

Management of Environmental Catastrophe for Tourism Business in Coastal Odisha, India

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Abstract: Efforts have been made in this study to examine the various types of environmental catastrophe and their effect on Tourism Business in Odisha that affects Tourist movement and socio-economic life of the Local communities. This article begins with the meaning and importance of Natural disaster and its impact on the Tourism business, local societies and environment of the Tourism zone of Odisha. Key issue of this paper is to find out various natural catastrophes which are having devastating effect in the Tourism destination within the study area. Education, communication, awareness, Preparedness, emergency planning, disaster mitigation and tourism are the key area of discussion in this article. Role of the government and local communities are also highlighted here. This paper highlights the urgent need for attention on tourism disaster planning, reduction and preparedness.

Keywords: Environmental catastrophe, disaster management, hazards, disaster mitigation, preparedness, coastal tourism, sustainability, cyclone, erosion.

Introduction

Disaster is a serious disturbance in life and livelihood over a large area due to natural or man-made calamities, which is beyond the capacity of the local community to sustain. It has a long-lasting impact on Tourism business in the area. This paper examines various types of environmental catastrophe and their effect on Tourism Business in Odisha that affects Tourist movement and socio-economic life of the Local communities. This article highlights the meaning and importance of environmental catastrophe and its impact on the Tourism business, local societies and natural tourism resources in the study area. The key issue of this paper is to find out various natural disasters which are having a devastating effect in the Tourism destination. Nature education, communication, awareness, preparedness, emergency planning, disaster mitigation and impact of the disaster on tourism business are the key area of discussion in this article. Responsibilities of the government, local communities and tourism service providers for mitigating disasters are also discussed here.

In coastal Odisha, especially in Puri, Konark, Gopalpur, Chandipur, Chilika, and Bhitarkanika, etc, tourism is the major economy. Here, mass tourism also has a great impact on the economy and environment. Every year during summer to autumn, the coastal region of Odisha experienced numbers of severe Cyclone that required evacuation of over millions of

people. Those cyclones destroyed several major tourist attractions including houses, hotels, Tourism infrastructure, etc and caused a major disruption of the region during pick tourism season. Other natural catastrophes like a flood, drought, etc have a disastrous effect here. This study has been undertaken to examine what impact the disaster has on the Tourism Business in this region, how Odisha's tourism industry is prepare to tackle this and what lessons were learned. This article examines possible deficiencies and future directions for disaster mitigation in the region.

In spite of the increasing of environmental catastrophe, growing of natural hazards and devastating effect on sustainability of tourism destination, very little research has been conducted on tourism disaster management and planning. As Cioccio and Michael (2007) observed it is the nature of the tourism environment which is often hazardous or offers experiences in volatile settings. Despite the growing threat of natural disasters to tourism businesses and destinations, few tourism businesses are prepared to handle the impacts of such threats (Cassedy, 1991).

Faulkner (2001) differentiates between the words 'crisis' and 'disaster.' A 'crisis' describes a circumstances 'where the root cause of an event is, to some extent, self-inflicted through such problems as inept management structures and practices or a failure to adapt to change', while a disaster can be defined as 'where an enterprise (or collection of enterprises in the case of a tourist destination) is confronted with sudden unpredictable catastrophic changes over which it has little control'.

Objectives

The main objectives of the Research paper include the following: -

- ❖ To understand the meaning and effect of Natural Disaster.
- ❖ To study the present scenario of Tourism destinations of Odisha and its impact on tourist inflow in the state.
- ❖ To study, analyze and evaluate the effect of environmental catastrophe on Tourism destinations of Odisha.
- ❖ To find out some solution and preparedness to mitigate natural disaster and maintain the sustainability of tourism destinations of Odisha.

Methodology

To gain knowledge about the concept and issues of environmental catastrophe and disaster management, extended conversations were held with the local people, service providers, and tourists. These types of experiences were chosen because they represent a diversity of issues

in the tourism destinations. This study was conducted using self-administered questionnaires. For collecting the data from the primary sources, two sets of the structured questionnaire made both for tourists and local people including local service providers. Apart from that, observation, schedules and interview methods were followed for the above-said purpose. Secondary data were also collected through books, related articles in journals, newspapers and electronic sources relating to study area.

Disaster: Meaning & Concept

The word, 'Disaster' derives from two French words 'Des,' means-'bad' or 'evil' and 'master,' means-'Star.' So, it can be understood that Disaster means loss of life and property due to unfavourable star. Disaster can occur due to the natural or man-made causes. A disaster is an event of nature or man-made causes that lead to sudden disruption or the normal life of society, causing damage to human life, flora, fauna, and property.

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

According to United Nations Disaster Management Training Program, "A disaster is a serious disruption of the functioning of a society, causing widespread human, material, or environmental losses which exceed the ability of affected society to cope using only its resources. Disasters are often classified according to their speed of onset (sudden or slow), or according to their cause (natural or man-made)."

According to International Federation of Red Cross and Red Crescent Societies, "Disasters are the combination of a number of factors: vulnerability, capacities, hazards, risks. Most commonly agreed definitions of disasters contemplate the element of capacity to cope with the situation. For example life-threatening situations which put people at risk of death or severe deterioration in their health status or living conditions, and which have the potential to outstrip the normal coping capacity of the individual, family, community and state support systems."

Disasters are the combination of a number of factors:

1. Hazard
2. Vulnerability
3. Capacities
4. Risks

1. **Hazard:** Hazard is an occurrence that has the potential to adversely affect human life and activity to the extent that can cause a disaster. Hazards are dangerous conditions or events with the potential for causing death, injury to life and damage to property, agriculture, and environment. Natural hazards are caused by environmental catastrophe, especially by biological, geological, seismic, hydrologic or meteorological conditions. Human-made hazards are conditions where human beings are the cause of hazard and derive from technological processes, human interaction with the environment, or relationships within the human communities. A hazard is an event while the disaster is the consequence.
2. **Vulnerability:** Vulnerability is the capacity of the community to cope with the hazard. Human vulnerability is the extent to which an individual, community, or geographical area is getting damaged or disrupted by the impact of a particular natural or man made hazard.
3. **Capacity:** Capacity refers to the internal and external resources, people, households, and communities have to adjust to the situations that threaten their life and well being.
4. **Risk:** The risk is defined as the expected impact caused by a particular hazard. It combines the likelihood or probability of a disaster happening and its negative impact if occurs.

Typology of Disasters

1. Weather & Climate-Related:

- Floods & Drainage related
- Cyclones
- Tornadoes & Hurricanes
- Hailstorm
- Cloudburst
- Heat wave & Cold wave
- Snow storm
- Droughts
- Sea erosion
- Thunders & Lightning

2. Geologically Related:

- Landslides
- Earthquakes

- Dam burst
- Mine fires
- Tsunami

3. Chemical, Industrial & Nuclear-Related:

- Chemical & Industrial problem
- Nuclear disaster

4. Accident Related:

- Forest fire
- Urban Fires
- Mine flooding
- Oil spill
- Major building collapse
- Serial bomb blasts
- Festival related
- Electrical and fires
- Air, Road, and Rail accidents
- Boat upturn
- Village fire

5. Biologically Related:

- Biological disasters and Epidemics
- Pest attack
- Cattle epidemics
- Bird flu
- Swine flue
- Food poisoning
- Covid-19

About Odisha and Its Vulnerability for Disasters

The state Odisha is located in the north-eastern coast of India. It is a maritime state and has enormous potential in natural resources, which is also vulnerable to natural catastrophe. It is located between 17°49' N and 22°34' N latitudes and 81°27' E and 87°29' E longitudes. The State is broadly divided into four geographical regions. These are: the northern plateau, central river basins, eastern hills and coastal plains. The northern and western portion of

the state is part of *Chota Nagpur* plateau. The eastern part of Odisha is consists of sea coast and the valleys of the *Mahanadi*, *Brahmani*, and *Baitarani* rivers, which fall into the Bay of Bengal that are fertile alluvial plains. This region is the combination of several deltas formed by the major rivers of Odisha, such as the *Subarnarekha*, the *Budhabalanga*, the *Baitarani*, the *Brahmani*, the *Mahanadi*, and the *Rushikulya*. Therefore, the coastal plain of Odisha is called the 'hexadeltaic region' or the 'Gift of Six Rivers'. These alluvial plains are home to intensive rice cultivation.

The state of Odisha has a coastline of 480 km., and one of the most effervescent coastal environments in India due to its location, and physical factors especially its rivers with their delta, variety of flora and fauna and estuarine systems. The coastline of Odisha is the major nesting ground for the endangered species like Olive Ridley sea turtles and Estuarine Crocodile. Popular tourist's destinations like Puri, Konark, Bhubaneswar, Chandipur, Gopalpur, Bhitarkanika, Chilka, etc are situated in coastal Odisha and have attracted huge numbers of domestic and international tourists from the globe.

It is unfortunate that Odisha is also vulnerable to multiple disasters such as *tropical cyclones*, *storm*, *heat wave*, *drought*, and *tsunamis*. The threat of hazards has increased with the growing population. Most of the environmental damage caused by tourism development is often due to poor planning of individual tourism schemes and lack of coordination with other departments of various ministries (*Kumar R. B. 1995*).

Except for the above mentioned natural catastrophe, human-made hazards also destroy the beauty of the tourist destinations here. Many of the attractive beaches of Odisha are densely populated. Due to lack of proper planning, people used to dump sewage and other effluents directly into coastal waters. Stretches and creeks of beaches are contaminated by sewage of tourist area. Except for this many industrial effluents including dangerous chemicals are also thrown into the sea. All these waste materials contaminate sea water making it unhealthy for bathing of tourists and harming aquatic life. A large portion of aquatic life like fishes, coral and some endangered species like an estuarine crocodile, Olive Ridley sea turtle, etc. around the boat jetties and hotel beaches dies every year.

Due to the increasing urban settlements, people used to cut trees; the ecological balance used to get disturbed. Soil erosion increases and water supply becomes inadequate and polluted. The environmental damage is aggravated by the frequency of visitor or by crossing carrying capacity. In pick season when a large number of tourists visit beaches, they leave waste materials like feces, plastic materials, food wastage, bottles, and other garbage materials. Due

to the lack of proper cleaning mechanism, these are accumulated on beaches and gradually become unsuitable for recreation.

Facts of Odisha

- ❖ About 480 Km long coastline
- ❖ Average five cyclones in the Bay of Bengal each year. One-third of cyclonic disturbances in the Bay of Bengal hit Odisha coast. Super Cyclone of 1999 had a wind speed of 260km per hour
- ❖ Situated in Zone-3 in Earthquake Hazard Map (which are less predominant compare to other zones like 4 & 5)
- ❖ Floods in Mahanadi river system & other major rivers in every year
- ❖ Western parts suffer from drought conditions
- ❖ Chemical/industrial hazards occur sometimes
- ❖ Odisha is mainly prone to flood and cyclone.
- ❖ Major districts of the state frequently affected by flood and Cyclone are *Balasore, Bhadrak, Jajpur, Cuttack, Kendrapara, Puri, Ganjam, Jagatsinghapur*. Besides these, some other districts are also experiencing flash floods sometimes.

TOURIST VISITS IN ODISHA (Domestic and Foreign Tourists)

Year	Domestic	% Change	Foreign	%Change	Total	% Change
2009	68,91,510	8.38	45,684	3.9	69,37,194	8.35
2010	75,91,615	10.16	50,432	10.39	76,42,047	10.16
2011	82,71,257	8.95	60,722	20.4	83,31,979	9.03
2012	90,53,086	9.45	64,719	6.58	91,17,805	9.43
2013	98,00,135	8.25	66,675	3.02	98,66,810	8.21
2014	1,07,90,622	10.1	71,426	7.13	1,08,62,048	10.08
2015	1,17,86,117	9.2	66,971	(-) 6.24	1,18,53,088	9.12
2016	1,28,42,899	8.97	76,361	14.02	1,29,19,260	9.00
2017	1,40,11,229	9.10	1,00,014	30.98	1,41,11,243	9.23
2018	1,52,08,540	8.55	1,10,818	10.80	1,53,19,358	8.56

Source: Dept. of Tourism, Govt. of Odisha

Disaster in Odisha:

Year	Calamity
2020	Umphun
2019	FANI, Extremely Severe Cyclonic
2018	Cyclone Titli
2017	Flood

2016	Flood
2015	Flood
2014	Cyclone Hudhud
2013	Very Severe Cyclonic Storm (VSCS) “PHAILIN”
2011	Flood
2009	Drought
2008	Flood
2007	Flood
2006	Flood
2005	Flood
2003	Flood
2002	Drought
2001	Flood
2000	Drought
1999	Super Cyclone
1998	Drought
1997	Drought
1996	Drought

Findings

1. Odisha is being situated in the coastal area is vulnerable to multiple natural hazards, mainly prone to flood and cyclone. Average five cyclones occur in the Bay of Bengal every year.
2. Due to its sub-tropical littoral location (close to the seashore), the coastal Odisha is prone to tropical cyclones, storm surges and tsunamis which are the major hindrances for tourist inflow.
3. Odisha has long 480 km of coastline. There are eleven major river systems in Odisha such as the *Subarnarekha*, the *Budhabalanga*, the *Baitarani*, the *Brahmani*, the *Mahanadi*, the *Rusikulya*, the *Vansadhara*, the *Nagabali*, the *Indravati*, the *Kolab*, and the *Bahuda*. The coastal plains of Odisha are densely populated. The rivers in these areas with heavy load of silt have very little carrying capacity, resulting in frequent floods every year. Major tourists’ destinations are situated in this region.

4. About two-thirds of the total cultivated area of Odisha is rain-dependent, drought create a serious threat due to the failure of monsoon in these areas especially in western Odisha.
5. Tsunami is also a potential hazard for the State. Though it was not highly affected by the tsunami of December 2004, in future, it remains a potential hazard for the State.
6. Odisha is situated in Earthquake zone-3 which is less predominant compare to other zones like 4 & 5.
7. A heat-wave condition during summer months is also a hazard, especially in central and western Odisha. In some parts like, *Titlagarh, Sambalpur, Jharsugura*, etc. the maximum temperature rises to 48°C. That led to heatstroke and death of people.
8. There are a number of springs and a few hot springs in Odisha. Hot springs which are popular for the tourists are *Deulijharna, Atri, and Taptapani*.
9. Among the natural lakes, the most popular for the tourists is *Chilika Lagoon Lake*. It is the largest lake in Odisha, and its area varies between 1,165 sq km during the moist season and 891 sq km during dry seasons. Other sweet water lakes are *Ansupa, Udyanakhanda*, etc.
10. The coastal Odisha comprises of mangrove forest like *Bhitarkanika*, is a house of a number of rare and endangered species, like Estuarine Crocodile, Olive ridley turtle, etc. Rapid depletion of mangrove forest has made Odisha coast vulnerable to cyclones and storm surges.
11. Odisha government has constructed more than two hundred multipurpose cyclone shelters through Odisha state disaster management authority in six coastal districts.
12. Community based Cyclone Shelter Management and Maintenance Committee (CSMMC) has been constituted for the maintenance and management of these cyclone shelters.
13. 50 numbers of multipurpose flood shelters have been constructed in 9 flood-prone districts
14. Odisha Disaster Rapid Action Force (ODRAF) has been formed by the government at ten different locations in the State at *Cuttack, Chatrapur, Balasore, Jharsuguda, Koraput, Bhubaneswar, Paradeep, Bolangir, Rourkela and Baripada*.

Recommendations

1. Tourism provides a massive economic benefit in Odisha, both regarding job creation and earnings. Tourism is the major business in the coastal areas and remote locations. So the values of Tourism and its impact should be recognized by the State Government and other local policymakers.

2. Tourism policies and programs related to destination planning and management, management of potential hazards & safety and maintaining carrying capacity are interconnected and should be treated as a whole.
3. Information regarding the types, magnitude, and nature of environmental catastrophes are not easily available. These information are vital while planning and taking precautions of environmental disasters.
4. Erosion is a major problem in seashores. One-third of the state's coastline is under the threat of erosion. To control erosion, the Geosynthetic tube technology (geo-tubes made with high-quality resin material and filled with sand) may be used and put on the bank of the sea.
5. The government should review all erosion control plans through a competent authority to ensure that protection of one area does not result in damage to another area.
6. Continuous disaster profile survey must be done, and accordingly, decisions can be taken for protection.
7. Plantation on the tourist destinations must be done seriously to maintain its sustainability. Dumping of garbage increases population of fungi and algae which affects the vegetation.
8. The drainage system should be upgraded to control flood around the tourist's destinations. Many waste material like plastic and glasses are not decomposed and block drains and sewage which increases the effect of the flood.
9. Local government should create awareness for prevention and mitigation of natural disasters through Information Education Communication (IEC) awareness campaign. Accordingly, mock drills may be organized at the community level.
10. The government should motivate to construct flood-resistant buildings in coastal Odisha.
11. High-risk infrastructural elements near to the beaches which are prone to cyclones and tsunamis, especially in *Puri, Konark, Chandipur, and Gopalpur*, must be eliminated.
12. Importance to be given to flood control mechanisms like flood detection and warning systems, development of a master plan for flood management, community participation, and education, etc
13. Clean water facility must be upgraded in tourists destinations. Cleanliness to be maintained. Proper sanitation, garbage disposal system, regular cleaning of drainage must be done on urgent basis.
14. Priorities must be given to medical facilities. Public health system should be upgraded.

15. Private sectors like hotels, transporters, travel agents and tour operators, etc. should ensure their active participation in the pre-disaster activities by the overall plan developed by the local bodies.
16. The local community, societies, and voluntary organizations should actively participate in prevention and mitigation activities planned by the local bodies.
17. The geographical Information system must be upgraded for providing prior information regarding natural catastrophe accordingly precautions can be taken to save tourists as well as local people.
18. Disaster awareness programme can be incorporated into the syllabus of school and college education.

Conclusion

Odisha is a maritime state and situated on the east coast of India. Nature has gifted variety of recourses to Odisha, like: hills, fountain, river, forest, wildlife, pilgrims, historical places, etc. The state also has world famous unique works of *Applique*, Metal Crafts, Silver Filigree, *Pattachitra*, textiles, sand art, and handicrafts. Tourism is one of the most important economies of the state. Due to its geographical location, Odisha is one of the most disaster-prone states in India.

Disaster is a serious disruption in the life and livelihood over a large area due to natural or manmade calamities, which is beyond the capacity of local community and tourists to recover. The 'vulnerability atlas of India' places the entire 480 kilometres coastline of Odisha in the 'very high damage risk zone B' regarding cyclone occurrence with wind speed up to 300 kilometres and tidal waves surges of between 3 to 10 meters. Due to large-scale depletion of coastal vegetation, including the mangrove forests, the medium range cyclones have also been life-threatening. The western Odisha is prone to drought. Natural disasters like cyclone, flood, drought, are however regular features in the state.

The environment planning approach is essential for sustainable development of tourism. This involves all aspects of environment be carefully studied, analyzed while recommending development at sensitive tourist destinations. Environmental considerations must be integrated in planning, designing and implementation of development projects for sustainable development and optimal use of natural resources. Environmental Impact Assessment (EIA) is one of the proven management tools for incorporating environmental concerns especially its impact in the development process in various tourism destinations in Odisha. Providing environment-related education and creating awareness among the tourists and local

communities about the hazards of the natural calamities are extremely important in the Tourism destinations of Odisha.

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