Ethnographic Approaches In Disaster Management Among Indian States- A Comparative Study

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Abstract
Indigenous knowledge refers to the understandings, skills, and philosophies by societies with long histories of interaction with their natural surroundings. For rural and indigenous peoples, local knowledge informs decisions making about fundamental aspects of day-to-day life. The Indigenous traditional knowledge found in local communities in India is an amalgation of strategies, skills, rules and techniques gained through shared adaptive man- environment interactions to live and survive in the natural way of life. There is much to learn from indigenous and community-based approaches, for the natural disaster preparedness. The people have developed their own strategies and traditional knowledge, and practices provide an important basis for facing even greater challenges of natural disasters. Although their strategies may not succeed completely, they are effective to some extent and that is why the people continue follow those. The present paper tries to explore the Ethnographic approaches in Disaster Management practiced in select Indian States.

Key Words: Ethnography, Disaster Management

INTRODUCTION

Ethnography is a methodical investigation into people and their cultures. Its aim is to delve into cultural phenomena by immersing the researcher in the perspective of the subjects under scrutiny. Ethnography serves as a tool to depict the customs and beliefs of a community visually and textually. As a data-gathering approach, ethnography involves scrutinizing the actions of participants within particular social contexts, while also grasping their perceptions and interpretations of these actions.

The integration of Indigenous practices and ethno-cultural awareness represents a valuable national asset in confronting disasters by blending scientific and traditional methods. This synergy offers pathways to enhance disaster prevention, preparedness, response, and mitigation. Disasters can strike unpredictably and in various forms - be it floods, hurricanes, fires, earthquakes, tornadoes, hazardous spills, or acts of terrorism. Each year, millions of individuals confront the harrowing aftermath of such events. Effective disaster management is essential to exert control or at least minimize their impact. A robust disaster preparedness strategy must encompass all phases of the disaster cycle, including preparedness, response, recovery, rebuilding, prevention, and mitigation. Indigenous traditional knowledge embedded within local communities in India represents a fusion of strategies, skills, rules, and techniques cultivated through generations of adaptive interactions with the environment to sustain a harmonious way of life. Embracing indigenous and community-based approaches holds immense value for natural disaster preparedness. Communities have evolved their own unique strategies, rooted in traditional knowledge, which serve as vital assets in confronting increasingly severe natural disasters. While these strategies may not offer foolproof solutions, their efficacy to a certain degree explains why communities persist in their utilization.

Indigenous knowledge

Indigenous knowledge encompasses the distinctive, culturally specific wisdom and practices nurtured and transmitted across generations within Indigenous communities. This knowledge spans a wide array of domains, including traditional medicine, agriculture, hunting, spirituality, environmental stewardship, storytelling, and various facets of daily life. Rooted deeply in cultural, spiritual, and historical narratives, Indigenous knowledge reflects the profound wisdom, expertise, and philosophies honed by societies with rich legacies of harmonious coexistence with their natural surroundings. Particularly for rural and Indigenous communities, this local knowledge forms the cornerstone for crucial decision-making across all spheres of daily existence.

The profound significance of Indigenous knowledge transcends local boundaries, contributing significantly to broader societal goals such as environmental conservation, sustainable agriculture, and ensuring food security. Safeguarding and

preserving this knowledge actively sustains traditional practices and ways of life, safeguarding the diverse tapestry of Indigenous heritage for generations to come.

Indigenous and Cultural tradition of India

India's rich tapestry is woven from diverse indigenous and cultural legacies, forged over millennia of history, religion, and regional variance. These traditions have left an indelible mark on every facet of Indian existence, from the vibrant realms of art, music, and dance to the flavorsome delights of cuisine, the kaleidoscopic array of clothing, and the profound depths of spirituality. Ethnographic endeavors within India have yielded invaluable insights into the country's manifold cultures, communities, and societal dynamics. They serve as pillars upholding the preservation and documentation of India's cultural wealth, while also illuminating contemporary social landscapes and transformations.

Importance of Indigenous knowledge for disaster Risk, reduction.

Historical data indicates that India stands as one of the world's most disaster-prone nations, facing recurring devastations from cyclones, floods, droughts, and earthquakes across centuries. Early literature on disaster management predominantly focuses on relief efforts within the framework of prevailing governmental policies. In the face of such calamities, communities often perceive disasters as acts of nature, enduring pain and suffering with or without governmental aid or support. India has grappled with some of the most catastrophic disasters in recent memory, including the devastating Gujarat earthquake in 2001 and the tsunami that struck the Andaman and Nicobar Islands in December 2004.

Scholarly and scientific works from ancient India delve into the realm of disaster preparedness and mitigation. One notable example is Varahamihira, a philosopher, astronomer, and mathematician, who addressed earthquakes, their origins, and predictability in the Brahma Samhita. Within this text, he explores indicators of earthquakes and links them to celestial and planetary influences, subterranean water movements, undersea activities, unusual cloud formations, and atypical animal behavior. Additionally, the Atharva Veda provides insights into strategies for mitigating drought, while Chanakya's Arthashastra includes a section on famine relief and measures for alleviating its impact.

Literature indicates that local communities possess an awareness of shifting climates, prompting them to develop adaptation measures rooted in cultural practices and historical experiences. The interconnectedness between knowledge, culture, and beliefs assumes significance as belief systems frequently integrate environmental ethics, thereby contributing to mitigating disaster risks.

OBJECTIVES OF STUDY:

1. To know the different Indigenous traditional practices of Disaster preparedness in select Indian States
2. To compare the impact of Indigenous traditional practices in facing disasters
3. To search the significant best practices undertaken by various Indigenous groups.

METHODOLOGY:

This paper is of qualitative nature. Relevant data for the study was collected through a vast Literature Review with emphasis on ethnographic methods. For the purpose, twelve Indian States were selected which were mostly affected by flood and other drought like disasters during recent occasions. The States were then classified into region wise as Southern and Northern.

Indigenous practices followed by the select Indian States.

Sr.No.	State	Areas of indigenous practices	Indigenous practices
1.	Nagaland	Village Planning & grain safe strategies	Research indicates a systematic approach to village planning in which grain storehouses were strategically situated away from residential areas. These designated locations housed individual grain stores for all villagers. One rationale behind this practice was to ensure the safety of grains in the event of household emergencies such as fire accidents or attacks, safeguarding essential food supplies.
2.	Nagaland	Ensured the Drainage System	Efforts were made to maintain the natural passage through the village, ensuring it remained intact and undisturbed. Bamboo plants flourishing along roadsides or riverbanks were carefully conserved, as they play a crucial role in soil stabilization, preventing erosion and minimizing the risk of landslides.
3.	Tamil Nadu	Agricultural practices	The adoption of flood-resistant paddy seeds, coupled with traditional agricultural practices, was embraced by local communities. Additionally, the application of

			organic fertilizers derived from natural sources, such as orange peels, was integrated into farming methods. These approaches aimed to enhance resilience against floods while preserving indigenous farming techniques and promoting eco-friendly soil management.
4.	West Bangal and Orissa	Fish cultivation practices	Coastal farmers employ a unique method of protection by securing bamboo pegs and hanging dried fenugreek leaves along riverbanks during floods to safeguard fish populations. This innovative practice serves as a practical and environmentally sensitive solution to mitigate the impact of flooding on aquatic ecosystems.
5.	Orissa and AndraPrades	To protect crops against drought	Communities practice shifting cultivation and cultivate drought-resistant tuber crops, following a rotational cycle that allows for sufficient space for conservation efforts. This approach ensures sustainable land use while promoting resilience against drought conditions.
6.	Bangladesh	House building practices	Communities construct elevated platforms to safeguard essential belongings and small livestock from floodwaters, while also implementing earthquake-resistant housing designs. Additionally, residents are trained in swimming techniques to navigate flood-prone areas safely, enhancing their resilience to natural disasters.
7.	Rajasthan	Drought practices	Communities embrace environmentally friendly fertilizers, implement enhanced storage methods for fodder and food grains, and prioritize water conservation efforts alongside indigenous harvesting techniques. These sustainable practices contribute to ecological balance, food security, and resilience to environmental challenges.
8.	Kerala (Alappuzha)	Planting building practices	Communities have planted numerous kattadi and mangrove trees to fortify coastal areas against erosion and storm surges. Additionally, they have invested in constructing sturdy concrete houses to withstand the rigors of coastal weather conditions. Furthermore, residents are trained in swimming techniques to navigate the sea safely, enhancing their resilience to maritime challenges.
9.	Sikkim	Land Slide Practices	They employ slope farming techniques to mitigate soil erosion, preserving the land's fertility. Additionally, they have cultivated "Kair," a native plant revered for its role in weather forecasting and valued as a spice. Notably resilient to heat and drought, Kair serves as a vital asset in their agricultural practices, enhancing their ability to adapt to changing environmental conditions.
10.	Assam	Flood and soil degradation Practices	Utilizing bamboo planting as a preservation method, communities effectively conserve water and mitigate soil and bank erosion. This sustainable approach not only safeguards natural resources but also strengthens resilience against environmental degradation.
11.	Kashmir	Earthquake Practices	In the taq system, large pieces of wood or timber are integrated into masonry walls as horizontal runners. This method enhances structural stability and reinforces the integrity of the construction, contributing to the resilience of the built environment.
12.	South Bengal	Cyclones, Floods, water logging	They secure vegetable trees by binding them with bamboo sticks and engage in betel farming, which facilitates quick drainage. These practices not only optimize agricultural productivity but also contribute to soil health and water management, enhancing resilience in farming communities.

13.	Himalaya (Sikkim)	Landside	In areas prone to fresh landslides, softwood trees like Himalayan alder are initially cultivated to stabilize the soil. Once these trees establish a firm grip on the topsoil, hardy hardwood species are introduced to further reinforce soil retention. This progressive approach transforms landslide-prone regions into lush, forested areas, bolstering environmental resilience and biodiversity.

DISCUSSION AND FINDINGS:

Studies show that systematic village planning programs were practiced in this state. The grain store houses were in a particular area. In the case of an eventuality within houses the grains remain safe.

In Nagaland, the local pupil ensured the drainage system. Natural passage through the village is preserved and undisturbed. Bamboo plants were planted on the roadsides or riverbanks were preserved as it helps to bind the soil and prevents soil erosion and land side.

Many research studies show that Tamil Nadu use flood resistant paddy seed along with indigenous agricultural practices. They broadcast the seeds in late summer and in early monsoon without any chemical fertilizer. It grows well and before the season its root grows deep, and the plant becomes strong. During harvesting the plants are cut into two pieces. One is used for fodder and the other part for annual renovation of thatched houses.

In West Bengal and Orissa, the farmers in the coastal regions put bamboo pegs in the fishpond before the flood and just before the pond submerge with flood water, they hang fried fenugreek leaves on these pegs at different places in the pond putting it in thin cotton cloths. As per the farmers, if the fried fenugreek in hanged inside the pond, then the fish don't leave the pond. This considerably reduced the risk of washing away fish in flood water.

Orissa and Andrapradesh established traditional practices to protect crops against drought. Indigenous communities here practice shifting cultivation which provides enough space for conservation. They cut down the forest, set fire, and cleaned the shifting cultivation site. Then they collect and keep the residence and loose boulders of the topsoil layer across the slope following the contour lines. This is a unique practice of conservation of soil and water and to resist drought.

In Bangladesh flash flood and river erosion are the main curse. They give training to swim in flood prone areas. They also construct elevated platforms to keep key belongings and small livestock safe from floods, earthquake resistant houses.

In Rajasthan the main disaster is drought. They grow new crops such as vegitables, fodder and higher value medicinal crops for commercial sale. Use of environmentally sound fertilizers, improved storage of fodder and food grains. They also developed indigenous water conservation and harvesting technique through construction of anticuts and digging or deepening ponds and wells.

During 26th dec:2004 Tsunami. Alappad was the most exceedingly terribly influenced village in Kerala. After that the local pupil of each panchayat practiced ingenious knowledge mixed with scientific skills. Studies show that they planted so many kattadi and mangroves. Concrete strong houses were built. Training the local pupils to swim in the sea. The pupil also gives awareness about indigenous warning signals.

In Sikkim Landslide is the major disaster. Slope farming prevents erosion. "Kair" is a native plant found in India's arid and Semiarid regions. It is a Valuable Species of Weather for easting because of its capacity to withstand heat and drought. It contributes to the rural economy of western Rajasthan and Gujarat by Supplying food, Medicinal applications, Construction Materials, fuel, timber and environmental Sustainability because of its Soil binding capacity and ability to lower soil alkalinity.

Flood and Soil degradation are the most affected disaster in Assam. They used bamboo planting as a preservative measure. This method saves water and prevents soil and bank erosion. This locally devised conservation strategy has allowed people to reap the benefits of bamboo's many applications.

At regular intervals devastating earthquakes occur in the Kashmir region, which is located in a Seismically active area. Large pieces of wood or timber are implanted into the masonry walls as horizontal runners in the Taq System. A building or residence in held together by these runners, preventing the Spread, and breaking of brick work by connecting all Components.

South Bengal is the Second densely populated State in India. A wide range of hazards including Cyclones, storm surges, floods, water logging and salinity, Embankment failure in the coastal zone and drought, landslides and earthquake, flash flood in plateau and mountainous region in prominent in Bengal. Farmers applied their local indigenes knowledge in the agricultural field to reduce expected loss from advice environment make their crop field suitable for irrigation to reduce wastage of water, making clay layer along the boundary to reduce infiltration from ail etc. some disaster adaptive farming methods are bound vegetable trees with bamboo sticks to reduce cyclone related risk for betel farming create raised and gradient land for quick drainage.

In Himalaya region in a fresh landslide softwood trees like Himalayan alder are normally grown and when those trees hold the topsoil then hardwood trees hold the topsoil then hardwood trees can be grown to convert the land slide prone area into a forested area.

All these studies show the importance of indigenous practices to disaster risk reduction. India in the present scenario is rich in biodiversity. The indigenous people have developed in conservation of biodiversity. However, the efforts for conservation have to be made in both vertical as well as horizontal direction due to rapid industrial revolution.

Indigenous warning signals for Disasters.

Ethnic tribes and other local people, especially farmers, fishers and hunters are very astute weather watchers and are quick to recognize weather conditions and whether they are favorable to their production system. Local indicators and local knowledge systems cannot be replaced with scientific knowledge because they are holistic and specific to local situations. Mechanisms for integrating both traditional and scientific weather forecast systems could reduce uncertainties and improve farm management.

For the traditional weather forecasters, the Phenology of certain plants and behavior of certain animals is a reliable indicator of a wet or dry year, or of the onset of the rainy season or adverse aspect. Regarding our ancient scriptures is that the weather of the upcoming years can be predicted with relatively high accuracy.

Plant Indicators

Plants and certain fungi can accurately forecast the certainty of wet and dry weather eg:, clovers, wild indigo, and tulips all of which fold their petals prior to the rain. Pleurotus Ostreatus, a type of edible mushroom growing on stumps and tree trunks, expands prior to rain and closes in dry weather. Traditional indicators of an upcoming rain include, ripening and early rotting of fruits, unusual flowers of plants, increased length of inflorescence etc. In coastal areas, seaweed is often used as a natural weather forecaster. Brown sea algal weed, shrivels and feels dry in fine weather, but swells and becomes damp if rain is in the air.

Animal Indicators

In traditional weather forecasting, the onset of the rainy season and upcoming rain is often indicated by the unusual behavior of certain animals. This includes birds chirping more than usual and bathing with sand, native frogs croaking in swampy areas while hiding their egg masses, dragonflies flying at lower altitudes, female crabs migrating from rivers to brackish water, and spiders spinning shorter and thicker webs.

During heavy rain, crickets produce shrill infrasonic sounds, serving as an alarm due to the sound waves generated by storms and thunder, as well as changes in barometric and hydrostatic pressure.

Presage biology focuses on the activity of species as they prepare for upcoming natural dangers, offering insights for short, medium, and long-range rain forecasting. Changes in humidity and the formation of low pressure in oceans can lead to sudden rain, thundershowers, and hailstorms over the following days. Plants undergo regeneration of defensive chemicals, stress hormones, and enzymes, while animals' nervous systems become more active, a couple of hours before rainfall.**Land Slide**- New cracks or unusual bulges in the ground or street pavements, rapid increase in stream water levels. Sticking doors and windows and sudden decrease in steam water levels though rain is still falling or just recently stopped.

Earth Quake- Different behavior of a particular variety of fish (singhi) which comes to the top of the water before an earth quake.

Tornado- Sudden change in the colour of sky.

CONCLUSION

Kerala with its magnificent natural landscapes and fertile valleys is often described as God’s Own Country. Kerala has witnessed one of the most devastating floods in history; many lives and livelihoods were lost. To reduce future occurrences and the impact of such calamities, it is important that we focus on implementing and improving the measures that can offer greater resilience.

In addition to examining and managing the immediate consequences, the question is what can be done to cope more effectively with future water related disasters and thus reducing damage, and loss of life.

Now it is time of integrate the data from modern techniques of weather forecasting with presage biological evidence from traditional knowledge to support the extra demands for local weather prediction at specific times and in particular regions of rapid climate change. If it is not done countries like India which are totally dependent on the seasonal rainfall will suffer greatly in near future. So, there is an urgent need to authenticate the various traditional methods of weather prediction. Especially rainfall forecasting and ways to predict other natural weather phenomena such as floods, cyclones etc.

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