

A REVIEW ON MANAGEMENT OF CYCLONE PHAILIN: EARLY WARNING AND TIMELY ACTION SAVED LIVES

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ABSTRACT

On the evening of October 12, 2013 a very severe tropical cyclone, Phailin, brought damaging winds of more than 220 kilometres per hour (km/h), storm surges of up to 3.5 metres and torrential downpours to the eastern Indian states of Odisha. The impacts of Phailin and ensuing floods affected more than 13.2 million people, and caused enormous damage. The estimated total damage to houses, crops and public properties was 14373.47 crore. There was massive destruction of power supply system, communication and transportation system.

However, early warning alerts, disseminated four days before landfall of Phailin, allowed for the evacuation and relocation of approximately 1.2 million people, resulting in the largest evacuation operation in India in 23 years. A total of 21 lives were lost as a result of the cyclone and an additional 23 lives due to severe flash flooding in the aftermath of the cyclone. A comparable cyclone, Cyclone 05B, hit Odisha in 1999 with winds of up to 260 km/h, but had a much more than 10,000 lives were lost. Early warning using multiple channels of communication and timely action saved lives during Phailin. Government cooperation, preparedness at the community level, and lessons learned from Cyclone 05B contributed to the successful evacuation operation, effective preparation activities and impact mitigation.

This event exhibits the importance, benefits and effectiveness of the use of early warning for a massive disaster. The lesson learnt from this event can act as a guide for development of plan for management of other similar disasters in future.

Key words: Cyclone phailin, Disaster preparedness

INTRODUCTION

Each day, natural disasters such as floods, earthquakes and hurricanes/cyclones threaten human life and cause severe environmental losses around the world. During the last decade, disasters have affected the lives and assets of almost 2.4 billion people across the world. In India alone since the year 2000, an average 65 million people have been affected by disasters every year¹.

Disasters disrupt progress and destroy developmental work of several decades. It is not possible to eliminate the possibility of disasters. However, with due care and proper preparation, the risks and damages from disasters can be reduced considerably. Effective management of disaster can save lives and reduce economic loss to the affected area.

India has witnessed several disasters. Various states of India are vulnerable for different kinds of disaster. Odisha is a state on the eastern seaboard of India, having a 480 km coastline². The long coastline adjoining the Bay of Bengal makes the state vulnerable to cyclonic storms and their aftermath of heavy rain and floods. The state experienced a disaster of great magnitude when a super cyclone struck it on 29 October 1999. Cyclonic storm Phailin slammed Gopalpur area of Ganjam District, Odisha on 12th October 2013, triggering heavy rains and strong winds with speed reaching up to 200-215km an hour³. Very Severe Cyclonic Storm Phailin was the second-strongest tropical cyclone ever to make landfall in India, behind only the 1999 Odisha cyclone⁴. Ganjam district was the worst-affected district in Odisha^{5,6}.

This study examines response to disaster Phailin. An analysis of management of various stages of disaster provides insight into the factors affecting disaster management. Building on these insights, the study outlines desirable qualities for effective management of disaster and proposes areas that could be given attention in the future.

AIM OF THE STUDY

To assess management of cyclone Phailin 2013 in Odisha

OBJECTIVES

To identify lessons learned from Cyclone Phailin and how they can be applied to other disasters

METHODOLOGY

Type of study-cross-sectional

Place of study- Ganjam district of Odisha

Duration of study- 7 months (10th Oct 2013 to 9th May 2014)

Method of data collection:

Data were collected by two means

- i) Review of literature documenting responses to the above stated natural calamity (newspaper, internet, TV channel)
- ii) Perception of individuals from the disaster-affected communities (casual telephonic conversation and face to face communication with near and dears before and after cyclone)

Sampling method and sample size-

Convenient sampling (sample size-100) for perception of people affected

Analysis of data done manually

RESULTS

Description about the study area

Ganjam district is one of the coastal district of Odisha. According to the 2011 census Ganjam district has a population of 3,520,151 and population density of 429 Persons per square Km. The sex ratio is 981 and average literacy is 71.88% (female literacy 61.84 %) The Bay of Bengal touches

the eastern frontier of Ganjam district and its coast extends over 60 Kms⁷. Agriculture is the main occupation of the people of the district and backbone of their economical background (Main crop paddy).

Assessment of services during phailin

1. Disaster preparedness

I. Detection and tracking of storms & Hazard Assessment

Timely identification of disaster: Phailin was monitored & predicted continuously since its inception by the India Meteorological Department. The forecast of its genesis on 8th Oct 2013, its track, intensity, point & time of landfall, as well as associated adverse weather like heavy rain, gale wind & storm surge were predicted more accurately, contributing to better forecasts and more effective early warning communication^{8,9}.

II. Dissemination of information

Dissemination of cyclone warning through various channels

- As soon as the 1st cyclone warning was received on 8th October 2013, the Collectors of all the 14 cyclone prone districts were alerted through e-mail, fax & telephone ². All Collectors were directed to activate Control Rooms round the clock at district, Blocks, Sub-divisions and Tahasils.
- Awareness message for local people regarding "do and do not during cyclone and flood" was disseminated using different modes of communication like inter personal communication, loud speaker, newspaper, radio, TV channel, internet (e mail, twitter, face book), mobile (phone, sms).

III. Preparation for cyclone shelter

- Mock Response drill was conducted in each multi-purpose cyclone shelters/ flood shelters and test check of various equipment in cyclone shelters was carried out (Generator, Water Pump, Inflatable Tower Light and Mechanized Tree Cutters). Steps were taken for repair of defective ones.

- Initiative was taken for identification of other school, college and other public buildings as cyclone shelters. As part of the preparations, 600 buildings were identified as cyclone shelters. Arrangement of Lighting, Drinking Water, and Temporary Toilets was carried out. Arrangement for availability of stock for relief operation (rice, chuda, gud, baby food, kerosene etc.) was done by procurement and stocking.
- Information regarding location of shelter home and safe building in public places was displayed at various places.

IV. Evacuation

- To ensure zero casualty, the Collectors of cyclone prone districts were directed to evacuate all people living in low lying areas and in kutcha houses to the nearby cyclone/ flood shelters or other identified buildings. Special care was taken to shift the old, infirm, physically challenged, pregnant women, nursing mothers and children. About one million people were shifted in the 36 hours preceding the landfall of the cyclone⁵. The cyclone prompted India's biggest evacuation in 23 years. Free Kitchen centers were opened from the night of 11th October 2013 for the evacuated people⁸.
- Steps were taken to shift the livestock to safer place.

V. Preparation for disaster response (rescue, relief)

Keeping the response forces in readiness

- Odisha Disaster Response Force (ODRAF) and National Disaster Response Force (NDRF) teams were stationed/ deployed at strategic locations to carry out search & rescue operations without loss of time. Cyclone Phailin was expected to cause maximum damage to the Ganjam district of Odisha. About 40% of the relief and rescue teams were stationed at Ganjam².

- Truck, helicopter, and planes were kept ready for relief with stockpiling of emergency food supply.
- It was decided to divert manpower and materials of neighboring unaffected districts to affected districts on requisition of the concerned district administration in case of necessity.

Arrangement of means of transportation

- Requisition of Boats (for rescue & relief operation) and vehicles (for evacuation/ transport of relief materials) was done. The Ministry of Defense, Govt. of India was requested for deploying 7-8 no. of MI-17 Helicopters at Bhubaneswar airport for air dropping operation in case of necessity². Eighteen helicopters, 12 aircraft and two warships had been kept ready by the government for rescue and relief operations. Indian Air Force helicopters were kept on standby in West Bengal to move in for help at short notice².

Arrangement for food, drinking water and fuel

- It was decided to prepare one lakh food packets in advance for air dropping. Odisha government had made arrangements for over 1,000,560 food packets for relief.
- 5 lakh tonnes of food grain was kept ready for distribution to Phailin victims².
- Arrangement of food, drinking water, medical facilities, relief and rescue operation at stations had been made by East Coast Railway, under whose jurisdiction the area that Cyclone Phailin was expected to hit. Arrangement for supply of drinking water and disinfection/ restoration of sources, dewatering of rain/ flood water was also made.

Pre-positioning of sufficient stock of fuel

- Availability of sufficient quantity of fuel in districts likely to be affected by very severe cyclone was ensured. Fuel reserves for at least 7 days were stored.

Preparation for medical care

- The Health and Family Welfare Department took steps to pre-position adequate quantity of medicines and form mobile medical teams for deployment
- The Fisheries & Animal Resources Development Department took similar steps to take care of the cattle health.
- Arrangement for disposal of dead (if any) was also made.

VI. Seeking national support for Resource mobilization

- Support from defense personnel, particularly the Air Force and Navy, for rescue and relief operations.

VII. Other precautionary measures

Preparation for clearance of road

- Advance arrangements for immediate restoration of road communication for movement of relief materials to the affected areas (in order to get JCB excavator, Earth Removers at short notice to clear the road blockades).

Arrangement to keep the communication systems operational

- All the 14 cyclone-prone districts were provided with satellite phones for ensuring communication in case of failure of telephone/ cell phone, temporary police wireless Stations were installed in the vulnerable areas for this purpose .BSNL authorities made necessary arrangements to ensure operation of the telephone/ cell phone with backup power system and pre-positioned adequate fuel for operation of generators at telephone exchange/ cell towers.

Safety measures

- Restricting use of unsafe buildings for accommodation of rescued persons.
- Closing all schools and AnganwadiCentres in view of the upcoming cyclone.
- Prohibition for fishing: Calling back the fisherman who were inside sea

and also instructed not to allow any body to go inside sea.

- Electric supply authorities in Odisha switched off the power in 12 districts.
- 183 trains were cancelled, 22 partially cancelled, 26 diverted due to cyclone¹⁰.
- Many flights were cancelled while few others were diverted.
- Arrangement for stocking of disinfectant for disinfecting water after cyclone.
- Precautionary measure against epidemic, medical care and disposal of dead.

Depleting the water Reservoirs

- Steps were taken for lowering water level in local reservoirs of Ganjam district in Bhanjanagar, Soroda and Dah dam and lowering reservoir of Hirakud dam (to manage the flood situation, if any).

Power supply

- To ensure prompt restoration of power supply, the Energy Department was directed to mobilize manpower and materials to the districts likely to be affected.
- All the Departments were advised to make their own power backup arrangement for their offices as power supply was likely to be stopped during cyclone for safety reasons.

Issue of High Alert and cancellation of leave

- In Odisha, the government issued a high alert to the 14 districts, cancelled the Dusshera holidays of employees of all 30 districts of the state, asking them to ensure the safety of people. Request was made for diversion of collected fund of Dusshera for disaster relief (Phailin relief fund).

VIII. Monitoring preparedness

- Key senior officials of the Government of India were reportedly attending a meeting in the Home Ministry to review the state of preparedness for countering the after effects of Cyclone

Phailin. Senior officers were deputed to Blocks likely to be affected, to take stock of the situation.

IX. Intersect oral Co ordination

- Preparedness meetings were held among various Disaster Response Teams in Odisha and volunteer teams, such as the International Federation of Red Cross (IFRC), to assist with evacuation and relief.
- The Collectors were advised to convene meeting of the District Disaster Management Authority to review the status of preparedness of all the departments and give necessary directions to take further measures as necessary.
- The inter-departmental coordination meeting was held for cyclone preparedness under the chairmanship of Minister, Revenue and Disaster Management.

2. Disaster Impact

Damages caused by the cyclone Phailin were mainly due to gusting action of wind with unprecedented velocity of up to 220 kmph and torrential rainfall from 11th to 13th October 2013. Due to storm surge up to 3.5m, large areas were inundated in Ganjam, Puri, Jagatsinghpur, Bhadrak, Kendrapada, Khurdha and Balasore districts. A total of 21 lives were lost as a result of the cyclone and an additional 23 lives due to severe flash flooding in the aftermath of the cyclone. Though loss of life was minimized with adequate preparedness, there was huge economic loss. Estimated loss was of about 14373 crore. There was damage to houses, public property, roads, transport system, communication, power supply. More than 3,000 villages had been affected by the black out. More than 7,000 telephone towers had been destroyed. After the landfall of Phailin countless streets were blocked due to thousands of transmission towers along the highways and uprooted trees everywhere. Many vehicles have toppled by strong winds and suffered severe damages. The railway infrastructure had suffered extensive damage. It also affected livelihood of many people. The fishing communities had been severely affected due

to huge loss to their boats and nets. The poor artisans had lost their looms, equipment, accessories and raw materials. The farmers had lost their livestock and sericulture farms. There was damage of crop due to the wind and heavy rainfall activity of the cyclone.²

3. Disaster response

In the days following Phailin's landfall, several measures were taken to jumpstart the recovery effort.

I. Search & Rescue

All 10 units of ODRAF, 28 units of NDRF, 12 units of CRPF and 10 platoons of OSAP were pre-positioned at strategic and vulnerable places for search & rescue operation. More than 350 teams consisting of mostly Fire Service personnel with some Home Guards and Civil Defence volunteers were formed for various tasks to be performed in the pre and post cyclone period.²

The teams assisted the local administration and police in evacuating people from low lying and unsafe buildings and moving them to cyclone shelters and relief camps. Post cyclone, the teams were engaged in cutting the fallen trees and clearing the roads to establish road connectivity. Apart from these, 300 personnel of Indian Army divided into 4 groups were deployed in strategic locations of Ganjam, Puri and Cuttack districts for search, rescue & relief operation during cyclone.

II. Free kitchen

People evacuated and placed in cyclone / flood shelters & other relief camps were provided with adequate quantities of dry food and cooked food through free kitchen centres. Emergent relief in shape of chuda&gud and rice was distributed to the people in dire need of sustenance in the cyclone & flood affected villages. In addition to dry food, candles, matchboxes, kerosene, clothes and other essential materials were distributed. Flood hampered distribution of relief material in some inaccessible areas.

III. Temporary Shelter Materials

5.41 lakh families were provided with polythene sheets for temporary shelter since houses were damaged either fully or severely.

IV. Drinking Water

Elaborate arrangements were made for supply of safe drinking water in the cyclone & flood affected areas. 234 water tankers and 345 mobile vans were deployed. 28,97,500 water pouches were distributed in rural areas. Restoration of power to water supply systems was given top priority. Steps were taken for disinfecting the water sources.²

V. Health & Sanitation

In order to restore the health services in the affected areas, 185 medical teams and 338 medical relief centres were opened. 47 medical officers, 132 paramedics were mobilized from medical colleges and unaffected areas. 1249670 ORS packets, 9655000 Halogen tablets and 16700 Anti Snake Venoms were supplied. Medical rehabilitation camps were conducted in all affected areas. In some areas there was increased incidence of measles, dengue, malaria and chikungunya, thus measures were taken to contain their spread. Data regarding daily case load was sent to higher authority till 45 days.

VI. Animal Care

31,062 animals were shifted to safer places. 283 veterinary teams were deployed in the cyclone & flood affected areas

VII. Clearance of Roads

The Departments of Works, Rural Development, Panchayati Raj and Housing & Urban Development Department took immediate steps for cutting of the fallen trees and clear the roads to restore road connectivity

4. Restoration, reconstruction and rehabilitation

I. Energy Infrastructure

Restoration of power supply was taken up on war footing. Power supply to 24789 out of 45960 affected villages was restored within one month². Additional technical manpower and materials had been mobilized for restoration of electricity to all affected villages/ consumers. It took 4 to 6 months for complete restoration.

II. Restoration of Communication/Mobile

Most networks of town areas were restored within two to four days, but it took longer time in interiors. For a temporary period telecommunication operators have shared their infrastructure to provide a mobile network.

III. Compensation

Compensation for death/ injury, monetary help for damaged houses/ agricultural field/ crop was given after verification by proper authority. Similarly steps were taken to relax loans of farmers in highly affected areas. Assessment for disaster Impact was done by World Bank, Asian development bank and European commission. External assistance was also provided by these agencies for disaster reconstruction, mitigation & prevention. Red Cross crescents were also involved in various stages.

5. Mitigation

In response to Cyclone 05B in 1999, Odisha established the first state agency in India to address disaster management specifically (Odisha State Disaster Management Authority – OSDMA)¹¹. This initiative has led to the construction of 200 new cyclone shelters, operating in places such as schools and community centers to ensure regular maintenance¹². Cyclone shelters have proven to be useful as 75 shelters operated by the Indian Red Cross provided safety to more than 100,000 people during Phailin¹³ with some shelters holding up to 500 people¹⁴. The Odisha government, with support from the World Bank National Cyclone Risk Mitigation project, had spent US\$255 million on increased disaster preparations including building shelters, evacuation planning, conducting drills and strengthening embankments. Since its inception in 2011,

the project has helped to increase disaster preparedness and early warning communication down to the local level. It is the World Bank's first project in India concerning preventative disaster risk management.

DISCUSSION

More than 10,000 lives were lost when comparable cyclone, Cyclone 05B, hit Odisha in 1999 with winds of up to 260 km/h.⁸ Unlike in 1999, when the cyclone warning had come barely 48 hours before the catastrophe, allowing little reaction time to the government, there was a continuous flow of information since October 8 from the Bhubaneswar centre of the Indian Meteorological Department on the formation of the cyclonic storm in the Bay of Bengal, its intensification, progress path and landfall spot (four days prior to cyclone phailin). This helped the government to build a defense system and alerted the people to take necessary precautions. In fact, the improved communication systems, aided by mobile reach and 24x7 media coverage, helped to keep the damage and destruction at a low level, besides restricting human casualties. The Indian Army, Navy, Air-Force, National Disaster Response Forces (NDRF) were called to action for emergency and relief efforts, helicopters distributed food rations and the Red Cross emphasized the distribution of safe drinking water as a top priority for those involved in relief efforts.

Defence, Police, fire personnel helped in evacuation, transportation & relief distribution. CATS (centralized ambulance trauma services), NGOs, Red Cross, Indian Medical Association and other medical association were also involved. Medical teams were formed for health care delivery. Community was involved in rural area, but it was not that visible in urban areas.

Odisha was the first state to form State Disaster Management Authority after

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1999 super cyclone⁸. Revenue dept of the state was named as revenue and disaster management dept or OSDMA (Odisha State Disaster Management Authority) with Chief Minister as chair person in the year 2010 as per the framework mentioned in Disaster Management Act 2005. Early warning and response activities for Phailin exhibited major improvements over those performed during Cyclone 05B in 1999 due to the evaluation and inclusion of lessons learned. There were minor problems related to relief distribution and accessibility to some areas due to submersion of roads and bridges. Planning for flood was lacking as flood of this massive degree was never expected.

CONCLUSION

Early warning using multiple channels of communication and timely action saved lives during phailin. Government cooperation, preparedness at the community level, and lessons learned from Cyclone 05B contributed to the successful evacuation operation, effective preparation activities and impact mitigation.

Chief Secretary, Odisha State Disaster Management Authority was awarded ICHL (International Conference on Humanitarian Logistics) Award 2013 for outstanding action during Phailin management. Odisha Chief Minister Naveen Patnaik was honoured by United Nations for successful management of cyclone Phailin.

Continued early warning efforts could have similar positive results in the future, and when accompanied by good communication and adequate preparation, impacts of disasters could be mitigated or even prevented. The lessons learnt from this event can act as a guide for development of better plan for management of other similar disasters in future.

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Conflict of interest-Nil

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