

# Children's Vulnerability in Coastal Slums during Cyclone: A Case Study of Puri Municipality Area

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## INTRODUCTION

Hazards are the natural events that take place in an area locally. When this natural event causes huge devastation or destruction of live and property is called disaster. Different natural disasters occurred in different places of the world in different times. For example, flood, drought, landslide, earthquake, volcanic eruption, cyclone, tsunami, bush fire etc. are the natural events but when these natural events take the lives and property in huge numbers or amount it called as disaster. There are many vulnerable groups in context of climate change whose impacts vary spatially and temporally. It varies with location, economic status, age, sex etc. Over the last 3 decades, various extreme events like heavy rainfall, high tides, drought, floods, cyclone and tsunami have brought huge devastation to the society.

Most of the world cities are generally found in the places where the food and water facilities are found easily. So most of the developed cities of the world developed along the river coast or ocean coast area. Hence the coastal areas are facing different types of natural hazards and disasters most of the time. The present study area, i.e. Puri urban area is a heritage city which is very ancient in nature. It is one of the four "Dhamas" of the Hindus and at the same time has beautiful golden beach attracting crowds from all around the world. Hence, plethora of employment opportunities attracted huge number of migrants. As a result there is proliferation of slum development. Basic characteristics of these slums are dilapidated housing structures with poor ventilation, overcrowding, inadequate lighting, lack of portable water, absence of sanitation facilities, faulty alignment of streets, inundation during monsoon season, lack of access for fire-fighting and control measures.

In our society the women, children and old people are most vulnerable for every changing environment due to their lower capacity than the young people. Generally when a disease or any disaster happened, the women children and old people are affected more due to their less tolerance capacity to the changing face of the normal environment. They also don't have access to property or financial resources which makes them more vulnerable in the face of disaster.

## Study Area

Puri, urban area is located at 19° 47' 55" N and 85° 49' 55" E along the eastern coast of India, on the shores of the Bay of Bengal. The area of Puri Municipality is about 16.32sq.k.ms. The slope of Puri is not more than 2 meters as this area is situated within coastal sensitive zone.

## Location Map



Figure – 1

## Location of Slums in Puri Town



Figure – 2

According to 2011 census 14522 numbers of slum HHs has been resided in 64 slums of the town. The total slum population according to 2011 census is 70452 out of which 36094 are male and 34363 are female. The slum population constitutes about 34.53% of the population of the town.

## Significance Of Study

India stands the most populous country of the world since 2023 constitute around 140 Crores of Population. As per 2011 Census, out of total Population of India, 10.93 percent of urban population under the age group of 006 years are resided in urban areas. In the study area, 11.25 percent of city population of under age 6 years are resided in Puri City, whereas out of total city population 34.23 percent are resided in slum area which shows a malicious picture. In the event of recurrent onslaught of natural hazards, slum infrastructure goes from bad to worse which creates a very nasty environment. The vulnerability of slum children at the time of natural hazards makes the present study more significant.

## OBJECTIVE, METHODOLOGY AND DATABASE

The objective of the present study is to find out the common diseases among the slum children and the impact of the coastal disaster on the vulnerable section of the slum children. Table 1 gives a comparative demographic analysis of city and slum.

Table No. – 1 Comparative Demographic analysis of City and slum

Characteristics	City			Slum		
	Total	Male	Female	Total	Male	Female
Population	204028	106190	94838	70,452	36094	34363
Child Below 6	22973	11965	11008	7865	4067	3798
SC Population	18791	9645	9146	10809	5383	5426
ST Population	420	258	162	360	194	166
Literates	148351	82472	65879	47948	26242	21706
Illiterates	55677	23718	31959	22509	9852	12657
Total Worker	61576	52800	8776	26766	20530	6236
Main Worker	57058	50329	6729	24587	19265	5322
Marginal Worker	4518	2471	2047	2179	1265	914
<u>Non Worker</u>	<u>142452</u>	<u>53390</u>	<u>89062</u>	<u>43691</u>	<u>15564</u>	<u>28127</u>

Source: Census India, 2011

This study is based on both primary and secondary sources of data. Secondary sources of data has been collected from different Government publications sources and online and offline journals. By adopting Simple Random Sampling Method, 1488 numbers of sample households from 19 different sample slums has been selected for conducting questionnaire survey and collect the primary data. Further, the researcher has been adopted the methods like observation, PRA and informal discussion to get some additional information for the present study. The collected primary data processed through SPSS software and statistical methods like frequency distribution, comparative analysis the result has been derived.

### Analysis

The Eastern Coast of Odisha is mostly affected by different tropical cyclones those occurred in Bay of Bengal. Puri urban area is experienced a number of Cyclones every year. Before 1995 there are numbers of disasters occurred in several times of a year and destroy the life and property of the people in Puri. But there is no systematic study of cyclones has been found in any Government or Meteorological record. “1999 Super Cyclone” is the landmark of natural disaster for Odisha which shake the sentiment of the people of the whole world and it encourage the disaster management system in Odisha. Table no. 2 gives the List of Cyclone Occurred in Puri.

Table No - 2, List of Cyclone Occued in Puri

Year	Cyclone Name	Low Pressure (MB)	Wind Speed
1999	Super Cyclone	912	276
2013	Phailin	940	215
2014	Hudhud	950	185
2018	Titli	978	110
2019	Fani	932	250
2020	Amphan	925	260

Source: Meteorological Centre, Bhubaneswar, Odisha

It is found from table number 2 that, “1999 Super Cyclone” is the deadliest cyclone occurred in Puri with highest wind speed. It has stroked the coast in the early hours of Friday on 29 October 1999 and created wanton destruction. It had uprooted a large number of trees, electric poles, vehicles and human settlement. Tidal waves and intrusion of the sea were experienced while heavy rain continued for more than 2 days. It cut off Orissa’s communication link from rest of the world for more than 24 hours. The whole State came under darkness due to power failure and snapping of power lines. The communication link between various villages and districts snapped and roads were washed away, railway’s link of Southern Railway disrupted due to infrastructure breakdown.

“Fani” is also a deep cyclonic storm with 250 K.ms/P.Hr. wind speed, which has its land fall at Puri and create a devastating situation. Result of which property lost and communication has been broken with other areas and also takes a month to resettle everything.

There are some Cyclones with low intensity has been occurred during 2020 to 2025 which has less impact on Puri like, Cyclone Yaas (2021, 165k.ms/P.Hr. wind Speed) and Cyclone Jawad (2021, 80 k.ms/P.Hr. wind Speed). Cyclone Asani (2022) brought heavy rain to the area and in 2025 Cyclone Montha have its effect with 80-90 km.s / P.Hr. with speed.

### Health Issues Of Puri Slums

The children are very sensitive for every climatic change both from health and psychological point of view. Due to bad socio-economic condition, the slum dwellers passed through a hard time for maintaining good health of their children which creates big problem within this vulnerable group. The major health problems found in the slums are related to water and sanitation, malnutrition, vector born and infectious diseases, respiratory problem, heal stress and injury etc. Table No. 3 shows the Health Issues of Puri Slums, which is commonly observed among the slum children.

Table No. - 3  
Health Issues of Puri Slums

Disease	Percentage
Water and Sanitation	45.4
Malnutrition	27.8
Vector Born and Infection	10.5
Respiratory	8.1
Injury	7.5
<u>No Health problem</u>	<u>0.7</u>

Source: Primary Data

### Health Hazards Due To Water & Sanitation Problem

Inadequate access to clean water and proper sanitation increases the risk of a range of health problems. Fever like typhoid cold, hepatitis A, Cold, diarrheal diseases (like cholera and dysentery) and intestinal worm infections are the diseases which found among the children due to water and sanitation problems. Children with less immunity power have frequently caught with this type of diseases. Breakdown in supply of piped water and bad sanitation practice among the slum dwellers can takes more lives than the disaster. From table 3, it is found that 45.5 percent of slum children are suffering from different health issues due to water and sanitation problem.

### Malnutrition

It is observed from table-3 that out of total slum children, 27.8 percent of children are suffering from *Malnutrition*. Malnutrition is directly related to shortage of food due to different Natural disaster, failure of agriculture and bad economic condition. The above all conditions are the effect of disasters which bring this malnutrition condition. Generally children in age group of 0-6 years are suffering most in this malnutrition

condition. Headache, weakness, eye problems are the diseases which is mainly found among the children due to malnutrition.

### **Vector-Borne and Infectious Diseases**

It is noticed that 10.5 percent of children of slums are suffering from different vector borne and infectious diseases. High temperature and changing precipitation encourage various vector-borne diseases from which malaria is a serious threat. Malaria, Jaundice are the diseases which is basically vector born which increases the severity of other diseases and increases the infant mortality rate. This disease also affects the mental growth of during acute periods of children.

### **Respiratory Illness**

Respiratory illnesses are mainly causes from flood, pollution and ozone depletion. Pneumonia, Upper respiratory diseases and Asthma are the examples of respiratory diseases. From the Global Burden of Diseases (GBD) study 2021 it is found that the trends of Asthma over the last three decades show a decline trend. It is very severe in the case of children and old age people. Out of total slum children 8.1 percent children are suffering from respiratory illness.

### **Injury**

Due to the playing activity and lack of capacity to understand and response well to danger, children face different types of injury like falling, burning, drowning etc. Children also experience long term and more serious burns, head injury marks, poisoning, bone fracture etc because of their physiological immaturity. It is found from table – 3 that, 7.5 percent slum children are suffering from different types of injury.

### **Coping with the Adversity**

Especially in low income group people, children may orphan or separated from family. In this case these children get care take by any other family member or extended relatives due to which these children can't get proper care from them and faces any mistreatment from them.

Disasters and long term displacement are not unique however in terms of stress they create. Even less extreme events can create havoc in people's lives, depend the level of poverty- whether through short term displacement, loss of work, reductions in food security, rising prices for basics or just the time and energy drain associated with more challenging conditions.

## **CONCLUSION**

When times are hard, children can become an asset that is drawn on to maintain the equilibrium of the household. They may be taken out of school to work or take care of younger sibling and some children may be considered more "expendable" than others. The poor people sacrifice their some children so that others may survive who are involved in various other types of works like begging, prostitution, stealing etc. which creates social disturbances.

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