal is more than 6.4 °C

#### II. Based on actual maximum temperature

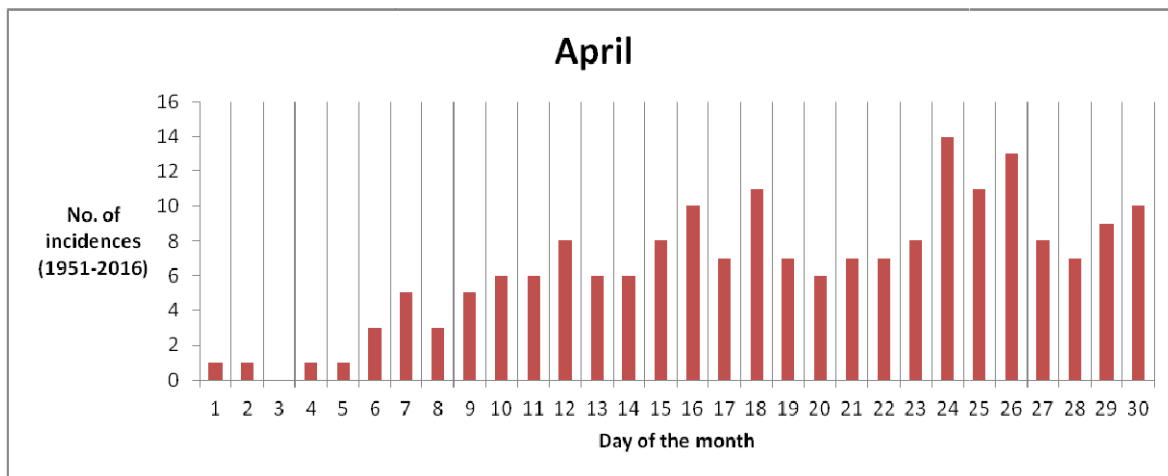
- Heat Wave:** When actual maximum temperature is equal to or higher than 45°C
- Severe Heat Wave:** Departure from normal is more than is equal to or higher than 47°C

An analysis of the daily temperatures in Begusarai district (from 1951 till 2016) reveals the following significant information:

- In the month of **April**, 40degree Celsius is expected around the last week. The highest temperature in April was recorded on 29<sup>th</sup> April 1980 at 42.6degree Celsius. With a mode of 6, the district administration can expect at least 6 days in the month of April with maximum temperatures above 40degree Celsius especially in the second and fourth weeks

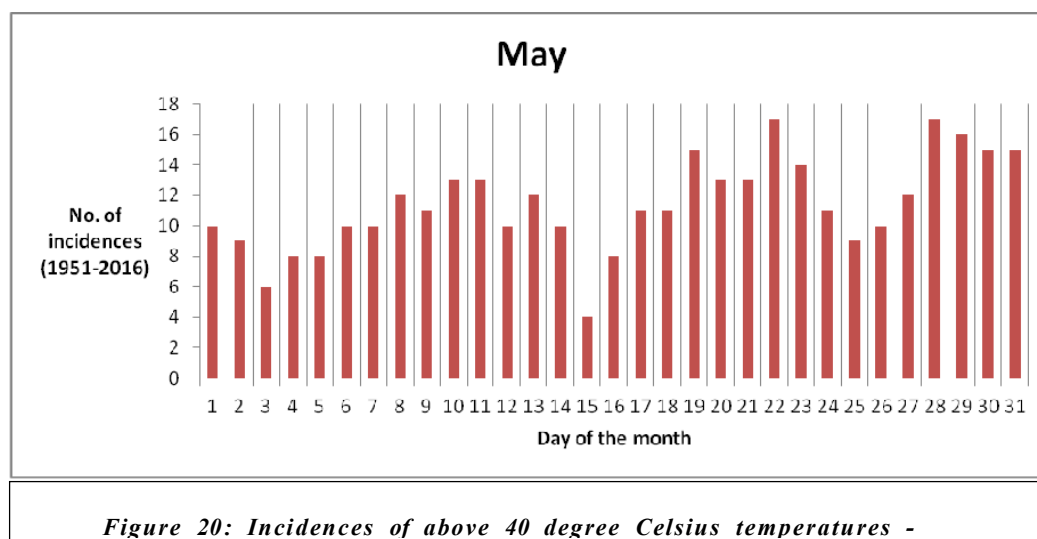


*Figure 21: Incidences of above 40 degree Celsius in June – Begusarai*



*Figure 19: Incidences of above 40 degree Celsius in April - Begusarai*

- In the month of **May**, maximum temperatures have crossed 40degree Celsius on 353occasions. District administration can expect maximum temperatures to increase above 40degree Celsius throughout the month of May. The highest temperature recorded in May since 1951 is 43.8degree Celsius. With a median of 10, the district administration can expect at least 10 days of above 40degree Celsius temperatures in the month of May
- median of 9 days, the district administration can expect at least 9 days in June above 40 degree Celsius especially in the first and second weeks. The chart below shows the incidences of above 40degree Celsius day-wise in the month of June. The highest temperature reached was 43.6degree Celsius in the year 1979 on 6th June
- The first week in the month of June is significant for Heat Waves in Begusarai.



### 3.2.6 FIRE

As per the fire risk assessment of Fire Hazard and Risk Analysis in the Country for Revamping the Fire Services in the Country, Bihar report, MHA, 2012, Begusarai is categorized as “very high risk” based on population density, residential and industrial built up.. The district has 6 fire stations with an average population severing per fire

Sr. No.	Block Name	Fire Incident in Year-2019	Fire Incident in Year-2020	Fire Incident in Year-2021	Fire Incident in Year-25-08-2022	Total Fire Incidents
1.	Begusarai	31	20	26	13	90
2.	Matihani	10	04	05	06	25
3.	Birpur	12	08	01	01	22
4.	Samho	0	05	03	03	11
5.	Barauni	45	14	21	06	86
6.	Balia	41	27	27	08	103
7.	Dandari	17	01	07	02	27
8.	Sahebpur kamal	22	10	18	08	58
9.	Teghra	36	28	25	06	95
10.	Bachhwara	08	06	06	06	26
11.	Bhagwanpur	27	08	08	04	47
12.	Mansurchak	04	01	02	00	07
13.	Cheriyabariyarpur	34	13	14	05	66
14.	Chhourahi	05	01	01	01	08
15.	Khodawandpur	07	06	02	02	17
16.	Bakhri	24	12	08	10	54
17.	Garhpura	10	05	02	05	22
18.	Nowkothi	08	00	00	03	11
<b>Total</b>		<b>341</b>	<b>169</b>	<b>176</b>	<b>89</b>	<b>775</b>

station of about 5 Lakhs. This is in addition to mandatory private fire stations required and available in the industries like the refinery in Barauni. Of the 6 fire stations 4 are located in

<sup>9</sup> Ba the urban areas of the district.

### 3.2.7 LIGHTNING

Lightning is a sudden high-voltage discharge of electricity that takes place between clouds and travel all the way to the ground. As heavily charged air rushes to the ground from the clouds, anything that comes in its way gets destroyed.

Lightning strikes are common occurrences in the heavy monsoon across Bihar. The Conditions responsible for lightning are created where warm, moist air rises and mixes with cold air above. More lightning happens near the equator. India's eastern regions are most vulnerable to lightning. A significant number of recent deaths are farm labourers and people working in the open fields. Probability of occurrence of lightning in Begusarai district is observed as more or less at higher side. Because of lack of awareness and preparedness, deaths also happen due to lightning strikes. Predicting lightning is very complicated as everything from trigger to strike happens within a second.

Sr.No	Block	Date/Year	Human Death	Animal Death
01	Matihani	19-05-2022	1	0
02	Barauni	15-07-2022	1	0
03	Nowkothi	20-07-2022	1	2
04		21-07-2022	0	1
05	Bachhwara	23-07-2022	1	0
06	Birpur	29-07-2022	1	0
07	Begusarai Sadar	01-08-2022	1	1
Total			6	4

**Sensors based early warning system** has been developed by Department of Disaster Management with the support of earth network, established 8 sensors in 07 districts. Early warning alerts about lightning can be received in any part of state before 30-35 minute before. The early warning alerts being disseminated to community through SMS.

**Through Indravajra mobile app** the lightning alerts signals can be received before 40 minutes under the range of 20 kilometer. Awareness about downloading the Indravajra app from google play store is being disseminated among community and other stakeholders.

### 3.2.8 EPIDEMICS / PANDEMICS

Currently COVID19 has been reported as an epidemic globally. **Coronavirus disease 2019 (COVID-19)** is a contagious disease caused by a virus, the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). The first known case was identified in Wuhan, China, in December 2019. The disease quickly spread worldwide, resulting in the pandemic. Symptoms are variable, but often include fever, cough, headache fatigue, breathing difficulties, loss of smell, and loss of taste. Symptoms may begin one to fourteen days after exposure to the virus. At least a third of people who are infected do not develop noticeable symptoms. Of those people who develop symptoms noticeable enough to be classed as patients, most (81%) develop mild to moderate symptoms (up to mild pneumonia), while 14% develop severe symptoms (dyspnea, hypoxia, or more

than 50% lung involvement on imaging), and 5% develop critical symptoms (respiratory failure, shock, or multiorgan dysfunction). Older people are at a higher risk of developing severe symptoms. Some people continue to experience a range of effects (long COVID) for months after recovery, and damage to organs has been observed. Multi-year studies are underway to further investigate the long-term effects of the disease. COVID-19 transmits when people breathe air contaminated by droplets and small airborne particles containing the virus. The risk of breathing these is highest when people are in close proximity, but they can be inhaled over

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COVID 19 transmits when people breathe air contaminated by droplets and small airborne particles containing the virus. The risk of breathing these is highest when people are in close proximity, but they can be inhaled over longer distances, particularly indoors. Transmission can also occur if splashed or sprayed with contaminated fluids in the eyes, nose or mouth, and, rarely, via contaminated surfaces. People remain contagious for up to 20 days, and can spread the virus even if they do not develop symptoms.

Continuous rain and flood situation often lead to water logging situation and conducive environment for waterborne and vector borne diseases. However, the temperature during these monsoon months is not that favorable for multiplication of pathogens and probably that is the reason for any outbreak of diseases. However, the district has reported cases of dengue recently.

### 3.2.9 INCESSANT RAINS AND UNTIMELY RAINFALL

Incessant and untimely rainfall create problem, which lead to uncomfortable situation for the people in the district. It has been observed that such incessant and untimely rains are occurring frequently in recent past. Climate change scientists associate such rainfall patternsto the climate change and its impacts.

Sr.No.	Month	General Rainfall Report	2020	2021	2022
01	January	11.80	4.50	0.00	10.40
02	February	12.30	8.00	0.00	29.60
03	March	10.70	21.70	0.00	00.00
04	April	17.30	84.80	0.00	00.00



05	May	41.50	77.50	272.50	44.30
06	June	144.20	269.70	381.80	137.00
07	July	256.80	145.20	166.00	131.90
08	August	289.20	144.80	184.70	117.20
09	September	198.80	309.7	95.30	Till 25-08-2022
10	October	79.10	17.80	21.50	
11	November	40.80	00.00	00.00	
12	December	2.20	00.00	00.00	470.40
Average Rainfall			1083.70	1311.80	39.20

### 3.2.10 ROAD ACCIDENTS

The National Highways 28 and 31 pass through the district and link this district to the other parts of the country. Its total length through the district is 95 km. State roads have a total length of 262 km. Ninety five percent of the total villages is linked to the rural and urban roadnetwork. The industrial area of Barauni and urban areas on Begusarai attract heavy traffic and is vulnerable to road accident to the heavy traffic density as well as narrow road. There is no major accident of oil refinery vehicle reported in the recent past.

Sr. No	Road Accident	Year	Death	Injured	Total Accidents
01	NH/SH	2021	22	09	31
02	NH/SH	2022	27	34	61

#### BLACK SPOT ZONE / ACCIDENT PRONE AREA IN BEGUSARAI

Serial No	Location of Black Spot	Police Station	Type of Road	Road is Under
1	Between Bihat Chandani Chowk to Railway Gumti	Barauni, Zero Mile, F.C.I	NH-31	NHAI
2	Har Har Mahadev Chowk	Town Police Station	NH-31	NHAI
3	Town Police Station Nigam Area Near B.P.School	Town Police Station	NH-31	NHAI
4	Khamhar	Mufassil	SH-55	RCD
5	Hardiya	Mufassil	SH-55	RCD
6	Rajauda	Mufassil	SH-55	RCD
7	Barauni 01 Near Notradame School	Teghra	SH	RCD
8	Genharpur To Noorpur	Teghra	SH	RCD
9	Pakthaul to Chilhay	Teghra	SH	RCD

*Figure 29: Road accidents vulnerability- Begusarai district*

### 3.2.11 Boat accidents and drowning

Boat tragedies in Begusarai district are closely associated with festivals, religious events that have large congregation of people for example Simaria ghat during Makar-Sankranti for holy bath in the Ganga River has threatening potential for any accident to happen due to drowning. There is one threat looming large in the district during festive month of Savan when kawarians especially “Dak Bam” take route for holy water offering to the temple in Devgarh. Data of past years shows that drowning in not only happened in rivers, whereas large number of drowning incident happened in ponds, ditches, abandoned water channels, canals etc. Data of drowning deaths of Begusarai districts in different blocks are shown below:

Sr.No.	Number of Blocks	Number of drowning deaths in different years				Total
		2018	2019	2020	2021 (Till November 2021)	
1	18	6	36	38	64	144

### 3.2.12 Snakebite:

Begusarai district is surrounded with rivers in which blocks like *Bachwada, Begusarai, Teghra, Barauni, Ballia, Sahebpur Kamal, Matihani and Samoh* lies at the bank of the rivers where incidents of snake bite is very common. Snake bite is also very common in the world. Every year 94,000–125,000 people dies due to snake bite. A common sign of a bite from a venomous snake is the presence of two puncture wounds from the animal's fangs. Sometimes venom injection from the bite may occur. This may result in redness, swelling, and severe pain at the area, which may take up to an hour to appear. Vomiting, blurred vision, tingling of the limbs, and sweating may result. Most bites are on the hands, arms, or legs. Fear following a bite is common with symptoms of a racing heart and feeling faint. The venom may cause bleeding, kidney failure, a severe allergic reaction, tissue death around the bite, or breathing problems. Bites may result in the loss of a limb or other chronic problems or even death.

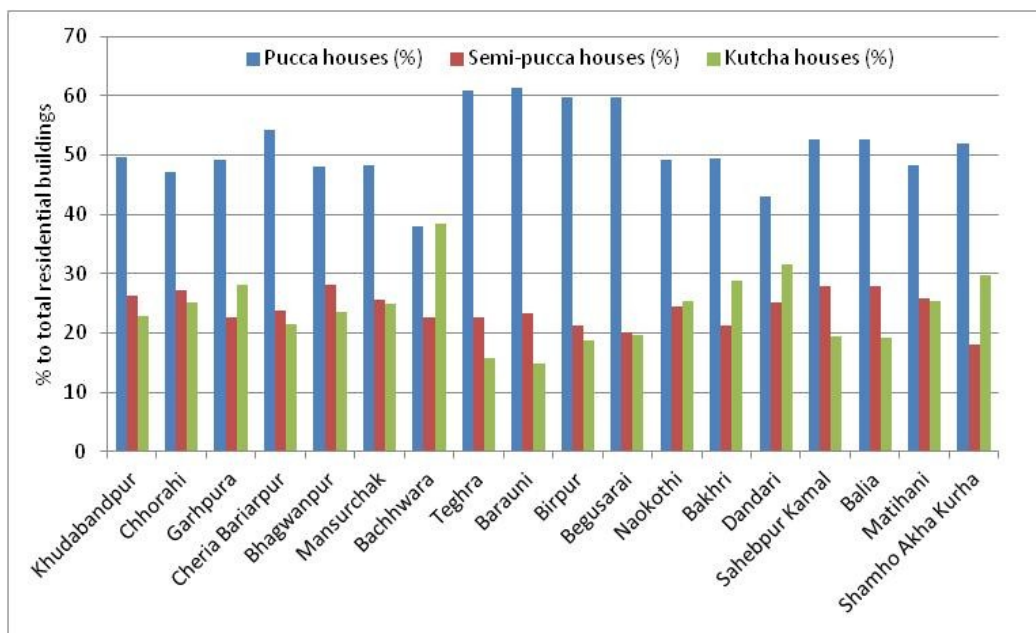
The outcome depends on the type of snake, the area of the body bitten, the amount of snake venom injected, the general health of the person bitten and whether or not anti-venom serum has been administered by a doctor in a timely manner. Problems are often more severe in children than adults, due to their smaller size. Allergic reactions to snake venom can further complicate outcomes and can include anaphylaxis, requiring additional treatment and in some cases resulting in death.

Snakes bite, both as a method of hunting, and as a means of protection. Risk factors for bites include working outside with one's hands such as in farming, forestry, and construction. Snakes commonly involved in envenomation's include elapids (such as kraits, cobras and mambas), vipers, and sea snakes. The majority of snake species does not have venom and kill their prey by squeezing them. Venomous snakes can be found on every continent except Antarctica. Determining the type of snake that caused a bite is often not possible. The World Health Organization says snakebites are a "neglected public health issue in many tropical and subtropical countries", and in 2017, the WHO categorized snakebite envenomation as a Neglected Tropical Disease (Category A). The WHO also estimates that between 4.5 and 5.4 million people are bitten each year, and of those figures 40-50% develop some kind of clinical illness as a result

### 3.2.13 Physical Vulnerability

Physical vulnerability refers to the degree to which a building or infrastructure would undergo damage or destroyed in a hazardous environment caused by hazardous events. As the district

is prone to floods and earthquake, it is important to understand the physical vulnerability of the buildings to assess the potential risk to the community.



*Figure 22: Distribution of buildings - Begusarai district*

The district has more pucca houses (average 53%) compared to kutchha and semi pucca houses. However, it needs detailed structural investigation to understand whether these pucca houses and commercial buildings follow engineering standards for zone IV potential earthquake events.

### 3.2.14 Socio- economic Vulnerability

The district has higher population density (1225 person per sq km) compared to the State average. The sex ratio shows there are less female compared to male (912 female per 1000male). The Sahebpur Kamal block has the lowest female numbers compare to male (873 female per 1000 male) with Mansurchak having the high of 932 female per 1000 males. In <6 yrs age group shows more female (924 female per 1000) indicating higher outmigration inthe district. The population <6 and >60 age group constitute about 24% of the totalpopulation of the district.

The district literacy rate is 47.98 with female literacy is much lower of 35.64. The schedule case and schedule tribe population of the district constitute to 12.3% of the total population.

All the hazards create a kind of fear among people of the district which may lead to increasein poverty and isolation of people in terms of migration from one village to other village.

As Begusarai district is prone to multi-hazards such as flood, drought, earthquake and other hazards that directly affect the livelihood of the people. Frequent occurrences of hazards can directly affect the agricultural productivity, which reduces the livelihood

options for villagers and thus their source of income remains non-permanent. As the vulnerability due to disaster situation persists, it has implications on the revenue of the district.

### 3.2.15 Environmental vulnerability

Begusarai district has agro-based, wood and wooden-based furniture, mineral based, electrical machinery, repairing and servicing, rubber plastic and petro-based industries. Barauni block has potential of environmental stress due to the high-density industrial activities. Apart from this, there are some pockets in the district particularly in Bachhwara, Teghra, Matihani and Samho Akha Kurha blocks, which has reported to have water logging problems. The water logging problem in the state is mainly due to the heavy siltation (silt being carried by the rivers), construction of roads and culvert blocking the passage of river.

Block wise vulnerability to hazards is presented in Table 9: Block-wise hazard vulnerabilities

*Table 9: Block-wise hazard vulnerabilities*

Block	Flood	Earthquake	Drought	Snake Bite	Cold Wave	Industrial/ Chemical hazards	Road/Rail Accidents	Epidemics
Bakhri		✓	✓	✓	✓		✓	✓
Garhpura		✓	✓	✓	✓		✓	✓
Naokothi		✓	✓	✓	✓		✓	✓
Balia	✓							
Dandari		✓	✓	✓	✓		✓	✓
Sahebpur Kamal	✓	✓	✓	✓	✓		✓	✓
Barauni	✓	✓		✓	✓	✓	✓	✓
Begusarai	✓	✓	✓	✓		✓	✓	✓
Birpur		✓	✓	✓	✓		✓	✓
Matihani	✓				✓		✓	✓
Shamho Akha Kurha	✓	✓	✓	✓	✓		✓	✓
Cheria Bariarpur		✓	✓	✓	✓		✓	✓
Chhorahi		✓	✓	✓				
Khudabandpur			✓	✓	✓		✓	✓
Bachhwara	✓	✓			✓		✓	✓
Bhagwanpur		✓	✓	✓	✓		✓	✓
Mansurchak		✓	✓	✓	✓		✓	✓
Teghra	✓	✓	✓	✓		✓	✓	✓

*Figure 23: Flood vulnerability map - Begusarai district*

### 3.2.16 INDUSTRIAL/CHEMICAL HAZARDS VULNERABILITY

<sup>9</sup> Ba Begusarai district has some key industrial units of the State. This district has some key

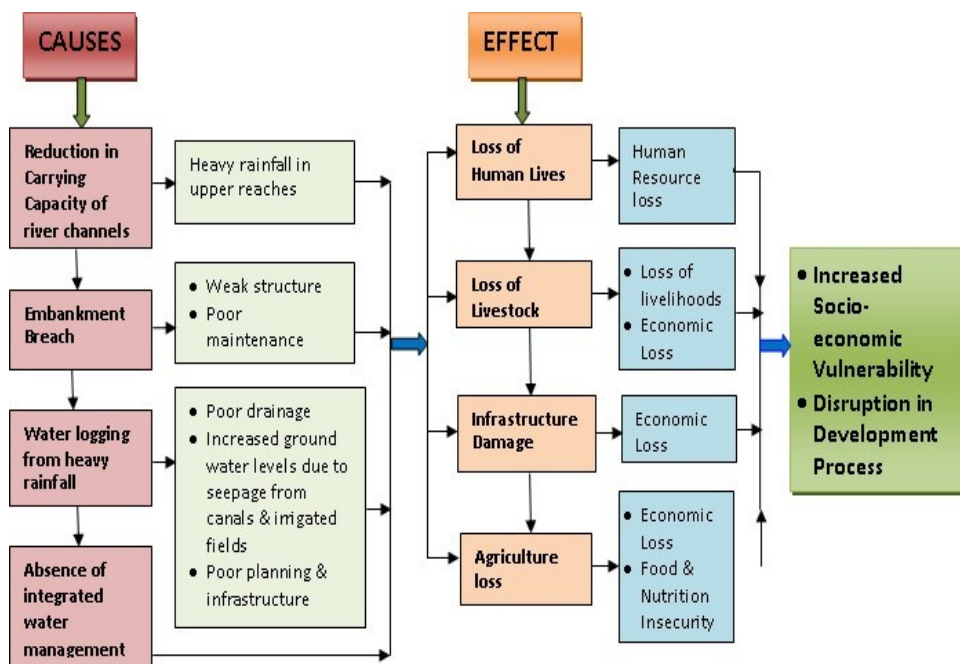
industrial units of the State including a unit of Indian Oil Refinery, Hindustan Fertilizer Limited and a thermal power station are located in the Barauni block, while other block like Begusarai, and Teghra are also has chemical hazard vulnerability. As these industries handle combustible materials and chemicals the block is highly vulnerable to industrial/chemical hazard. Considering the size of these industries as per the NDMA norms all these industry should have an onsite DM plan and mock drills. The following figure (Figure 27) represents the block wise vulnerability for industrial/chemical hazards.

### 3.2.1 RISK ANALYSIS

The risk analysis has been done in reference to last several incidents of disasters and deaths occurred due to those disasters those are mainly Flood, Lightning, Corona, Drowning , Snake Bite and Road Accidents,

The cause and effect assessment of the major hazards in Begusarai is provided below:

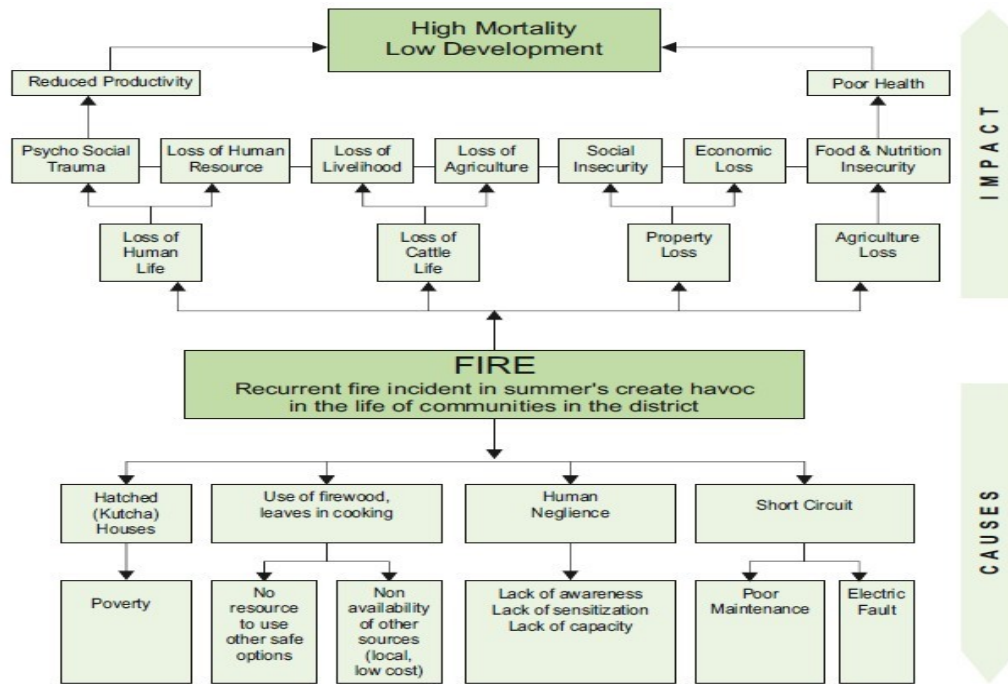
**For Flood:**



*Figure 30: Cause and effect relationship for flood*

For Fire:

Figure 31: Cause



Cause and effect relationship for Fire

For Drought

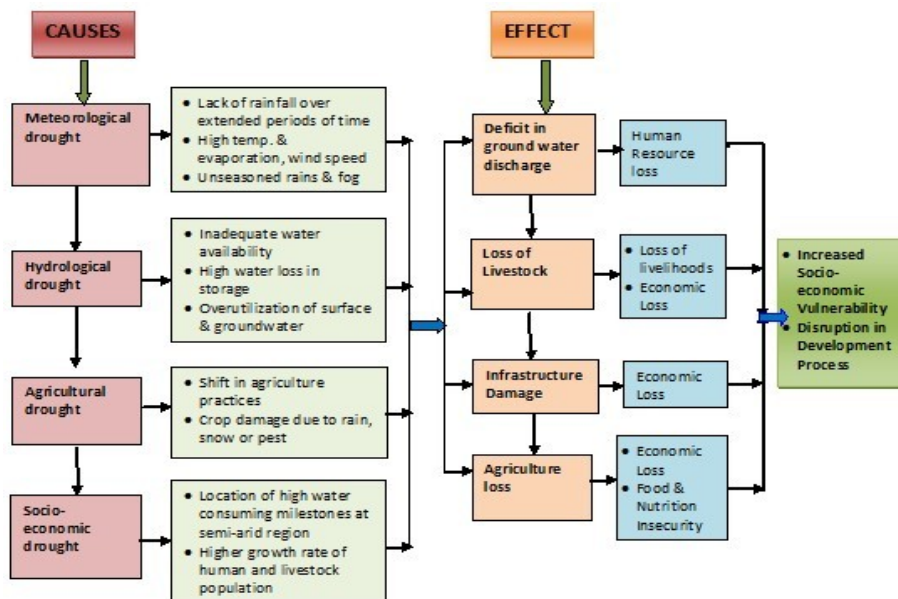


Figure 32: Cause and effect relationship for drought

## For Earthquake

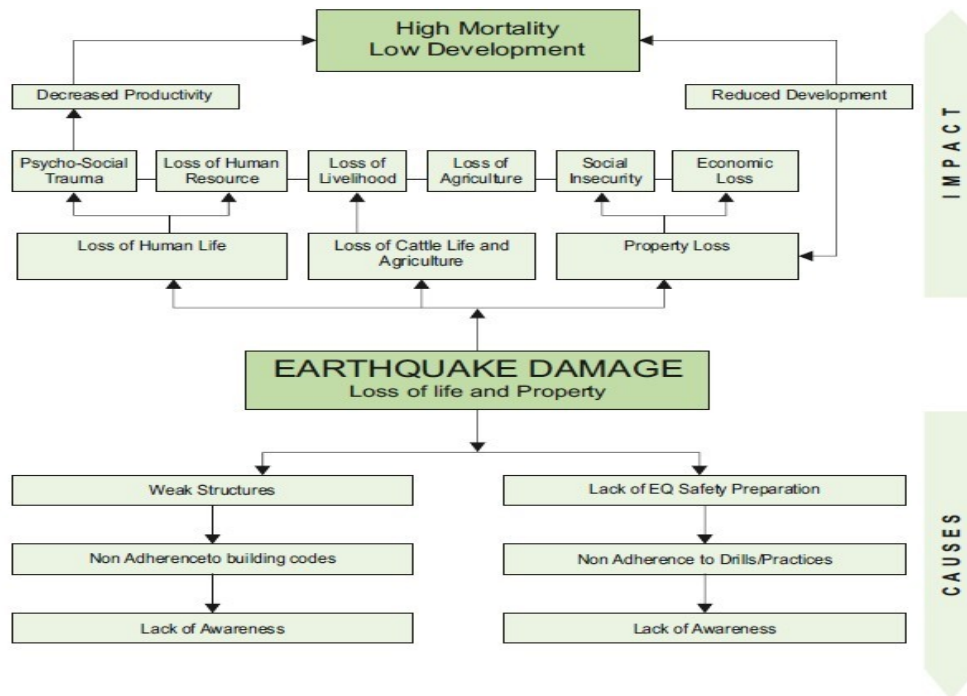


Figure 33: Cause and effect relationship for earthquake

### 3.1 Capacity Analysis

Capacity refers to the resources available with the district that can be used during disaster event for the safe living of the people in the district. The resources include human resource, skill, infrastructure and finance. In the present section, we have provided resource status of the key sectors, which are involved in pre, during and post disaster events. This gives insight for the district administration to manage resources during any disaster event or emergency situation and further requirement to increase capacity of the stakeholders to tackle disaster events. It is important to note that the demand of the key resources is directly related to the severity of disaster. In severe disaster situation, resources from other adjoining districts can be utilized in coordination with respective district administration. Further resources can be brought from the State level in order to handle severe disaster events. The key resources available within the district are provided in Table 12. Further details of capacities are collated in the Annexure section 12.2.

**BSDRN** is a portal of resources aims essentially to serve as a state repository of database for emergency/disaster management and to assist the stakeholders/Administration at various levels in preparedness and emergency situation. Data available at appropriate scales to emergency response managers at all levels. Bihar State Disaster Resource Network is a web based platform for managing the inventory of equipment, skilled human resources and critical supplies for emergency response. Primary focus of the portal is to enable the decision makers to find information on availability of



equipment and human resources required to combat any emergency situation. This database also enables managers to assess the level of preparedness for specific disasters. Main objective of BSDRN is to build up a systematic inventory of equipment and skilled human resources so that disaster managers easily can find the location and details of the resources for immediate and effective response within Golden hour for minimizing deaths. SDRN will be accessible by the Emergency Officers, District Collectors, Relief Commissioners and other disaster managers at various levels of Government.

*Table 12: Key resources available with district*

<b>Infrastructure</b>	<b>Quantity</b>	<b>Infrastructure</b>	<b>Quantity</b>
<b>Health</b>		<b>Banks</b>	
Civil Hospital	01	Commercial banks	66
Sub-Divisional Hospital	04	Cooperative banks	09
Referral hospitals	02	<b>Police</b>	
PHC	18	Police posts	20
APHC&HSC	22& 292	Police stations	37
Major Private Hospital	25	<b>Fire stations</b>	
Major Clinics	08	Fire stations	06
Ambulance Services	35	<b>Roads</b>	
Blood Banks	02	National highways	NH 31 (46km)
Veterinary Hospitals	27	State highways	180km
<b>Education</b>		Main district roads	69
Primary schools	745	Other roads	950
Middle schools	746	<b>Others</b>	
Senior secondary schools	234	Petrol pumps	92
Higher Senior Secondary/Colleges	24	Kerosene Depots	04
<b>Communications</b>		PDS shops	1485



## 4 Institutional Arrangement

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Disaster Risk Management and governance is a cross-cutting issue requiring actions and interactions between various stakeholders at multiple levels and at different scales. The Hyogo Framework for Actions (HFA), 2005 paved the way for nations to lay down institutions with focus on disaster management. The DM Act 2005 provides for an effective institutional mechanism in India for drawing up and monitoring the implementation of disaster management plan for prevention and mitigating effects of disasters and for taking a holistic, coordinated and prompt response to any disaster situation. Under Section 78 of the DM Act 2005, powers are conferred to the State Government for making rules to carry out the provisions of this Act and notify such rules in the official gazette. The basic responsibility of undertaking rescue, relief and rehabilitation measures in the event of natural disasters, as at present, is that of the State Governments concerned. The Central Government supplements the efforts of the States by providing financial and logistic support.

India has an integrated framework for risk-informed planning and decision making at the National, State, District and sub-district levels to help planners examine hazards and produce integrated, coordinated and synchronized plans:

**National Level:** The overall coordination of disaster management vests with the Ministry of Home Affairs (MHA). The Cabinet Committee on Security (CCS) and National Crisis Management Committee (NCMC) are the key committees involved in top-level decision making with regard to disaster management. The National Disaster Management Authority (NDMA) is the lead agency for preparation of National Disaster Management Plan and the execution of Disaster Management functions at national level.

**State Level:** The DM Act 2005 mandates each state government to establish a state disaster management authority (SDMA) that is responsible for planning for the development of a disaster resilient state. The SDMA under the Chief Minister of the state as the chairperson and other members nominated by the state authority is responsible for laying down policies and plans for disaster management in the State. A State Executive Committee consisting of the Chief Secretary to the State Government (as the chairperson) and four secretaries to the government of the State shall have the responsibility for implementing the National and State Disaster Management Plans and act as coordinating and monitoring body for management of disasters in the State.

**District Level:** According to the DM Act 2005, the following are to be established at the district level:

- **District Disaster Management Authority:** Section 25 of the Disaster Management Act 2005, emphasized that every State Government shall establish a District Disaster Management Authority in each district. District Disaster Management Authority is functional in Begusarai district. The structure of the DDMA is mentioned in section 4.1.
- **District Emergency Operations Centre:** The DEOC is the central point of activities in a disaster situation in the district apart from its routine normal time activities. The EOC should have the flexibility to expand when demand increases and contract when the

situation comes to normalcy. It is connected with SEOC in the upstream (which further connects to National EOC) and other EOC(s) in the downstream including other field offices during emergencies (Further details about the functioning of the EOC is provided in section 4.4). The DDMA is the prime agency responsible for issuing disaster warnings at district level. The DDMA issues warnings through the DEOC. Agencies responsible to issue the warnings should issue the warning before any disaster. However, disasters can also take place without any warning such as Earthquakes, flash floods & man-made disaster. The preparedness action plan is crucial in order to safeguard the lives and properties.

Other institutional arrangement that could be utilized for disaster management include:

- **Local Self Government:** Local Self Government includes Panchayati Raj Institutions (PRIs), Municipal bodies, District and Cantonment Boards and Town Planning Authorities, which control and manage civic services. These bodies prepare DM Plans in consonance with the guidelines of NDMA, SDMA and DDMA. This also ensures capacity building of their officers and employees for managing disasters, and to carry out relief, rehabilitation and reconstruction activities in the affected areas.
- **Public-Private Partnerships:** Development activities involve both private and public enterprises. To mitigate disasters and create better prepared society for disasters and other hazards, strong public-private coordination is critical. In order to achieve community resilience and preparedness, public and private owners of critical infrastructures and key resources like manpower, technical expertise & equipment need to work together, before, during and after a disaster. The key issue is to recognize and embrace the public-private interfaces that can improve the ability of a community to manage the response and recovery phases of disaster management. There are several non-governmental organizations- international, national, and local, actively working in the district on various issues related to disaster management such as capacity building, preparedness, intervention, rehabilitation, etc. DDMP in this regard spells out clear role and responsibilities of both Public and Private Sector. Private sector must be involved closely into community development and organization of mock drills etc. A resource inventory be maintained indicating the capabilities in terms of human, equipment and infrastructure both in public and private sectors.<sup>6</sup>

## 4.1 District Disaster Management Authority

Under section 25 of the DM Act 2005, every state government shall by notification in the official gazette, establish a district disaster management authority (DDMA) for every district in the State. The DDMA shall consist of the following members, *not exceeding seven*, as prescribed by the state government, and unless the rules otherwise provide:

Members of the DDMA	Particulars
<b>Chairperson</b>	Collector or District Commissioner
<b>Co-Chairperson</b>	Elected representative of the local authority, ex officio <ul style="list-style-type: none"> <li>In Tribal Areas, VI Schedule to the Constitution, the Chief Executive Member of the district council of autonomous</li> </ul>

Members of the DDMA	Particulars
	<ul style="list-style-type: none"> <li>district</li> <li>Where Zila Parishad exists, the Chairperson of Zila Parishad</li> </ul>
<b>Chief Executive Officer of the district authority</b>	The state government shall appoint an officer not below the rank of Additional Collector or Additional District Magistrate or Additional Deputy Commissioner, as the case may be, of the district to be the Chief Executive Officer of the District Authority, ex officio
<b>Superintendent of Police of district</b>	Ex officio
<b>Chief Medical Officer of district</b>	Ex officio
<b>Two other district level officers</b>	To be appointed by the state government
<b>Chairperson of Zila Parishad</b>	Co-Chairperson of District Authority

According to the DM Act 2005, the District Authority shall meet as when necessary and at such time and place as the Chairperson may think fit. The Bihar DRR Roadmap (Roadmap for Disaster Risk Reduction (2015-2030), 2016) lays down specific actions of the District Authority.

#### 4.1.1 POWERS AND FUNCTIONS OF DISTRICT AUTHORITY

The District Authority shall act as the district planning; coordinating and implementing body for disaster management and take all measures for the purposes of disaster management in the district in accordance with the guidelines laid down by the National Authority and State Authority.

The following are the powers and functions of the District Authority (as per clause 30 of the DM Act 2005).

The Nation Disaster Management Act 2005, Clause 41 specifies the function of local authorities in regards to Disaster Management. It enlists following functions:

1. Ensure that its officers and employees are trained for disaster management;
2. Ensure that the resources relating to DM are so maintained as to be readily available for use in the event of any threatening disaster situation or disaster;
3. Ensure all construction projects under it or within its jurisdiction conform to

**Preparedness and prevention phase:**

- |  |  |
|--|--|
| <ul style="list-style-type: none"> <li>i. Prepare District Disaster Management Plan (DDMP) including district response plan for the district</li> <li>ii. Coordinate and monitor the implementation of the national policy, state policy, national plan, state plan and district plan</li> <li>iii. Ensure that areas in the district vulnerable to disasters are identified and measures for the prevention of disasters, mitigation of efforts are undertaken by the departments of the Government at the district level as well as by the local authorities</li> <li>iv. Ensure that the guidelines for prevention of disasters, mitigation of its effects, preparedness and response measures are followed by all departments of the government at district level and the local authorities in the district</li> <li>v. Give directions to different authorities at the district level and local authorities for preparing, mitigating, responding to disaster events</li> <li>vi. Lay down guidelines for disaster management plans by the department of Government at the district level and local authorities in the district</li> <li>vii. Monitor the implementation of disaster management plans prepared by the Departments of the Government at district level</li> <li>viii. Lay down guidelines for mainstreaming disaster risk reduction into the development plans and projects of the departments of the Government at the district level</li> <li>ix. Monitor the implementation of measures in clause (viii)</li> <li>x. Review the state of capabilities for responding to any disaster or threatening disaster situation in the district and give directions to the relevant departments or authorities for upgradation as may be necessary</li> <li>xi. Review preparedness measures and give directions to the concerned departments at district levels or other concerned authorities where necessary for bringing the preparedness measures to the levels required for responding effectively to any disaster or threatening disaster situation</li> <li>xii. Organize and coordinate specialized training programmes for different levels of officers, employees and voluntary rescue workers in the district</li> <li>xiii. Facilitate community training and awareness programmes for prevention of disaster or mitigation with the support of local authorities, governmental and non-governmental organizations</li> </ul> | <p>4. prevention of disasters and mitigation by National Authority, State Authority and District Authority; and Carry out relief, rehabilitation and reconstruction activities in the affected area in accordance with the State Plan and District Plan.</p> |
|--|--|

**Mitigation phase:**

- i. Set-up, maintain, review and upgrade the mechanism for early warnings and dissemination of proper information to public
- ii. Prepare, review and update district level response plans and guidelines
- iii. Coordinate response to any threatening disaster situation or disaster

- iv. Ensure that the departments of Government at the district level and the local authorities prepare their response plans in accordance with the district response plans
- v. Lay down guidelines for, or give direction to, the concerned department of the government at the district level or any other authorities within the local limits of the district to take measures to respond effectively to any threatening disaster situation or disaster
- vi. Advise, assist, and coordinate the activities of the departments of the government at the district level, statutory bodies, and other governmental and non-governmental organizations in the district engaged in the disaster management
- vii. Coordinate with, and give guidelines to, local authorities in the district to ensure that measures for the prevention or mitigation of threatening disaster situation or disaster in the district are carried out promptly and effectively
- viii. Provide necessary technical assistance or give advice to the local authorities in the district for carrying out their functions
- ix. Review development plans prepared by the departments of the government at the district level, statutory authorities or local authorities with a view to make necessary provisions therein for prevention of disaster or mitigation
- x. Examine the construction in any area in the district and, if it is of the opinion that the standards for the prevention of disaster or mitigation laid down for such construction is not being or has not been followed, may direct the concerned authority to take such action as may be necessary to secure compliance of such standards
- xi. Identify buildings and places which could, in the event of any threatening disaster situation or disaster, be used as relief centers or camps and make arrangements for water supply and sanitation in such buildings or places
- xii. Establish stockpiles of relief and rescue materials or ensure preparedness to make such materials available at short notice
- xiii. Provide information to the State Authority relating to different aspects of disaster management
- xiv. Encourage the involvement of non-governmental organizations and voluntary social-welfare institutions working at the grassroots level in the district for disaster management
- xv. Ensure communication systems are in order, and disaster management drills are carried out periodically
- xvi. Perform such other functions as the State government or State Authority may assign to it or as it deems necessary for disaster management in the district

#### **Response and recovery phase:**

- i. Give directions for the release and use of resources available with any Department of the Government and the local authority in the district
- ii. Control and restrict vehicular traffic to, from and within, the vulnerable or affected area
- iii. Control and restrict the entry of any person into, his/her movement within and departure from, a vulnerable or affected area
- iv. Remove debris, conduct search and carry out rescue operations
- v. Provide shelter, food, drinking water and essential provisions, healthcare and services

- vi. Establish emergency communication systems in the affected area
- vii. Make arrangements for the disposal of the unclaimed dead bodies
- viii. Recommend to any Department of the Government of the State or any authority or body under that Government at the district level to take such measures as are necessary
- ix. Require experts and consultants in the relevant fields to advise and assist as it may deem necessary
- x. Procure exclusive or preferential use of amenities from any authority or person
- xi. Construct temporary bridges or other necessary structures and demolish structures which may be hazardous to public or aggravate the effects of the disaster
- xii. Ensure that the non-governmental organizations carry out their activities in an equitable and non-discriminatory manner
- xiii. Take such other steps as may be required or warranted to be taken in such a situation

## 4.2 Local Self Government - Panchayati Raj Institutions

The local self-government or Panchayati Raj Institutions (PRIs) established under the 73<sup>rd</sup> and 74<sup>th</sup> amendment to the Constitution are statutory bodies with its members elected by the local people through democratic processes. The elected members of these institutions are accountable to the people of their respective wards, blocks, and Panchayat areas. Owing to its proximity to the community, universal coverage, and the capacity for social mobilization for community based management approaches, the PRIs are an important component of disaster risk management.

### Preparedness and prevention

- Organizing awareness campaigns
- Promoting community education on disaster preparedness
- Community based preparedness plan and emergency response plans development
- Identifying resource gaps and opportunities for capacity development
- Establishing synergies with NGOs and CBOs
- Mainstreaming disaster risk reduction in development planning and in development projects
- Encouraging community to insure assets and livestock
- Formation of task forces and develop capacities for disaster response
- Development and implementation of local bye laws for disaster risk mitigation

### Response and Recover

- Emergency communication through available resources
- Assisting in evacuation to temporary shelters and in the establishment and functioning of relief camps
- Supplementing rescue and relief operations, mainly coordinating with responding agencies
- Monitoring relief distribution and ensuring relief reaches the most needy
- Assisting in the safe disposal of carcasses and arranging safe drinking water and sanitation

### Mitigation

- Assist in damage and loss assessment
- Assisting in the formulation of rehabilitation and reconstruction plans
- Ensure reconstruction is risk informed and complying to local requirements for disaster resilient infrastructure
- Supervise and monitor long-term recovery and risk mitigation projects

## 4 . 2 TRAINING PROGRAMS

In view to build the capacity of various stakeholders of Begusarai district following Training programme conducted by Bihar State Disaster Management Authority :

Sr. No.	Programme Name	No. of Participants
1.	Management of Animals in Emergencies Training of Veterinary Doctors	28
	Training of Livestock Assistant	10
2.	Training of PRI Memmbers on DRR	34
3.	Training of Master Trainers for Jeevika Didis Training	06
4.	Training of District Panchayat Officers	06
5.	Training of Engineers for construction Earthquake safe housing	29
6.	Training of Masons for construction Earthquake safe housing	527
7.	Training of Master Trainers for boatmen and boat owners training	5
8.	Training of boatmen and boat owners at community level	125
9.	Training of master Trainers under safe swim Programme	19

The following training programmes are recommended for the gram Mukhiyas and ward members of the Panchayati Raj Institutions (Panchayats and the urban local bodies (ULBs)):

*Table 13: Training plan for PRIs*

Learning Unit	Key concepts	Training duration
Disaster, Development and Climate Change	<ul style="list-style-type: none"> <li>• Examine critical linkages between development and disasters in the context of disaster risk management and climate change</li> <li>• To develop an understanding of how development models contribute to exacerbating disaster vulnerabilities and risk</li> <li>• Understanding vulnerabilities and capacities with specific focus on marginalization, gender, disability</li> <li>• To develop solutions towards development measures that could possibly pre-empt and mitigate disasters</li> </ul>	4 sessions 1) DRR: a conceptual overview 2) DRR and CCA 3) Planning for DRR and CCA integration 4) Mainstreaming DRR/CCA in development planning
Learning Unit	Key concepts	Training duration
Role of PRIs in implementation of development programmes	<ul style="list-style-type: none"> <li>• Roles and functions of PRIs in the implementation of development programmes at GP/ULB level</li> </ul>	Sessions: 1) Overview of major national developmental programmes at village/ULB level 2) Role of PRIs in implementation of national development programmes
Hazard, Risk, Vulnerability and Capacity Assessment and Mainstreaming Disaster Risk Reduction/Climate Change Adaptation into Development	<ul style="list-style-type: none"> <li>• Participative assessment of specific disaster risks</li> <li>• Exploring areas of integration of risk assessments to development programmes</li> </ul>	Sessions: 1) HRVCA: What, Why and How? 2) HRVCA: in a real life situation in a village



Programmes		
Role of PRIs in Disaster Management and Community Based Disaster Risk Management (CBDRM) Planning	<ul style="list-style-type: none"> <li>• Basic concepts and approaches to CBDRM planning at village/ward level</li> <li>• Role of PRIs in various phases of Disaster Risk Management (with specific focus on emergency preparedness and response)</li> </ul>	<p>Sessions:</p> <ol style="list-style-type: none"> <li>1) Role of PRIs during various phases of DRM</li> <li>2) CBDRM planning: What, Why and How?</li> </ol>

The Mukhiyas and ward members trained will help in further training other Gram Panchayat members and members of ULBs thereby aiding in awareness generation and mainstreaming disaster risk reduction into development planning.

The District Authority will maintain a list of individuals who have undergone training and shall constantly strive to ensure all elected members of the PRIs are provided necessary training for mainstreaming disaster risk reduction in development programmes.

### 4.3 Community Based Organizations

Community based organizations (CBO) are an important part of disaster risk management. CBOs are public or private non-profit organizations that is representative of the community or of a significant segment of the community and is typically engaged in the satisfaction of emergent needs of the community. The CBO include research based organizations, religious institutions, and professional associations. Their major contribution to the nation is in the development of marginalized communities especially in the backward areas. They provide flexibility of operations in the field especially in awareness building, community level preparedness and capacity building of communities. They offer specific advantages in various stages of disaster risk management, especially in relief activities including distribution of relief items, and in the long-term recovery post disasters.

Following community based organization is functional in the Begusarai district:

- Sarvyapi Janshyog Shiksha Seva Sansthan, Begusarai
- Society for Bright Future, Begusarai

The roles and responsibilities of CBOs in disaster risk management are outlined below:

### **Preparedness and prevention**

- Understanding disasters and their effects/ impacts on the community
- Assisting in the preparation of preparedness plans
- Assisting in the development and implementation of mitigation measures
- Assist the PRIs and the State in performing disaster risk and vulnerability analysis
- Ensuring resource assessment and mobilization of resources for disaster risk management
- Assist in proper implementation of CSR towards disaster risk management
- Assist in improving insurance penetration in the community

### **Response and recovery**

- Assist in the search, rescue and evacuation measures
- Assist in the provision of shelter for disaster affected communities
- Assist in the provision of first aid and psychological first aid
- Assist in the distribution of relief items (food and non-food items including fodder)
- Assist in debris clearance
- Assist in the movement of injured to hospitals
- Assist in the safe disposal of carcasses and dead bodies

### **Mitigation**

- Assist in damage and loss assessment
- Assisting in the formulation of rehabilitation and reconstruction plans
- Ensure addressing community vulnerabilities is an important component of post disaster recovery plans
- Ensure the protection and uplifting of the most vulnerable, mainly women, children, aged and differentially abled post-disasters

## **4.4 District Emergency Operation Centre**

The Standard Operating Procedure for Responding to Natural Disasters (Disaster Management Division, MHA, GoI, 2010) requires the district to set up a District Emergency Operation Centre (DEOC) and provide adequate manpower for manning them on 24\*7 basis round the year and arrange training for the EOC staff on EOC operations. The District Emergency Operation Centre (DEOC) is the hub of activity in a disaster situation in the district. This is, however, not to underestimate its normal time activities. The DEOC should have the flexibility to expand when demand increases and contract when the situation comes to normalcy. The DEOC is connected with State EOC in the upstream (which further connects to National EOC) and other EOC(s) in the downstream including other field offices during emergencies.

The primary function of the DEOC is to assist the DDMA to implement the DDMP, which includes coordination, data collection, operation management, record keeping, public information and resource management.

For the effective management of resources, disaster supplies and other response activities, focal points or centers will have to be established. These points will have to be well networked starting from the State to the District and finally leading to the disaster site.

- Emergency Operations Centers at the State (SEOC/SEC) and the District (DEOC) and Incident Command Post (ICP) at the disaster site are the designated focal points that will coordinate overall activities and the flow of relief supplies from the State.
- The District Emergency Operations Centre (DEOC) will be maintained and run round the clock, which will expand to undertake and coordinate activities during a disaster. Once a warning or a First Information Report is received, the DEOC will become fully operational.
- **During a disaster situation**, the DEOC will be under direct command of the District Magistrate or the designated person by him as the Chief of Operations.
- **During non-disaster times**, the District Emergency Operations Centre stays operational through-out the year in preparedness mode, working during day time in order to take care of the extended preparedness activities of data management, staff awareness and training, which is essential for the smooth functioning of the DEOC during crisis situations and handling of emergency Toll Free Contact Lines. Other functions during non-disaster times are:
  - Serve as repository of DM plans
  - Maintain list of inventory along with contacts, important maps and satellite imagery, demographic data at block and lower levels
  - Other critical information that might be required during disaster response.
- **During an emergency**, the DEOC will get upgraded and will have all emergency stakeholders operating it round the clock.

## Functions of DEOC

The DDMA is the prime agency responsible for issuing the disaster warning at the district level through the DEOC. Additionally, the local technical agencies authorized to issue warning will also communicate the same to the DEOC and State Emergency Operation Centre (SEC) for further actions. Agencies responsible to issue the warnings should issue the warning before any disaster. However, disasters can also take place without any warning such as Earthquakes, flash floods & man-made disaster. The preparedness action plan is crucial in order to safeguard the lives and properties.

During non-disaster time, the DDMA will ensure that the following activities are being carried out in coordination with the concern line departments:

### Pre-Disaster Warnings and Alerts

The existing control rooms for flood relief and other disaster relief system can be used for disasters like wind storms, lightning and thunderclap. **Indravajra App** is now very much effective and efficient for giving pre lightning alerts which gives alert at 30 to 40 minutes prior any lightning situation Any public can install and use this app for safety purposes. By receiving alerts from the **Indravajra App** we can make maximum people alert through further downward communication by sharing the alert to masses. Here the information desk of the Incident Command System (ICS) will play an important role. It should be ensured that the warning system is easy to operate, reaches a large number of people simultaneously and take little or no maintenance at all. If any electrical equipment is involved, power supply should be ensured and there should be provisions for backup supply. In addition, it should be checked at regular interval to ensure its working at the time of need. Often animals exhibit different kind of behavioral patterns prior to the onset of disasters like flood and earthquake. These patterns should be studied and integrated in the awareness program for communities.

For any information received on likelihood of disasters such as Floods, Droughts, Fire, Epidemics (Human/Animal), Industrial, etc DDMA should carry out the following activities:

- Activate the DEOC
- Based on early warning received, prepare initial information report with estimation of likely severity and scale of disaster.
- The ESF (Emergency Support Functions) will be asked to conduct a review of the preparedness level of the districts likely to be affected by the disaster, by calling a meeting of District DMCs (Disaster Management Committees).
- Prepare a team for deployment to assess damage and need.
- Inform respective departments to activate respective SOPs
- Inform the recognized national and international organizations.
- Provide appropriate warning to public.
- Coordinate with district authorities on dissemination of warning to public and if necessary, carry out evacuation.
- Request DDMA to be on standby for rescue and relief operations. If required, declare de-warning.

The NDMP (National Disaster Management Plan, 2016) specifies that the following officers shall be the Operations Section Chief (OSC) for corresponding incidents:

Incident	Operations Section Chief
Fire	District Fire Officer
Health related issue	District Chief Medical Officer
For other incidents	Police / Armed Forces/SDRF

The OSC shall coordinate with the Responsible Officer (the District Magistrate) in handling the DEOC.

The following points would help in an effective functioning of the DEOC (Department of Disaster Management, Government of Bihar, 2012):

- 1) Even with advancement in technology, coordination still remains a big challenge
- 2) The successful working of an EOC is in its effectiveness of disseminating information and to work as a medium for linkage for information flow between the state, district, blocks and Panchayat/ULBs
- 3) The EOC needs to be sustained and strengthened even during non-disaster times
- 4) It is extremely important to update databases and maps of basic life support services on regular basis (annually) at the EOC
- 5) The Bihar Institute of Public Administration and Rural Development (BIPARD) can be involved for providing training on EOCs and for imparting operational technicalities to the concerned/ nominated officials handling the EOCs
- 6) Regular workshop for Additional District Magistrate and the District Magistrate for ensuring accountability to disaster management
- 7) GIS based decision support system would help the EOC in effective functioning

## 4.5 Coordination Mechanism

This section deals with the coordination required at district level for disaster risk management. The necessary meetings and steps to be initiated by the DDMA in pre-during and post crisis-situations are listed below:

### 4.5.1 PRE-CRISIS SITUATION COORDINATION

1. Quarterly meet of DDMA with district staff involved in disaster risk management to discuss proceedings, challenges and solutions
2. Half-yearly meet of DDMA, district staff involved in disaster risk management and CBO's to discuss disaster risk reduction measures and support required
3. Pre-monsoon meet of DDMA, officials, irrigation / agriculture department, dam maintenance for flood preparation
4. Pre-festival meet of DDMA, officials, police department, traffic police, and trustees of the

- temples/mandirs, etc. for crowd management
- 5. Quarterly meet of DDMA with officials, police, hospitals, road department to identify pre-positioning of capacities and mitigation measures for reducing accidents
- 6. Pre-monsoon meet of DDMA, officials and health department for identifying potential hotspots for epidemics and for discussing mitigation measures
- 7. Pre-monsoon meet with concerned officers of
- 8. NDRF/SDRF and Army for preparation and establishing norms for coordination during disaster events

#### 4.5.2 DURING-CRISIS SITUATION COORDINATION

1. Mobilization of Incident Response System (DEOC) for coordination for all incidences
2. Rapid Needs Assessment coordination with cluster agencies and inter-agency groups (such as Sphere India) for effective response during disaster events and convergence of relief and rescue operations

The coordination mechanism is inherently dependent on the level of the unfolding disaster. The following section focuses on the levels of disasters, and the coordination that would be required with the nodal agencies for early warning of hazards:

##### 4.5.2.1 Level of Disasters

According to the National Disaster Management Plan (NDMP) (National Disaster Management Plan, 2016), disaster management and its planning must take into account the vulnerability of the disaster affected area and the capacity of the authorities to deal with the crisis situation. The NDMP categorizes disasters into the following four levels:

- Level L0: Period of normalcy, to be utilized for disaster risk reduction
- Level L1: The level of a disaster that can be managed within the capabilities and resources at the district level. However, the state authorities will remain in readiness to provide assistance if needed.
- Level L2: This signifies the disaster situations that require assistance and active mobilization of resources at the state level and deployment of state level agencies for disaster management. The central agencies must remain vigilant for immediate deployment if required by the state
- Level L3: This corresponds to a nearly catastrophic situation or a very large-scale disaster that overwhelms the State and District authorities.

### 4.5.3 POST-CRISIS SITUATION COORDINATION

1. DDMA meeting with officials for carrying out detailed post disaster needs assessments as per National Institute of Disaster Management's Post-Disaster Needs Assessment (PDNA) framework (District Level Committee)
2. DDMA meeting with government departments in the district for recovery planning post disaster event
3. DDMA meeting with NGOs, Private organizations in the district for coordination and convergence of efforts towards recovery of disaster affected communities
4. Quarterly meetings with government departments in the district for proceedings as per recovery plans identified

## **5 Prevention, Mitigation and Preparedness Measures**

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### **Disaster Prevention**

Disaster prevention includes actions that reduce risk from natural or man-made disaster events. Prevention measures like building codes, flood water management plan, catchment area zoning and management plan, etc. are required. These measures can be planned and implemented by Begusarai district, as a part of prevention and reducing disaster impacts. It is required to list and elaborate all types of measures.

Long term prevention and mitigation goals should be in place and these goals should be connected with measures that district has planned and implemented. These goals may include (but not limited to):

- Provide better early warning mechanisms for flood, cyclonic winds/strong winds, heat/cold waves
- Reduce the destruction and loss of life within buildings by monitoring construction practices and materials as per local bye-laws
- Provide for safer environments for transportation systems
- Reduce flooding in populated areas
- Ensure resilient water supply systems
- Reduce environmental degradation and restoration of livelihoods
- Reduce effects of the natural environment on the infrastructure
- Ensure resilient power systems for critical facilities such as government buildings, hospitals, etc.
- Ensure adequate manpower and materials are available for maintenance of critical facilities

Protection reduces or eliminates threat to people, property and the environment. Primarily focused on adversarial incidents, the protection of Critical Infrastructure and Key Resources



(CIKR) is vital to local districts, national security, public health & safety and economic vitality. Protection includes actions or measures taken to cover or shield assets from exposure, injury or destruction. Protective actions may occur before, during or after an incident and prevent, minimize or contain the impact of an incident.

**WORK DONE IN ACCIDENT PRONE AREA OF BEGUSARAI TO MINIMIZE RISK OF ACCIDENT**

Serial No	Location of Black Spot	Work Done	Type of Road	Road is Under
1	Khamhar	Rumble Strip,Zebra Crossing,Speed Limit Board Placed	SH-55	RCD
2	Hardiya	Rumble Strip,Zebra Crossing,Speed Limit Board Placed	SH-55	RCD
3	Rajauda	Rumble Strip,Zebra Crossing,Speed Limit Board Placed	SH-55	RCD
4	Barauni 01 Near Notradame School	Rumble Strip,Zebra Crossing,Speed Limit Board Placed	SH	RCD
5	Genharpur To Noorpur	Rumble Strip,Zebra Crossing,Speed Limit Board Placed	SH	RCD
6	Pakthaul to Chilhay	Rumble Strip,Zebra Crossing,Speed Limit Board Placed	SH	RCD
7	Barauni Block Chowk	Rumble Strip,Zebra	NH31	NHAI

		Crossing,Speed Limit Board Placed		
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## Disaster Mitigation

Disaster mitigation is the effort undertaken before any untoward event to reduce loss of life and property by lessening the impact of disasters. For mitigation strategies to be effective we need to take actions now - before the next disaster - to reduce human and financial consequences later. It is important to know that disasters can happen at anytime and anyplace and if we are not prepared, the consequences can be fatal. Effective mitigation requires that we understand local risks, address the hard choices, and invest in long-term community well-being. Without mitigation actions, we jeopardize our safety, financial security and self-reliance.

Mitigation measures are described as the strategies and interventions to reduce both the effect of the hazard and the vulnerable conditions. Therefore, mitigation activities can be focused on the hazard itself or the elements exposed to the threat. Mitigation plan involves both structural and non-structural mitigation measures<sup>7</sup>. Structural mitigation measures are the most traditional approach used to reduce disaster risk through proper engineering practices and physical construction to reduce or avoid possible impacts of hazards. Examples include designing electrical power systems and transportation infrastructure to withstand weather and earthquakes; sinking transmission lines for protection from cyclones and windstorms; and, building levees and dams to minimize floods. Other flood mitigation measures include: construction of floodways, spillways, hydraulic control structures, dykes, dams, control gates, drainage system improvements (including river-dredging) and flood detention basins. Non-structural mitigation measures are non-engineered activities that reduce the intensity of and vulnerability to hazards. Non-structural mitigation measures include such activities as land use planning and management; zoning ordinances and building codes; public education and training; and upstream and mountain reforestation. Numerous parties can implement non-structural mitigation measures: governmental authorities with the power to legislate and enforce building codes and zoning requirements; NGO's that initiate neighborhood loss-prevention programs; and private sector enterprises that provide incentives for loss-reducing measures.

Mitigation plan is very important part of the disaster management plan. Most of the time natural disaster event occurs at random and without any prior notice. In this light, the mitigation plan intends to reduce the risks of disaster. Begusarai district is prone to many disasters.

## Disaster Preparedness

DDMP of Begusarai is prepared after consultations with various stakeholders in the district. The experience gained on the basis of community consultations and field visits to the most vulnerable locations in the Blocks and GPs has

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helped incorporate ideas relevant to Begusarai district. This document also incorporates the best practices from different States in the country. Mainstreaming DRR concerns with the developmental works has also been suggested. To make DM plan more district specific, following institutions should take follow up actions:

### **5.1.1 DDMA**

Prepare a comprehensive contingency plan specific for each hazard in the district

- Prepare a detailed Hazard/Risk assessment incorporating all the relevant parameters
- Set up an EOC
- Ensure establishment of GP level task force/committee
- Periodic review of the DDMP and its annual updating as per district requirement
- Updating of data/information annually
- Form an advisory committee to ensure efficient discharge of its functions
- Ensure preparation of detailed Departmental DM Plan/SOPs in each Government department
- Prepare a checklist of resources available with all the District departments and local authorities
- Prepare a format for the deployment of initial assessment team
- Establish a District Disaster Response Force

### **5.1.2 EOC**

- Prepare a list of all the nodal Emergency Support Functions(ESF) and resources available
- Establish a permanent seat for each ESF in the EOC hall for emergency situation
- Prepare a list of manpower and equipment
- Prepare a List of all the roads and important infrastructures
- Prepare a list of safe shelters
- Prepare a list of all the means of communication and broadcasting
- Prepare a list of means of information broadcasting agencies with full address and proper documentation ESF
- Prepare a checklist of resources, tools, etc. available
- Prepare a format for minimum standard of resources, materials, etc. required
- Prepare a module to conduct training and mock drills
- Prepare a list of all the important contact numbers with full addresses

### **5.1.3 GOVERNMENT DEPARTMENTS**

- Prepare a Departmental DM Plan and SOPs
- Prepare a detailed Hazard/Risk assessment of the district considering all the relevant indicators
- Nominate the nodal officer for disaster management
- Prepare a format for collection of information and proper documentation

- Prepare a list of staffs with clearly defined roles and responsibilities
- Prepare a checklist of resources available within the department
- Prepare a list of the resources and materials required for effective functioning and procure these if there is a gap GP committee
- Nominate the members for each committee within 3 months of the release of DDMP
- Prepare a detail Hazard/Risk assessment.
- Clearly define the role and responsibility of each member
- Checklist of the resources available within the committee

#### **5.1.4 ROLE OF Stakeholders/ Line Departments / NYKS / NSS**

Several NGOs- national and international and Inter Agency Groups (IAGs) are active in the district which have played critical role in community capacity building on various issues related to disaster management, etc. Their roles are crucial for effective outreach to the communities and targeting actual beneficiaries in various phases of disaster management.

Local NGOs and CBOs, due to their proximity to the community, can act as a vital link between government and the community particularly during disaster. They are in a good position to understand the area and problems of the people and their flexibility in approach makes them more acceptable in the community.<sup>8</sup>

The role of NGOs and CBOs in disaster management will be in three stages (Table 14 and Table 15):

##### **Disaster Preparedness Stage**

Community awareness and capacity building

Community Based Disaster Management Planning.

Assisting and participating in preparation of disaster management plans at district, block, municipal and GP levels

Support in vulnerability assessment and mapping

Support in preparing mitigation strategy and plans; and assessments for structural and non-structural mitigation.

Support in policy review on disaster management

Reviewing and updating DM Plans

Documentation

##### **Disaster Response Stage**

Dissemination of early warnings

Evacuation, Search and Rescue operations

Relief distribution

Medical aid

Shelter from disaster

Immediate restoration

Relief to vulnerable population including women and children

Trauma Counseling

Coordination of Volunteers

Community mobilization

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Documentation

**Disaster Recovery Stage**

Restoration of damaged community structures (schools, hospitals, etc.)

Restoration of livelihood

Rehabilitation of vulnerable population

Restoration of environment

Managing emergent group activities

Recovery planning, coordination, evaluation

Documentation

**Table 14 : Main roles and activities of Line Departments during disaster management cycle, Begusarai district**

Disaster Preparedness Stage		
Key Components	Roles of Stakeholders/ Line Departments / NYKS / NSS	
	Community Level	District Level
Institutional Arrangements	Formation of Task Force	Facilitate formation and participate in district level task forces, Facilitate establishment of DDMA NGO Advisory Committee
Coordination Mechanism	Establishment of community level coordination mechanism	
Capacity Needs Analysis and Standardized Capacity building	Assessment of needs and capacities at community level Training and mock drills	Facilitate detailed assessment of current needs and capacities at district levels Facilitate training and mock drills to the concerned stakeholders
Hazard Monitoring, Forecasting, and Early Warning	Establish linkages with the stakeholders for hazard monitoring and early warning dissemination	
Information and Knowledge management and communication	Facilitate, support and establish mechanisms for information dissemination before, during and after disaster Collect, manage, process and share data during and post-disaster Research, develop, document and disseminate best practices, including traditional coping strategies for reproducibility and scaling up	

*Table 15: Disaster response and recovery stage - contribution of Line Departments*

Disaster Response and Recovery Stage		
Phase	Needs and Timely Action	Remarks
Disaster response phase	Search and rescue; first aid; disposal of dead bodies and animal carcasses; damage and needs assessment; relief mobilization and distribution; temporary shelter; registration; information management; coordination; etc.	Duration: 1-30 days (depending upon the extent and gravity of disaster)  Timely and appropriate response will depend on the preparedness and contingency planning put in place by the Government, NGOs, and CBOs.
Care, maintenance and recovery phase	Food, water, sanitation, health care, psycho-social care, education, livelihoods, training, coordination, etc.	Duration: depending upon the type of emergency.  (e.g., In flooding this might not exist while in case of big earthquake it might be couple of years. This is the phase before affected population can return to normalcy. It may also be called as transitional phase)
Reconstruction and long term recovery	Durable solutions for livelihoods, housing, skill-building, institution building, coordination, etc.	Duration: 2 to 5 years to restore the lives of people back to normalcy and establish all the institutions and infrastructure "better than pre-disaster days".

Source: References taken from various DDMPs of India.

### 5.1.5 OTHER STAKEHOLDER

Other stakeholders comprise public and private sectors including community, educational institutions, religious institutions, business establishments, traders, etc. which are also active in the district to supplement the efforts put in by the government and NGOs in various stages of disaster management.

The role of private sector in mitigation, prevention and preparedness is vital especially in industrial and chemical disasters. The formulation, maintenance and implementation of on-site and off-site plans for industries is of vital importance to ensuring a disaster resilient Begusarai district. Among private sectors, Media along with the Public Relation Officer who is an important part of the information desk in IRS can play an important role during disaster to provide important information as well as stop rumors. Hospitals in private sectors along with government hospitals can act as essential stakeholders due to their infrastructure and specialty.

The Indian Railways has a strong Disaster Management System in place, which can be looked upon as a model for the accident prevention in the district.

## 5.2 Disaster-wise functions of departments/agencies

The department specific functions for disaster management are tabulated in Table 16.

1. District Magistrate, Begusarai shall ensure that preparedness checklist is duly followed by each front line department and status of the same is discussed in monthly meetings
2. District Head of department of each frontline department shall ensure that the departments are prepared to meet the challenges of any emergency/ disaster by duly following the preparedness checklists
3. Nodal officers of each of the frontline departments shall ensure quarterly updation of District Disaster Management Resource Inventory (DDMRI) and submission of the same to District Revenue Officer, Begusarai
4. Adding to it any changes in the human resources of their department along with their updated contact numbers, if any
5. Adding to the equipment list, relevant resources for response activities from both the government and private sector
6. DRO shall ensure that the same has been updated and uploaded on website of District Administration on quarterly basis with the help of District Information Officer (DIO).
7. Nodal officers of each of the frontline departments shall also report to District Head of Department and/or District Magistrate, Begusarai about requisition of any relevant resource/equipment, not available with the Government and/or private sector, for disaster management activity
8. DDMA, Begusarai shall ensure the establishment of District Emergency Operation Centre, Begusarai with the following:
  - a. Proper space for Planning and Logistics Section Chief and staff
  - b. Proper space for control room with adequate communication equipment including landline telephones, mobile phones, satellite phones, walkie-talkie, ham radio, computer/ laptop with printer facility, email facility, fax machine, television, etc.
  - c. Ensure power backup facilities along with availability of generator set
  - d. Ensure proper space for meeting, conference, media briefing along with LCD, computer and video conferencing facilities
  - e. Availability of vehicle at Emergency Operation Centre
  - f. Availability of District Disaster Management Resource Inventory, Begusarai and also of the neighboring districts (Khagaria, Samastipur, Patna, Lakhirsarai, Munger), Disaster Management Resource Inventory of the state and also of critical national resources
  - g. Availability of Hazard Seasonality Map of Begusarai district
  - h. Availability of DDMP, Begusarai



Table 16: Main function of lead department during various phases of different disasters

Department / Agency	Prevention	Mitigation	Preparedness
Drought			
Department of Agriculture		<ul style="list-style-type: none"> <li>Identify hotspots and possible risk mitigation options to arrest long-term risk of flood and</li> </ul>	

Department / Agency	Prevention	Mitigation	Preparedness
Dept of Water resources	<p>Ensure proper functioning of all equipment including dewatering pumps. Ensuring filling of water ponds, lakes, storage tanks of PHED/ MC in the district with canal water prior to the onset of summer.</p>	<p>drought hazard</p> <p>Identify physical measures</p> <ul style="list-style-type: none"> <li>Ensure proper early warning mechanism in place for flood by monitoring water level of surface water bodies.</li> </ul> <p><b>Water Management:</b></p> <ol style="list-style-type: none"> <li>Construction of underground reservoirs to escape the impact of evaporation</li> <li>Conservation of floodwater in the branches of mainstreams and the network of rivulets</li> <li>Creation of Anicuts or check dams to hold water in the riverbeds and make it flow through the canals for irrigation purposes.</li> <li>Revival of ahar, pynes and pond systems of the past and maintain the same</li> <li>Digging of recharge wells and water harvesting structures to conserve water through rain water harvesting and by developing the culture of roof water</li> </ol>	<ul style="list-style-type: none"> <li>Ensure proper and timely inspection of conditions of bunds, siphons, regulators, embankments, inlet and outlets of lakes, drains/ nallah, channels and pump houses.</li> <li>Ensure timely de-silting and dredging of rivers and canals, if required.</li> <li>Ensure prompt repair of channels, if required. Prepare for the arrangements of clean drinking water for affected livestock and poultry.</li> <li>Ensure availability of ballies, and gunny bags/ECB.</li> </ul> <p>Ensure provision of back up supplies for dewatering or other operations.</p>

		<p>harvesting in each household.</p> <p>Spring water harvesting by diverting hill streams through small excavated channels, called KULS for irrigation and domestic use</p>	
Dept of Agriculture	<ul style="list-style-type: none"> <li>Constitute a Crop Weather Watch Group at district level (as per 'A Model Manual</li> </ul>	<ul style="list-style-type: none"> <li>Identify vulnerable areas prone to pest infestation, drought, flood and other hazards</li> <li>Ensure awareness generation in farmers</li> </ul>	<ul style="list-style-type: none"> <li>Prepare Agriculture Contingency Plan</li> <li>Identify source for procurement of fodder</li> <li>Prepare trained and equipped team for</li> </ul>

Department / Agency	Prevention	Mitigation	Preparedness
	<p>or Drought Management', Gol) with representatives from Meteorological Department and concerned officers dealing with agricultural inputs, credit extension, etc to keep a close watch on the monsoon situation, extreme temperature, hail and wind storm</p> <ul style="list-style-type: none"> <li>• Ensure proper mechanism for fodder management</li> </ul>	<p>regarding proper fodder management, various plant diseases, alternate cropping practices in disaster-prone areas, crop insurance, provision of credit facilities, proper storage of seeds, etc.</p> <ul style="list-style-type: none"> <li>• Provide training to farmers in alternate cropping techniques, mixed cropping and other agricultural practices which minimize crop losses during future disasters</li> <li>• Ensure surveillance for pest infestation and crop diseases</li> <li>• Ensure availability of stock for immediate replacement of broken/non-functioning gadgets/equipment</li> <li>• Ensure availability of adequate stock of seeds and other agro inputs particularly for areas vulnerable to hazards</li> </ul> <p><b>Soil Management:</b></p> <p>a. The use of organic fertilizers</p> <p>b. Afforestation</p> <p><b>Crop Management:</b></p> <p>Use of cropping patterns that help in soil conservation as well as in getting better farm yield:</p> <p>a. Strip cultivation:</p> <p>b. Cover Cropping</p> <p>c. Crop rotation</p>	<p>assessment of damage to soil, crop and forest and impact on other agricultural activities</p> <ul style="list-style-type: none"> <li>• Prepare for establishment of public information booths, with appropriate and modern means of communication, to assist farmers in providing information regarding insurance, compensation, repair of agro equipment and restoring of agricultural activities at the earliest</li> </ul>

		d. Alternate cropping	
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Department / Agency	Prevention	Mitigation	Preparedness
Dept of Animal Husbandry & Dairying			<ul style="list-style-type: none"> <li>• Arrange for fodder suppliers before impending drought season or floods</li> <li>• Ensuring cattle and poultry owners are aware of Do's and Don'ts with respect to handling livestock during drought events</li> <li>• Ensuring veterinary doctors and medicines are available for ready utilization during drought</li> </ul>

Department/Agency	Prevention/Mitigation	Preparedness
Earthquake		
District Administration		<ul style="list-style-type: none"> <li>• Awareness generation among the house owners about what details to look for or insist upon about the building, household fittings and equipment, in the houses they own or intend to purchase.</li> </ul>
Urban Development Department/ Rural Development and Rural Works		Capacity building of Architects/Engineers/Builders and even masons for construction of earth quake

Department/Agency	Prevention/Mitigation	Preparedness
Departments	<ul style="list-style-type: none"> <li>Guidelines both for earthquake-resistant constructions as well as for retrofitting have to be formulated with specifications about site selection, foundation, construction, materials and workmanship making involvement</li> </ul>	resistant houses/structures
Building Construction Department and other works departments	<ul style="list-style-type: none"> <li>Empanelment of specialist architects, trained engineers and masons for building earthquake resistant structures.</li> <li>Properly designed, engineered and constructed structures —residential, service or infrastructure — built on well tested soil for adapting to suitable adjustments in design</li> </ul>	<ul style="list-style-type: none"> <li>Retrofitting in old structures so that short-comings in construction could be externally strengthened to a considerable extent to withstand the convulsions caused by Earthquake</li> </ul>
Fire Department	<ul style="list-style-type: none"> <li>The Certification of commercial buildings by Fire Dept and urban regulatory bodies both at the planning and completion stages.</li> </ul>	<ul style="list-style-type: none"> <li>fire safety measures - formulation, implementation and training of persons at all level in both urban &amp; rural areas.</li> </ul>
District Disaster Management Authority	<ul style="list-style-type: none"> <li>Impart training to Architects/ Engineers/ Builders and masons in large number to build disaster resistant houses/structure</li> </ul>	<ul style="list-style-type: none"> <li>At the community level, program and activities to bring home to them the do's &amp; don'ts.</li> <li>Awareness among the stakeholders about the need to build/rebuild earth quake resistant houses/structures and keeping safe neighbourhood.</li> </ul>
Training Institutions  (BSDMA/NIDM)		At the District & Block levels training programme for awareness activities, community volunteer training, relief and rescue operations through SDRF and other resources.

Department / Agency	Prevention	Mitigation	Preparedness
<b>Flood</b>			
Department of Water Resources	<ul style="list-style-type: none"> <li>• multipurpose storage dams for flood prevention and sediment detention, administrative measures for restricting occupancy of flood zone</li> <li>• Converting the abandoned course of the river bed into reservoirs with proper intake and outlet channels so that, instead of allowing the flood water to flow down, the excess water gets accumulated in these reservoirs..</li> </ul>	<ul style="list-style-type: none"> <li>• The revival and maintenance of traditional practices of ponds system for diverting and storing flood water and making use of the same for multipurpose activities including irrigation, restoration of water tables etc.</li> <li>• conversion of rivulets and tributaries into reservoirs for storing flood water for a desired period and for later use</li> <li>• in suitably selected places large anti- flood sluices across the rivers are built then a controlled release of water will take place, a considerable level of water would be maintained in the tributaries as well</li> <li>• <b>Storing Flood Water</b> in reservoirs</li> <li>• <b>Channel Alterations</b> with provisions for regular maintenance of the slopes in the channel, removing of debris and other obstructions, using natural vegetation for strengthening the sides of the channels and for using it as a source of promoting</li> </ul>	

Department / Agency	Prevention	Mitigation	Preparedness
		<p>fisheries etc.</p> <ul style="list-style-type: none"> <li>• <b>Watershed Management.</b></li> <li>• <b>River bank plantation:</b> (a) large trees with deep root systems in the <b>upperreaches</b>, (b) a good mix of trees, shrubs and ground cover that may bind middlereaches and (c) trees, shrubs and ground cover with matted root systems and flexible branches at the lower reaches.</li> <li>• Deepening of chaur and mauns for intake of inundating water through natural 'dhars' and 'bahiyars'.</li> <li>• Exploring the possibility of setting up of hydroelectric power generating units of 5 to 10 MWs.</li> <li>• the traditional practices of interlinking dhars, bahiyars, chaur and mauns should be revived</li> </ul>	
Urban Development Department		<ul style="list-style-type: none"> <li>• long term planning for key structures, sewerage system &amp; human settlements are required to be done. For the human settlements in low lying areas small ponds at the four corners and middle of the settlements</li> </ul>	



Department / Agency	Prevention	Mitigation	Preparedness
<b>Fire</b>			
Police and Fire Service Department Departments of Health and Disaster Management	<ul style="list-style-type: none"> <li>wiring of houses and buildings properly insulated and fitted with cut-outs, fuses and fire alarms.</li> </ul>	<ul style="list-style-type: none"> <li>developing low-cost houses with non-flammable walls like mud, bricks and roofing like tin sheets properly fitted.</li> <li>Providing sufficient number of fire extinguishers at cluster of hutments Gram Panchayat and Thana buildings</li> <li>making it mandatory to have emergency exit facility in high rise office buildings and apartments etc</li> </ul>	<ul style="list-style-type: none"> <li>Organizing regular level training for fire safety awareness so that the incident of fire can be minimized through mass awareness and community volunteer training.</li> </ul>

Department / Agency	Prevention	Mitigation	Preparedness
<b>Chemical and Industrial Accidents</b>			
Dept. of Labor Resources		<ul style="list-style-type: none"> <li><b>Legal liability Framework:</b> holding the management responsible for the payment of huge compensation to affected parties or persons.</li> </ul>	
District Disaster Management Authority			<ul style="list-style-type: none"> <li><b>Community Preparedness:</b> people in the locality remain alert, advanced warning, and be advised by the government agencies.</li> </ul>

BIADA		<ul style="list-style-type: none"> <li>• <b>Land use Planning:</b> locating the hazardous industries in isolated place so that agriculture, human settlement, social and health infrastructure remain at a distance.</li> </ul>	
<b>Epidemics</b>			
PHED/ HEALTH DEPARTMENT / MUNICIPAL CORPORATION		<ul style="list-style-type: none"> <li>• hospitalization, confinement of the patients and other containment measures</li> <li>• coordination with various departments for identifications of patients, vaccination of the vulnerable</li> </ul>	

Department / Agency	Prevention	• Mitigation	Preparedness
		<ul style="list-style-type: none"> <li>section of society</li> <li>Enforcing situations that only properly trained personnel shall implement the measures and apply treatments.</li> </ul>	
PHED/ HEALTH DEPARTMENT / MUNICIPAL CORPORATION		<ul style="list-style-type: none"> <li>control-room based implementation of preventive measures coupled with proper monitoring</li> </ul>	

Department / Agency	Prevention	Mitigation	Preparedness
<b>Road Accidents</b>			
Department of Transport , Traffic Police, Police and Fire Department and Road Construction Department		<ul style="list-style-type: none"> <li>Enforcing Legal Requirements consisting of a set of do's and don'ts for two wheelers, light and heavy vehicles</li> <li>Providing directions for safe driving: <ul style="list-style-type: none"> <li>for the vehicle</li> <li>for the driver, and</li> <li>appropriate signs &amp; signals along the road</li> </ul> </li> </ul>	

## **6 Capacity Building through Training & Awareness Generation**

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Key stakeholders in Begusarai district have various roles to play from community to district levels in terms of disaster management. Development and strengthening the skills and competencies of district administration, line department and community at large is critical to achieve the desired goal of disaster risk reduction.

Emphasis on the indigenous traditions; and methods and materials used for disaster management locally are to be also considered and incorporated appropriately in the disaster management planning. As communities are the first emergency responders to any incidents, particularly in remote areas, it is critical to capacitate them for disaster risk reduction. Capacity building intends to develop and strengthen skills, competencies and abilities of both government and non-government officials and communities to achieve their desired results pre, during and post disasters, as well as preventing hazardous events from becoming disasters.

Developing institutional capacity is very important. At the same time, by making the local community part of the process and solution would help in ensuring that disaster mitigation measures are more likely to be implemented and maintained over the period with local flavor.

The capacity building plan should cater to the differential capacity building needs based on the functional responsibilities assigned to the stakeholders. It should address -

- Institutional capacity building:

Government officials / policy makers,

Engineers, Architects, Masons, Doctors, Nurses, Teachers and other professionals,

State Police, Fire Services, State Disaster Response Force,

- Community capacity building and Community Based Disaster Management: It should focus on vulnerable groups – women, children, aged persons, female headed households and disabled persons.
- Knowledge Management, networking and sharing: Community registries to collate basic contact information for persons with disabilities
- Training of Trainers: Civil Defense/Home Guards/Volunteers
- Disaster Management Education:

Schools,

Colleges- medical, Engineering.

- Skill up gradation and follow up training programmes,
- Inventory of trained professionals, engineers, architects and masons, medical professionals, rescue specialists, etc.

Training modules, fulfilling the specific requirements of the State / District, should be designed and implemented in consultation with BSDMA. Capacity building requirement at all levels in institutional hierarchy as well as community should be addressed adequately. Training and capacity building program should be integrated with the monitoring and evaluation system for effective revision of the program.

The following table shows an analysis of the key stakeholders identified (Table 17).

*Table 17: List of key stakeholders in District*

<b>Key Stakeholders</b>	
<b>District level Line Departments</b>	
1. Agriculture Department	11. Panchayati Raj Institutions Department
2. Animal Husbandry and Fisheries Department	12. PHED Department
3. Civil Supplies	13. Planning and Development Department
4. Education Department	14. Police Department
5. Fire Department	15. Rural Development Department
6. Water Resource Department	16. Rural Works
7. Food Corporation Department	17. Social Welfare
8. Health Department	18. Statistics Department
9. Information and Public Relation Department	19. Transport Department
10. Minor Irrigation	
<b>Other Stakeholders</b>	
1. Academic Institutions	8. Inter Agency Groups
2. Architects, Engineers, Diploma Holders and Masons	9. Local and International Media
3. Artisans, Craftsmen Groups	10. Local NGOs, International NGOs, UN Agencies, Red Cross, National NGOs
4. Business Groups and Private sectors including corporate, industry, SMEs, traders and market associations	11. SHG, Women, Farmers, JEEVIKA Groups
5. Dalit and Tribal Associations	12. Transporters (Train, Road and Ferries)
6. Ex-Servicemen and Retired Professionals Associations	13. Youth Groups (NYKS/NSS/NCC)
7. Health Associations (Medical Association, Chemist and Druggist Association, RVC, Nurses)	

Training, tests and exercises are essential to ensure Government officials, emergency response personnel and the public are operationally ready. As part of the emergency management training Curriculum, it shall be ensured that personnel with emergency responsibilities complete emergency management courses as prescribed from time-to-time by the National / State/ District Authority.

Training program should include all stakeholders including – community, home guard, NSS, NCC, NYKS, Schools and colleges, Civil society, CBOs, corporate entities, SDRF, Fire Service, Media, Police etc.

*Table 18: Preparedness training and capacity building of key stakeholders*

S. No.	Activity	Responsibility
1	Training to Home Guard personnel in various phases of disaster management including search and rescue	Police Dept.; BSDMA
2	Training to NCC and NSS personnel in various phases of disaster management	Education Dept.; Director NCC
3	Training to educational and training institutions personnel in various phases of disaster management	BSDMA
4	Training to civil society, CBOs and corporate entities in various phases of disaster management	BSDMA; NGOs
5	Training to fire and emergency services personnel in various phases of disaster management	Fire Service Dept.
6	Training to police and traffic personnel in various phases of disaster management	Police Dept.; PTS, BSDMA
7	Training to State Disaster Response Force (SDRF) Teams in various phases of disaster management	NIDM; NDRF; BSDMA
8	Training to media personnel in various phases of disaster management	NIDM; Information Dept.; BSDMA
9	Training to govt. officials in various phases of disaster management	NIDM; BSDMA
10	Training to engineers, architects, structural engineers, builders and masons in various phases of disaster management	Hazard Safety Cell of PWD; NIDM; BSDMA

## 6.1 Institutional Capacity Building

District Administration is of prime importance in the development of a disaster resilient Begusarai and Bihar. Training and capacity development of the district administration staff and the officers of the Bihar Administrative Services is important as they play a prime role in the management and reduction of disaster risks. A paradigm shift in disaster risk management from a response centric approach to a proactive approach focusing on disaster risk reduction and arresting disaster risk even before it materializes can only be achieved if the most important members of India's administration – the district administration are proactive in their duties and responsibilities. It is important for these members to understand the following:

- The intricate relationship between development and disasters
- Potential risks of disasters and climate variability that could impact their district/jurisdiction
- Mainstreaming disaster risk reduction into development planning
- The state and district level disaster management plans
- Incident command system/incident response system
- Emergency response, including search and rescue, first aid
- Norms of disaster relief (including NDRF/SDRF norms)
- Documentation of disaster damages and losses
- Post disaster reconstruction, and recovery including Build Back Better

It is important that the training is provided to the following concerned staff members:

1. DDMA staff
2. DEOC staff
3. BAS Officers
4. Circle and Block Development Officers
5. Village level Officers (Agriculture, Rozgar sevak, etc.)
6. Frontline workers (Aanganwadi, ANM sevikas, etc.)

The DDMA is responsible to perform the Training Needs Assessment in coordination with the BSDMA and ensure all concerned staff of district administration are trained.

## 6.2 Community including CBOs and PRIs/ULBs

Capacity Development at community level has to be largely self-oriented such as swimming, firmly thatching of roofs, handling injuries and first aid, handling people (and injured people) in debris, saving people from drowning and other such activities. Thus the requirement is to develop capacities built around oneself and simple technologies based equipment such as plying motorized boats, debris removal, usage of fire extinguishers, first aid, handling dog/snake bites, driving two and four wheelers, setting up of tents, operating basic communication equipment, etc.

Training for such skills will be essential for

- Thana level Peace Committee
- Gram Panchayat + Gram Katcheri
- Community level volunteers (Gram Raksha Dal)

- District Emergency Operation Center
- NYKS and NSS
- Specific training plan for PRIs is mentioned in

## 6.3 Professionals

BSDMA have prepared training modules for Professionals (Engineers, Architects, etc.). The training modules can be accessed on BSDMA website<sup>10</sup>. Other training needs are to be assessed according to district requirements and request sent to BSDMA to arrange for trainings.

## 6.3 Training Institutes and other facilities

Bihar State Disaster Management Authority in Patna and NIDM New Delhi is the apex training institute in the field of disaster management, It has been developed as a centre for excellence to provide necessary support to the State and National Government for enhancement of institutional development and capacity building. BSDMA is equipped to conduct required capacity building training for strengthening disaster risk management and governance in the State.

## 6.4 Awareness Generation

The involvement of the community and their participation in mitigation, prevention and preparedness measures are an important component of any success in disaster risk management. Community participation and involvement will depend on the awareness of community members regarding the nature and potential impacts of hazards, the vulnerabilities and the extent of risk.

At a community level, the following modes of awareness generation could be attempted:

1. Campaign mode through local NGOs, CBOs, and in Gram Sabhas focusing on hazards, impacts, etc.
2. Demonstration mode through puppet shows, street plays, etc.
3. Learning mode through small group meetings, focus group discussions, self-help group meetings Aanganwadi ASHA workers, community leaders, PACs, PRIs, structured meeting of teachers, etc.

Awareness generation is required to be followed up with capacity building measures for converting the organized awareness into disaster risk reduction outcomes. The capacity building at community level would therefore have to encompass multi-mode engagements including visuals, dos and don'ts at community, family, and individual levels.

At institutional level, awareness generation can be attempted by visits to disaster-affected sites within and outside the state. Focusing on direct interaction with the communities, and victims in particular, the Gram Panchayats, local CBOs, NGOs, BDOs are to be trained about the possible impacts of disaster events on people to motivate their empathetic engagement in disaster risk reduction efforts.

Key activities and responsible agencies for awareness generation for DRR is provided in Table

<sup>9</sup> Ba



*Table 19: Awareness generation activities and responsibilities*

<b>S. No.</b>	<b>Task</b>	<b>Activities</b>	<b>Responsibility</b>
1	Information	Advertisement, hording, booklets, leaflets, banners, shake-table, demonstration, folk dancing and music, street play, and exhibition, TV Spot and Radio spot, Audio-visual and documentary	Information and Public Relation Department (IPRD); District Disaster Management Authority; BSDMA;
2	Education	School campaign	Education Department; BSDMA;
3	Communication	Planning and Design; Execution and Dissemination	District Magistrate; All line Departments; Local Bodies; BSDMA;

## 7 Response Planning

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Disaster response planning requires coordinated and concerted efforts from all the concerned stakeholders from state to community levels. It provides rapid and disciplined incident assessment to ensure a quickly scalable, adaptable and flexible response. It broadly follows the National and State guidelines for response, which defines basic roles and responsibilities for incident response across all levels of the government and non-government sectors. It requires materials and logistics management, carrying out search and rescue operations, providing relief and shelter, providing sanitation and health needs, close coordination between line departments, quick communication and reporting, etc.

Before taking up response activities, the District Magistrate (RO/IC as per IRS(NIDM, 2015)) will hold a meeting to take stock of the situation, availability and mobilization of resources for listing out the various tasks and to provide proper briefing to the responders. *The Incident Action Plan* will be drawn and put into action based on the situation assessment. The DM / RO will nominate Operation Section Commander (OSC) based on nature and severity of incident and rest will follow as per IRS/IRT and other procedural guidelines issued by the state.

### Goals of response planning:

- To alleviate suffering of the people (and livestock, animals) affected by the hazard
- Meet basic human needs
- Address the needs of the vulnerable groups such as people with disabilities, senior citizens, pregnant women, children, Female headed households, etc.
- Quick restoration of Essential Services in the district
- Support community for faster recovery

### 7.1 District Disaster Response Plan

“Disaster response is a three-legged race against time(BSDMA)”. It requires the co-ordination of efforts, actions and strategies of concerned functionaries at state, district and the community level. Three important functionaries in the disaster response are the existing government machinery, non-governmental organizations, and the affected community. There are three main important activities in disaster response: planning, mobilization and operationalization.

When a disaster event occurs, and is notified as a disaster event, the Incident Command System (ICS) (also known as Incident Response System (IRS)) is operationalized. Disaster response requires management of materials and logistics, carrying out search and rescue operations, providing shelter and relief, caring for health and sanitation, communicating to a host of stakeholders, documenting and reporting. All these functions require involvement of highly specialized resource and institutions. There are three main functionaries such as the government machinery, the non-government organization and the affected communities. It also requires coordinated and concerted efforts of these functionaries at the state, district, block & community levels. Response structure mainly involves three sets of activities: planning, mobilization & operationalization.

Incident Response System (IRS) formulated by the National Disaster Management Authority is a system of management by objectives through IAP (Incident Action Plan). It takes care of any expanding incident through an organizational structure of command staff, sections, branches, divisions, groups, units, resources and span of control. Through Unified Command (UC), it allows all agencies having jurisdictional or functional responsibilities to jointly develop incident objectives and strategies. IRS requires that every emergency response involving multiple area or multiple agencies include the four functions.

IRS establishes lines of supervisory authority and formal reporting relationships. There is complete unity of command as each position and person within the system has a designated supervisor. Direction and supervision follows established organizational lines at all times.

The Incident Commander's responsibility is the overall management of the incident. On most incidents, a single Incident Commander carries out the command activity. The Incident Commander is selected by qualifications and experience.

Disaster level functional responsibilities during the disaster response are structured below:

*Table 20: Indicative structure of emergency functions and respective leads in district*

S. No.	Emergency Management Functions/Tasks	Function/ Task Lead	Support Function officer/ agencies
1	Direction, Control, and Coordination	District Magistrate	SP, Additional Collector, Halka Karamchari/ CO
2	Information Collection, Analysis and Damage Survey	District Magistrate	SP, Additional Collector, Halka Karamchari, Exec. Engineer, CO
3	Communication	DIO	Mobile Operators, TV, Radio, Police, Forest, Fire
4	Alert and Warning	Additional Collector	EOC, DIO (District Information Officer)
5	Transport (ESF, Evacuation, Relief supply)	DTO	DSO, SP
6	SAR (Search and Rescue)	SP, Civil Defense, SDRF, NDRF	Fire, Civil Defense, Home Guards, SDRF (when magnitude of any disaster is beyond coping capabilities of these response agencies; NDRF may be requisitioned for search & rescue operations)
7	Emergency Public Information	DDC	EOC/Police/Transport/Forest
8	Law and Order / Public Protection	SP	Dy. SP, Home Guards Commandant, NGOs, Para-military and Armed Forces
9	Public Works	Exec. Engineer, PWD	Irrigation, Ex. Engr., Panchayat, NGOs, Water Supply Board, Municipalities, Home Guards, Police
10	Mass Care/Emergency Assistance / Shelters	Dist. Primary Education Officer	School Principals, Teachers, Health, PHC, State Transport, Water Supply, RTO, Halka Karamchari, TDO
11	Health and Medical Services, psycho social care	Chief Medical Officer	Supt. Govt. Hospital, Municipality, PHCs, CHCS, Red Cross, Fire Brigade, Civil Defense, R&B, NGOs, Doctors, TDO, Halka Karamchari

S. No.	Emergency Management Functions/Tasks	Function/ Task Lead	Support Function officer/ agencies
12	Animal Health & Welfare	Dy. Director Animal Husbandry	Veterinary Inspector, NGOs
13	Water Supply and Sanitation	Ex. Eng. Water Works	Dy. Ex. Engr., Halka Karamchari, TDO, Health, Dy. Engineer
14	Power	Supt. Engr. Electricity board	Ex. Engr., Dy. Engr. Technical, EB, Transport
15	Resource Management (Including food and relief supplies and other logistic support)	DDO	RTO, DSO, Private & Public sector, Municipal Water Supply Board, Halka Karamchari, Dist. Supply Halka Karamchari

The Disaster Response shall cover State, District, Block and Gram Panchayat/ULB and shall consist of the following main stakeholders:

**(i) Crisis Management Group**

Headed by the Chief Secretary, with Development Commissioner and Principal Secretaries/Secretaries of concerned department as members, it may also be supported by professionals and special invitees depending on the nature of crisis and requirement for its management

**(ii) Emergency Support Groups**

Fourteen emergency functions and well trained teams to carry out each function are suggested by the BSDMA. These teams are called the Emergency Support Groups. Emergency Support Functions (ESF) constitute the backbone of Disaster Response Plan and consist of groups of persons groomed to provide specific assistance in a dedicated manner and with missionary zeal. They shall respond to all possible requirements to mitigate the hazard. The ESFs shall assess damage and take measures to repair the damages and control the situation. Each ESF shall have a set of supporting departments, a set of functions in emergencies and in normal times. The following are the ESFs:

## 1) Communication

Supporting Dept.	Emergency Functions	Normal Functions	Time
1) Dept of Science & Technology 2) BSNL & other services providers 3) AIR/Television 4) Satellite phones 5) Mobile phones 6) SW/Ham Radio 7) Police wireless	<ul style="list-style-type: none"> <li>To restore communication</li> <li>To provide emergency communication linking EOCs, IMT</li> <li>To provide communication to communities</li> <li>To ensure communication facilities to support State and District</li> <li>To coordinate temporary communication requirements</li> </ul>	<ul style="list-style-type: none"> <li>To update hardware and software in communication technologies</li> <li>Repair &amp; maintenance of EWS &amp; communication equipments</li> <li>Periodic checking of communication system among disaster related setups</li> </ul>	

Supporting Dept.	Emergency Functions	Normal Functions	Time
		<ul style="list-style-type: none"> <li>Provide training at Gram Panchayat EOC in communication technologies</li> </ul>	

## 2) Search & Rescue

Supporting Dept.	Emergency Functions	Normal Functions	Time
1) Home Dept 2) Fire Dept 3) Civil Defense 4) NDRF 5) SDRF 6) BMP/Police 7) Army 8) Navy 9) Air Force	<ul style="list-style-type: none"> <li>To check the evacuation tools &amp; equipment</li> <li>To work out evacuation Plan</li> <li>To establish linkages and coordination with camp office</li> <li>To carry drinking water and packed food, emergency medicine etc. for the victims</li> <li>To prioritize evacuation of children, women, old, disabled etc.</li> <li>To avoid overloading</li> </ul>	<ul style="list-style-type: none"> <li>Repair and maintenance of evacuation tools and equipments</li> <li>Maintain fitness exercises</li> <li>Prepare teams of search and rescue operators at the district &amp; Panchayat level</li> <li>To maintain a list of trained manpower and to ensure their availability in the eventuality of any hazards</li> </ul>	

## 3) Relief & Shelter

(The checklist for relief camps is provided in section 12.3 in the annexure)

Supporting Dept./ Stake Holders	Emergency Functions	Normal Functions	Time
1) Food & Civil Supplies Dept 2) State Food Corporation 3) Associations and Clubs 4) Building	<ul style="list-style-type: none"> <li>To carry cooked dry, fast food materials in properly packaged form for immediate distribution</li> <li>To organize the supply of drinking water</li> <li>To setup Shelter camps, Kitchen camps, mobilize</li> </ul>	<ul style="list-style-type: none"> <li>Create awareness and organize a system of saving food grains on household basis for emergency needs</li> <li>Groom officers to</li> </ul>	

Supporting Dept./ Stake Holders	Emergency Functions	Normal Functions	Time
construction Dept 5) Corporate bodies 6) Voluntary organizations	volunteers for cooking, serving, washing, etc. <ul style="list-style-type: none"> <li>To organize supply of food grains and vegetables</li> <li>To line up teams of local youths to carry those rescued to relief and shelter camps</li> <li>To maintain records of names, villages, Panchayat, blocks to which the victims belong</li> <li>To setup bathrooms and latrines</li> <li>To take special care of children, women, old and disabled, especially those separated from families</li> <li>To setup disaster relief center to receive, collect, sort out and distribute relief materials</li> <li>To organize proper supply chain to reach the victims and ensure last mile connectivity</li> </ul>	maintain stock of fast food like chura & sattu for at least three days at the block level	

#### 4) Health & Sanitation

Supporting Dept.	Emergency Functions	Normal Functions	Time
1) Health dept 2) Government and private hospitals 3) Red Cross Society 4) Indian Medical Association 5) Voluntary bodies 6) PHED/ Municipal Corporation	<ul style="list-style-type: none"> <li>To check the equipment and stock of medicines</li> <li>To form teams of medical personnel</li> <li>To organize first aid providing team and to ensure scalability in case of L2 &amp; L3 disasters</li> <li>To organize mobile medical van to attend to emergency needs</li> <li>To carry medical camp setting facilities</li> <li>To establish trauma counseling desks</li> </ul>	<ul style="list-style-type: none"> <li>Checking, replacement and maintenance of medical kits/ medicines</li> <li>To keep updated first aid kits and to ensure sufficient quantities of the same for ready utilization in case of emergencies</li> <li>To enlist block wise doctors available</li> </ul>	



Supporting Dept.	Emergency Functions	Normal Functions	Time
	<ul style="list-style-type: none"> <li>• To carry out Psychological First Aid</li> <li>• To keep a watch for the possibilities for any epidemic outbreaks</li> <li>• To include locally available medical staff in health check up exercises</li> <li>• To keep a record of patients treated</li> <li>• To visit shelter camps and ensure proper sanitation and to make proper arrangements for the same</li> </ul>	<ul style="list-style-type: none"> <li>• with phone numbers and specialization</li> <li>• Train young boys and girls at the Block, Panchayat and Community level in providing First Aid</li> <li>• Training young boys and girls in helping and carrying seriously injured</li> </ul>	

#### 5) Livestock shelter & fodder

Supporting Dept. / Stake Holders	Emergency Functions	Normal Functions	Time
1) Animal Husbandry & Fisheries Dept 2) Veterinary college & hospital 3) Fodder supplies	<ul style="list-style-type: none"> <li>• To set up cattle camps at safe and appropriate locations</li> <li>• To vaccinate animals if not previously vaccinated</li> <li>• To organize safe disposal of garbage</li> <li>• To mobilize mobile veterinary team locally</li> </ul>	<ul style="list-style-type: none"> <li>• Vaccination camps for livestock at Gram Panchayat level</li> <li>• To line up suppliers of fodder bricks during emergencies</li> <li>• To enlist district wise veterinary doctors available with phone numbers</li> <li>• To maintain stock of medicines needed in case of emergencies</li> </ul>	

### 6) Drinking water & supplies

Supporting Dept.	Emergency Functions	Normal Functions	Time
1) PHED 2) Civil supplies	<ul style="list-style-type: none"> <li>To identify the sources to</li> </ul>	<ul style="list-style-type: none"> <li>Installation of</li> </ul>	

Supporting Dept.	Emergency Functions	Normal Functions	Time
3) Mineral water manufacturers 4) Corporate bodies 5) Donor agencies 6) Local NGOs	provide drinking water and restore supply if affected <ul style="list-style-type: none"> <li>Restoration of wells</li> <li>Installation of hand pumps</li> <li>Provision of chlorine tablets</li> <li>To distribute mineral water bottles during emergency relief</li> </ul>	hazard resilient hand pumps in identified areas of shelter <ul style="list-style-type: none"> <li>Ensuring supply of water bottles during emergencies through contract with suppliers/corporate</li> <li>Raising of platform of wells and hand pumps</li> <li>Encouraging community and households to keep water purifiers (tablets) handy for use in emergency situations</li> </ul>	

### 7) Power

Supporting Dept.	Emergency Functions	Normal Functions	Time
1) Energy Dept 2) Electricity board 3) Dept of non-conventional energy 4) Gen-set suppliers	<ul style="list-style-type: none"> <li>To carry repair and maintenance kits for gen-set, etc.</li> <li>To check electricity supply line and restore supply</li> <li>To organize power supply to hospitals, shelter camps, kitchens camps, onsite EOC, etc.</li> <li>To organize alternate sources of electricity</li> <li>To carry gen-sets, diesel, petrol, spare batteries, etc.</li> <li>To carry candles, matchboxes, solar lamps, petromax, etc.</li> </ul>	<ul style="list-style-type: none"> <li>Interaction with Electricity board for keeping updated about generation, and supply situation</li> <li>Interaction with non-conventional energy dept to gather information about possible sources of electricity in emergency situation</li> <li>To enlist suppliers of gen-sets</li> <li>Maintaining stock of</li> </ul>	

Supporting Dept.	Emergency Functions	Normal Functions	Time
		solar lamps, petromax, candles, torches, etc. with spare battery chargers  <ul style="list-style-type: none"> <li>To promote community/households to make store candles, torches, etc in case of emergencies</li> </ul>	

### 8) Transport

Supporting Dept.	Emergency Functions	Normal Functions	Time

1) Transport Dept 2) Transport Agencies 3) Air Force 4) Boat Owners 5) Ambulance service providers	<ul style="list-style-type: none"> <li>• To know loading and unloading points nearest to incident sites</li> <li>• To coordinate the transport requirements of emergency support forces</li> <li>• To arrange transportation of relief and rescue materials</li> <li>• To coordinate and provide transport facilities to all support agencies</li> <li>• To regulate movement of traffic onsite</li> <li>• To organize transportation of sick and wounded</li> </ul>	<ul style="list-style-type: none"> <li>• To keep updated list of transport facility providers</li> <li>• To enlist the ambulance service providers with phone numbers</li> <li>• To plan for alternative roadmap of vulnerable areas in the district</li> <li>• To enlist contact nos. of helicopter service providers</li> <li>• To enlist boat owners with phone number and number of boats</li> </ul>
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### 9) Public works

Supporting Dept.	Emergency Functions	Normal Functions	Time
1) Public works dept	<ul style="list-style-type: none"> <li>• To restore road connectivity</li> </ul>	<ul style="list-style-type: none"> <li>• Storing</li> </ul>	
Supporting Dept.	Emergency Functions	Normal Functions	Time
2) Road construction dept 3) Pul Nirman Nigam	<ul style="list-style-type: none"> <li>• To construct temporary bridges where required</li> <li>• To organize repairing of health centers, schools, important buildings</li> <li>• To undertake supervision and surveillance of construction works done</li> </ul>	<ul style="list-style-type: none"> <li>• equipment and materials required in emergencies</li> <li>• Enlisting the construction companies for support in the case of emergencies</li> <li>• Make arrangements for borrowing equipment/ manpower/material if required</li> </ul>	

### 10) Removal & Clearances

Supporting Dept.	Emergency Functions	Normal Functions	Time
1) Civil Defense 2) Home Guard 3) Municipalities 4) Scout and guides 5) NCC 6) NYKS	<ul style="list-style-type: none"> <li>To organize volunteers for removal of dead bodies – humans and livestock</li> <li>To organize local force for clearing debris of building, bridges, road, etc. for reconstruction</li> <li>To organize local force for chopping and removing dangerous trees especially post cyclonic storm events</li> <li>To organize safe disposal/ burial/ burning of dead bodies</li> </ul>	<ul style="list-style-type: none"> <li>Ensuring availability of equipment such as gas cutters, cranes, in order</li> <li>Enlisting truck owners with phone numbers</li> <li>Enlisting workers in municipalities and grooming them to work as a team</li> <li>To ensure regular interaction with such teams to facilitate timely response during emergencies</li> </ul>	

### 11) Information Dissemination & Helpline

Supporting Dept./ Stake Holders	Emergency Functions	Normal Functions	Time
1) Dept of Information & Public Relations 2) Scouts and Guides 3) Media 4) Colleges and Universities	<ul style="list-style-type: none"> <li>To gather correct information from authorities onsite</li> <li>To keep list of persons rescued with full details about each person</li> <li>To update list of missing persons</li> <li>To update number of dead bodies and their locations</li> <li>To keep a track of positioning of teams &amp; ESFs</li> <li>To make use of public address system</li> <li>To keep 5 -6 scouts around to provide escort services</li> <li>To schedule work in short shift duration</li> </ul>	<ul style="list-style-type: none"> <li>To get orientation and training to handling people in trauma</li> <li>To develop a comprehensive understanding of psychology, public relations, mass communication for ensuring effective handling of distress situations</li> </ul>	

**12) Damage Assessment**

Supporting Dept.	Emergency Functions	Normal Functions	Time
1) Disaster Management Dept 2) Dept of Agriculture 3) Rural Development Dept 4) Urban Development Dept 5) Public Works Dept 6) Dept of Animal Husbandry & Fisheries	<ul style="list-style-type: none"> <li>To have the format of the damage assessment</li> <li>The following information to be collected:</li> <li>Affected, Block, Panchayat, Population, Human lives lost, Livestock lives lost, Resources damaged, Infrastructure damaged (roads, bridges, schools, hospitals, govt. buildings, electric supply, water supply), crops, orchards</li> <li>Synthesized assessment</li> </ul>	<ul style="list-style-type: none"> <li>Developing tools &amp; techniques for Rapid Damage Assessment</li> <li>Identification of Training Needs for manpower for performing Damage Assessment</li> </ul>	

**13) Donation Management**

Supporting Dept.	Emergency Functions	Normal Functions	Time
1) Disaster Management Dept.	<ul style="list-style-type: none"> <li>To set up donation camp onsite</li> </ul>	<ul style="list-style-type: none"> <li>Providing</li> </ul>	

Supporting Dept.	Emergency Functions	Normal Functions	Time
Management Department 2) Dept of Supplies 3) State Warehousing Corporation 4) Cooperative dept	<ul style="list-style-type: none"> <li>To create three centers: Fund, Relief, Services</li> <li>To carry receipts, stamps, etc. for cash/cheque/drafts</li> <li>To identify storage centre for receiving relief materials for storing, packing, proper distribution of the same</li> <li>To keep records of supplies sent, with whom and when</li> <li>To post volunteers required and take care of their basic needs : Food, rest, etc.</li> </ul>	orientation in human resource and materials management to NGOs work <ul style="list-style-type: none"> <li>Train them in material handling, packing and distribution</li> </ul>	

**14) Media**

Supporting Dept.	Emergency Functions	Normal Functions	Time

1) Dept of Information & Public Relations 2) Disaster Management Dept	<ul style="list-style-type: none"> <li>Organize media briefings by senior officer in charge</li> <li>Provide graphic and statistical details to the extent possible</li> <li>Organize visit to shelter, relief, and various activity camps</li> <li>Organize briefings on daily basis preferably in evening</li> </ul>	<ul style="list-style-type: none"> <li>Development of pamphlets, literature for disaster awareness</li> <li>Educating people about Do's and Don'ts during disasters</li> </ul>
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### 15) Law and Order

Supporting Dept.	Emergency Functions	Normal Functions	Time
1) Dept of Home 2) District Administration	<ul style="list-style-type: none"> <li>Posting of Police, Home Guards, Civil Defense forces in strategic places</li> <li>Deputing a Magistrate to keep vigil and give necessary orders</li> </ul>		

Depending on the level of disasters (further details in section 4.5.2.1), the following actions are recommended for incidence response:

#### 7.1.1 INCIDENT RESPONSE FOR LEVEL -1 DISASTER

In L1 level disaster DDMA shall be the prime institution and District Magistrate the Incident Commander. DEOC shall become the Command Centre and Block/Anchal shall become on site centre to manage the operations.

*Figure 38: L1-Disaster Response*

#### 7.1.2 MANAGEMENT OF LEVEL 2 AND LEVEL 3 DISASTER

In case of L2 level incident the response shall emanate at the state level. The main respondents shall be: DMD, SEOC, DMD & SDRF & NDRF. In this case DMD shall be overall in-charge but Chief Secretary /as chief of SEC/Principal Secretary, DMD shall manage the operations. The Centre level agencies shall be in readiness to respond.

##### Key Indicators for decision making of level 2 and level 3 Disaster

- Large-scale devastation of life, property, and infrastructure
- Break down of response machinery of district administration
- Large scale displacement and relocation of the people
- Threatening health risks, etc.

**Authority for declaration of L2 disaster:** State relief commissioner on request of DDMA or

directly on advice of State agencies and BSDMA can declare a particular disaster as State level disaster.

### **Key Actions for Level 2 Disaster**

- Request Divisional Commissioner and Relief Commissioner to activate Divisional resources and mechanisms
- Request BSDMA and Relief Commissioner at State level for activation of State resources and mechanism
- Prepare for receiving Divisional and State level agencies (resources), their quick briefing, plan of actions if possible and support for their deployment
- Enable additional capacity of EOC to support State level resources in coordination
- Seek cooperation of neighboring district as per existing contingency plans and understanding
- Develop strategies for response and recovery in coordination with State authorities and other agencies
- After dealing with immediate action plan, make quick assessment of resources further needed for medium and long term intervention from the State and make requisitions for the same.
- Request for formation of Armed Forces, if required, in near vicinity for SOS mobilization to support civil authorities.
- Request for activation of SDRF and other Para military capacities, if required, at State level.

**Assistance for L3 disaster:** On request from State Government/ BSDMA, the Central Government/ NDMA can provide technical and resource support when the damages due to disaster exceed the coping capacity of the affected State.

### **Support from India Armed Forces**

Indian Armed Forces are well equipped to handle any kind of disaster management operations. Their expertise and experience in handling such situation will help in support minimize the damage to life, property, infrastructure, and environment. The services of the armed forces can be taken in the quickest possible time as they are strategically located throughout the country.

- The district magistrate (response officer) may ask support from the armed forces as and when there is requirement for handling the disaster situation in the district.
- The armed forces shall work under the civil administration in the affected area and the commanding officer of the operating unit will share the situation report with the EOC and DDMA.
- The armed forces will work in close coordination with the EOC in the district.
- The commanding officer of the operating unit will share the situation report (Sitrep) with the responsible officer.
- If there is no armed force unit present in the district, then the responsible officer may ask the divisional commissioner to communicate with the commanding officer of the armed force unit in that area and ask for his assistance.



- Additionally, the armed forces will support in search and rescue operations; in providing shelter, food, medical aid and critical logistics; in restoring and establishing critical infrastructure needs in an emergency situation; etc.

## 7.2 Communication and disaster alerts

There will be the trigger mechanisms that can be set up, depending on the warning signals mentioned below:

### Warning Signal Available

The national disaster management plan (National Disaster Management Plan, 2016) has designated specific agencies to monitor onset of different natural disasters, set up adequate early warning system (EWS), and disseminate necessary warnings/alert regarding any impending hazards, for all those hazards where early warning and monitoring is possible with currently available technologies and methods. The specific agencies notified are:

*Table 21: Central Agencies designated for natural hazard specific early warnings*

Hazard	Notified Central Agencies for natural hazard specific early warnings
<b>Avalanches</b>	Snow and Avalanche Study Establishment (SASE)
<b>Cyclone</b>	India Meteorological Department (IMD)
<b>Drought</b>	Ministry of Agriculture and Farmers Welfare (MoAFW)
<b>Earthquake</b>	India Meteorological Department (IMD)
<b>Epidemics</b>	Ministry of Health and Family Welfare (MoHFW)
<b>Floods</b>	Central Water Commission (CWC)
<b>Landslides</b>	Geological Survey of India (GSI)
<b>Tsunami</b>	India National Centre for Oceanic Information Services (INCOIS)

In such cases, where the central agencies generate early warnings for impending hazards, it is important for the blocks/Gram Panchayats and villages in the district to receive the alerts and act accordingly. Arrangements need to be in place to ensure prompt receipt of these signals and actions thereon. The flow of such information and early warnings is provided in Figure 41. After the State Govt. receives such warning/advisory, the State Emergency Operations Centre (SEOC) will communicate it to the District Emergency Operations Centre (DEOC) urgently. The DEOC will communicate such warning to the departments at the district level.

The information flow in such cases will be as follows:-

*Figure 41: With warning information flow from top-down*

### Activities post receipt of warnings

The disaster response structure will be activated on the receipt of a disaster warning or on the occurrence of a disaster by the competent authority. The occurrence of a disaster may be reported by the concerned monitoring authority to the Commissioner of Relief/BSDMA by the fastest means. The BSDMA/State Executive Committee (SEC) will activate all departments for emergency response including the SEOC, DEOC, police personnel and Emergency Response Centers (ERC). In addition, they will issue instructions to include the following details:

1. Exact quantum of resources (in terms of manpower, equipments and essential items from key departments/stakeholders) that is required.
2. The type of assistance to be provided
3. The time limit within which assistance is needed
4. Details of other Task/Response Forces through which coordination should take place
5. The SEOC, ERCs and other control rooms at the State level as well as district control rooms should be activated with full strength.
6. Flood, drought, strong winds/cyclone forecasting is generally the responsibility of the Indian Meteorological Department (IMD). IMD is the nodal agency for providing warning services for such disaster occurrences. Bordering districts of Nepal also provide warnings with respect to rainfall and water discharge from the dams there
7. After getting information from IMD, warning dissemination is a responsibility of State

Government. The Disaster Management Department, Govt. of Bihar is responsible for disseminating such warnings to the public and line departments.

8. On receiving an initial warning, the responsible officer shall disseminate the warning to all line departments, the district administration and DG Police. Warning messages are transmitted through wireless to all districts and Blocks. District Magistrates are provided with satellite phones and a Ham radio to maintain effective communication, even if terrestrial and cell phone communication fails

The state EOC and control rooms of the other line departments at the State level as well as district level also get the warnings. The control rooms are activated on receiving the warnings.

### **Important aspects for warning**

The following aspects may be considered for dissemination of warning:

- All warning systems and equipment are maintained in good working condition and should be checked regularly
- Only the designated agencies/officers can issue the warning.
- Communities in disaster prone areas should be made aware of the warning systems
- Alternate warning systems must be kept in readiness in case of technical failure (e.g., power failure)
- Multiple warning systems should be used to ensure the maximum spread.
- Warnings should, to the extent possible, be clear about the severity, the time frame, area that may get affected.
- Warning statements should be conveyed in a simple, direct and non-technical language, and incorporate day-to-day usage patterns.
- Do's and don'ts should be clearly spelt out to the community to ensure appropriate responses.
- Warning statements should not evoke curiosity or panic behavior. This should be in a professional language devoid of emotions.
- Rumor control mechanisms should be activated.
- All relevant agencies and organizations should be alerted.
- Once a warning is issued, it should be followed-up by subsequent warnings in order to keep the people informed of the latest situations.

## **8 Reconstruction, Rehabilitation and Recovery**

Recovery and rehabilitation is one of the most vital aspects in post-disaster event. “Short-term recovery” will return the vital life support systems to minimum operating standards while “long term rehabilitation” will continue till complete redevelopment of the area takes place. Rehabilitation and reconstruction comes under recovery phase immediately after relief and rescue operation of the disaster. This post-disaster phase continues until the life of the affected people comes to normal. This phase mainly covers damage assessment, disposal of debris, disbursement of assistance for houses, formulation of assistance packages, monitoring and review, cases of non-starters, rejected cases, non-occupancy of houses, relocation, town planning and development plans, awareness and capacity building, housing insurance, grievance redressal and social rehabilitation etc.

Post-disaster reconstruction and rehabilitation should pay attention to the following activities for speedy recovery in disaster hit areas. The contribution of both government as well as affected people is significant to deal with all the issues properly.

- Damage assessment
- Disposal of debris
- Disbursement of assistance for houses
- Formulation of assistance packages
- Monitoring and review
- Cases of non-starters, rejected cases, non-occupancy of houses
- Relocation
- Town planning and development plans
- Reconstruction as Housing Replacement Policy
- Awareness and capacity building
- Housing insurance
- Grievance redressal

### **Administrative Relief**

The district is responsible for responding to any natural calamity, through the issue of essential commodities, group assistance to the affected people, damage assessment and administering appropriate rehabilitation and restoration measures.

The district level relief committee consisting of official and non-official members including the local legislators and the members of parliament review the relief measures.

When a disaster manifests, the entire machinery of the district, including the officers of technical and other departments, swings into action and maintains almost continuous contact with each village in the disaster threatened area.

### **Restoration of basic infrastructure**

Based on the degree of damage to the existing structures of houses and other infrastructure, the victim will be issued funds for carrying out the restoration activity.

The PWD will be the nodal agency and also the housing board will take care of the reconstruction plans. Adherence to the zoning laws and other necessary precautions depending on the type and degree of disaster will be ensured while the infrastructure is being restored.

### **Reconstruction of damaged buildings/social infrastructure**

Reconstruction of damaged buildings will be addressed and supported through the advance tools like Insurance, Short-term Loans, and by any other important means, which are affordable.

Houses should be reconstructed in the disaster-hit areas according to the following instructions:

- Owner Driven Reconstruction
- Public Private Partnership Program (PPPP)
- Under the PPPP, the houses are reconstructed by the NGOs for the beneficiaries to be registered in the joint names of the husband and wife.
- All the houses should be insured.
- Financial, technical and material assistance provided by the government.
- The designs for seismic reconstruction of houses provided by the government.
- The material assistance provided through material banks at subsidized rates.
- Design of model houses provided to the public to choose from with an option to have one's own design.

### **Restoration of livelihoods**

Restoration of livelihoods in post-disaster phase is an important component of post-disaster recovery. It is expected that the vulnerabilities existing pre-disasters are reduced in the post disaster recovery efforts. Centrally Sponsored Schemes, targeted CSR interventions, and convergence of multi-agency efforts towards a focused long term rehabilitation and sustainable livelihood will help reduce vulnerability of Begusarai district residents to future disasters.

### **Psycho-social interventions**

Specific emphasis on the psycho social needs of the affected community members, including women and children will help in the inclusion of Build Back Better in post-disaster recovery. Psycho social interventions do not only mean the provision of therapeutic mental health related interventions post disaster events. It involves a thorough understanding of the various disaster impacts and provision of support across the spectrum of impacts. An example of a psychosocial intervention post disaster is “**Sukhi Baliraja Initiative (SBI)**” in Maharashtra (Vidarbha region that is prone to droughts and farmers distress). The SBI focuses on developing a holistic strategy to reduce drought affected farmer distress through various thematic interventions that includes: sustainable agriculture, soil and water conservation, community development, promotion of farmer producer groups and collective farming techniques, and **mental and physical health** initiatives<sup>11</sup>

## **8.1 Damage Assessment**

A detailed assessment of damages caused by the disaster event is essential before commencing rehabilitation and reconstruction activities.

Post disaster damage and loss assessment involves the estimation of the value of destruction of

physical, durable assets and of the value of the disaster induced disruption of production flows in all affected sectors of economic and social activity, and their subsequent aggregation to ascertain total disaster effects and impacts (Disaster Management Division, Ministry of Home Affairs, 2018). The damage and loss assessment needs to be conducted in a bottom-up approach to obtain a fully representative and valid estimation of total disaster effects and impacts.

The objective of the damage assessment is to determine the precise nature and extent of damage so that relief and recovery measures can be undertaken by the district administration. The following components are to be included in the damage assessments:

- (a) Nature of calamity
- (b) Data and time of occurrence
- (c) Affected area (number and name of affected revenue circles)
- (d) Name and number of villages affected
- (e) Total crop area affected (in hectares)
- (f) Total population affected (disaggregated by age, gender)
- (g) Human lives lost (disaggregated by age, gender)
- (h) Number of persons missing (disaggregated by age, gender)
- (i) Animals affected (disaggregated by big, small, and poultry)
- (j) Animals washed away (disaggregated by big, small, and poultry)
- (k) Total number of houses damaged (fully and partially)
- (l) Infrastructure damage (embankments, roads, culverts/bridges, others)
- (m) Relief measures undertaken in brief (number and location of relief camps along with inmates disaggregated by age, gender)
- (n) Relief distributed

Table 22 : Post disaster damage assessment methodology and responsibility

Components	Description – methodology	Responsible agencies
(a) Nature of calamity (b) Data and time of occurrence (c) Affected area (number and name of affected revenue circles) (d) Name and number of villages affected (e) Total crop area affected (in hectares) (f) Total population affected (disaggregated by age, gender) (g) Human lives lost (disaggregated by age, gender) (h) Number of persons missing (disaggregated by	Tools for damage assessment: (a) Aerial survey (b) Photographs, video graph of affected area (c) Satellite imagery (d) Field reports (e) TV/Press coverage (f) Visual inspection checklist: a. Camera b. Laptop c. Notebook d. GIS Map e. GPS	<ul style="list-style-type: none"> <li>Halka Karamchari for field inspection and village level information including human lives lost, affected, number of houses damaged</li> <li>Respective departments (Agriculture department for crop area affected, Energy department for electricity supply, PWD department for roads, embankments, etc., Dept of agriculture husbandry and fisheries for livestock details, Disaster Management</li> </ul>

age, gender) (i) Animals affected (disaggregated by big, small, and poultry) (j) Animals washed away (disaggregated by big, small, and poultry) (k) Total number of houses damaged (fully and partially) (l) Infrastructure damage (embankments, roads, culverts/bridges, public buildings, water supply lines, electricity supply lines, public utilities, others) (m) Relief measures undertaken in brief (number and location of relief camps along with inmates disaggregated by age, gender) (n) Relief distributed	113	
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## 8.2 Relief to the victims

According to notification no.17/2015/1973 (new Mandar letter 2015-2020), disaster relief can be provided by the government to the victims of the following disaster events:

### **District notified disasters:**

1. Cold wave
2. Drought
3. Earthquake
4. Fire
5. Flood
6. Pest attack
7. Covid 19
8. Snake Bite

### **State notified disaster (Local disasters)**

1. Lightning
2. Heat wave
3. Unseasonal or excess rainfall
4. Boat tragedies
5. Drowning (rivers, ponds, ditches)
6. Human induced group accidents such as road accidents, airplane accidents, rail accidents, gas leakages

The items and norms of assistance from the State Disaster Response Fund (SDRF) and the National Disaster Response Fund (NDRF) for the above-mentioned disasters are provided in letter 1418 in the annexure (section 12.6).

## 8.3 Restoration of basic infrastructure and repair / reconstruction of life line buildings

Details of restoration of basic infrastructure and repair/reconstruction of lifeline buildings are mentioned under the Emergency Support functions in section 7.1.

## **9 Budget and Financial resources**

The following are the budgetary and financial provisions for preparing and executing the DDMP:

- **District Disaster Response and Mitigation Fund**

According to the DM Act 2005, 48 (1) (b) and (d), the state government shall establish for the purposes of the DM Act, the District Disaster Response Fund and the District Disaster Mitigation Fund. Under 48 (2) (iii), the state government shall ensure that the funds are available to the District Authority

- **Emergency procurement and accounting**

According to the DM Act 2005, 50 (a) and (b), during disaster situation or disaster, if the District Authority is satisfied that immediate procurement of provisions or materials or the immediate application of resources are necessary for rescue or relief, it may authorize the concerned department or authority to make the emergency procurement and the standard procedure requiring inviting of tenders shall be deemed to be waived. A certificate of utilization of provisions or materials by the controlling officer authorized by National, State or District Authority shall be deemed to be a valid document or voucher for the purpose of accounting of emergency, procurement of such provisions or materials

- **Allocation of funds by Ministries and Departments**

According to the DM Act 2005, 49 (1) and (2), every Ministry or Department of the Government of India shall make provisions in its annual budget for funds for the purposes of carrying out activities and programmes set out in its disaster management plan and such provisions shall, mutatis mutandis, apply to the departments if the Government of the State.

### **9.1 Schemes and programmes supporting DRR**

The national disaster mitigation fund (NDMF) has not been set up in India as the purpose of mitigation is being served by existing Centrally Sponsored Schemes (CSS) such as Pradhan Mantri Krishi Sinchai Yojana, Krishonnati Yojana, National Mission on Sustainable Agriculture, MGNREGA, Major Irrigation Projects, Namami Gange- National Ganga Plan, River Basin Management, National River Conservation plan, Water Resource Management (Ministry of Home Affairs, 2016). Further, the Ministry of Finance through the Office Memorandum F.No 55(5)/PF-II/2011 dated 6th September 2016 (Ministry of Finance, 2016) provides the guidelines for Flexi Funds within Centrally Sponsored Schemes to provide flexibility to states to meet local needs and for undertaking mitigation/restorative activities in case of natural calamities.

The Government of India has approved various schemes to strengthen the existing institutions, improve response mechanisms, build capacities and mitigate the impact of disasters (Ministry of Home Affairs, Government of India, 2011). The following are the schemes and funding pattern at national level:

- **State Disaster Response Fund** – with focus on relief/aid to disaster affected families and communities, the norms for relief are provided in the annexure (letter 1418).
- **Capacity Building for Disaster Response** for building capacity within administrative machinery for better handling of disaster response and for preparation of District and State level Disaster Management plans. The guidelines of the Capacity Building for Disaster Response is provided in the annexure (Letter no: 23(32) FCD/2010 dated 05.10.2010)
- **Revamping of Fire Services** – grant to Urban Local Bodies for revamping of fire services within their respective jurisdiction (Letter no. 12(2) FCD/2010 dated 23.09.2010)
- **Plan Schemes:**

Strengthening of Fire and Emergency Services with an objective to transform fire services into a multi-hazard response force capable of acting as first responders in all types of emergency situations

Revamping of Civil Defense Setup to revitalize Civil Defense setup in the nation to play a significant role in disaster management and assist the police in internal security and law and order situations

- **Non-Plan Schemes:**

Financial Assistance to Administrative Training Institutes and other Training Institutes in States/UTs

- **Externally Aided Schemes:**

**Gol-UNDP Disaster Risk Reduction Programme** for building community resilience in disaster preparedness and mitigation measures

**Gol-USAID Disaster Management Support Project** for reducing vulnerabilities to disaster and build capacity of key institutions in India

**National Cyclone Risk Mitigation Project** to upgrade cyclone risk mitigation, preparedness and response

- **Schemes in Pipeline:**

**National Emergency Communication Plan** for improving communication between NEOC, NDRF and NDMA

**School Safety Programme** to promote a culture of safety in schools

**National Earthquake Risk Mitigation Project** to reduce loss to life and property caused by earthquakes

**National Landslide Risk Mitigation Project** to strengthen structural and non-structural landslide mitigation efforts

**National Flood Risk Mitigation Project** to mitigate consequences of floods by improving capacity for effective preparedness, promptness in response and to assess risk and vulnerabilities associated with floods

- Other schemes such as **Centrally Sponsored Schemes (CSS)** that can be utilized by the district administration for disaster risk reduction are mentioned in the following table with their respective implementing departments/agency: (Table 23)

*Table 23: Centrally Sponsored Schemes, potential for DRR and respective implementing agencies/department*

Sector	DRR potential	CSS	Implementing Agency
Agriculture	Address core vulnerabilities, develop capacities, mitigation measures	Green revolution	Department of Agriculture, Cooperation and Farmer's Welfare
		White Revolution	Department of Animal Husbandry, Dairy and Fisheries
		Blue Revolution	Department of Animal Husbandry, Dairy and Fisheries
		Pradhan Mantri Krishi Sinchai Yojana (PMKSY)	

		<ul style="list-style-type: none"> <li>a) PMKSY: Har Khet Ko Pani</li> <li>b) PMKSY: Per Drop More Crop</li> <li>c) PMKSY:</li> <li>d) PMKSY: Accelerated Irrigation</li> </ul>	<ul style="list-style-type: none"> <li>a) Ministry of Water Resources, River Development and Ganga Rejuvenation</li> <li>b) Department of Agriculture, Cooperation and Farmers' Welfare</li> <li>c) Department of Land Resources</li> <li>d) Ministry of Water Resources, River Development and Ganga Rejuvenation</li> </ul>
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Sector	DRR potential	CSS	Implementing Agency
Livelihood	Address core vulnerabilities, disaster risk mitigation through structural measures suited to the local mitigation requirements	Mahatma Gandhi National Rural Employment Guarantee Programme	Department of Rural Development
		National Livelihood mission (Ajeevika) a) National Rural Livelihood Mission b) National Urban Livelihood Mission	a) Department of Rural Development b) Ministry of Housing and Urban Poverty Alleviation
		Jobs and Skill Development a) Employment Generation Programmes b) Pradhan Mantri Kaushal Vikas Yojana	a) Ministry of Labor and Employment b) Ministry of Skill Development and Entrepreneurship
		Shyama Prasad Mukherji Rurban Mission (SPMRM)	Department of Rural Development
Infrastructure	For building capacities and addressing vulnerabilities through physical infrastructure	Pradhan Mantra Gram Sadak Yojana	Department of Rural Development
		Pradhan Mantri Awas Yojana a) PMAY Rural b) PMAY Urban	a) Department of Rural Development b) Ministry of Housing and Urban Poverty Alleviation
		National Rural Drinking Water Mission	Ministry of Drinking water and sanitation

Sector	DRR potential	CSS	Implementing Agency
		Swachh Bharat Mission a) SBM Rural b) SBM Urban	a) Ministry of Drinking water and sanitation b) Ministry of Urban Development
		Urban Rejuvenation Mission AMRUT (Atal Mission for Rejuvenation and Urban Transformation and Smart Cities Mission	Ministry of Urban Development
		Infrastructure facilities for Judiciary	Ministry of Law and Justice
		Modernization of Police Forces	Ministry of Home Affairs - Police
		Border Area Development Programme	Ministry of Home Affairs - Police
Social Security Net	For addressing core needs of the most vulnerable population	a) National Social Assistance Programme b) Umbrella Scheme for development of scheduled castes c) Umbrella Programme for development of Scheduled Tribes d) Umbrella Programme for development of minorities i. Education scheme for Madrasas and Minorities	a) Department of Rural Development b) Department of Social Justice and Empowerment c) Ministry of Tribal Affairs  d) The following: i. Department of School Education and Literacy ii. Ministry of Minority Affairs iii. Ministry of Minority Affairs

		ii. Multi sectoral development plan for	
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Sector	DRR potential	CSS	Implementing Agency
		<p>minorities</p> <p>iii. Education empowerment, skill development, and livelihoods and special programme for minorities</p> <p>e) Umbrella Programme for development of other vulnerable groups</p> <p>i. Schemes for Backward Classes</p> <p>ii. Schemes for other vulnerable groups</p> <p>iii. Schemes for differently-abled persons</p>	<p>e) The following:</p> <p>i. Department of social justice and empowerment</p> <p>ii. Department of social justice and empowerment</p> <p>iii. Department of empowerment of persons with disabilities</p>
Health	Addressing core vulnerabilities with specific focus on health	<p>National Health Mission</p> <p>a) National Rural Health Mission</p> <p>b) National Urban Health Mission</p> <p>c) Tertiary Care Programmes</p> <p>d) Human Resources for Health and Medical Education</p> <p>e) National AYUSH Mission</p>	<p>a) Department of Health and Family Welfare</p> <p>b) Department of Health and Family Welfare</p> <p>c) Department of Health and Family Welfare</p> <p>d) Department of Health and Family Welfare</p> <p>e) Ministry of AYUSH</p>

Sector	DRR potential	CSS	Implementing Agency
		National Health Protection Scheme (erstwhile RSSY)	Department of Health and Family Welfare
Education	Addressing core vulnerabilities with primary and higher education	National Education Mission <ul style="list-style-type: none"> <li>a) Sarva Shiksha Abhiyan</li> <li>b) Rashtriya Madhyamik Shiksha Abhiyan</li> <li>c) Teachers Training and Adult Education</li> <li>d) Rashtriya Uchhatar Shiksha Abhiyan</li> </ul>	<ul style="list-style-type: none"> <li>a) Department of School Education and Literacy</li> <li>b) Department of School Education and Literacy</li> <li>c) Department of School Education and Literacy</li> <li>d) Department of Higher Education</li> </ul>
		National Programme of Mid Day Meal in Schools	Department of School Education and Literacy
Women and Child Welfare	Addressing core vulnerabilities with specific focus on Women and Children	Integrated child development services <ul style="list-style-type: none"> <li>a) Aanganwadi services</li> <li>b) National Nutrition Mission</li> <li>c) Maternity Benefit Programme</li> <li>d) Scheme for Adolescent girls</li> <li>e) Child protection scheme and scheme for welfare of working children in need of care and protection</li> <li>f) National Creche Scheme</li> </ul>	Ministry of Women and Child Development
		Mission for empowerment and protection of women	Ministry of Women and Child Development

Environment and	Ecological Protection	a) National Mission for a	Ministry of Environment, Forest and climate change
Sector	DRR potential	CSS	Implementing Agency
Natural Resources		Green India b) Integrated Development of Wildlife Habitats c) Conservation of Natural Resources and Ecosystems d) National River Conservation Programme	

## Other Options

### 9.2.1 MEMBER OF PARLIAMENT LOCAL AREA DEVELOPMENT SCHEME (MPLADS)

District authority may also pool the MPLADS funds for the works permissible in the guidelines. Each Member of Parliament gets of Rs. 5 crores funds for the development of essential functions in his/her own constituency. The projects are identified by the MPs and are implemented by the district authority. Moreover, the allocated fund could be clubbed with existing flagship programs and other developmental projects like MNREGA, etc.

MPLADS works can also be implemented in the areas affected by the natural disaster. Lok Sabha MPs from non-affected States can also recommend permissible work in the affected areas up to maximum of Rs.10 lakh per annum. In case of severe disaster, an MP can recommend work up to RS. 50 lakh for the affected district.

### 9.2.2 BACKWARD REGION GRANT FUND

Begusarai is entitled to receive financial assistance to accelerate socio-economic development under the Backward Region Grant Fund programme. As part of the programme focusing on the uplift of the backward districts, the funding pattern of the Centrally Sponsored Schemes have been revised for a focused approach and convergence/synergy among existing schemes. All CSS will give weight-age to the backward districts for fund allotment.

### 9.2.3 RISK INSURANCE AND MICRO-INSURANCE

Mitigation, preparedness, responding to disasters are important steps in disaster risk management. But given the nature of the calamity to possibly overwhelm any preparedness measures, risk insurance becomes a potent mechanism to account for residual risk. Two major schemes available towards risk insurance are:

1. **Pradhan Mantri Suraksha Bima Yojana** – a personal accident insurance scheme that offers protection against death or disability due to accidents available at a premium of Rs. 12/- per annum with a total coverage of Rs.2,00,000/-
2. **Pradhan Mantri Jeevan Jyoti Bima Yojana** – Life insurance scheme at a premium of Rs. 330/- per annum with a total coverage of Rs.2,00,000/-

Other schemes such as livestock insurance scheme, earthquake and flood insurance for property can be promoted in consultation with state and central governments. Micro-insurance schemes can be promoted through existing networks such as Bandhan<sup>12</sup>, Cashpor<sup>13</sup>, Ujjivan<sup>14</sup>, CDOT<sup>15</sup>, Saija<sup>16</sup> to suit local requiremen

### 9.2.4 MUTUAL AID

Mutual aid agreements can be promoted to lend assistance and emergency response across intra-jurisdictional boundaries. Begusarai district shares boundaries with other districts in Bihar. Few parts of Begusarai can be reached quicker from other districts especially during disaster (such as flood) events. Begusarai district can have mutual aid agreements with neighboring districts in Bihar for effective disaster response especially at the golden hour (immediately post disaster event) for alleviating the sufferings of the disaster affected community.

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### 9.2.5 CORPORATE SOCIAL RESPONSIBILITY (CSR)

Under section 135 of the Companies Act, it is mandatory for every company above the specified threshold of turnover or net worth or net profit, to spend at least 2% of the average net profits earned during the three immediately preceding financial years on CSR activities. Currently the following focus areas are notified under section 135 of the Companies Act, 2013 and Companies (Corporate Social Responsibility Policy) Rules 2014:

- Eradicating hunger, poverty and malnutrition, promoting preventive healthcare and sanitation and making available safe drinking water
- Promoting education, special education, and employment enhancing vocation skills especially among children, women, elderly, and differently-abled, and livelihood enhancement projects
- Promoting gender equality, empowering women, setting up homes and hostels for women and orphans, setting up old age homes, day care centers, and other facilities for senior citizens, focusing on socially and economically backward groups
- Reducing child mortality, and improving maternal health by providing good hospital facilities and low cost medicines
- Providing with hospital and dispensary facilities with more focus on clean and good sanitation with focus on combating HIV, AIDS, malaria and other diseases
- Ensuring environmental sustainability, ecological balance, protection of flora & fauna, animal welfare, agro forestry, conservation of natural resources, and maintaining quality of soil, air and water
- Employment enhancing vocational skills
- Protection of natural heritage, art & culture, including restoration of buildings and sites of historical importance, and works of art, setting up public libraries, promotion and development of traditional arts and handicrafts
- Measures for the benefit of armed veterans, war widows and their dependents
- Training to promote rural sports, nationally recognized sports, sports and Olympic sports
- Contribution to the PM Relief fund or any other fund set up by the central government for socio-economic development and relief & welfare of the scheduled castes, scheduled tribes, other backward classes, minorities and women
- Contributions or funds provided to technology incubators located within academic institutions, which are approved by the Central Government
- Rural development projects
- Slum area development

\*The above list is not exhaustive

These funds could effectively be utilized to reduce vulnerabilities and increase capacities for disaster risk conscious rural and urban slum development. District administration can promote specific focus areas and invite CSR and individual donations for the cause as promoted by various districts<sup>17</sup>.

## **10 Monitoring, Evaluation and Update of DDMP**

The District Disaster Management Plan (DDMP) provides a framework and direction to the government agencies for all phases of disaster management cycle, which must be reviewed and revised periodically. Plan maintenance is a dynamic process of updating the plan on a periodic basis. The backbone of maintaining the plan is carrying out mock drills and updating the plan based on lessons learnt thereof. This is a method of identifying the gaps and putting in place a system to fill the same. Regular updating of stakeholder details, contact numbers and resource inventory is another inherent and essential function of plan maintenance.

It is recommended that a special committee under the District Collector is constituted with designated nodal officers for maintenance, evaluation and update of the DDMP. Vulnerabilities are dynamic, and with a increasing frequency of high magnitude disaster events, the DDMPs would require focused maintenance and upkeep in order to remain relevant and as an operational framework. A special committee for DDMP monitoring, evaluation and update would also help in mainstreaming disaster risk reduction into development plans.

### **10.1 Guidelines for monitoring and evaluation of the plan**

- According to the DM Act 2005 31(2), the district disaster management plan shall be prepared by the District Authority after consultation with local authorities.
- According to clause 31 (4) and (7), the district plan shall be reviewed time to time (at least annually) and implemented (or issue such instructions to different departments of Government in the district for the implementation)
- The local authority shall ensure that disaster management drills and rehearsals are conducted periodically
- While updating the plan, the following aspects need to be considered:

Critical analysis of the outcome of exercises & mock drills as part of plan testing.

Incorporation of lessons learnt in the updated plan as a result of recommendations received from different stakeholders and as a result of mock drill exercises conducted.

Regular updating of the resource inventory and key infrastructure available in the district, and their updating on the State Disaster Resource Network.

- The plan testing should preferably be organized on the first Thursday in the months of April and October every year.
- The main objectives of the plan testing are to:

Determine the feasibility and compatibility of back up facilities and procedures

Identify areas in the plan that need modification

Identify training needs of key stakeholders

Assess the ability of the organization/department to respond to disaster threats.

- All departments that have specific roles and responsibilities in the DDMP must have a system to ensure that all Officers of their departments who have a specific role to play are fully conversant with their responsibilities/tasks
- Debriefing and evacuation mock drills:

After the mock exercise, debriefing and evaluation is very important. It is of critical

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importance that insights are collected from participants and used to modify the plan. Debriefing is very effective as it is carried out immediately after the exercise. It also includes documentation in terms of recommendations and improvements of the plan.

The lessons learned from the mock exercise are likely to be similar to those from real events. The only difference is that exercises are controlled events, specifically designed to test procedures and they can be repeated until sound/workable arrangements are in place.

- Review/update Plan: The Disaster Preparedness and Response Plan should be reviewed and updated regularly, based on inputs as under:

Drills and Rehearsals

Recommendations from all Depts. in their Annual DM Report

Lessons learnt from Disasters in other Districts, States and countries

Directions from BSDMA, DMD, Ministry of Home Affairs, NDMA, Government, etc.

- BSDMA and all other concerned Depts. should encourage formal and informal interactions with various stakeholders at different levels to learn and document their experiences, so that such experiences can contribute constructively towards updating of the DDMP and for further improving the capacity and capability to deal with future Disasters.

The interactions with key respondents such as Fire personnel, the SDRF, NDRF, the army, NEOC, officials and Local Authorities of neighboring districts is of prime importance to develop amicable and coordinated efforts during the golden hour as well as in mitigation, preparedness and recovery.

- The Plan can be updated online in Begusarai's official webpage (<https://Begusarai.nic.in/>) and views or comments can be sought from the public for improvements and updated on a periodic basis.

## 11      **References**

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## **12 Annexure**

### **12.1 Important Contact numbers**

#### **12.1.1 IMPORTANT HELPLINE NUMBERS**

<b>Department</b>	<b>Helpline Number</b>
DEOC	06245-230210

#### **12.1.2 CONTACT NUMBERS OF OFFICIALS IN DM OFFICE**

<b>S. No</b>	<b>Designation</b>	<b>Name</b>	<b>Mobile No</b>
1	District Magistrate	Mr. Roshan Kushwaha	9473191412
2	S.P	Mr. Yogendra Kumar	9431800011
3	Commissioner	Mr. Daya Nidhan Pandey	9431236740
4	Additional District Magistrate	Mr. Rajesh Kumar Singh	9473191413
5	Civil Surgeon	Mr. Pramod Kumar	9470003084
6	In charge – Disaster Management	Mr. Aneesh Kumar	8800875965
7	District Agriculture Officer	Mr. Shailesh Kumar	9431818803
8	Manager, State Food Corporation		
9	District Informatics Officer	Manish Kumar Mishra	9430282681
10	District Nazareth Officer - SDC	Mukesh Kumar Sinha	9431844933
11	DDC (Dy. Development Commissioner)	Mr. Sushant Kumar	9431818370
12	Indian Red Cross Society		
13	District Fire Brigade Officer	Mr. Krishna Prasad Singh	9430200034
14	District IT Manager	Mr. Ajeet Kumar	9472150678
15	District Animal Husbandry officer	Dr. Animesh Kumar	7992349503/ 9934461159
16	Engineer PHED	Mr. Alok Kumar	9934213828

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### 12.1.3 CONTACT NUMBERS OF POLICE OFFICIALS IN THE DISTRICT

Name	Designation	Contact No.	Email ID
Shri Yogendra Kumar, IPS	Superintendent of Police	9431800011	<a href="mailto:sp-begusarai-bih@nic.in">sp-begusarai-bih@nic.in</a>
Sri Satya Veer Singh (I.P.S)	DIG BEGUSARAI RANGE	9431822953	<a href="mailto:dig-begusarai-bih@nic.in">dig-begusarai-bih@nic.in</a>

## 12.2 Critical Resources

### 12.2.1 BOATS/ MOTORBOATS/ NETS (MAHAJALS) /TENTS

Details of resources available in district		
Sl. No.	Name of Resources	Quantity (Allotted in Blocks)
1	Computer	1
2	Generator (RR 03 KVA)	0
3	Government Boat	41
4	Private Boat	184
5	Inflatable Motor Boat	8
6	F.R.P Motor Boat	2
7	Inflatable lighting system	0
8	Tent	195
9	Polythene sheet	24,032
10	Life Jacket	80
11	GPS System / Satellite Fone	04

<b>12.2.1 RESOURCES at FIRE STATIONS IN BEGUSARAI</b>				
<b>Resources in Fire Stations in Begusarai</b>				
<b>Sl. No.</b>	<b>Name of Fire Station</b>	<b>Contact</b>	<b>Vehicles and Pumps</b>	<b>Manpower</b>
1	FIRE STATION BAKHRI	7485805948, 7485805949	YES	SUFFICIENT
2	FIRE STATION TEGHRA	7485805952 , 7485805953	YES	SUFFICIENT
3	FIRE STATION MANJHAUL	7485805946 , 7485805947	YES	SUFFICIENT
4	FIRE STATION BALLIA	7485805955 , 7485805954	YES	SUFFICIENT
5	FIRE STATION BEGUSARAI	7485805944	YES	SUFFICIENT

### 12.2.2 DO'S AND DON'TS

The following sub-section consists of DO's and Don'ts for common hazards<sup>18</sup> faced by Begusarai district:

#### DO'S AND DON'TS for Flood

##### Do's –

- Keep Emergency kit, jewelry and important documents ready.
- Listen carefully to flood warnings.
- Immediately move to a higher and safer place.

##### Don'ts –

- Do not enter into floodwater.
- Do not stand close to electric poles and wires.
- Do not use contaminated water.

#### DO'S AND DON'TS for Earthquake

##### A. Before an earthquake:

- Follow and advocate local safe building codes for earthquake resistant construction.
- Follow and advocate upgrading poorly built structures.
- Make plan and preparation for emergency relief.
- Identify the medical centers, fire-fighting stations, police posts and organize relief society of your area.
- Know the electric and water shut off locations in your house.
- Heavy objects, glasses, cutlery should be kept in lower shelves.
- Flowerpots should not be kept on the ramparts.

##### B. During an earthquake:

- Keep calm and reassure others.
- During the event, the safest place is an open space, away from buildings.
- If you are indoors, take cover under a desk, table, bed or doorways and against inside walls and staircase. Stay away from glass doors, glass panes, windows or outside doors. Do not rush to go out of the building, to avoid stampede.
- If you are outside, move away from buildings and utility wires.
- Once in the open, stay there till the vibrations stops.
- If you are in a moving vehicle, stop as quickly as possible and stay in the vehicle.
- Free all pets and domestic animals so that they can run outside.
- Do not use candles, matches or other open flames. Put out all fires.

##### C. After an earthquake:

- Keep stock of drinking water, foodstuff and first aid equipment in accessible place.
- Do not spread and believe rumors.
- Turn on your transistor or television to get the latest information/bulletins and aftershock warnings.
- Provide help to others and develop confidence.
- Attend the injured persons, give them aid, whatever is possible, and inform hospital.

- Be prepared for aftershocks as these may strike.
- Close the valve of kitchen gas stove, if it is on. If it is closed, do not open. Do not use open flames.
- Do not operate electric switches or appliances, if gas leaks are suspected.
- Check water pipes, electric lines and fittings. If damaged, shut off the main valves. Do not touch live wires of electricity.
- If needed, open doors and cupboards carefully as objects may fall.

## **DO'S AND DON'TS FOR HEAT WAVES**

### **Do's:-**

- Drink 2 to 3 liters of water per day or sufficient water, as often as possible, even if not thirsty
- Wear lightweight, light-colored, loose, porous natural fiber clothes.
- Always carry water while travelling.
- Wear hat and keep clothing damp, while working outside.
- Use umbrella, sunscreen as sunburn limits your ability to cope up with heat.
- Visit doctor, if you suffer chronic illness or feel ill.
- Use ORS, homemade indigenous drinks like lassi, torani (rice water), lemon sherbet (lemon water), and butter milk, etc., which help to rehydrate the body, and protect us from sunstroke.
- Keep animals in the shade with plenty of water.
- Keep your home cool with curtain, shutters or awnings on the sunny side and open windows at night.
- Use fans, damp clothing and have frequent cool showers.
- When a person is affected by heat wave, ensure the person lies down in a cool place; wipe her/him with a wet cloth; wash the body frequently.
- Pour normal water on the head of the affected person to bring down the body temperature.
- Use an icepack on the head of the affected person.

**Don'ts:-**

- Do not go out in the hot sun, especially between 12 noon to 3 p.m.
- Do not undertake strenuous activities; avoid work outside during 12 noon to 3 p.m.
- Do not consume alcoholic, caffeinated or carbonated drinks, which dehydrate the body.
- Do not eat high-protein foods, which increase metabolic heat.
- Do not leave children or pets in parked vehicles.
- Do not come directly in touch with sunlight.

**DO'S AND DON'TS for Fire****Do's –**

- Keep sand bucket and fire extinguishers ready.
- In case of fire, follow Stop – Drop – Roll principle.
- In case of smoke in a room, crawl on your knees.

**Don'ts –**

- Do not put excess load on electric sockets.
- Avoid oiling up of garbage and dry leaves on roof of the house.
- Do not light firecrackers at congested places and near vehicles.

**How to stay safe in Lightning:**

- Avoid using electronic equipment
- Stay indoors.
- If no shelter is available, bend down low but do not lie on the ground.
- Do not lean on concrete walls.
- Stay aware of the weather forecasts, preferably through a battery operated radio.

**Mitigation Measures:**

- Provision for lightning arrester in the high rise buildings
- Provision of lightning arrester (tarit chalak) in the field to avoid any lightning strike in the field, which poses threat to the farmers while in the field

**DO'S AND DON'TS for Road Safety****Do's –**

- Always wear seat belt while driving or sitting in a car.
- Always wear Helmet on a two-wheeler.
- Obey Traffic Rules.

**Don'ts –**

- Do not talk on Mobile phone while driving.
- Do not overtake from wrong side.
- Do not drink and drive.

## 12.3 Check-List for RELIEF CAMP

### 1) Tent Camps

- The layout of the site shall meet the following specifications:
- Three-four hectares of land per 1,000 people
- Ten meters-wide roads
- Minimum distance of 2 meters between the edge of the roads and tents
- Minimum distance of 8 meters between tents
- Minimum floor area of 3 square meters per person

### 2) For proper water distribution, campsites shall have:

- Tanks with a minimum capacity of 200 liters
- Minimum capacity per capita 15 liters/day
- Maximum distance between two tanks should not exceed 100 meters

### 3) Solid waste disposal containers shall be:

- Waterproof
- Insect-proof
- Rodent-proof
- Waste should be covered tightly with a plastic or metallic lid
- Waste should be incinerated or buried

### 4) Solid waste units shall have a capacity of 1 liter per 4-8 tents or 50-100 liters per 25-50 people

### 5) Excreta and liquid waste shall be disposed of in bore-holed or deep trench latrines built according to the following specifications:

- At a distance of 30-50 meters from tents\
- 1 seat/10 persons
- Modified soakage pits for wastewater to be made by replacing layers of earth and small pebbles with layers of straw, grass or small twigs. The straw needs to be removed on a daily basis and burnt

### 6) A bench for washing shall be:

- 3 meters in length
- Double-sided
- 2 per 100 persons

### 7) Buildings: Buildings to accommodate victims during relief shall have:

- Minimum floor area of 35 sq. meter per person
- Minimum air space of 10 sq. meter per person
- Minimum air circulation of 30 cubic meter per person per hour
- Separate washing blocks for men and women

### 8) Washing Facilities:

- 1 hand basin per 10 persons
- Wash bench of 4-5 meter per 100 persons
- 1 shower per 50 persons in temperate climates or 1 shower per 30 persons in hot climates

9) Toilet accommodation in buildings housing displaced persons shall meet these requirements:

- 1 seat per 25 women
- 1 seat and 1 urinal per 35 men
- Maximum distance from building should be 50 meters
- Plastic or metal refuse containers with closed lids with 50-100 liter capacity per 25-50 persons

#### 10) Latrines

Depending on the type and duration of the disaster, different types of excreta disposal measures need to be taken in the camps. People must be discouraged from open defecation. The area must be adequately lighted and the approach road must be clearly demarcated. The most suitable types of latrines are:

Shallow trench latrines

Deep-trench latrines

Pit privies

Borehole latrines

Septic privies

Urinals

Mobile latrines

Community latrines

Attempts shall be made to provide community latrines with water, so that cleaning is practical

There shall be separate blocks for men and women

- At least five seats per 100 persons
- Must be 1.5 km away, and downhill from any water source
- The bottom of the latrine shall be at least 15 m above the groundwater table. In the presence of limestone formations and fissured rocks, additional precautions are necessary to protect sources of water supply.
- The site shall be dry, well drained and above flood level.
- The surroundings should be cleared of all vegetation, waste and debris.

#### 11) Laundry

In temporary encampments, people shall be expected to wash their clothes in plastic or iron tubs.

One washing stand for every 100 persons is recommended

Proper drainage and soap traps shall be provided for the wastewater

Following standards shall be maintained for food & water supply:

##### 1. Food

- For the Marooned
- Only non-perishable, ready to eat and long-lasting food items should be included.
- Food shall be packed in small packets for individual use.
- Airdropping shall be done from minimum heights with ropes and hooks, to ensure minimum damage to supplies.
- Supplies shall be dropped from stationary and not moving helicopters.
- Food shall be tagged first and then distributed



## 2. Storage

- If possible, food shall be kept in a shade in a dry and cool place.
- Food shall be kept covered at all times.
- It should be stored in plastic bags and kept in airtight containers.
- Salt and spices shall be stored in their original packing
- To prevent looting, guards shall be posted at warehouses and supply depots.
- Damaged stocks shall be stored separately to protect the remaining stock from odour and damage.
- Maintain food stock register and report to appropriate authorities.
- Prompt transport schedules and delivery of perishable food stocks to the needy at the earliest need to be maintained.

## 12.4 Plan Maintenance certificate

Major Learning based on experience of past disasters and mock drills (on planning/implementation/compliance)	Revisions adopted/proposed in the DDMP	Remarks
District Level/Block Level Awareness Activities on Flood Safety/ Earth Quake Safety/ Lightning/Fire Safety	Awareness Activities on Flood Safety/ Earth Quake Safety/ Lightning/Fire Safety on Regular Basis	Learning Oriented Workshop/ Training
Training of Community Volunteer on Disaster Management	Awareness Activities on Flood Safety/ Earth Quake Safety/ Lightning/Fire Safety on Regular Basis	Learning Oriented Workshop/ Training
Training of Public Representatives on Disaster Management	Awareness Activities on Flood Safety/ Earth Quake Safety/ Lightning/Fire Safety on Regular Basis	Learning Oriented Workshop/ Training

### DDMP Status of the Current Year 2022

Action	Complete	In Progress	Pending
Completed	Yes	Completed	No