DECLARATION

Date:

DECLARATION

I hereby declare that the Research Project work embodied in the project titled ***"Comprehensive Analysis of Cyclonic Hazards in New Baxipalli, Gopalpur, Orissa"*** submitted to the university of North Bengal for the partial fulfillment of B.A Program Sixth Semester Examination 2024, paper: Disaster Management, is my own project work. The Research Project has not been submitted to any other University for any other degree.

Signature:

Roll No:

Registration No:

College:

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CHAPTER 1

1.1 INTRODUCTION TO DISASTER & DISASTER MANAGEMNET

DISASTER:

ACCORDING TO WHO 1998 – “a serious disruption of the functioning of a community or a society causing widespread human material economic or environment losses that exceed the ability of the affected community or a society to cope using its own resources.”

ACCORDING TO AMERICAN RED CROSS [ARC] – “a disaster can be defined as an occurrence either natural or manmade that causes human suffering and causes human needs that victims alleviate without assistance”

ACCORDING TO THE UNITED NATIONS INTERNATIONAL STRATEGY FOR DISASTER REDUCTION [UNISDR] 2009 DEFINES DISASTER AS : “a serious disruption of the functioning of a community or a society involving widespread human material economy or environmental losses and impacts which exceeds the ability of the affected community or society to cope using its own resources”

As per the disaster management act 2005 disaster means a catastrophe, mishap calamity or grave occurrence in any areas arising from natural or manmade causes or by accidents or negligence which results in substantial losses of life or human suffering or damage to and destruction of property or damage to environment and is of such of nature or magnitude as to be beyond the coping capacity of the community of the affected areas.

1.2 CYCLONE

1.2.1 Introduction

The word “Cyclone” comes from the Greek word “Cyclos” which means Snake coils. Cyclone was officially coined by Henry Paddington between 1863 and 1855 in the journal of Asiatic Society. Generally Cyclones are associated with violent Storms and bad weather condition. Cyclones are formed by rapid invert air circulation around a low pressure area. In Cyclones air moves clockwise in Southern Hemisphere and Anti- Clockwise in Northern Hemisphere. The Coriolis Effect which is a result of the Coriolis force causes many large scale Cyclonic Patterns in the 05^0 North and South region close to the Equator, There is no Coriolis force, so Cyclones cannot form there. Cyclones can occur anywhere in the World, but they are most common in the Tropics. Cyclones occur around the Equator in 05^0 to 30^0 latitudes. They reach their greatest intensity while located over warm tropical water. As soon as they move in the land, they begin to weaken. The strongest Cyclones tend to occurs in the Bay of Bengal and The Arabian Sea. Cyclone activities is typically at its highest during the summer and early fall Months.

The Cyclone is known to have different names in different region of the World and they are-

The North Atlantic, Eastern North Pacific and South Pacific Ocean, they are called “Hurricanes”. In the Bay of Bengal, Arabian Sea and Western South Indian Ocean the name is “Cyclonic”. In the Eastern part of Southern Indian Ocean, it is “Willy Willy”, and the Western North Pacific ocean they are called”Typhoons”.

1.2.2 Characteristics of Cyclone

i. Cyclones have low pressure at center, high pressure at the Periphery.

ii. The flow of the wind is invert. It brings wet, humid conditions.

iii. Center of the Cyclone is commonly known as “Eye of the Cyclone”, deprives precipitation due to calm weather at the center It is known by numerous names like Taifu in Japan, Willy Willies in North Australia, Tournedos in USA, Hurricanes in North Atlantic and Pacific Ocean etc.

iv. Cyclones move in anti- Clockwise direction in Northern Hemisphere and in Clockwise direction in Southern Hemisphere.

1.2.3 Characteristics of Anti-Cyclone:

I. Anti- Cyclones consists of high pressure at the center while periphery consists of low pressure.

ii. The flow of the wind outward from high pressure to low pressure. Hence, warm and dry condition prevails over the area.

iii. Anti-Cyclones are opposite to Cyclones. They move in Clockwise direction in the Northern Hemisphere and Anti- Clockwise in the Southern Hemisphere.

1.2.3 Types of Cyclone:

There are two types of cyclone

a. Tropical Cyclones:

These cyclones occur in 00^0 Equator to 30^0 Northern and 30^0 Southern Hemisphere. Size of tropical Cyclones varies considerably. On an average, their diameters ranges between 80 Km and 300Km but sometimes they become so small that their diameter is restricted to 50 Km or even less.

b. Temperate Cyclones:

These cyclones are observed in the mid and high latitudes extending from 30^0 latitudes to 65^0 Latitude in both Northern and Southern Hemisphere. These Cyclones are also referred to as mid latitude Cyclones, Frontal Cyclones, Extra tropical Cyclones and Wave Cyclones. They have varying shapes such as near Circular Elliptical or Wedge (V).

1.2.4 Causes of Cyclone:

The different causes of cyclone formation are briefly mentioned under following heads:-

1. Warm Ocean Waters: Cyclones typically form over warm ocean waters, where sea surface temperatures exceed 26.5°C (80°F). The warm water provides the energy needed to fuel the storm by evaporating moisture into the atmosphere.

2. Moisture: Evaporation from the warm ocean surface increases atmospheric moisture content, providing the necessary fuel for cyclone development. Moisture-laden air rises and condenses, releasing latent heat, which further enhances the storm's intensity.

3. Low-Pressure Systems: Cyclones originate from areas of low atmospheric pressure. Atmospheric disturbances, such as tropical waves or troughs, can trigger the initial development of low-pressure systems, which may evolve into cyclones under favorable conditions.

4. Coriolis Effect: The Coriolis Effect, caused by the Earth's rotation, deflects moving air masses to the right in the Northern Hemisphere and to the left in the Southern Hemisphere. This deflection helps in the formation of cyclonic circulation patterns around areas of low pressure, leading to cyclone development.

5. Convergence of Winds: Cyclones require convergence of winds at the surface, where air masses with different temperatures and moisture content meet. This convergence initiates the upward motion of air, leading to the formation of clouds and precipitation.

6. Upper-Level Winds: Favorable conditions in the upper atmosphere, such as low wind shear, allow cyclones to develop and intensify. Low wind shear enables the storm to maintain its vertical structure and prevents the disruption of its circulation.

7. Tropical Easterly Jet Stream: In tropical regions, the tropical easterly jet stream can provide additional support for cyclone development by creating a favorable environment for rising air motion and convergence.

8. Pre-existing Weather Systems: Sometimes, pre-existing weather systems, such as tropical disturbances or monsoon troughs, can serve as the initial seed for cyclone formation when environmental conditions become conducive.

1.3 LITERATURE REVIEW

In response to frequent cyclonic events, both the government of Odisha and local communities have taken significant steps towards better preparedness and response strategies. Post-1999, Odisha has been recognized for developing one of the most efficient disaster management systems in India, focusing on early warning systems, community preparedness, and infrastructure resilience (Ray-Bennett, 2018).

The state government, along with non-governmental organizations, has established cyclone shelters and developed evacuation plans that have saved countless lives during subsequent storms, such as Cyclone Phailin in 2013 and Cyclone Fani in 2019. These shelters are strategically located to provide refuge during emergencies, as seen in New Baxipalli, where the community relies on designated evacuation routes and shelters (Nayak & Pradhan, 2019).

Cyclones lead to loss of income, especially in agriculture and fishing, which are the primary sources of livelihood for many. A study by Tripathy et al. (2014) indicated that frequent cyclones disrupt the socio-economic fabric by causing damage to infrastructure, loss of agricultural productivity, and forced migration, further exacerbating poverty and inequality.

In New Baxipalli, the economic repercussions are particularly felt in the fishing industry, where damaged boats and equipment translate to immediate income loss and long-term financial instability (Mishra, 2017). This underlines the importance of economic diversification and investment in resilient infrastructure to protect vulnerable communities.

The environmental impact of cyclones includes changes in landforms, soil erosion, and loss of biodiversity. Coastal ecosystems, such as mangroves, which are critical for buffering storm impacts, have been degraded due to both natural and anthropogenic pressures. The destruction of these ecosystems further exacerbates the vulnerability of coastal communities (Jena et al., 2011).

Efforts to restore mangroves and implement sustainable environmental practices have gained momentum, as evidenced by projects in the Ganjam district aimed at rehabilitating coastal ecosystems to mitigate cyclone impacts (Chakraborty & Bhadra, 2018).

1.4 RATIONAL OF STUDY

This study aims at learning & gathering the information of cyclone & its effects to the population of New Baxipalli village in Gopalpur, Orissa. This study also focuses on the various Disaster Risk Reduction strategies & mitigation measures from Cyclone & its effects in that area. As the study area is totally a fisherman village where majority of the population are engaged in fishing activities cyclonic hazards impacts widely over the population.

1.5 OBJECTIVES OF THE STUDY

The objectives behind the survey of this area are to understand the effects of cyclone in coastal region of Orissa, the problems faced by the population from cyclones & how they mitigate the problems. This study also aims to look forward to the government aids & policies which the people receive & also the measures which they follow during cyclonic conditions.

1.6 METHODOLOGY

In any kind of geographical project report or research work three points should be taken into consideration i.e.

1. Data collection.

2. Data processing.

3. Data interpretation

Field visit of the study area & observation along with a questionnaire with open ended questions was prepared to collect the data from the residence of the area which provided us with a primary data. The questionnaire was then processed to gather information about the cyclonic conditions & its impacts, to the local residents, mitigation measures followed by the population, problems they faced & government aids received by the effected population.

Information about geographical setup of that area, climate, has been collected from secondary sources also.

Aids from open ended map sources have also been taken to understand the geographical setup of the area & to understand the land use pattern of the study area.

1.7 DATA ANALYSIS

The questionnaire was designed in a way that gained qualitative data from the concerned study area related with the theme of the survey. The qualitative method of data analysis helped in interpretation of the theme in deeper perception whereas on the other hand quantitative measures were also taken into consideration for tabulation of the data's collected.

CHAPTER 2

2.1 GEOGRAPHICAL OVERVIEW OF ORISSA

Odisha features a diverse physiography that includes coastal plains, central plateaus, hilly regions, flood plains, and uplands, with about a third of the state covered in greenery.

The Mahanadi River, the state's largest, has a catchment area covering 42% of Odisha. Other significant rivers include the Subarnarekha, Brahmani, Baitarani, and Vansadhara.

Chilika Lake on the east coast is one of the world's largest brackish water lagoons. Other notable lakes include Anshupa, Tampara, and Kanjia.

Odisha's geology boasts some of the world's oldest rocks and includes two major cratons: the North Odisha Craton and the Western Odisha Craton, both sedimentary formations from the Cretaceous period that contain coal deposits. The coastal areas consist of deltaic sediments from the Mahanadi, Brahmani, Baitarani, and Subarnarekha rivers, dating to the Quaternary age.

2.1.1 TOPOGRAPHY & BOUNDARY

Odisha, located on the eastern coast of India, spans an area of 155,707 square kilometers. It is bordered by West Bengal to the northeast, Jharkhand to the north, Chhattisgarh to the west, Andhra Pradesh to the south, and the Bay of Bengal to the east.

Odisha's topography is characterized by a varied landscape, including coastal plains, central plateaus, hilly regions, and uplands. The eastern part of the state is dominated by the coastal plains, which stretch along the Bay of Bengal and are known for their fertile alluvial soil, ideal for agriculture. The coastal belt also includes several significant deltas formed by major rivers such as the Mahanadi, Brahmani, and Baitarani. The Mahanadi River is the largest in the state, with a catchment area covering 42% of Odisha.

Moving inland, the central plateaus, including the Eastern Ghats, rise gradually, featuring rugged hills and dense forests. These areas are rich in minerals and biodiversity. The central hilly regions, particularly in the western and southwestern parts of the state, include notable ranges like the Niyamgiri and the Eastern Ghats, which reach elevations of over 1,000 meters.

The flood plains, primarily in the Mahanadi basin, are vital for irrigation and agriculture. The uplands, scattered across various parts of the state, are interspersed with rivers, streams, and undulating terrains.

The northern boundary of Odisha is shared with Jharkhand and West Bengal, defined by the Subarnarekha River and the rugged terrain of the Chotanagpur Plateau. To the west, Odisha's boundary with Chhattisgarh follows the contour of the Eastern Ghats, characterized by dense forests

and mineral-rich regions. The southern boundary with Andhra Pradesh is marked by the Eastern Ghats' continuation and the hilly terrain, while the eastern boundary is defined by the long coastline along the Bay of Bengal.

2.1.2 CLIMATE

Odisha, located on the southeastern coast of India, experiences a tropical climate characterized by distinct seasonal variations. The state's climate is influenced by its proximity to the Bay of Bengal, resulting in a diverse weather pattern across its regions. Odisha experiences high temperatures throughout the year, with significant variations between seasons. Summer temperatures can soar above 40°C (104°F) in interior regions, while coastal areas are slightly cooler. Winter temperatures are more moderate, ranging from 15°C to 25°C (59°F to 77°F), providing relief from the extreme heat of the summer. The state receives substantial rainfall, primarily influenced by the southwest monsoon. The monsoon season, from June to September, brings heavy rains, with annual precipitation varying significantly across regions. Coastal areas and the northern parts of the state receive more rainfall, often exceeding 1,500 mm (59 inches) annually, while the interior regions receive less. Humidity levels in Odisha are high, particularly during the monsoon season. Coastal regions experience higher humidity, often exceeding 80%, while the interior areas have slightly lower levels. Odisha's climate is divided into four main seasons: summer (March to June), monsoon (June to September), post-monsoon (October to November), and winter (December to February.

Odisha is prone to cyclones due to its coastal location. Cyclones typically occur between April and December, with the peak season being from May to November. The state has experienced several severe cyclones in the past, causing significant damage and influencing weather patterns.

2.2 BRIEF PROFILE OF THE STUDY AREA

Ganjam district, located in the southern part of Odisha, India, is bordered by the Bay of Bengal to the east and spans an area of 8,070 square kilometers. Its diverse geography includes coastal plains, fertile river valleys, and hilly terrains. The district's coastline features sandy beaches and the

significant Chilika Lake, the largest coastal lagoon in India, which is a critical habitat for migratory birds and a hotspot for biodiversity.

The Rushikulya River, one of the major rivers, flows through the district, providing essential irrigation for agriculture, which is the primary occupation of the local population. The hilly regions, part of the Eastern Ghats, are rich in minerals and forests, supporting a variety of flora and fauna. These geographical features contribute to Ganjam's ecological and economic importance.

New Baxipalli village, situated within Ganjam district, is notable for its proximity to the Rushikulya River and its involvement in sustainable agricultural and fishing practices. The village's location along the coastline makes it an important area for fishing activities. The local fishermen engage in both riverine and marine fishing, leveraging the rich aquatic biodiversity of the region as its coastal location provides ample opportunities for marine and inland fishing. Fishermen from Baxipalli frequently venture into the Bay of Bengal, contributing to the local economy.

Additionally, New Baxipalli is known for its active participation in conservation efforts to protect the nesting sites of Olive Ridley turtles along the nearby coastline. The community's involvement in these activities reflects a strong commitment to preserving the local ecosystem while maintaining their livelihoods. The village's blend of traditional practices and modern sustainability initiatives highlights its role in the broader environmental and economic landscape of Ganjam district.

2.3 CYCLONE- A CASE STUDY OF ORISSA

New Baxipalli, located in the cyclone-prone Ganjam district of Odisha, has been severely impacted by multiple cyclones over the years. The village's proximity to the Bay of Bengal makes it particularly vulnerable to these storms. Cyclones frequently affect this region due to several factors, including the warm sea surface temperatures and favorable atmospheric conditions in the Bay of Bengal, which contribute to the formation and intensification of tropical cyclones.

The Super Cyclone of 1999 and Cyclone Phailin in 2013 had devastating effects on New Baxipalli. Cyclone Phailin, which struck Odisha in October 2013, was one of the strongest cyclones to hit the region, with wind speeds reaching up to 220 km/h (137 mph).

This cyclone caused extensive damage to infrastructure, homes, and crops, leading to significant economic losses and displacement of residents. In New Baxipalli, 64 out of 100 surveyed households were displaced during such events, highlighting the severity of the impact.

Causes behind Cyclone in Ganjam District, Orissa

The primary causes behind these cyclones include climatic conditions that favor cyclone formation, such as high humidity, low wind shear, and the presence of a low-pressure system over the Bay of Bengal. These factors combine to create powerful cyclones that can cause severe flooding, storm surges, and wind damage. The impact on New Baxipalli includes not only physical damage to homes and infrastructure but also disruption of essential services like electricity and communication, often cut off for up to 14 days post-cyclone. The local economy, heavily reliant on fishing and agriculture, suffers greatly, with loss of boats, crops, and income.

2.4 HISTORY OF CYCLONE IN ODISHA

Odisha has a long history of cyclones. Devastation and death toll were very high during 1999 Super cyclone and cyclone Fani in 2020. Throughout the 19th century, Odisha suffered from a series of heavy cyclones. Major cyclones before independence were, one on 22nd September 1885(with a loss of about 5000 human lives), another on 31st October 1931(which killed about 20000 human beings and two in October and November 1942).

Since independence the state has faced two severe cyclones, one in 1971 and the other in 1999 and the most recent tropical cyclone to strike Odisha was Cyclone Fani (2020).

The 1971 cyclone stuck at midnight on 29th October. It hit the inland with a gathered speed of upto 175km/hr and wrought havoc over vast areas destroying crops and blowing off roofs over 8214sq miles in the districts of Cuttack, Balasore, Puri, Mayurbhanj, Keonjhar and Dhenkanal. More than 10000 people died. Over 6065 sq km of cultivated area and 33.04 lakh people were affected. About 7397 human lives were lost and 77921 heads of cattle were killed due to the high tidal waves and devastating storm.

The 1999 Super cyclone, hit Odisha twice within a period of two weeks. The first cyclone on October 17th and 18th, affected mostly two districts, viz. Ganjam and Gajapati. However, the worst affected district was Ganjam, where there were more than 150 human casualties. The second cyclone which came on October 29th and 30th, affected 12 districts. The second was severe that it affected more than 10,000 people and it was termed as Super cyclone.

The 1999 Super cyclone moved with a speed of about 260km/hr. As many as 128 blocks, 46 urban local bodies, 2399 GPs and 17933 villages with a population of 1.9 lakh were affected. About 10092 human lives were lost, 18.97 lakh houses were damaged. However, the estimate of loss and damage by the government varied from time to time. Over 90 per cent of the school buildings, dispensaries, offices, government buildings and roads in the rural areas were destroyed.

Plenty of warnings were given about the approaching cyclone by the government . Block and district officials made efforts in many areas to warn the people through loud speakers besides warning over the radio and television. The warning even reached the remote villages. But the people did not take the warnings seriously for various reasons. The impact of the warning was lessened by the fact that 12 days before, the people throughout the coastal belt had been warned of a cyclone which had only affected Ganjam and Gajapati districts. Moreover, the cyclone warning was not unambiguous, creditable and specific. When in doubt, the people stayed home.

The institutions which relied on for immediate assistance after the super cyclone were themselves initially its victims. Many NGOs found it difficult to respond quickly. The state government ceased to function effectively. Odisha had a woefully inadequate infrastructure for saving lives during cyclones. For instance, Odisha (whose coastline is around 40 per cent of Andhra Pradesh's) had 23 specially constructed cyclone shelters in October 1999 compared to 1041 in Andhra Pradesh. Odisha's Emergency Plan for natural disasters like cyclone is available in two documents which are The Orissaa Relief Code (ORC), and the District Contingency Plan. But the ORC concerns itself more with post-disaster relief modalities, than with handling emergencies.

Around 20 INGOs, 20 national level NGOs, 100 state level NGOs and 12 states had participated in the relief and rehabilitation operations. The international response was tremendous. The role of international bodies like UNICEF and UNDP in relief and rehabilitation particularly in the construction of houses, supply of nets and boats to fishermen, and Mamata Gruhas for women and destitute is innovative and praiseworthy.

YEAR	CYCLONE NAME	IMPACTS	DEATHS	AFFECTED AREAS
1971	Cyclone	Severe flooding and wind damage	~10,000	Coastal Odisha, Puri, Kendrapara

1999	Super Cyclone	Devastating winds and storm surges	~10,000	Entire coastal Odisha, Bhubaneswar, Paradip
2013	Cyclone Phailin	Major destruction, massive evacuations	44	Gopalpur, Bhubaneswar, Puri
2014	Cyclone Hudhud	Significant wind and water damage	2 (in Odisha)	Southern Odisha, Visakhapatnam (Andhra Pradesh)
2018	Cyclone Titli	Heavy rainfall, flooding, landslides	57	Ganjam, Gajapati, Rayagada
2019	Cyclone Fani	Extreme winds, infrastructural damage	64	Puri, Bhubaneswar, Khurda
2020	Cyclone Amphan	Wind damage, uprooted trees, flooding	2 (in Odisha)	Coastal Odisha, West Bengal
2021	Cyclone Yaas	Severe flooding, storm surge, wind damage	4	Balasore, Bhadrak, Kendrapara, Jagatsinghpur

Table 1 – Showing History of Cyclone in Orissa

2.5 VULNERABLE AREAS & POPULATION

2.5.1 VULNERABLE AREAS

Tropical cyclones affect millions of lives in the Indian Subcontinent which makes the region highly vulnerable to cyclones. Classifying the region's vulnerability greatly helps the stakeholders involved in the Disaster management associated with tropical cyclones.

There is a study which provides a comprehensive assessment of India's vulnerability to cyclones of different categories prepared at district level. It is based on recently updated cyclone track data and considers both meteorological parameters such as surface level winds, daily rainfall, storm surge height and socio economic parameters like population and household densities. Statistical tools like the cyclone return period as well as the landfall frequency count are also calculated for cyclones of varied intensities. There is also a normalized cyclone vulnerability index which is defined as a combination of above parameters that provides an overall vulnerability of each district ton cyclonic, severe cyclonic, and the total cyclonic storm categories. Results show that coastal districts of the northwestern states of the East coast consisting of West Bengal and Odisha are the most vulnerable to tropical cyclones followed by districts of Andhra Pradesh and Tamil Nadu on longer time scale. However, a southward in the cyclonic activity as well as vulnerability is absurd for the recent period. Along the West coast, coastal district of Gujarat show and increased vulnerability in recent times than before. In terms of percentage of districts extremely vulnerable to cyclones, Andhra Pradesh dominates the list with show and increased vulnerability in recent times than before. In terms of percentage of districts extremely vulnerable to cyclones, Andhra Pradesh dominates the list with (40-50%) followed by Odisha (29-34%), West Bengal (13-14%) and Tamil Nadu (7-13%).

2.5.2 VULNERABLE POPULATION

Vulnerable population during the cyclones include:

Coastal communities: Residents living in coastal areas are particularly vulnerable to cyclone due to their proximity to the ocean and exposure to storm surges, high winds, and heavy rainfall. for example, the coastal communities of Odisha, India are after impacted by cyclone like cyclone Phailin in 2013, which cause significant damage and displacement.

Fisherman and Maritime Workers: People whose livelihood depends on the sea, such as fisherman and Maritime Workers are vulnerable during cyclones due to the risks, associated with rough seas, strong winds, and storm surge. For instance, during cyclone Amphan in 2020, fisherman in West Bengal, faced severe challenges and economic losses.

Elderly And Disable Individuals: Elderly individuals and those with disabilities face heightened vulnerability during cyclones due to mobility issues, health concerns, and limited areas to evacuation shelters and Medicare.

Informal Settlements and Slums: Residents of informal settlements and slums are vulnerable to cyclones due to inadequate infrastructure, poor housing condition, and limited access to safe shelters.

CHAPTER – 3

3.1. AREA OF OCCURRENCE OF CYCLONE

Cyclones Impacting Ganjam District and Baxipalli Village

Ganjam District, located on the southeastern coast of Odisha, India, is frequently exposed to tropical cyclones due to its position along the Bay of Bengal. Baxipalli village, situated in this district, is particularly vulnerable to the impacts of these severe weather events. The region has experienced significant cyclonic activity over the years, causing considerable damage and disruption.

Cyclone Phailin (2013): Cyclone Phailin was a powerful and devastating storm that struck Odisha in October 2013. It made landfall near Gopalpur in Ganjam District as a Category 4 storm with winds reaching speeds of 220 km/h (137 mph). Baxipalli village was heavily affected, with extensive damage to homes, infrastructure, and the local economy. The cyclone caused widespread flooding, destroying fishing boats and equipment crucial to the village's economy. The damage to infrastructure and loss of fishing assets led to severe disruptions in livelihood and economic activity.

Super Cyclone (1999): The Super Cyclone of October 1999 remains one of the most catastrophic cyclones to hit Odisha. It struck the coast near Paradip and Ganjam District, bringing with it wind speeds exceeding 250 km/h (155 mph) and intense rainfall. Baxipalli, like other coastal areas, faced massive destruction. The cyclone led to the loss of life, extensive property damage, and severe disruption to agricultural and fishing activities. The event resulted in a significant economic impact, with many households losing their homes and livelihoods.

Cyclone Hudhud (2014): Cyclone Hudhud, which made landfall in October 2014 near Visakhapatnam, also affected Ganjam District. The storm, with wind speeds up to 180 km/h (112 mph), caused flooding and damage in Baxipalli. While not as severe as Phailin or the Super Cyclone, Hudhud contributed to continued economic strain on the local population, particularly affecting agriculture and fishing industries.

3.2 PROPERTY DAMAGE DUE TO CYCLONE

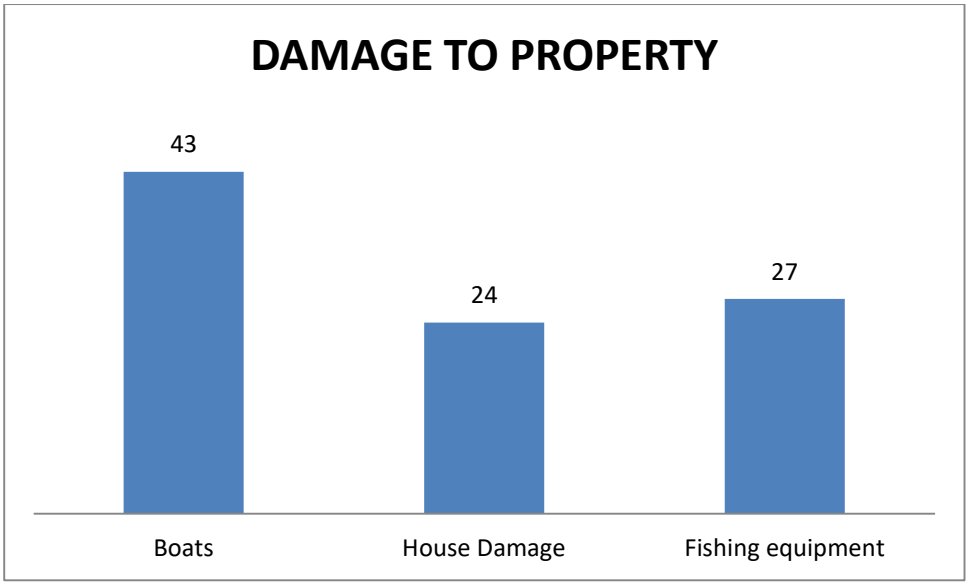
Cyclones have caused significant damage to property in New Baxipalli, severely impacting the livelihoods of its residents. In a recent survey, it was found that 43 boats were damaged, which is a substantial blow to the predominantly fishing community. The destruction of 27 fishing equipment further exacerbates the financial strain on fishermen, who rely on these tools for their daily income. Additionally, 24 houses were reported damaged, displacing families and necessitating urgent repairs and reconstruction.

The 2013 Cyclone Phailin and the 1999 Super Cyclone are notable examples of such devastation. These cyclones not only destroyed physical structures but also disrupted essential services such as electricity and clean water supply. The average duration of power outages during these events was around 8-9 days, with some areas experiencing blackouts for up to 14 days, complicating recovery efforts and daily life.

The roads leading to and within New Baxipalli were often rendered impassable due to debris and flooding, delaying aid and hindering evacuation efforts. In response, the government and various NGOs have focused on enhancing infrastructure resilience, such as building more durable pucca houses and improving cyclone shelters. Despite these efforts, the recurring damage highlights the ongoing vulnerability of New Baxipalli to cyclonic impacts and the need for continuous investment in disaster preparedness and resilient infrastructure.

Table 2 Showing Damage to Property in New Baxipalli Gopalpur,District – Ganjam, Orissa

Damage to Property	Numbers
Boats Damaged	43
House Damaged	24
Fishing equipments Damaged	27



Source- Field Survey 2024

3.3 LOSS OF INCOME FROM DIFFERENT SOURCES DUE TO CYCLONE

Tropical cyclones inflict extensive damage upon land, particularly affecting coastal regions through intense rainfall, high winds, and flooding. This damage severely disrupts various income sources and livelihoods.

In coastal areas such as Ganjam and New Baxipalli, Odisha, cyclones like Phailin (2013) and the Super Cyclone (1999) have caused significant economic losses. The fishing industry, a primary source of income for many families, is particularly hard hit. Cyclones destroy boats, fishing gear, and other critical equipment, leading to substantial revenue loss and livelihood disruption for fishermen.

Beyond the fishing industry, cyclones impact other sectors including business, transportation, hospitality, education, and agriculture. The destruction of infrastructure such as roads, power lines, and communication networks exacerbates the financial crisis. For example, businesses face operational disruptions and decreased revenue, while the hotel industry suffers from reduced tourist inflow. Educational institutions may close temporarily, affecting students and staff. Agriculture is impacted as standing crops are washed away or damaged, leading to financial losses for farmers.

The extensive property damage also results in direct financial losses for households. Families may lose cash, savings, and personal assets due to the destruction of their homes. The combined effects

on various sectors and personal finances lead to a substantial overall loss of income for the affected communities, highlighting the severe economic impact of cyclones in these regions.

3.4 DISPLACEMENT OF PEOPLE DUE TO CYCLONE

Extreme weather events such as tropical cyclone often trigger population displacement. The frequency and the intensity of tropical cyclone are affected by anthropogenic climate change. However the effect of historical climate change displacement risk has so far not been qualified.

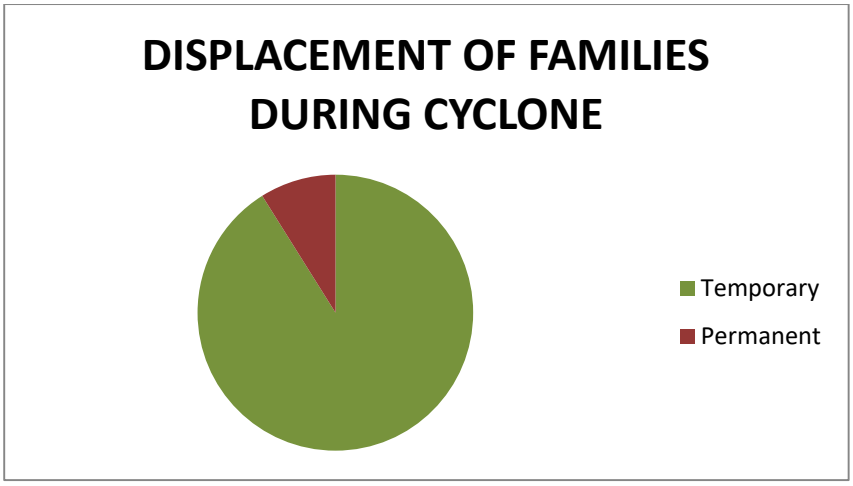
The residents of that area did not feel safe to live there permanently due to the frequent cyclones. These cyclones caused significant damage, making the area unsuitable for living. Most families lived in Kutccha houses, which were particularly vulnerable. During cyclones, they experienced extensive property damage, and there were losses of human lives and domestic animals.

The effect on population was that the people were facing the loss of life of both human and animal life. The people were facing many problems such as communication and transportation due to falling trees the roads were blocked that caused delay rescue medical supply. They were also facing scarcity of fresh drinking water.

The houses which were located too close to sea which were mostly affected by cyclone were mostly Kutccha house which led people to other area to seek refugees in safer location temporary. The 45 families temporarily moved to a other places or took refuges whereas 4 families left the area permanently. There were 30 pucca houses which were 150-200m away from sea which withstood the effected by cyclone so there was no displacement of these 30 families.

Table 3- Showing Displacement of Families during Cyclone in New Baxipalli, Gopalpur, District – Ganjam, Orissa

DISPLACEMENT during cyclone	No of families	Temporary displacement	Permanent displacement
Displaced during cyclone	45	41	4
Not displaced during cyclone	55	---	---



Source – Field Survey 2024

3.4.1SHELTER AND DISPLACEMENT DURING CYCLONES IN NEW BAXIPALLI, ODISHA

During cyclones, residents of New Baxipalli often seek refuge in nearby cyclone shelters. According to a survey among 100 households in the village, 64 families were displaced during cyclonic events, while 36 families chose to stay in their homes, often due to the perceived safety of their pakka (permanent) houses.

Among the displaced families 26 household sought shelter with relatives or friends in less affected areas. The remaining 38 families took refuge in the cyclone shelter.

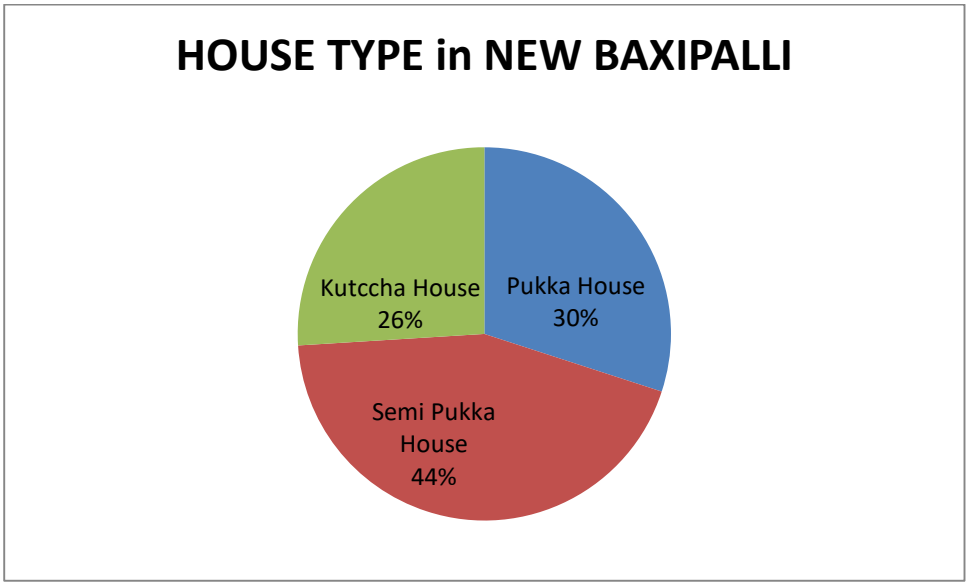
The cyclone shelter in New Baxipalli is strategically located in the center of the village, making it easily accessible to all residents. These shelters are equipped with essential supplies such as food, water, and basic medical care, ensuring the safety and well-being of the displaced population during the cyclone.

The displacement observed in New Baxipalli is predominantly temporary. Families typically return to their homes once the cyclone has passed and conditions stabilize. There have been no instances of permanent displacement directly attributed to cyclones in this village.

Interestingly, some families have migrated to New Baxipalli from other more cyclone-prone areas in Odisha. This migration includes a significant number of Tamilian families who have settled in New Baxipalli seeking relatively safer conditions and better community support during cyclonic events.

Table 4 – Showing House types in New BAxipalli Village, Gopalpur, Distrit – Ganjam, Orissa

TYPE OF HOUSE	Materials Used	Number of Houses
PUKKA HOUSE	Made of Brick & concrete	30
SEMI PUKKA	Made of Brick, concrete, tin & wood	44
KUTCCHA	Made of Wood, Tin	26



Source – Field Survey 2024

3.5 IMPACT OF CYCLONES ON ESSENTIAL SERVICES IN NEW BAXIPALLI, ODISHA

During cyclones, essential services in New Baxipalli, Odisha, are severely impacted and the disruption of these services is particularly evident in areas like drinking water supply, healthcare, electricity, communication, and transportation.

Drinking Water and Healthcare

The supply of clean drinking water is significantly affected during cyclones. Contamination of water sources due to flooding and storm surge leads to a scarcity of safe drinking water, posing a major health risk. Health facilities are also hindered; many healthcare centers become inaccessible due to damaged roads and infrastructure. For instance, during Cyclone Phailin in 2013, many residents of Ganjam district, where New Baxipalli is located, reported difficulties in accessing medical care. This

situation often leads to increased health risks and delayed medical treatment for cyclone-affected individuals.

Electricity and Communication

Electricity supply is one of the most severely affected services during cyclones. In New Baxipalli, power outages typically last for 8-9 days, and in some cases, extend up to 14 days. The prolonged absence of electricity disrupts daily life, affecting not only households but also essential services such as healthcare and water supply systems that rely on electric pumps. The lack of power also hinders communication, as mobile networks and internet services are disrupted. This isolation complicates relief efforts and delays the dissemination of critical information to residents.

Transportation and Road Infrastructure

Roads in and around New Baxipalli become impassable due to fallen trees, debris, and flooding, cutting off vital access routes. This disruption hampers the movement of emergency services, relief materials, and essential goods. During the Super Cyclone of 1999 and Cyclone Phailin in 2013, the Ganjam district experienced significant road blockages, making it difficult for rescue operations to reach affected areas promptly. The damaged infrastructure also delays the restoration of other essential services.

CHAPTER 4

4.1 MANAGEMENT OF DISASTER

INTRODUCTION

"A disaster is a natural or man-made event that negatively affects life, property, livelihood or industry often resulting in permanent changes to human societies, ecosystems and environment."

As the definition suggests , disasters are highly disruptive events that cause suffering , deprivation , hardship, injury and even death , as a result of direct injury, disease, the interruption of commerce and business , and the partial or total destruction of critical infrastructure such as homes , hospitals , and other buildings , roads , bridges , power lines , etc. Disasters can be caused by naturally occurring events, such as earthquakes, landslides, hurricanes, flooding, or tornadoes, or they can be due to man-made events, either accidental or deliberately caused.

Disaster Management is a process of effectively preparing for and responding to disasters. It involves strategically organizing resources to lessen the harm that disasters cause. It also involves a systematic approach to managing the responsibilities of disaster prevention, preparedness, response, and recovery.

Disaster, as defined by the United Nations, is a serious disruption of the functioning of a community or society, which involve widespread human, material, economic or environmental impacts that exceed the ability of the affected community or society to cope using its own resources. Disaster management is how we deal with the human, material, economic or environmental impacts of said disaster, it is the process of how we deal with the human, material, economic or environmental impacts of said disaster, it is the process of how we "prepare for, respond to and learn from the effects of major failures. Though often caused by nature, disasters can have human origins. According to the International federation of Red Cross and Red Crescent Societies a disasters occurs when a hazard impacts on vulnerable people. The combination of hazards, vulnerability and inability to reduce the potential negative consequences of risk results in disaster.

This chapter deals with disaster management or management strategies for cyclonic hazards in the area including different local measures for management, early warning techniques, preparedness and mitigation.

4.1.1 PRE-DISASTER MITIGATION OF CYCLONES

Pre-disaster mitigation involves proactive measures to reduce the impact of cyclones before they strike. In New Baxipalli, Odisha, these strategies include both structural and non-structural measures aimed at minimizing potential damage and ensuring community resilience.

Early Warning Systems: Effective early warning systems are crucial. The Indian Meteorological Department (IMD) provides timely alerts and weather updates via television, radio, SMS, and social media. Local authorities and NGOs disseminate these warnings using loudspeakers, ensuring that even those without digital access are informed.

Cyclone Shelters: Construction of cyclone shelters is a key structural mitigation strategy. In New Baxipalli, a centrally located cyclone shelter provides refuge to residents during storms. These shelters are built to withstand high winds and flooding, ensuring the safety of those who evacuate their homes.

Community Training and Drills: Regular training sessions and disaster preparedness drills are conducted by NGOs and government agencies. These activities educate residents on how to respond during a cyclone, including evacuation procedures and basic first aid. Such programs enhance community readiness and reduce panic during actual events.

Infrastructure Strengthening: Reinforcing buildings and critical infrastructure is another vital measure. The government has supported the construction of pucca (permanent) houses, which are more resistant to cyclonic winds and flooding. Roads, bridges, and communication networks are also fortified to ensure they remain operational during and after a cyclone.

Environmental Management: Mangrove plantations along the coastline serve as natural barriers against storm surges. Initiatives to restore and expand these mangrove forests are crucial for reducing the impact of cyclones. Additionally, proper land use planning prevents construction in high-risk areas.

4.1.2 POST-DISASTER MITIGATION OF CYCLONES

Post-disaster mitigation focuses on recovery, rebuilding, and reducing the long-term impact of cyclones. In New Baxipalli, these efforts are essential for restoring normalcy and preparing for future events.

Damage Assessment and Relief Distribution: Immediately after a cyclone, government agencies and NGOs conduct rapid damage assessments to identify the extent of destruction. Relief materials, including food, water, clothing, and medical supplies, are distributed to affected families. Temporary shelters are provided for those who have lost their homes.

Reconstruction and Rehabilitation: Rebuilding efforts prioritize the construction of resilient infrastructure. The government supports the rebuilding of houses, schools, and healthcare facilities using cyclone-resistant designs. Roads and communication networks are repaired to restore connectivity and facilitate aid delivery.

Financial Assistance and Livelihood Restoration: Financial aid is provided to affected families to help them recover economically. In New Baxipalli, fishermen receive support to replace lost boats and fishing equipment. Small businesses receive grants or loans to rebuild their operations.

Health Support: Cyclones often result in health crises due to injuries, disease outbreaks, and stress. Medical camps are set up to address immediate health needs, while long-term psychological support is offered to help residents cope with trauma. Vaccination drives and sanitation campaigns prevent disease spread in the aftermath of flooding.

Community Involvement and Capacity Building: Engaging the community in the recovery process ensures that rebuilding efforts meet local needs. Community-based organizations play a crucial role in coordinating relief and reconstruction activities. Training programs on disaster-resilient practices help residents build safer homes and infrastructure, enhancing future preparedness.

Environmental Restoration: Post-disaster, efforts are made to restore damaged ecosystems. Replanting mangroves and rehabilitating coastal areas help to rebuild natural defenses against future cyclones. Sustainable land management practices are promoted to reduce vulnerability.

4.2 AWAREENESS & PREPAREDNESS DURING CYCLONE

The survey was conducted in New Baxipalli, Gopalpur, in Ganjam district of Odisha. The village was situates about 500 meters away from the ocean. Hence, making it vulnerable to cyclone hazards. Despite of the waterbody's close proximity, the residents were not fully equipped to face the hazards properly but they fully relied on the government's infrastructures and their own indigenous knowledge.

According to the survey conducted, during the times of natural hazards or calamities the villagers opted to stay indoors or went to evacuation shelters in their area along with their valuable and personal belongings. One such infrastructure in that area built for evacuation purpose is " Toofan Ghar" or "Cyclone Building" through the government of Odisha's initiative. Other than that, the residents also took shelter in pucca houses of that area.

As the locals mostly belonged in fishing sector, their first response to mitigate the adverse effects was to row their boats and fishing nets to safer places. They being experienced in maritime activities can sense the onset of cyclones by the waterbody's abnormal behavior.

For cyclone warning, the villagers relied on different sources such as television, internet, news and in case of power outrage they depend on community announcements, and announcements made by the government officials and through sirens. Some of the villagers has prepared an emergency go bag during the time when cyclone hits so that the important documents can be easily accessed and be saved. Besides, no such awareness & mitigation measures during the pre disaster phase has been observed among the population in the survey area as most of them only rely over the government for such hazards.

"Aapda Mitra" a scheme initiated by the government of India to provide training in disaster response in selected 30 most flood prone districts of 25 states of India. Under the scheme, the some youths or middle aged men have received trainings in first aid, community building, etc.

4.3 SHELTER & RELIEF RECEIVED DURING CYCLONES

The area of survey Baxipalli village is located in the State Odisha. The total geographical area in which this village is expanded in 143 hectares/ 1.43sq km. Cyclones produces torrential flooding, damaging buildings, coastal flooding and storm surge. During all this the relief received in the village i.e. Baxipalli is given adequate amount of refuge.

In the times of Cyclone disaster the people of Baxipalli receives pre warnings by the coastal guards through Social media or police departments. The shelters (Pakka house) were already prepared and made for refuges and the shelter or the refuge shelter was in the middle of the village so that all the people around from the village could easily access to it during evacuation. The Government and the NGOs provided sufficient necessary needs for a couple of days. Even locals were trained and were given sufficient drills by the government or NGOs to tackle the situation during a Cyclone. The local authorities usually get warnings using warning sirens. On the basis of the survey the foods that they received were satisfactory and other necessary items like cloths, drinking water, juice, money etc, were also provided.

Many of the house that are located there are Pakka houses which were made during the Cyclone disaster by the Government of Odisha hence the people who stay in such houses usually don't prefer to leave their house unless the condition is at its extreme as they feel secure in their houses. On contrary to this the people residing in kutccha houses usually move to take refuge in the nearby cyclone refuge building which is located in the close proximity of the most of the houses of the village.

People from the village are also evacuated in severe conditions by government temporarily by also providing buses.

Source- Google Earth

4.4 COMMUNICATION & INFORMATION DISSESMINATION DURING CYCLONE

In New Baxipalli, effective communication and information dissemination during cyclones are vital for ensuring community safety and preparedness. The villagers primarily rely on a combination of news broadcasts, telephone SMS alerts, and speaker announcements to receive timely and accurate information. Local authorities, in collaboration with meteorological departments, issue warnings through various media channels, including radio and television, to keep residents informed about impending cyclones and necessary precautions. Additionally, SMS alerts are sent to mobile phones, providing real-time updates and instructions. However, the most critical method of communication in New Baxipalli is the use of loudspeaker announcements. These announcements are made through public address systems installed in key locations across the village, ensuring that information reaches everyone, including those who may not have access to other forms of media. This multi-faceted approach helps in effectively disseminating vital information, enabling residents to prepare for and respond to cyclones promptly. The integration of these communication methods ensures that the entire community is aware of cyclone warnings, evacuation procedures, and safety measures, thereby enhancing overall disaster preparedness and resilience.

4.5 CYCLONE MANAGEMENT BY LOCAL COMMUNITIES

Odisha, a state in India prone to frequent cyclones, has faced numerous severe storms over the decades, with devastating impacts on infrastructure, the economy, and human lives. Notably, the Super Cyclone of 1999 was a turning point, affecting around 18 million people, causing over 10,000 fatalities, and leaving the economy in ruins. This catastrophe spurred Odisha to strengthen its cyclone management strategies, aiming for “zero-human casualties” and emerging as a global leader in disaster preparedness.

In New Baxipalli, a coastal village in Odisha, community-level cyclone management has become an integral part of daily life. Some of the techniques followed are:-

1. Early Warning Systems: New Baxipalli relies on an integrated early warning system that includes alerts from the India Meteorological Department (IMD), local authorities, and NGOs. The village receives timely updates through multiple channels, such as radio broadcasts, mobile alerts, and community announcement systems. This advance warning allows residents to prepare adequately, reducing the risk of casualties and property damage. For instance, during Cyclone Phailin in 2013, the early warning system enabled effective evacuations and minimized loss of life.

2. Evacuation Plans: The village has well-defined evacuation plans, including designated routes and shelters. In the event of a cyclone, community leaders coordinate the evacuation process, guiding

residents to safe shelters such as community halls and schools. The government and local NGOs collaborate to ensure these shelters are equipped with essential supplies and first aid kits.

3. Community Preparedness: Residents of New Baxipalli participate in regular preparedness drills and training sessions. These activities, often organized by local government bodies and NGOs, focus on educating people about cyclone risks, safety measures, and response strategies. For example, before Cyclone Hudhud in 2014, community workshops emphasized the importance of securing homes and stockpiling emergency supplies.

4. Post-Disaster Recovery: After a cyclone, the community engages in collective recovery efforts. This includes damage assessment, distribution of relief materials, and reconstruction of damaged infrastructure. Local volunteers and organizations play a crucial role in this process. For instance, following Cyclone Phailin, Baxipalli saw swift mobilization of resources for rebuilding homes and restoring local services. The emphasis on community involvement ensures that recovery is both effective and equitable.

5. Infrastructure and Resource Management: Baxipalli has invested in disaster-resilient infrastructure, such as elevated houses and reinforced shelters, to withstand cyclone impacts. Additionally, the community works on sustainable practices, such as mangrove plantation, which acts as a natural barrier against storm surges and erosion.

6. Collaboration with Authorities: The village collaborates with government agencies and non-governmental organizations to enhance its cyclone management capabilities. This partnership includes training programs, resource sharing, and participation in state-wide disaster preparedness initiatives.

4.5.1 ENGAGAEMNET AND SUPPORT OF LOCAL COMMUNITY DURING CYCLONE

In New Baxipalli, the local community demonstrates resilience and solidarity during cyclones through various forms of engagement and support. Despite the economic challenges faced, particularly since many residents are fishermen whose livelihoods are directly impacted by storm damage, the community comes together in meaningful ways. After cyclones, locals often participate in rebuilding efforts, including repairing and reconstructing boats, which are essential for their livelihood. Additionally, neighbors assist each other in repairing and rebuilding damaged houses, showcasing their collective strength and cooperation. During evacuation processes, villagers support one another in reaching the nearby cyclone refuge center, ensuring that everyone is accounted for and

safe. The community, which includes both Oriya and Tamil populations, might not always have deep personal connections due to cultural differences, but they unite during crises to aid one another. This support extends to sharing resources and offering help despite limited personal resources, reflecting the strong communal bonds and shared commitment to overcoming the challenges posed by cyclones.

4.5.2 SUPPORT OF LOCAL NGO

New Baxipalli, a village in Odisha, non-governmental organizations (NGOs) play a crucial role in cyclone disaster management, providing essential support and relief to affected communities. Several prominent NGOs are active in the region, offering a range of services from disaster preparedness to post-cyclone recovery.

The Indian Red Cross Society has been instrumental in disaster relief efforts in New Baxipalli. Their work includes providing immediate relief supplies such as food, water, and medical aid. They also facilitate evacuation and provide temporary shelter to displaced residents. During Cyclone Phailin (2013) and Cyclone Fani (2019), the Red Cross was actively involved in setting up relief camps, distributing emergency supplies, and offering first aid services.

CARE India provides comprehensive disaster response services, including emergency relief and recovery assistance. In New Baxipalli, CARE has been involved in distributing relief materials, including food and water, and supporting community-based disaster risk reduction programs. They also work on rebuilding efforts, such as repairing homes and infrastructure.

NDMA collaborates with various NGOs to coordinate disaster response efforts. In New Baxipalli, this partnership ensures that relief activities are well-coordinated, avoiding duplication of efforts and ensuring efficient distribution of resources.

These NGOs work in close collaboration with local authorities and community leaders to ensure that relief and recovery efforts are effectively targeted. Their contributions are critical in managing the impacts of cyclones, helping communities to recover and build resilience against future disasters. Through their dedicated efforts, NGOs help mitigate the immediate effects of cyclones and support long-term recovery and development in New Baxipalli.

4.6 SUPPORT OF GOVERNMENT IN CYCLONE MANAGEMENT AND MITIGATION STRATEGIES

In New Baxipalli, Odisha, the government's support for cyclone management and mitigation is pivotal in reducing the impact of cyclones and aiding in the recovery process. Here's how the government contributes to these efforts:

Early Warning Systems: The government employs advanced early warning systems to alert New Baxipalli and surrounding areas about impending cyclones. These warnings are disseminated through various channels, including television, radio, SMS, and social media. The use of speaker announcements in local languages ensures that even remote communities receive timely information.

Cyclone Shelters and Infrastructure: To safeguard residents, the government has established cyclone shelters within New Baxipalli. These shelters are equipped to provide refuge during severe weather conditions. Additionally, Pakka houses (strong, permanent structures) have been constructed to replace vulnerable Kutcha houses, offering better protection against cyclones.

Evacuation Plans: The government has developed comprehensive evacuation plans for New Baxipalli, including designated routes and safe zones. Community leaders and local authorities coordinate evacuation efforts, ensuring residents are moved to safety efficiently.

Community Training and Drills: Regular training sessions and disaster preparedness drills are conducted to educate New Baxipalli residents about cyclone response strategies. These drills cover evacuation procedures, first aid, and emergency management, helping the community to respond effectively during a cyclone.

Emergency Relief and Assistance: In the aftermath of a cyclone, the government provides immediate relief, including food, clean water, medical supplies, and financial aid. Relief teams are deployed to assist with damage assessment, temporary shelter, and distribution of essential resources.

Post-Cyclone Recovery Support: The government supports recovery efforts by facilitating the repair and reconstruction of damaged infrastructure and homes. Financial assistance and resources are provided to help affected residents rebuild their lives, particularly focusing on sectors like fishing and agriculture.

Coordination with NGOs: The government collaborates with non-governmental organizations (NGOs) to enhance disaster response and recovery efforts in New Baxipalli. These partnerships extend the reach of relief efforts, including emergency aid and long-term rehabilitation programs..

Through these comprehensive strategies, the government of Odisha effectively supports New Baxipalli in managing and mitigating the impacts of cyclones, ensuring the safety and recovery of its residents.

4.7 FINDINGS

i) Due to the frequent occurrence of cyclone in the area the people have adopted to their environment in which they lived. Hence they are capable of mitigating or at in general evacuating the disaster in time.

ii) The houses are constructed with cement, bricks etc, as compared to those houses built in the past which were made up of mud and woods etc. Mostly the kutcha houses are the houses which get severely affected during cyclones while on the other hand many villagers are upgrading their houses to pukka house.

iii) As most of the families from the survey village New Baxipalli depends on fishing activities during the time of cyclone their economy gets severely affected. This incudes damage to their properties and also including damage to their boats, fishing quipments. Some also stated that after post cyclonic events the fishing zone is also effected as the rate of fish caught is severly dropped.

iv) The people of the area usually migrate during cyclones if the case is severe. The Early warning systems helps the people to evacuated before the disaster. Evacuation mainly involves temporary to the nearby cyclone shelter.

v) Most of the people in the survey village is satisfied with the aid provided by the government who usually helps them in reconstruction & also helps people by providing some cash to recover their loss. However small loopholes like not sufficient medical aids, delay in financial aids are still existing.

CHAPTER 5

5.1 CONCLUSION

The occurrence of cyclone plays a significant role in the livelihood of residents of New Baxipalli, village of Gopalpur of Ganjam district in Odisha. The event of cyclone results in the loss of life and property. However, local people have adopted themselves by evacuating the area during the cyclonic hazards and depending upon early warning systems and also by constructing cyclone centers in strategic locations and also constructing pukka houses. However most of the time during cyclonic events the fishing boats and equipment of the residents get severely damaged due to no proper sheltering and also by getting exposed to the cyclones.

The process of rebuilding homes, reviving the economy and restoring normalcy will require sustained efforts and resources. Additionally, measures need to be taken to mitigate the risk of future cyclones through improved infrastructure, planning, early warning system and effective disaster management strategies.

The present scenario of the area is normal but as the monsoon wind approaches every year there are chances of occurrence of cyclonic disaster in the area and also as the people are dependent on coastal fishing for their livelihood they cannot also move and settle in interior location which are much safer.

The government and local communities have worked together to mitigate the damages but besides the risk factor still remains in the area.

RECOMMENDATIONS

[Study this whole report in brief and write at least 4-5 recommendations to the surveyed area that you think is necessary or is important]

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