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STAKEHOLDERS' PERCEPTIONS ABOUT CYCLONE RISK MANAGEMENT AND INSTITUTIONAL ACCOUNTABILITY IN EASTERN ODISHA

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Abstract *Natural calamities, particularly cyclones, are devastating as they cause serious damage to infrastructure, natural resources, cattle and human population, as a whole. Among all other natural disasters, cyclones are quite prevalent in eastern coasts of India. Just in the year 2013 and 2014, cyclones colliding on the coastal Odisha, continuously brought in huge damages to habitats, natural resources and allied infrastructure. As an aftermath, there is a likelihood of long lasting physical, psychological and social consequences, posing a big challenge to the surviving population as well as to the Odisha Government and other agencies. Thus, the present study builds itself on the perceptions of stakeholders about cyclone risk management and institutional accountability in eastern Odisha. Sample included 120 respondents representing the fisherman dominated and mixed caste village inhabitants to assess the risk management and institutional accountability with reference to cyclone affected population of Eastern Odisha along with understanding the psychological / behavioral consequences of cyclone on people. A specially designed questionnaire "Cyclone Impact Assessment and Adaptation Index" (CIAAI), was used. Level of institutional accountability was equally perceived by both male and females, may be due to government and non-government organizations paying equal attention to both of them to create awareness about calamities in rural and urban areas. Media has also contributed to develop positive awareness about cyclone preparedness during pre-cyclonic conditions. Both male and females were equally convinced of the support rendered by village / town, environment and disaster management institutes when cyclone hits the coast and male and females also equally availed basic facilities from the government and non-government agencies during cyclonic conditions. No positive correlation between the increasing age of the respondent and institutional accountability was found. In regard to cyclone risk perceptions too, no gender differences were found. Results were discussed in the line with various, models of cyclone vulnerability assessment/ management and recommendations for future preparedness at micro and macro level were extended.*

Keywords: *Institutional Accountability, Natural Resources, Calamities, Habitat, Collided & CIAAI*

INTRODUCTION

Natural disasters are one of the biggest threats to infrastructure as well as natural resources in a country like India where a great proportion of population lives below the poverty line. Tropical cyclones have caused an estimated 1.9 million deaths worldwide during the past two centuries (Nicholls et. al. 1998). Generally, throughout a natural disaster, a much higher percentage of the population in developing nations sustains severe loss and extreme trauma, and experiences that constitute clinically significant distress (Schultz et.al.2005). The impact of a calamity is felt much more in developing countries due to borderline economic status of the vulnerable population, high population density and limited resources (Juvva and Rajendran, 2000). The frequency as well as intensity of natural disasters is increasing globally as well as in India.

During 1980-2000, averages of 11,800 deaths per year were attributed to cyclones (United Nations Development Program, 2004).[1] History reveals and eastern coast of India is quite susceptible to cyclones. It starts with the super cyclone on October 29, 1999, ravaging the lives of over 15 million people in the 12 coastal districts of Orissa in which almost 20 000 people lost their lives, and there were massive

[1] http://odisha.gov.in/e-magazine/Orissareview/2013/nov/eng-pdf/31-38.pdf

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losses to houses, properties and cattle (Juvva and Rajendran, 2000). The total damage was estimated at around one billion US dollar as reported by Government of Orissa.

Behavioral health effects are among the most long-term and debilitating outcomes of natural disasters (Norris, 2005). In addition to the public health and medical consequences of these disasters, the social, cultural, and psychological impact of cyclones have an enormous and long-lasting impact throughout the world. The monumental devastation of the December 2004 Indian Ocean tsunami prompted a meta-analysis of the psychosocial consequences of natural disasters in developing countries versus developed countries (Norris, 2005). In India, Sharan et al (1996) reported a 59% prevalence of psychiatric disorders in adults following the Marathwada earth-quake (23% had posttraumatic stress disorder (PTSD) and 21% had depression).

Post cyclone traumatic situations can be broadly categorized as financial loss and Psycho-social loss to the human population however; the most difficult task would be to restore the psycho-social loss. Various Psycho-social problems faced by the people of cyclone affected villages of coastal areas of Odisha were due to poor literacy rate and lack of awareness; social, cultural and ethical inter linkages within the villages; changes in socio-economic status due to losses from cyclone; scope of subsistence support extended by the government department; status of traditional cultural practices prevailing among the communities after rehabilitation; and changed pattern of livelihood after cyclone. Accountability is an integral aspect of good governance in order to ensure that the officials in public, private and voluntary sector are answerable for their decisions and/or actions for their conduct and performance in terms of delivering better services, improving vulnerable (disaster prone) people's welfare, and protecting disaster victims.[2]

The accountability mechanisms are supposed to play a key role in different phases of disaster management cycle: response, recovery, rehabilitation, reconstruction, prevention, mitigation and preparedness. The absence of such mechanisms has reduced the effectiveness of interventions in many situations.

REVIEW OF LITERATURE

Range of studies has been conducted to explore the psychosocial consequences of cyclones in different populations and have assessed vulnerability of Odisha to cyclones. Bahinipati (2014) conducted a comprehensive vulnerability assessment to unravel the scale of vulnerability across the districts of Odisha and provide a better understanding of adaptive capacity of households towards extreme events. Results and policy implications in the context of prioritizing of limited resources among vulnerable districts and determinants through disaster risk management program at state and district levels, were made.

Unnikrishnan and Basu (2001) in their multidisciplinary study emphasized on long-term programs to reduce the vulnerability of the people and proposed an institutional mechanism for organizational coherence and cooperation to save the people from disasters.[3] To synergize the disaster management programmes, they emphasized coordination process between various agencies and recommended the formulation of a comprehensive disaster response and mitigation policy that is people centric and backed by legal and administrative framework to implement it.

Panigrahi (2003) in his paper on Super Cyclone in Orissa focuses upon the failure of the state government to manage super cyclone. It was due to political unwillingness and bureaucratic callousness that it could not mitigate the devastation of super cyclone in time. Local government can minimize the loss on account of disasters, but the power and function of local government was not found to be sufficient to manage disasters. Coordination among different agencies is important to face any such eventuality in future.

Gupta, (2000) pointed out in her study that proper attention should be given by the media to focus on the lapses of government and non-government agencies. The role of the media is to criticize and pull up the government for its lapses, as in a calamity of such high magnitude, there were bound to be many such cases and media has to play very important role in this regard.

Adhisivam et. al., (2014) indicated that Psychological first aid in the immediate aftermath of disaster may reduce the initial distress and foster short and long-term adaptive functioning. Careful tracking of important health and mental health problems that confound recovery may lead to appropriate interventions that can help reduce morbidity associated with the inevitable next catastrophe.

In another study, Suar, (2004) suggested that survivors' greater exposure to disaster, old age, low caste status, low educational level and large families were risk factors for developing stress and distress during post-disaster phase. Swain et.al, (2010) studied that the Natural disasters have a substantial impact on mental health of affected population that requires health interventions by professionals. Kar (2010) also explored mental health issues and psychological

[2] http://siteresources.worldbank.org/PUBLICSECTORANDGOVERNANCE/Resources/AccountabilityGovernance.pdf

[3] http://shodhganga.inflibnet.ac.in/bitstream/10603/23677/9/09_chapter%201.pdf

interventions in Odisha 1999 super cyclone and indicated the need for evaluation of long term effects on victims and their needs.

The institutional interventions immediately required for cyclone disaster as proposed by Srivastava (2010) are depicted in following figure:

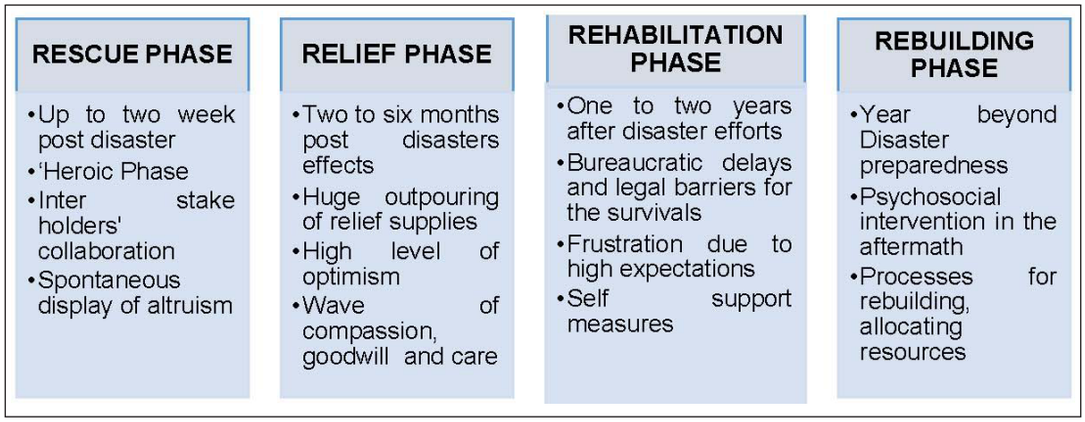

Fig. 1: Institutional Interventions for Cyclone Risk Management

In view of above background and review of literature, this study has been conducted to assess the cyclone risk management strategies along with understanding of the psychological / behavioral consequences of cyclone and perceived institutional accountability in affected population of eastern Odisha.

METHOD

In order to study the cyclone and its effects on the coastal region of Eastern Odisha from a holistic perspective, a steps wise procedure was adopted. A descriptive study based on primary data collected through survey type research methodology was conducted which was supplemented by secondary data obtained through various digital sources and records of Status Report on Cyclone "PHAILIN" 2013 and other cyclone records of Odisha Government. Although efforts were made on the part of local government and institutions to tackle the adverse effect of cyclone, but the psycho-social aspects of cyclone affected people were addressed in a very limited manner. Hence, this study was undertaken to conduct the in depth analysis of affected districts from behavioral / social perspective.

Study Site and Sampling The study was conducted in *phaillin* cyclone affected Ganjam and Puri districts of Eastern Odisha. A sample of 120 respondents from the coastal population of Ganjam and Puri districts of Odisha was selected through non probability sampling techniques based on the criteria of high proneness to cyclones. One block from each district and three villages from each block were selected with the equal representation of fisherman dominated and mixed caste group villages. 60% male and 40% female respondents with a total of 20 respondents were taken from each village according to the pre decided criteria.

District Ganjam - Ganjam district, located in the southern part of the state, is one of the advanced districts of Orissa. It is situated between 19.4°N latitude to 20.17°*N* latitude and 84.7° *E* longitude to 85.12° *E* longitude. A total of 1,21,49365 population were affected by cyclone out of 4,19,82000 of total population of Odisha and 15,02,000 population were affected from cyclone out of 35,29,031 of total population of the Ganjam district of Odisha[4].

District Puri – *Puri district of Orissa is one of the most popular and famous tourist spots of India. Being a coastal district of Odisha, Puri is famous for its historic antiquities, religious monuments, architectural grandeur. The Latitude of Puri is 19.28*° N to 20 .130° *N* Longitude and – 84 .29° E to 86 .250°*E,* covering a total geographical area of 3479 Square Kilometers.17, 50,975 population were affected from cyclone out of 16,98,730 of total population of Puri district of Odisha.

TOOLS AND TECHNIQUES

Various tools and techniques were administered to collect the primary data from the field which were subjected to quantitative and qualitative analysis for obtaining meaningful findings and drawing interpretations.

For quantitative analysis, data was collected through a pre designed questionnaire entitled *Cyclone Impact and Adaptation Scale (CIAS),* designed by the investigators to assess the study variables. It was divided into sub sections like pre cyclone, during cyclone and post cyclone associated risks and other psycho social consequences including institutional accountability. The questionnaire was field

[4] Source - Status Report on Cyclone, Odisha – 2013

tested and Principle Component Analysis (PCA) was conducted to weed-out the questions having lower factor loadings (less than .50) to best describe the results.

Table 1: Mean Values of Risk Perception and Institutional Accountability

Components		Means
Risk Perception		3.28
	Cyclone Risk	2.93
	Cyclone Effect	3.54
Institutional Accountability		2.94

Above dimensions were observed to assess the psychological, Social and behavioral consequences of the effect of cyclone on surviving populations. In cyclone risk perception there was a total number of 14 items however after PCA, 7 items could be retained with higher factor loadings. Determination of component wise high factor loadings were on: intensity of cyclone and its effect on population; reliability of prior information about the cyclone; accuracy in assessment of the magnitude of cyclone and the harm it can cause to the human life; scarcity of drinking water and rapid deforestation increasing the risk of cyclone and floods. The reliability coefficient through Cronbach's alpha was found to be $\alpha = .78$.

Institutional accountability (IA) section consisted of 17 items out of which total 7 items were retained with the factor loadings above .36. These were the most important items which represent the actual performance of Institutions in regard to pre, during and post cyclonic conditions and adaptation with the same. The major factors included: role of Govt. and non-government institutions and print/ visual media in creating awareness about the cyclone and preparedness in rural and urban areas, support rendered by village/town, environment and disaster management institutes, arrangements at government managed shelter homes, contributions of institutions to provide basic needs during cyclone in the affected areas and role of local institutions to provide/restore timely food and drinking water facilities during rehabilitation.

RESULTS AND DISCUSSION

The study assessed the Cyclone Risk Perception and Institutional Accountability of cyclone affected population of Odisha. Over all, level of cyclone risk perception was found to be M=3.56 indicating that cyclones were being perceived highly risky by the affected population. Risk perception indices were also compared across type of villages and gender, as given in table 2.

Table 2: Mean Values of Risk Perception Across type of Village and Gender

Component	Type of village		Z	Sig.
	Fisherman **(N= 60)**	Mixed Caste (N=**60)**		
Cyclone Risk Perception	3.60	3.82	1.461	**.000[b]
Institutional Accountability	3.89	3.82	.658	.445
	Gender			
	Male **(N= 60)**	Females (N=**60)**	**Z**	**Sig.**
Cyclone Risk Perception	3.69	3.75	.282	.505
Institutional Accountability	3.89	3.79	.658	.645

Mixed caste villagers were found to report higher level of Risk Perception in comparison to Fisherman dominated villages as evident from table 2. It might be due to the fact that mixed caste groups have more options of livelihoods in comparison to fisherman villages which have only one option of fishing. Therefore, in view of the possible threat to their livelihood, they perceive relatively higher risk to relocate and accommodate with other options. In regard to Risk Perception (RP) across gender, mean differences were calculated. Both male and females were found to perceive cyclone associated risk at the similar level (Mean-Male= 3.69 vs. Female =3.75, Z=.282, not significant) and were equally cautious about the devastation that the cyclone can do to their family life as cyclone associated disaster was equally threatening for both in the whole coastal zone. So being the resident of coastal zone, both the male and females were equally anxious about cyclone disaster every time.

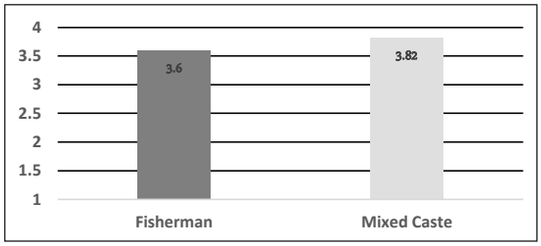

Fig. 2: Mean Value of Cyclone Risk Perception Across Type of Village

Overall level of perceived institutional accountability was found to be M= 3.05 indicating that respondents consider institutions (Government & Non-government) as the primary

accountable bodies for managing cyclone linked adversities. Institutional Accountability (IA) was also studied to see the differences across type of villages but the differences were found to be not significant (M-f=3.89 vs. h=3.82 and Z=.658). It indicated that both types of villages were availing equal level of institutional support during the cyclone and level of institutional accountability was also found to be equally perceived by the population. In regard to gender differences in perceived institutional accountability, no statistically significant differences in perceptions of males and females were found (M- Males=3.89 vs. Females=3.79)

In regard to quantitative aspect, Focus group discussions were held in Puri and Ganjam districts to explore Psychological, social and behavioral consequences of cyclone. Affected population shared the problems faced by them before, during and after the cyclone openly and reflected their concerns. It was reported that psychological, social and behavioral consequences of cyclone were not given much importance by any government or non-government agencies. The transportation facilities to migrate at rehabilitation center and the return to their home after settlement of cyclone disaster, needed adequate improvement as the respondents reported to face lots of difficulties in this process. The sanitation, hygienic food/ drinking water facilities were also not adequate enough at the rehabilitation centers and needed substantial improvement. Similar experiences were also reported in other countries too. Paul et. al. (2007) observed that Low capacity of cyclone shelters was a cause of inaction for respondents in Inland and Shoreline respectively. Cyclone shelters are often found to be overcrowded and unhygienic, with no separate sanitation facilities for males and females, and were very much uncomfortable to women. In many cases, shelters are occupied by nearby local elites first, and there is rarely space for marginalized vulnerable people. Thus, they are more likely to stay in highly vulnerable low-lying areas. Respondents were found to be more hopeful, and strongly believed that their own house would provide greater protection as they could stay closer to their assets.

The security of vacated houses was also one of the major concerns in the minds of people as the assets at their home were reportedly found to be damaged or stolen when they returned. People demanded to establish a cyclone information center nearer to their habitation with all the facilities for predicting cyclone incidences and rehabilitation facilities.

Suggestions were made by the respondents to the government/ institutions to address the issue of disaster management mechanism in cyclonic hazardous conditions. Out of 120 respondents, 54 % respondents have shown their top priority for proper transport facilities during migration, which is the immediate need to save the life. Followed by that 50 % respondents were of the opinion to propose to the Government for cyclone information center and community hall around their villages. Approximately 49% suggested for hygienic conditions and support to the survivors during cyclone conditions and 41% respondents said that people must be given better alternative housing for their safe existence during cyclone. 34% respondents suggested to insure house and assets during cyclone by the government authorities and laid emphasis on proper sanitation facilities to be provided at the rehabilitation centre. 27 % respondents laid emphasis on provision of sufficient food grain and hygienic drinking water for their survivals and the respondents also suggested to the government agencies to provide one safe place to save assets like fishing net etc. and to provide special security to their villages during cyclone by developing proper and strong boundary to seashore during cyclone hazards. Bhadra and Sekar (2004) suggested that impact of disaster and life events among survivors, left a long trail of sufferings. Multiple deaths, destruction, injuries, losses caused trauma among the survivors. While supporting to rebuild the shattered lives of the affected people it is also equally important to facilitate the healing of the mind to ensure normalizations and long term rebuilding process. The experiences in India and other countries regarding natural disaster show an increase in psychological disorders and disabilities among the survivors. Hence, the need for psychological interventions to survivors was very prominently felt.

CONCLUSION

Mixed caste village respondents reported higher level of cyclone risk perception in comparison to fisherman dominated villages in view of the greater sufferings experienced by them during cyclone. Both Males and females equally perceived the risk associated with cyclone. With the increased cyclone effect, scarcity of drinking water also increased in rural areas. Respondents wanted to live in a less risky area to save themselves from cyclone induced distressful situation. With increasing age, the tendency to keep saving food to manage disaster, also increased. Drinking water problem also increases during cyclone which forces people to migrate to other places.

In regard to Psychological, Social and Behavioral Consequences, Government or non-government agencies extended limited support and respondents had higher expectations in this regard. Transportation facilities to migrate to rehabilitation center were reported to be insufficient. Sanitation, hygiene and drinking water facilities were also reported to be not adequate as per perception. Rehabilitation centers were reported to be not fully equipped to provide the basic facilities and vacant houses were reported to be insecure by respondents. People demanded to establish a cyclone information center nearer to their place of habitation.

WAYS AHEAD

There is a need for development and implementation of cyclone awareness program in which vulnerable population should be trained to handle the cyclonic situation in a planned manner before the cyclone actually hits. More so, youth should be especially trained in this regard to take up the responsibility of the elderly women and children in the event of cyclone. Media needs to adopt a more proactive and responsive approach for helping in cyclone management in coastal areas and dissemination of factual information as against sensationalizing news. Vulnerable areas should be adopted by nearby corporate organization under their CSR fund for extending all possible support in pre - during and post cyclone phase. Services of expert counselors should also be provided to people to manage their distress in a psychologically healthy manner and to help them adjust in post cyclone phase. Future interventions must incorporate socio-psychological and behavioral dimensions of cyclone risk management.

To conclude, there is a need for more concrete efforts on the part of government, NGOs and other agencies to undertake pre cyclone efforts as seriously and diligently as during and post cyclone phase. With such efforts, the efficacy of their disaster management steps will increase further and populations frequently experiencing cyclones will be able to lead a better quality of life. Spiritual interventions to develop better resilience with the adverse coastal conditions are also desirable.

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