

DISASTER RISK REDUCTION THROUGH INDIGENOUS KNOWLEDGE OF COASTAL PEOPLE IN CHENNAI - A STUDY ON FISHER MAN COMMUNITY FACING THE VULNERABILITY, THEIR COPING MECHANISM AND SUSTAINABILITY

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ABSTRACT

Disasters are resulted due to the natural in early times now it also anthropogenic environmental damage processes such as deforestation, desertification, loss of biodiversity, soil erosion are increasing day by day. Man environment relationship was in harmony in past as science and technology develops it is diminishing. This as leads to potentialities for outbreaks and their high risk at any places at any time. The present study is an attempt to analyses the local knowledge and skills that are being practiced and used to reduce the risk of various types of natural hazards over the coastal Chennai of Tamil Nadu. Climate change have been a strong impact on livelihood and fisheries with far-reaching consequences on loss of life and property of a sizeable section of the population. The frequency and intensity of extreme climate events is likely to have a major impact on local community. Fishermen have excellent knowledge on the relationship between climatic, oceanographic factors to overcome the disaster and hazard for the generation wise. This knowledge enables them switch them to avoid activities with respect to local condition of weather and avoid going into the sea. Based on this backdrop, a survey was conducted to collect primary data on Indigenous Knowledge (INK) from 100 Fishermen opinion and their life time experience from and also knowledge least through their forefathers.

Keywords: Disaster, coping, cyclone vulnerability, local response, Monsoon, Indigenous knowledge

INTRODUCTION

Low-lying coastal cities are chronic to the bleakness of the coastal hazards and climate change exacerbates these hazards into multifold. Sea-level rise, intensified storms and storm surges, etc. will have a profound impact on coastal regions and coastal communities. In particular, densely populated coastal cities are at high risk to the impacts of changing climate and rising sea-levels. However, adaptation is considered as one of the appropriate methods to address these challenges and community-based adaptation. This study explores vulnerability to cyclone hazards using fishermen basic knowledge and how they are coping and adapting from prior to, during and after the monsoon.

Aims and objectives of the study in coastal areas of Chennai The research aimed to identify the people who are vulnerable to cyclone hazards and Tsunami experience in Coastal Chennai and gather local responses living who crossed over the impact and their response too. More specifically, it sought:

1. To examine the vulnerability of cyclone hazards and experience shared by the local people on the Chennai Coast
2. To identify adaptation strategies and coping before, during and after cyclone and Tsunami disasters and also throw light in to the local people's past experiences.

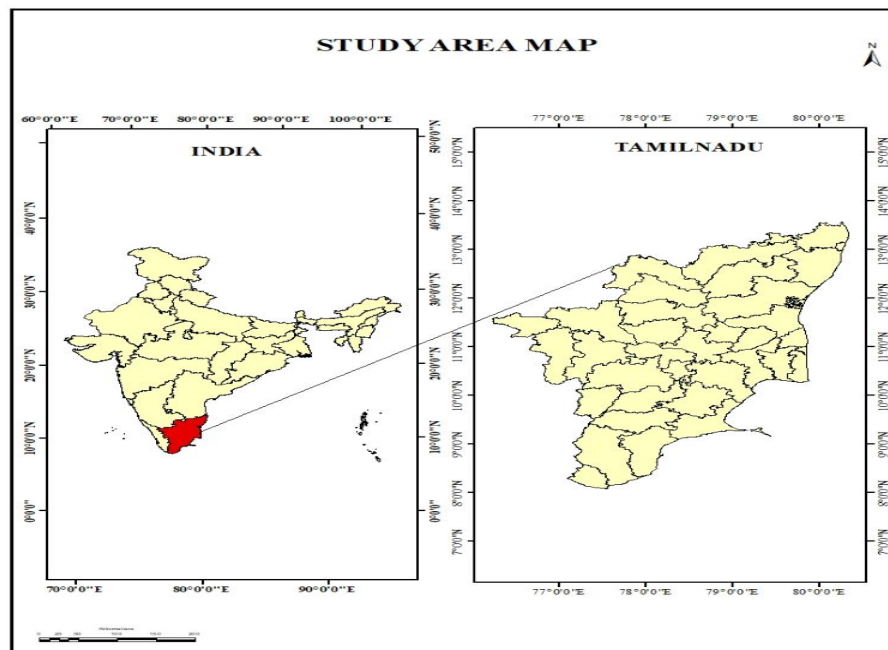
MATERIALS AND METHODS

The study adopted a case study design through studying coastal areas of Chennai affected by floods, as it sought to understand the contribution of indigenous knowledge of local communities from the participants' lived experiences. Purposive sampling was also used, and data were solicited through semi structured questionnaire interviews from 50 fisher man in three location of Chennai coast. In North, Kasimeddu fisshing area in the central part Lighthouse fisherman community and in the South coast -Pattinambakkam location has been choosen as the three spot of the study area

In order to identify local indigenous practices for the benefit of knowledge, skills, experiences, and support through partnerships with local communities, agencies, and organizations.

STUDY AREA - GREATER CHENNAI COASTAL CITY

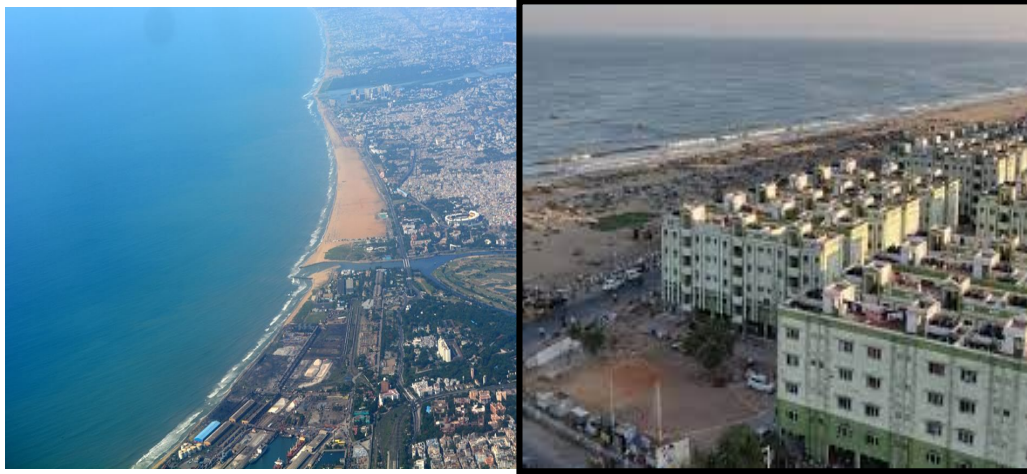
The topography of Chennai is almost flat and the ground level in the district slightly rises up to 22 ft. (6.7 m) above the mean sea level and favors devastating impact on this low lying coastal city to any coastal disasters including the threat of rising sea levels. Chennai's coastline, which includes tourist resorts, ports, hotels, fishing villages, and towns, has experienced threats from many disasters such as storms, cyclones, floods, tsunami, and erosion (Kumar and Kunte 2012).



Source: Compiled by the Authour

The city experiences flood during monsoon, which is the dominant season of the year. During floods, the water level of different water bodies rises and flow to different floodplains submerging them (Manohar and Muthaiah 2016). There were several past instances of catastrophic floods in Chennai caused by heavy rain associated with depressions and cyclonic storms, led to flooding in major rivers and failure of and drainage systems. Chennai was severally flooded due to heavy rains (16–20 cm, attributed to a trough of low pressure from the Gulf of Mannar to the South-west bay off the Tamil Nadu coast) during October 30 to November 2 during

2002. On November 5, 2004, a heavy rainfall (6 cm within 24 h or less) caused flooding and water-logging in many areas, inundating most of the slums.



Aerial view of Coastal Chennai

Chennai is one of the coastal cities lie along the Bay of Bengal, is a cyclone-prone area and is likely vulnerable to natural hazards such as coastal hazards and impacts of changing climate such as sea level rise. Tsunami in 2004, frequent floods due to cyclone especially during North East Monsoon lead to lot of structural changes along the shores of the city. Changing climate scenario and resultant sea level rise in Chennai are also reported to be one of the factors for the coastal vulnerability hazard (Marriappan and Devi 2012). Realizing the need of the hour with respect to Chennai city and coastal hazards, Methods

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RESULTS AND DISCUSSION

This section of the article presents and discusses the findings of the study in order to show the contribution of indigenous knowledge to disaster risk reduction activities. In the discussion, the findings are related to the research objectives and are also compared with results from previous studies. The Members of the community affected by floods in coastal areas of Chennai were found to possess a high level of indigenous knowledge. Such knowledge helped them to be aware of their vulnerability and to decide what action to take before, during and after flooding. *Nine months the wind will blow from south to north of the coast as the location of Chennai coast is on southern Hemisphere. They also shared that the sea water rushin towards the offshore during the last quarter of the year.*

From interviews conducted to decide with members of the community and disaster risk practitioners, it was mentioned that communities relied on their indigenous knowledge to forecast the magnitude of rains for the season, as well as to respond to the flood disaster.

INDEGENOUS KNOWLEDGE AND CYCLONE PREDICTION

According to the respondents, they studied cloud patterns, the behaviour of certain animal species and changes on certain types of trees to predict whether the intensity of the forthcoming rains would result in floods.

During rainy season, when we observe the continuous crying of an unsettled thumbi, we know that heavy rains with a potential for flooding are imminent. We then ready ourselves to move away from the coast before the rains start falling.'

PEOPLE PREDICTION OF DISASTER THROUGH THEIR INDEGENOUS KNOWLEDGE

Indigenous knowledge in local language (Tamil)	Indegeneous Knoledge	Symbolism to local communities
<i>Karu Megangal</i>	Dark patches of cloud accumulation	Heavy rains anticipated
<i>Unsettled behaviour of birds</i>	rain-making Birds	Heavy rains anticipated
<i>Gathering large number of Thubi</i>	Rain bearing Insects	Sudden down pour

<i>Ellai thulirthal</i>	growing of new leaves from trees	Heavy rains anticipated
<i>Kaattrin Thesai kezhakil erunthu nilathil visum</i>	Direction of wind blow from east towards the land	Brings cyclone to cross the land
<i>Kadal alaiyil athiga norai kelambum</i>	Sea waves bringing unusaul foam	Dangerous warning to furious action of the sea
<i>Kadal neer thurnatrum visum</i>	Bad smell from the sea	Threat to Tsunami or Big hit of cyclone over the coast
<i>Kezh vanam sevathal</i>	Lower sky seems to be red in colour	Formation of cyclone
<i>Paravaigal ondrugudi ozhi eluputhal</i>	Brids together make a noise	<i>Abnormal sign of disaster</i>
<i>Kilinchalgal , nadu mela therivathu</i>	Sea shell appear more in number along the coast	<i>New onset of rain</i>
<i>Kadal ullvanguthail</i>	Retreat of sea water	Anticipating Tsunami or Sea level raise some time water enter into the entire area
<i>Errumbugal saraisarai yaga veliya varuthal</i>	Ants come out in a group	Symptomes of Rain occurs

Source: Information Collected from the local people in the Chennai coast

FINDINGS FROM THE SURVEY

The local community have more knowledge and discussions with a female group indicated that the decision to save belongings and to leave home in most cases rests with the male head of the household. Therefore, the other family members wait for the arrival of the family head from outside. The household also considers the problems that can arise at cyclone shelters, such as space issues, lack of light and poor sanitation

DARK CLOUDS

The local people about 20 percent of elderly people says with the help of clouds they will predict the seasonal change. Mostly they are primary level of

education and they continue their fishing activities. Fishing is the tradition of the coastal people. Without knowing the concept of climate with their experience and learnt knowledge from their Ancisters.

Sagayam 55 years old fisherman in Kasimedu north fishing grounds of Chennai describes the cloud movement and their behaviour. When the clouds are white and clear sky they go for fishing. If the clouds are dark and big patches gather together they stay back in home. Sometimes even it darkens they move away from the coast.

UNSETTLED BEHAVIOUR OF BIRDS AND RAISING NOISE

When group discussion with the local people some of them spoke about that birds will come in group and making unusual noise before cyclone and fly here and there.

A fisherman managed 58 says during storm are any hazard going to hit this birds create such noise and fly in group it looks like that they were searching for the safely place to hide

This kind of symptoms makes us to alert and avoiding to enter into the sea. Fishermen community have enormous indigenous knowledge of their own early warning system. Majority of them are living very close to the coast not afraid of noise of waves and their action.

GATHERING OF LARGE NUMBER OF THUMBI (INSECTS)

The large gathering of Thumbi is one of the signs of severity in the community. Nearly 76 respondents said when there is a huge gathering of these insects, there is a high chance of occurrence of heavy rainfall. These insects only come on the rainy time after that it would not be visible. Before getting heavy downpour, these insects fly here and there in groups without anticipating. Many local communities have lots of experience of this knowledge of hazard from their childhood.

DIRECTION OF WIND

The older fisherman who goes regularly to the fishing from their childhood clearly says about the climatological reasons. Nearly 46 respondents explained they won't go for fishing when wind is blown from east towards the land at an abnormal speed. Wind speed and direction has been spoken by the community with their experience and not realising the basic concept of climatic factors. This is the basic

indigenous knowledge has been practised before the warning system has come in practice.

UNUSUAL FOAM IN THE SEA WAVES

This has been noticed by the middle aged people of the community. They narrate sometimes waves would bring enormous foam that times we had experience severe cyclone devastated out hamlets. When we are inside the sea the boat will thrown opposite to the wind direction. Sometimes we reached srilankan coastal areas. It has happened during severe cyclone approached the land. At times warning may be given delay. Many times we reached some other parts of tmil Nadu coast. After that when we see this abnormal symptom of the sea waves we never go to the seas, many times we evacuate and go to our relatives house. People of loacl have many experience of their own experience and knowledge many times they save themselves.

RETREATE OF SEA WATER

During the focus group interview some of the local explained clearly about this before a week before Tsunami we notice sea water going beyond and also change in the colour of the sand, it has mixed with brackish colour as we are not much educated unable to predict and also Tsunami

Rajan 54 years old man said he lost his wife and children during that time he was in the onshore that time. This gaint waves as there is no natural barrier in the chennai coast it hits turbulently and swallow the people and also their belongings. The early warining system has not reached to the coast guard department local people and more no of floating people were lost.

CONCLUSION

A community that possesses vast indigenous knowledge of disaster risk reduction is able to take care of itself and also able to deal with disasters with minimum external support. Routine practice of facing disaster in the coastal areas, from the childhood people have become strong enough to face the situation without changing their place and through their indigenous knowledge, people can deal with different kinds of hazards and disasters before the arrival of warning from disaster risk reduction practitioners. Indigenous knowledge is very important in planning for community development. This shows that indigenous knowledge can be used as a planning tool by local communities.

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