Research Paper

Comparative Analysis of Disaster Management system between the State of Odisha and Gujarat

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Abstract: *Every year, India is impacted by multiple disasters, which has transformed the country's disaster management system to be more organised and effective. Odisha created a more systematic process to prevent disaster risk than any other state, and the entire globe has praised these actions. However, other Indian states are also disaster-prone. Of course, they have a solid disaster-prevention policy in place, but it is time to restructure its structure for a more successful method. In this paper, the researcher examines the institutional architecture for disaster management in Gujarat and Odisha. The researcher also wants to compare disaster management systems in these two states and the difficulties that need to be addressed.*
Key Words*: Disaster Management, National Disaster Management Authority, Odisha, Gujarat, Cyclone, Institutional Framework.*

I.   Introduction:

According to CRED data, 7348 disasters were documented between 2000 and 2019. Disasters killed about 1.23 million people worldwide, an average of 60000 per year, and impacted nearly 4 billion people. Furthermore, calamities harmed the world economy by 2.97 trillion dollars (UNDRR, 2020). The Indian subcontinent is one of the world's most disaster-prone areas (CII Foundation, 2018). India is vulnerable to various natural and artificial calamities to varying degrees. Floods and river erosion threaten over 40 million hectares (12%) of land. Earthquakes of moderate to very high-intensity strike 58.6% of the landmass. Approximately 5,700 km of the 7,516 km long coastline is vulnerable to cyclones and tsunamis. Drought threatens 68% of the cultivable land, and landslides and avalanches threaten steep areas (Ediga, 2015). In the recent Assam floods, 18 people died, and approximately 7.2 lakh people were displaced across 22 districts (PTI, 2022). Every year, India is affected by several natural disasters. All Indian states must build or enhance their disaster management mechanisms to reduce disaster risk in this situation. Although the Indian Mechanism effectively fights natural disasters, states should learn from each other to reshape their disaster management for more significant public benefit.

The incidence of natural disasters has increased in recent decades, with many incidents occurring each year, necessitating the development of robust policies to mitigate natural catastrophe damages (Rajendran, 2012). Many injuries have emerged in recent decades due to a lack of preparation and contingency plans. Still, India has developed its disaster management systems to counter it appropriately. This article focuses on the institutional frameworks that Indian disaster management structures and the states of Odisha and Gujarat have implemented.

II.   Review Of Literature:

Shah, A. In his article, J. (2011) addressed the nature and forms of disasters, arguing that Earthquakes, Floods, and Droughts are at extremely high risk because they affect millions of people and do massive harm to life and property. In his paper, he outlined India's disaster management system, highlighting disaster preparedness and rehabilitation management. He also covered several case studies, such as the Gujarat Earthquake, Bhopas Gas Tragedy, and Tsunami, as well as his ideas on the role of engineering students in disaster management. In his work, **S. Iwasaki (2016)** argues that disaster management ignores the livelihood security of Odisha people in two big cyclones, the 1999 super cyclone and the 2013 Phalin. He also examines the many management stakeholders in the disaster risk reduction programme, emphasising the importance of necessary improvements for effective management. **M. Nambiar (2015)** highlights the increasing number of natural disasters in the future year due to climate change in her article. She maintained that disaster management is not solely a government job and that every citizen should participate in disaster relief efforts. In his paper, **R. K. Bhandari (2014)** argued that disaster management should begin with local communities and governments. The 2015-2024 decade will be better developed than previous decades in terms of disaster prevention in India. **Rajendran, C. P. (2012)** argued in his paper that India had seen several disasters in the recent decade, with multiple calamities causing loss of life and property in diverse regions. As a result, he claimed that India requires a more systematic strategy to address disaster-related risk and damages adequately. **Palakudiyil, T. & Todd, M. (2013)** address how to effectively reduce disaster-related risk and damage through good preparedness in their book. They said that both states lost many lives and property owing to a lack of readiness and a lack of contingency plans but that this could have been avoided if they had used a systematic disaster management plan.

Fig.1: Research Gap in Review of Literature
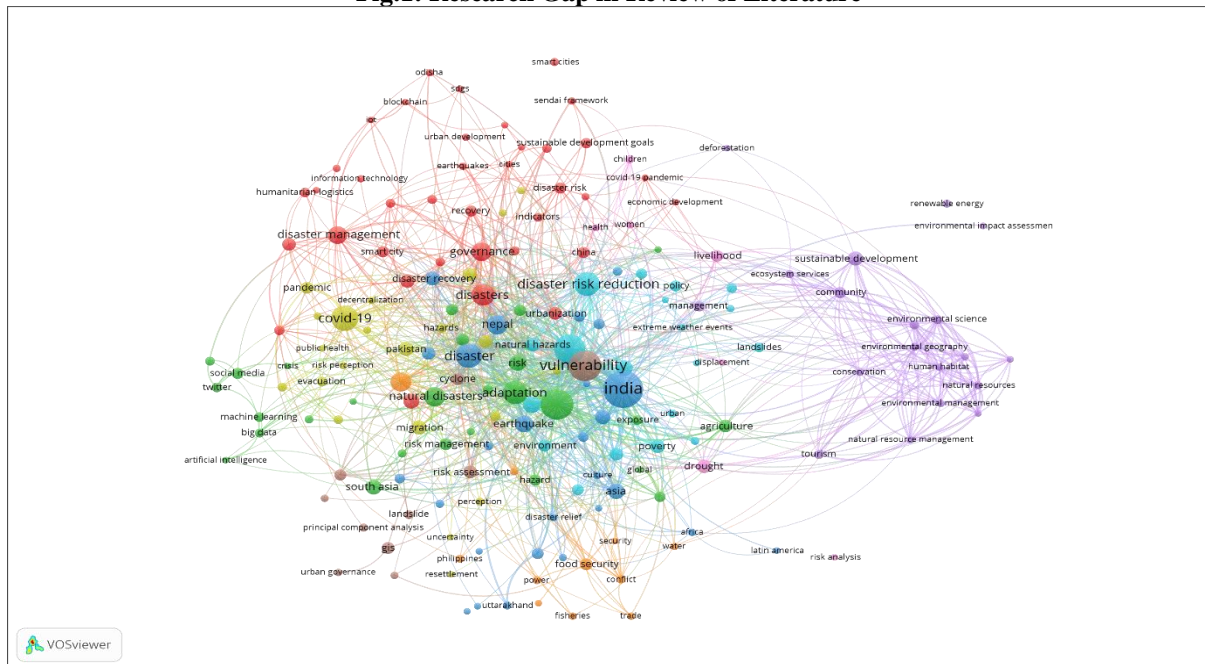
Source: ELSEVIER & JSTOR Database

Even though more than 85% of disasters occur in underdeveloped countries, disaster studies literature only covers about 1% of these consequences (Baruah & Kumar, 2014). There is a lot of literature on disaster management, but very little material at the regional level can provide helpful information about regional disaster management systems. The researcher's goal in this paper is to present a regional level institutional framework through a comparative analysis so that other researchers can better comprehend regional level management systems.

III.   Discussion:

Table No. 1: Natural Disaster's Impact on India

Death in Year	Cyclone		Flood		Earthquakes		Drought	
	Death	Total Affected (in mn)	Death	Total Affected (in mn)	Death	Total Affected (in mn)	Death	Total Affected (in mn)
1960	265	0.55	1070	1.13	19	0.005227	150000	10.07

1970	2635	2.81	838	10.56	7	0	0	21
1980	391	1.74	1235	15.31	42	2	0	40
1990	1809	3.23	1323	27.94	1139	0.07193	0	0.117
2000	101	0.59	1367	24.74	3771	0.713315	0	35
2010	274	3.62	1394	9.75	22	0.064593	0	33.82

Source: Our World Data Base (Natural Disasters - Our World in Data)

Table 1 shows that more than 167702 individuals died in disasters from the 1960s to the last decade, and more than 100 million people have been affected by natural disasters. The chart also includes further information about India's disasters. drought-related deaths haven't been documented since 1970. In contrast, earthquake-related damages will diminish with a better management system, and flood and cyclone related casualties remain a significant concern.

Table No.2: Major Disasters in the Last 10 Years (2011-2021)

State/Union Territory	Cyclone	Flood	Earthquake	Total Disasters
Odisha	11	0	1	12
Gujarat	7	4	0	11
Tamil Nadu	9	1	0	10
Andra Pradesh	9	0	0	9
Assam	0	6	0	6
Maharashtra	3	1	1	5
West Bengal	4	0	0	4
Puducherry	3	0	0	3
Kerala	1	2	0	3
Arunachal Pradesh	0	2	0	2
Delhi	0	0	1	1
Sikkim	0	0	1	1
Kashmir	0	0	1	1
Uttarakhand	0	1	0	1
Nagaland	0	1	0	1
Manipur	0	1	0	1
Madhya Pradesh	0	1	0	1
Karnataka	0	1	0	1
Goa	1	0	0	1

Sources: Ediga, 2015, Internet, News Papers

Table No.2 shows that India has experienced more than 74 massive disasters in the last ten years, with the majority of the Coastal Area and Assam being seriously affected. The states most affected are Odisha in the Eastern Coast Zone and Gujarat in the West Coast Zone. The primary disasters in the area are Cyclone and Floods. Some parts of Gujarat are also in an earthquake zone, and the state had a powerful earthquake in 2001. (Sinha, 2002).

Table No. 3: Cyclones number from 1861 to 2021

| West Coast		East Coast	
State	No. of Cyclone	State	No. of Cyclone
Kerala	4	West Bengal	79
Karnataka	5	Odisha	116
Maharashtra	18	Andra Pradesh	91
Goa	4	Tamil Nadu	61
Gujarat	35	Pondicherry	10

Source: Internet

Since the recent decade, both Odisha and Gujarat have seen the most cyclones in their respective areas. By 2021, Odisha will have experienced 116 cyclones, while Gujarat will have experienced 35. The Western Coast will experience fewer cyclones than the East Coast. Because cyclonic events are common, both the Arabian Sea and the Bay of Bengal have seen them, although the Bay of Bengal has seen five times more cyclones than the Arabian Sea. Cyclones in the Bay of Bengal are far more intense than those in the Arabian Sea; about 58 per cent of cyclones in the Bay of Bengal reach the shore, whereas only 25% of cyclones in the Arabian Sea reach the coast (Sen, 2018).

Disaster Management in India

The evolution of the disaster management system can be traced back to a high-power committee in 1999 after the Gujarat earthquake Indian government prepared the plan for disaster management. The 10th five-year plan provides a detailed chapter regarding the issue of disaster management. 12th finance commission also offered some financial management regarding the matter. Finally, on the 23rd Dec 2005 Indian Government enacted the Disaster Management Act, which is responsible for creating National Disaster Management Authorities and State Disaster Management Authorities. The prime minister is head at the national level, while the chief minister is state-level (Government of India, n.d.).

Fig.2: Disaster Management Structure in India
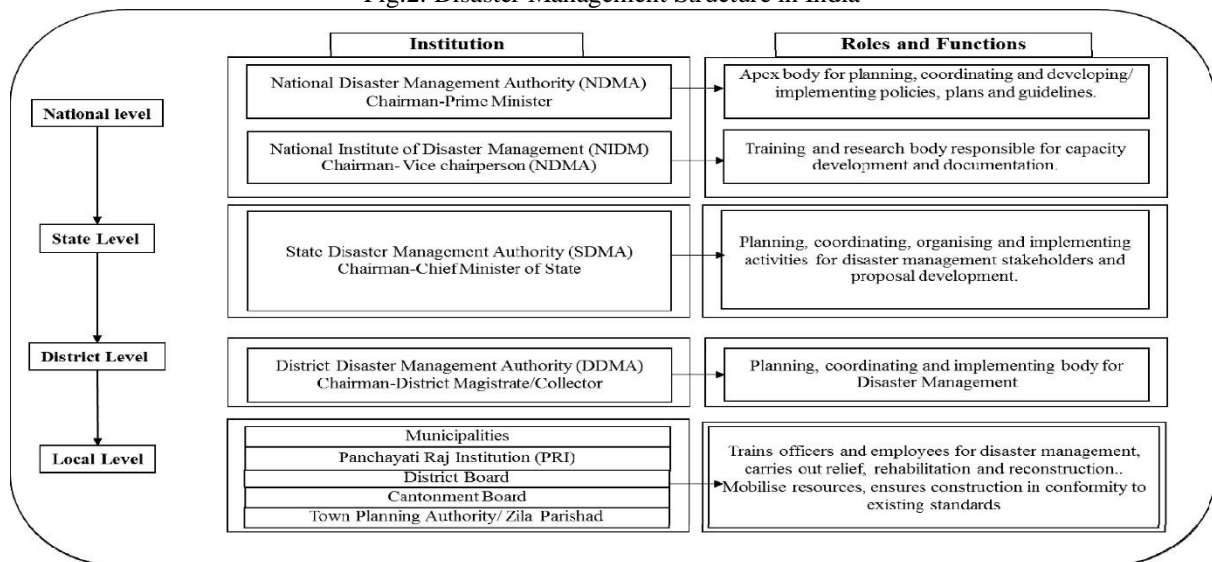
Source: Madan & Routray, 2015

The NDMA, National Executive Committee (NEC), NIDM, and NDRF are four high-profile bodies at the national level. The NDMA, which is under the Ministry of Home Affairs (MHA) and is chaired by the Prime Minister, serves as the central body for developing laws, plans, guidelines, and codes for dealing with all types of natural and man-made disasters in India (Government of India, 2005), as well as coordinating and implementing disaster preparedness and response activities. The Union Home Secretary chairs the NEC, which consists of 14 secretaries from various ministries and departments. The NEC is responsible for assisting the NDMA in carrying out its duties. The NIDM is in charge of planning and developing capacity building programmes, training, and research in DM, in collaboration with other research organisations. The NDRF is a special force established in 2006 with the formation of eight battalions of central paramilitary forces to provide a practical and specialised reaction to natural and man-made disasters. The NDRF now has 12 battalions, each with 1149 people, stationed across the country depending on the country's vulnerability profile and to shorten response time. The NDRF is directed and controlled by the NDMA; however, the NDRF's director-general is appointed by the national government. The SDMA, led by the state chief minister, is responsible for developing DM policies and programmes in compliance with the NDMA's requirements and serving as the state's DM coordinating, implementing, and monitoring organisation. The State Executive Committee (SEC), which the state chief minister also chairs, has been charged with assisting the SDMA in carrying out its duties. The district collector or district magistrate heads the DDMA, which is responsible for planning, directing, and implementing DM initiatives in the district in compliance with the NDMA and SDMA principles (Madan & Routray, 2015).

Institutional Framework for Disaster Management in Gujarat

The Gujarat State Disaster Management Bill was approved on March 28, 2003. He went into effect on May 13, 2003, making Gujarat the first state in India to provide legislative backing for competent disaster management administration. The Act aims to mitigate disaster consequences through good administration and coordination, monitor emergency aid during and after disasters, and offer effective disaster reconstruction and rehabilitation measures within Gujarat.

Fig. 3: Institutional Mechanism of Gujarat Disaster Management system
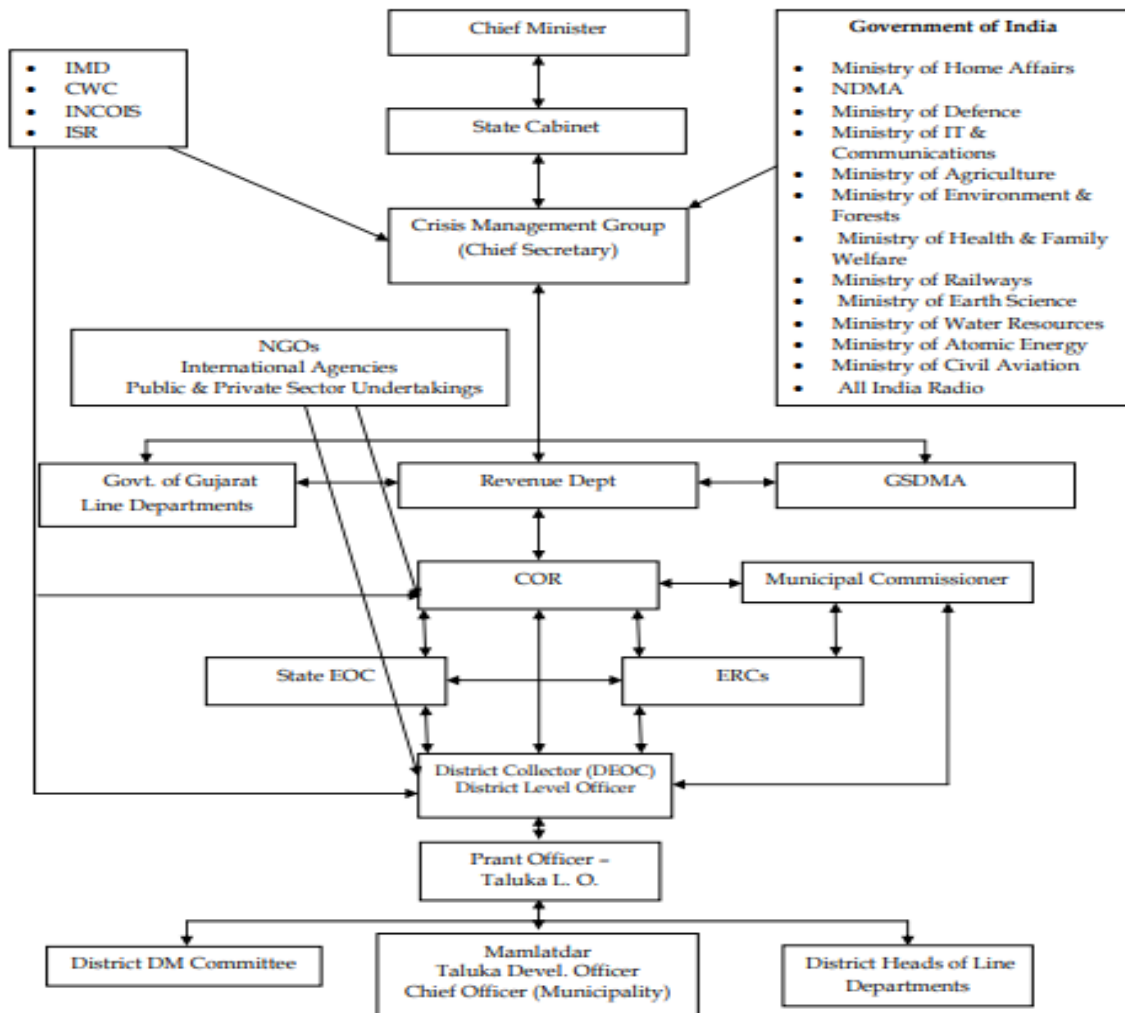
Source: (Gujarat State Disaster Management Authority, 2019)

In Gujarat, the disaster process typically begins with the Chief Minister of the State, who works with several state-level agencies before passing down to the district and taluka levels. The State Disaster Management Authority and the Officer of Commissioner of Relief and Revenue Department are the primary entities responsible for implementing disaster management measures at all levels. GSDMA is mainly accountable for numerous actions such as disaster management coordination at all phases, including disaster prevention and mitigation measures carried out by stakeholders. Disaster management is a multi-stakeholder method for handling disasters at every stage. Data collecting for analysis, research, and development on a wide range of disasters and disaster management Information repository for disasters and disaster management policies and plans are being developed and updated. Community and stakeholder education and training on preparedness Sections 12-19 of Chapter VI of the Act 2003 describe the coordination of rehabilitation and reconstruction measures by various government departments.

The Commissioner of Relief is in charge of emergency relief and response during a disaster. For efficient emergency assistance, a coordinated strategy at the Taluka and District levels is required; the relief commissioner serves as a major figure among these authorities. After all, rapid relief and reaction efforts would help lessen the disaster's effects. As a result, the Commissioner of Relief was compelled by Section 21 and 22 of

the Act, 2003 to: Prepare, evaluate, and update emergency plans and guidelines, as well as ensure that district-level emergency plans are prepared, reviewed, updated, and ensure that the communication system is in order. Reevaluate disaster management contingency plans regularly, and provide disaster management drills regularly. The Commissioner of Relief gives instructions to the Collector and Local Authorities in the affected area to deliver emergency relief.

The State Crisis Group develops a strategic policy framework for catastrophe management in the state. It ensures that disaster response actions in the state comply with GSDMA and adhere to its disaster management policy framework.

- Identifying resources within and beyond the state that could be utilised for disaster operations is the other activity conducted by the State Crisis Group.
- Providing catastrophe operation and management reports and advice.
- Creating local and district crisis groups.

GSDMA empowered the Gujarat State Disaster Management Institute (GIDM) to be created under section 14(a) of the Act 2003. GIDM was established to promote disaster management capacity building and training programmes among the community and other stakeholders, as specified by Section 16(1)(c) of the Act 2003. However, the Act makes no explicit provision for the establishment and operation of the GIDM. It was founded in 178as as the Natural Disaster Management Cell, part of the Sardar Patel Institute of Public Administration (SPIPA) and is responsible for providing training to state government officials in dealing with natural disasters. Gujarat Institute of Disaster Management was established in 2005. Since 2012, GIDM has been registered as an autonomous organisation under the Societies Registration Act of 1860 and the Bombay Public Trust Act of 1950, allowing it to operate independently. The institute conducts training programmes for government officials, members of Panchayati Raj Institutions, industry officials, and others to draw diverse approaches to disaster management.

The GSDMA Home Department formed the State Disaster Response Force (SDRF) following the National Disaster Response Force with the aim of professional response to a terrible disaster. 179 11 SDRF companies are stationed in Vadodara, Ahmedabad, Godhara, Nadiad, Gondal, Valiya, Vav, Gandhinagar, and Rajkot, with a total strength of roughly 1100 soldiers. As a result, the SDRF serves as disaster response and relief organisation for catastrophe victims. Although the Gujarat State Disaster Management Act 2003 does not explicitly provide for the establishment of such a force, the State Relief Commissioner has been empowered to use power to evacuate the populace from disaster-affected areas to save lives.

The SDRF is essentially a police unit that has been entrusted with the responsibility of performing during disasters, and the Act of 2003 makes no specific provision for its establishment or functions. At the district level, there is a Collector who is in charge of providing and facilitating emergency aid with the help of the local government. The Collector has been given authority to give instructions to local government authorities on emergency aid. Collector makes plans for disaster preparedness, response, and recovery, and if necessary, recommends disaster declaration to the Commissioner of Relief and the State Government. Collector has been tasked with various other tasks related to disaster management, including prevention, mitigation, and preparedness. Disaster Management Plan preparation, review, and update Coordination with the local government to guarantee that pre-and post-disaster management operations are carried out as planned. Facilitation of community training and awareness programmes with the help of the local government, non-governmental organisations, and the private sector, As underlined under Sections 23 and 24 of the Act, ensuring that equipment is in ready-to-use condition, among other things. Local authorities are primarily responsible for disaster management under Section 25 of the Act and work under the direction of the collector.

When disaster strikes, the local government is the first to respond. It must function under the district authority's and GSDMA's disaster management plans and coordinate with other frontline responders. Other measures to be carried out by the Local Authority include: assisting the GSDMA, Commissioner, or Collector in disaster management; ensuring sufficient staff training; Building or other buildings within the region comply with the rules or specifications issued by the Department of State Government; Carrying out relief operations as directed by the Commissioner; Measures of reconstruction and rehabilitation in accordance with established norms; disaster management drills Disaster management plan preparation and updating; coordination of plan implementation with stakeholders (Gujarat State Disaster Management Authority, 2019).

Institutional Framework for Disaster Management in Odisha

The Government of Odisha established OSDMA as an autonomous institution on December 28, 1999, after the 1999 Super-cyclone. It was established as a non-profit making and charitable institution for the benefit of the people of Odisha on December 29, 1999, under the Societies Registration Act, 1860, with its headquarters in Bhubaneswar and jurisdiction over the entire state.

Fig.4: Institutional Mechanism of Odisha Disaster Management system
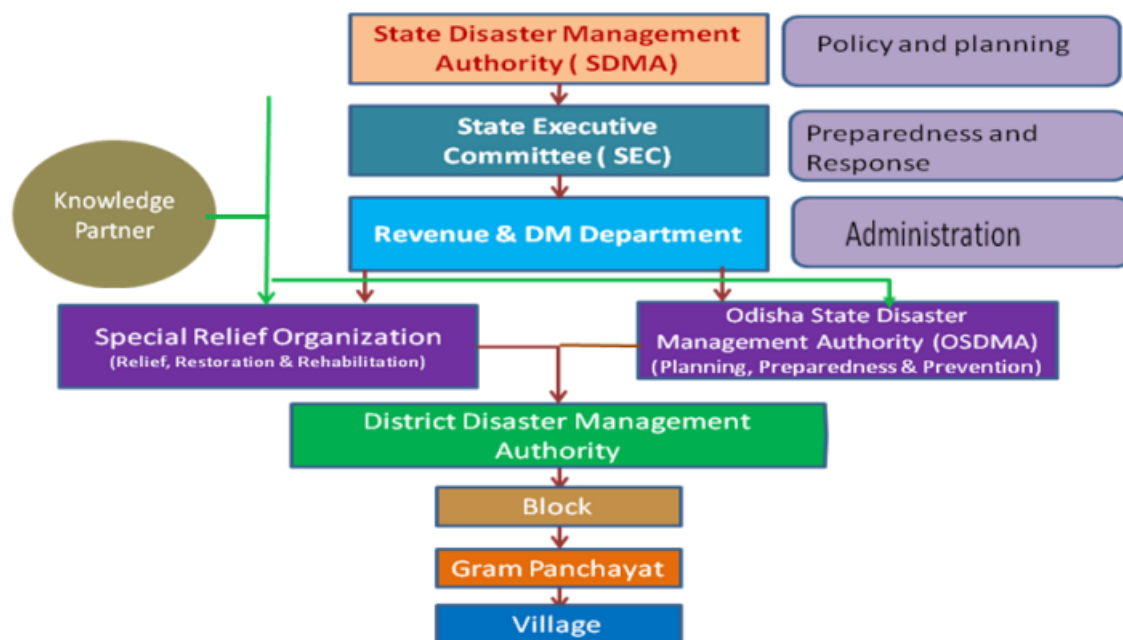
Source: State Disaster Management Plan 2017

The State Disaster Management Authority (SDMA), the Revenue & Disaster Management Department, the Odisha State Disaster Management Authority (OSDMA), and the Office of the Special Relief Commissioner are key disaster management institutions. Stakeholders in the State Disaster Management Plan include the State Government's principal line agencies, the District Administration, UN Agencies, other technical institutions, Panchayati Raj Institutions, Urban Local Bodies, the general public, and non-governmental organisations.

Under the Disaster Management Act of 2005, every state government must establish a State Disaster Management Authority (SDMA). The state's Hon'ble Chief Ministers serve as Chairpersons (ex-officio) of SDMA, and the Chairpersons may designate up to eight additional members. It lays out the state's disaster management policies and plans. It gives its approval to the state plan in accordance with the NDMA's requirements. Coordinate the state plan's implementation and recommend funding for mitigation and preparedness actions. It examines the development plans of many state departments to ensure that preventative, readiness and mitigation efforts are all integrated. Its growth plans or projects also provide guidelines for disaster avoidance and mitigation.

The State Government established the State Executive Committee (SEC) to assist the State Disaster Management Authority in carrying out its functions and coordinate action in accordance with the SDMA's guidelines, as well as to ensure that the state government's directions are issued under the disaster management act are followed. The National Policy, National Plan, and State Plan will be coordinated and monitored by the SEC. It looks at how vulnerable sections of the state are to various types of disasters and what steps should be made to prevent and mitigate them. It creates recommendations for disaster management plans for state and local governments and monitors their execution.

The Revenue and Disaster Management department is in charge of giving emergency help to those affected by natural disasters such as floods, droughts, cyclones, earthquakes, fires, and accidents. It also works on relief, rescue, rehabilitation, and restoration projects. The Principal Secretary/Addl leads the Revenue and Disaster Management Department. Chief Secretary, who has total administrative and financial authority. In 1965-66, the Board of Revenue established the Special Relief Organisation to provide relief and rescue operations during and after various calamities. The scope of the Relief Organization has expanded since its establishment. It now focuses on disaster management, including reaction, relief, and recovery. It works with districts and departments to coordinate rapid relief and rescue operations and restoration and rehabilitation efforts. The help of the Odisha State Disaster Management Authority also promotes disaster preparedness at all levels in the state (OSDMA).

The Special Relief Organization is known for its quick response in the face of natural disasters. They are helping the State Disaster Management Authority in the performance of its job, coordinate action in accordance with the SDMA's recommendations, and guarantee that the state government's orders issued under

the disaster management act are followed. The National Policy, National Plan, and State Plan will be coordinated and monitored by the SEC. It looks at how vulnerable sections of the state are to various types of disasters and what steps should be made to prevent and mitigate them. It creates recommendations for disaster management plans for state and local governments and monitors their execution.

The State Government established the District Disaster Management Authority. The District Disaster Management Authority (DDMA) comprises the Chairperson. As many other members as the State Government deems necessary, but not more than seven, and unless the rules provide otherwise, it shall be made up of the following:

a) The Collector, District Magistrate, or Deputy Commissioner of the District is the Chairperson (ex-officio) of the DDMA.

b) The Co-Chairperson (ex-officio) of the DDMA is the elected representative of the local authority.

It was felt necessary to form a professionally trained group equipped with state-of-the-art emergency equipment to assist the civil administration in search and rescue operations and relief line clearance for effective disaster management in the event of natural as well as human-caused disasters during the post-super cyclone reconstruction and preparedness phase. With a regulation number. 939/CD dated 07.06.2001, the government of Odisha established the Odisha Disaster Rapid Action Force (ODRAF). ODRAF is a multidisciplinary, multi-skilled, high-tech force for all forms of calamities. ODRAF strives to reduce casualties, clear communication lines, deploy personnel and equipment quickly, reduce costs and time lags, and assist institutional arrangements. 10 ODRAF units have been established in three phases. Units of the ODRAF are strategically placed throughout Orissa. The locations of these units are determined based on their vulnerability profiles to reduce the time it takes for them to be deployed. The ODRAF Units have no geographical or territorial limits in terms of the operational area.

Comparison between both state disaster management institutional framework
Finance
Gujarat and Odisha have robust disaster management structures, with financing being one of the essential components in disaster management. In Odisha, the state budget has a separate disaster management fund. However, in Gujarat, disaster-related funds are included in the social welfare and nutrition budget, comparable to the Indian national budget. In 2021-22, Indian governments were expected to set aside 6.3 per cent of their budgets on social welfare and nutrition. Payments for social security benefits, food, and disaster aid are included (State Budget Documents; PRS,2021).

Fig.5: Social Welfare and Nutrition share from the state budget (2021-22)
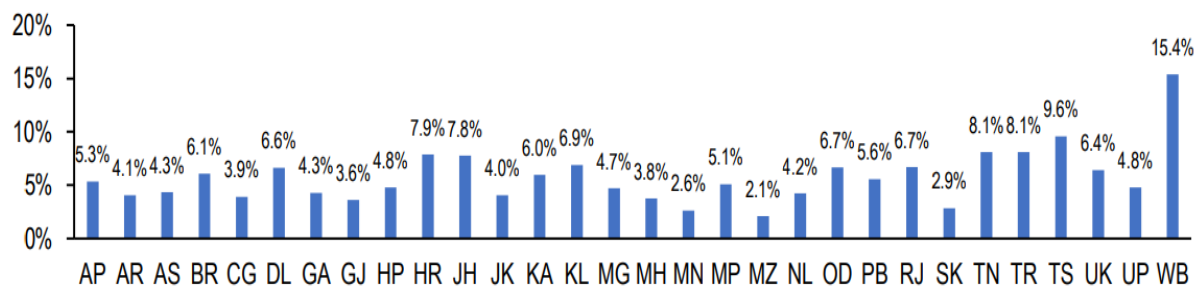
Source: State Budget Documents; PRS

Fig. 5 presents that in the section of Social Welfare and Nutrition section Gujarat shares only 3.6% of the budget while Odisha shares 6.7% of the budget. Apart from that, the Gujarat State Disaster management authority received the below-mentioned amount for Disaster-related expenditure.

Table No.4: Budget allocated to GSDMA Agency

Year	Amount (in Crore)
2001-02	1512.94
2002-03	911.53
2003-04	655.79
2004-05	677.2
2005-06	658.04
2006-07	322.62
2007-08	254.9
2008-09	281.32
2009-10	95.39
2010-11	51.34
2011-12	38.95
2012-13	39.76
2013-14	80.12
2014-15	86.72
2015-16	151.58
2016-17	91.4

Source: Gujarat State Disaster Management Authority

On the other hand, the state of Odisha maintains a specific revenue and disaster management unit and a special disaster management fund. It has the maximum amount authorised to the fund in 2022-23.

The agency has not published data for the previous five years; the most recent data on the GSDMA website is from 2016-17. Since 2001, data has been available on the site, and we can see that data from 2001 to 2016 is available and that the amount allotted to GSDMA is the largest during earthquakes, while the lowest amount awarded to GSDMA was 38.95 crore in 2011-12.

Table No.4: Budget allocation for Disaster Management Fund in Odisha

Year	Amount (in Crore)
2022-23	3210
2021-22	3050
2020-21	3200
2019-20	2000
2018-19	2089.57
2017-18	1824
2016-17	3258.87
2015-16	3065.76
2014-15	1835.66
2013-14	1344.84

Source: Government of Odisha

Vulnerability

Compared to West Bengal and Andhra Pradesh, Odisha is one of the most disaster-prone states in India, and east coast disasters are more effective than west coast cyclones. The East Coast of India was hit by roughly 308 cyclones between 1891 and 2000, with 103 severe. During the same period, 48 tropical cyclones made landfall on the West Coast, with 24 of them causing severe cyclonic storms. More than 58 per cent of cyclones that form in the Bay of Bengal approach and cross the East Coast in October and November. Only 25% of cyclones that form over the Arabian Sea landfall on the West Coast. During the pre-monsoon season, the values are 25% over the Arabian Sea and 30% over the Bay of Bengal (National Cyclone Risk Mitigation Project, n.d.).

The first disaster risk index was released in 2018, where Maharastra was declared the most vulnerable state in India, while Gujarat was placed 9th on the state list. The State of Odisha does not come under the top 10 vulnerable states list. Therefore, it is clear that due to its disaster management system, the state of Odisha can handle natural disasters better way than Gujarat.

Agency

State disaster management authorities, State Executive Committees, Special Relief Organizations, State level committees, District level management authorities, State Crisis Groups, NDRF, and the Early Warning Dissemination System are all similar structures for disaster management. Nonetheless, before implementing the National Disaster Management Act of 2005, Odisha established the Odisha Disaster Rapid Action Force, which is a trained professional force dedicated to disaster risk reduction.

NGOs

There are around 3095 NGOs active in Gujarat, with only 23 NGOs involved in disaster management. Odisha, on the other hand, has 3312 non-governmental organisations (NGOs) registered, with 51 of them active (Give India, n.d.). As a result, there are more NGOs working on disaster risk reduction in Odisha than in Gujarat.

Affected People

Table 3 shows that, in compared to Gujarat, Odisha has had more calamities over the last many decades. On their disaster management website, Odisha makes a decent gesture in terms of affected and dead counts from numerous natural disasters. Despite this, Gujarat's website does not include multiple statistics on the subject.

No.5: Disaster affected number statistics

Year	Gujarat		Odisha	
	Death	Affected	Death	Affected
2006	250	NA	107	6741384
2007	NA	NA	97	4235757
2008	NA	NA	36	4543590
2009	89	NA	59	661000
2010	NA	NA	14	89700
2011	NA	NA	82	6000000
2012	NA	NA	3	61000
2013	32	NA	21	13235000
2014	NA	NA	64	7343966
2015	525	NA	9	494088
2016	NA	NA	3	15100
2017	NA	NA	9	514669

He National Source: Odisha State Disaster Plan 2019 & Gujarat State Disaster Plan 2021

Natural disasters affect a large number of individuals in both states, as seen in Table 5. Due to a lack of statistical data from Gujarat, this table cannot be contrasted very effectively, although it is clear that the majority of people in Odisha are affected. Even still, natural disasters claimed the lives of far fewer people. This is a clear indication that Odisha has a well-developed disaster management policy.

IV.   Conclusion

In recent years, India has realised that strengthening disaster management mechanisms requires a community-based approach, as it is not just the responsibility of the government to safeguard people from natural disasters. In this area, ordinary people can play a vital role in reducing catastrophe risk (Bhandari, 2014). Aside from that, all states must maintain a systematics process for disaster-related statistics so that everyone can see how many people are affected. In terms of awaking and capacity building, all states must strengthen governance mechanisms at the grassroot level. These are some steps that need to be taken in order to improve management.

When comparing the two states of Odisha and Gujarat, the researcher discovered that Odisha had a more effective management system, as well as a larger number of NGOs and a more efficient administrative organisation. Prior to the establishment of the Odisha State Disaster Management Authority, the state of Odisha developed its own disaster management system and created the Odisha Disaster Rapid Action Force. Odisha is deemed less vulnerable than Gujarat because to its own robust system; Gujarat is ranked 9th, while Odisha is not on the list. Tsunami-ready villages have been declared in two villages in Odisha. This acknowledgment or appreciation is awarded by UNESCO, and these two villages are the first in the Inian Ocean Region to earn such a certificate of recognition or appreciation from the world's premier organisation (Times of India, 2020). As a result of the discussion, the researcher concluded that Odisha, rather than Gujarat, has a strong disaster mechanism.

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