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**MICRODIS VHAI PRELIMINARY
DATA ANALYSIS SUMMARY REPORT**

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TABLE OF CONTENTS

1.	Background	2
2.	Research Objectives	6
3.	Methodology	7
4.	Translation procedure	7
5.	Validation procedure	8
6.	Pilot Study	8
7.	Sampling	10
8.	Data Description	10
9.	DATA ANALYSIS and Discussion	12

MICRODIS PRELIMINARY DATA ANALYSIS SUMMARY REPORT BY VOLUNTARY HEALTH ASSOCIATION OF INDIA, NEW DELHI

BACKGROUND: India is among the world's most disaster-prone areas. It is vulnerable to wind storms originated from the Bay of Bengal and the Arabian Sea, earthquakes caused by active crustal movement in the Himalayan mountains, floods brought by monsoons, and droughts in the country's arid and semi-arid areas. India has also become much more vulnerable to tsunamis. Almost 57% of the land is vulnerable to earthquake (high seismic zones III–V), 68% to drought, 8% to cyclones and 12% to floods.

EM-DAT Information (1900-2004):

Disaster	# of Events	Total Killed	Avg. # Killed	Total Affected	Avg. # Affected
Cyclone	133	162,986	1226	91,322,407	686,635
Drought	21	4,250,430	202,401	1,391,841,000	66,278,143
Earthquake	24	60,396	2,517	27,108,561	1,129,523
Flood	158	51,020	323	663,187,348	4,197,388



These hazards threaten millions of lives and cause large-scale financial, infrastructure, crop, and productivity losses that hinder India's development. In the decade 1990-2000, an average of about 4344 people lost their lives and about 30 million people were affected by disasters every year. Orissa is one of the Indian states situated in the east coast of the country. It has a population of 36.8 million ranked as the poorest of the

fourteen major Indian states, with 47.15 percent of the rural population (or 17.35 million people) living below the poverty line. The state has the lowest social and



human development indicators in the country. The IMR in Orissa stands at 87/1000 live births much higher than the national average of 63/1000 births. On the other hand Orissa is vulnerable to multiple disasters. Due to its sub-tropical littoral location, the state is prone to tropical cyclones, storm surges and tsunamis. Its densely populated coastal plains are the alluvial deposits of its river systems. The rivers in these areas with heavy load of silt have very little carrying capacity, resulting in frequent floods, only to be compounded by breached embankments. Though a large part of the state comes under Earthquake Risk Zone-II (Low Damage Risk Zone), the Brahmani Mahanadi graben and their deltaic areas come under Earthquake Risk Zone-III (Moderate Damage Risk Zone) covering 43 out of the 103 urban local bodies of the state. Besides these natural hazards, human-induced disasters such as accidents, stampede, fire, etc, vector borne disasters such as epidemics, animal diseases and pest attacks and industrial / chemical disasters add to human suffering are also observed in frequent intervals.

VHAI has taken Jagatsingpur district in Orissa, as one of the survey sites under MICRODIS. Jagatsingpur is a district in coastal Orissa. It is geographically located between 20° 16' North Latitude and 86° 10' East Longitude and at an altitude 14 meters from sea level. It covers a geographical area of 1914.6 Sq. Km. with the



forest area of 132.92 Sq. Km. For the convenience of administration the district is divided into one subdivision, four Tahasil and eight blocks. Jagatsingpur district is well connected by road and railways. Devi, Mahanadi, Kathajodi and Biluakhai are the four main rivers that flow through the district. There are two main Canals in the district they are Taladanda and Machhagaon.

The district as well as blocks is disaster prone due to their geographic location. The entire geography of the district is coastal plain land with network of rivers and canals. In the last decade 5 disasters have affected the district. The



The major disaster that occurred in the district are Super cyclone of 1999, gas leakage in Paradeep Phosphet Ltd. in 2001, heavy flood in 2005 and another heavy flood in

2007. In the year 2008 the district was struck by one more flood which was of very high intensity caused massive devastation to a large number of populations and affected a larger geographic area. The vulnerability of the district as well as the blocks was clearly observed during the last Super cyclone and consecutive floods.



The flood in Orissa in September 2008 is due to heavy rainfall in the upper as well as lower catchments of the Mahanadi River System resulting out of the effect of a deep depression in Bay of Bengal from 16th to 21st September 2008. The magnitude and severity of this flood has even surpassed the ferocities of 1982 and 2001 floods which were known to be

greatest floods in the system. Massive and unprecedented damage has been caused to public properties like canal/ river embankments, roads, bridges, culverts, drains, water works, tube wells, lift irrigation points, electrical installations, telecommunications infrastructures, government buildings etc. As per preliminary report 283 nos. of PWD roads measuring 1927.60 Km have been damaged. Total number of breaches in PWD roads is 97. National Highway road: 42, 215, 200, 203, 6, 224, 203A, 201 and 217 have been extensively damaged at different locations. Similarly 956 numbers of rural roads measuring length of 2925.00KM have been washed away.



In the Jagatsinghpur district all the blocks were affected by the flood. 61 Gram Panchayats, 188 villages and 147427 populations were severely

affected. The preliminary report shows that 8072 houses were completely damaged in the flood. Crop from 25346 hectares of agricultural land were washed away. This disaster is taken as the reference point in this research.

Research OBJECTIVES: The broad objectives of MICRODIS Project are:

- To strengthen the scientific and empirical foundation on the relationship between extreme events and their health, social and economic impacts.
- To develop and integrate concepts, methods, tools and databases towards a common global approach.
- To improve human resources and coping capacity in Asia and Europe through training and knowledge sharing.

The specific objectives of the research are basically to develop and integrate concepts, methods, tools and database towards a common goal approach. The research will accomplish the following objectives:

- Assessment and evaluation of social, economic and health impact of Orissa flood September 2008.
- Analyze the impact of repeated disasters and its effect on coping mechanism of the vulnerable community in Jagatsinghpur district of Orissa.
- Validation and strengthening of relationship between extreme events and their social, health and economic impacts on affected community.
- Refinement and development of impact assessment models in considering frequent extreme events.
- Reviewing related literatures on disaster impact and integrated vulnerability assessment.

- Establishment of scientific and empirical tools and applications in terms of disaster management from people's perspective.

METHODOLOGY: In order to establish empirical evidence and test the hypotheses as per MICRODIS conceptual model we have adopted exploratory research design and concurrently collected data both by qualitative and quantitative method. It look into the problem by exploring different literatures related to study and



compiling views from different sets of respondents. It conducts experiment to the subjects by a set of interview schedule, with the hope to find answers to the research questions. This schedule will be administered among 757 respondents from test group and 816 from control group drawn from sampling. In these entire respondents's family, below five years children will be measured to know the nutritional status. The study will also cover 42 health institutions with a structured questionnaire to assess the institutional delivery mechanism in a disaster situation.

The study also employ qualitative research methods like focus group discussion, key informant interview, social mapping and other PRA methods to find and build theories that will explain the relationship between variables through qualitative elements in research.

Translation procedure: The questionnaire was translated from English to Oriya (Local Language) by VHAI team led by Prof. Nityanada Sahoo. The Oriya Version of the questionnaire was given to Prof. Rabi Narayan Das who translated it back in to English without seeing the original questionnaire of English version. The two version

of the questionnaire of English were then compared to isolate inconsistencies and differences in meaning between them. Then the whole team met together and the differences are resolved by detailed discussions.

Validation procedure: After translation and back translation the cultural adaptation phase was conducted involving a group 11 community members. The Principal

Investigator started discussing the questionnaire and presented types and examples of cultural equivalence, which helped in revising some of the questionnaire, replacing problematic items by culturally accepted ones. To



evaluate the language used in the instrument and the structure adaptation, the questionnaire was once again discussed with these 11 community members. Some items were adjusted to clarify questions resulting in the final version of Oriya.

Pilot study:

- 1st Phase: A set of Microdis Core and Thematic Core questionnaires were tested among 32 families in June 2008.
- 2nd Phase: After Country Meeting at Delhi the interview schedule was reviewed and once again pre tested with 45 families in November 2008. Out of 45 families 21 respondents were female and 24 respondents were male.
- There were 11 interviewers those who have under gone one-day orientation cum interaction programmes before conducting the survey in the field.

- On the first day these interviewers managed to cover only two families each, thus 22 respondents were covered. Each interviewer took 4 ½ to 5 hours for each set of questionnaire.
- After returning from field each filled in questioner was reviewed and given feedback.
- There were some mistakes, which have been corrected by the respective interviewers on the next day. It took only 15-20 minutes time for each family.
- On the second day interview with rest of the families were completed and we have also reviewed the filled in questionnaires. We found that there were new mistakes in some places but comparatively less number of mistakes and confusions.
- The interviewers informed that in each case they took around half an hour to explain the respondent and build rapport.
- It was observed that since many questions were repeated and some of the questions were not in order so the respondent lost interest after one/ one and half hour.
- In most of the cases after one hour the respondents started answering like machines and the participation level is very low.
- In all the cases women took much time as during interview they are consulting to the male members often.
- Finally the enumerators suggested that the length of the questionnaires should be shorter to be administered maximum with in 1 ½ hours so that quality of the interview will not be compromised.
- Accordingly the interview schedule was reviewed and edited.

Sampling: We adopted the Probability Proportion to Size (PPS) method to draw the sample. It is a sampling technique commonly used in multi cluster sampling, in which the probability that a particular sampling unit will be selected in the sample is proportional to known variables. We have adopted this method to reduce standard error, bias and avoid weighting.

DATA DESCRIPTION:

- Measurement Scale Used
 - Nominal Scale
 - Ordinal Scale
 - Ratio Scale
- Data Captured Using MS-Excel
- Data Imported to SPSS 16.0
- Analysis
 - Descriptive Analysis
 - Univariate Analysis
 - Multivariate Analysis
 - Correlation

Variables Considered For Study

- **General**
 - Demographic Data
- **Disaster Experience**
 - Number of Disasters faced
 - Severity of Disaster

- Pre disaster Warning
- Post Disaster Support
- Satisfaction Level

➤ **Social**

- Impact on Livelihood
- Individual Coping
- Sense of Community
- Functioning and Quality of Life
- Coping Behav

➤ **Economy**

- Loss of Assets
- Sale of Assets
- Migration
- Borrowing Status
- Damage to Agriculture
- Impact on Income and Expenditures

➤ **Health**

- Water and Sanitation
- Personal Hygiene
- Morbidity Pattern
- Injury

- Immunization
- Nutrition

DATA ANALYSIS and Discussion:

The study finding highlighted how the affected perceive flood risks in their areas and what type of consciousness they have to respond the early warnings and preparedness actions. It is observed that even if most of the people received the warning, the message was clear but due to lack culture of preparedness community



did not shift to the safe places. In this area people tend to perceive flood disasters as periodic phenomena and that if a major flood disaster occurs in a certain year, no major flood disasters will occur for some time after. In addition, many people believe that when embankments, dams, and other

structures are newly constructed, floods are completely prevented. These perceptions of people about natural disasters are affecting the culture of preparedness in the area.

The study shows that social impacts, which include psychosocial, socio demographic, socio economic, and sociopolitical impacts, can develop over a long period of time and can be difficult to assess. But it is important as it affects not only the long-term functioning of the households and but also livelihood. The study underlined the need for understanding disasters' social impacts and development of contingency plans to prevent emergency consequences.

The property damage caused by disaster impact causes direct economic losses and some of these are not replaced and so their loss causes a reduction in consumption and a decrease in the quality of life. In addition to direct economic losses, there are indirect losses that arise from the interdependence on community networks.

The flood has immediately multiplied the health burden of the affected community. The study of 42 health institutions shows that authorities have tried to meet extraordinary demands with resources that cannot begin to meet even basic health needs and that often have been drained by the immediate emergency response. There was a increase in number of hospital visits due to diarrheal diseases, acute respiratory infections, dermatitis, and other causes. It also the transmission of vector-borne diseases, from residual water that contributed to an explosive rise in mosquitoes leads to Malaria and Chikungunia. Further it has been established that Nutrition has a direct correlation with the persistent disasters.

The need for mental health care is by the total population experiencing the disaster.

Though there is a direct correlation with the occurrence of psychiatric problems with the degree of exposure, even those who have lived in the disaster area without comparatively less losses are also vulnerable to psychiatric problems. Services should be provided to the total



population and not only to those who have lost a family member or huge property.

A public health approach to disaster risk management should focus on decreasing the vulnerability of communities through prevention and mitigation measures and increasing the coping capacity and preparedness of the health sector and community.

Study also highlighted that a community's vulnerability to all types of disasters depends on demographic growth, the pace of urbanization, settlement in unsafe

areas, environmental degradation, climate change, and unplanned development.

Poverty also increases vulnerability due to lack of access to healthy and safe environments, poor education and risk awareness, and limited coping capacity.

Summary of preliminary analysis of data for test group:

Demography: In the areas exposed to flood 2008 where the MICRODIS study was conducted there were less female members in comparison to the male. However there were differences varies in different age groups. It was evident from the study that there were less female members than the male members in the family. In the age group of 15-34, & 45-59, there was less difference between number of male and female members. The above age groups consists mainly the couples. Thus the number is almost equal. The age group 0-5 and 6-14 are of the children and adolescents. In this age group the reflection of declining trend of female children is clear. This shows that boys are preferred to girls. Population distribution of male and female in the age group of 60 and above indicates that the male members are having more years of life expectancy than the female members.

The female members in the age group of 18-30 and 31-45 are the respondents in many cases as they are more educated and are exposed to the community due to their involvement in SHGs. As there are female enumerators in the team of survey the women felt comfortable to respond.

The ratio of Other Backward Caste people, like chasa, Gauda, Badhei and Teli was high in comparison to General, scheduled caste and non-caste population. More number of respondents was Oriya speaking followed by Urdu speaking people. As Oriya is the native language, the first language is Oriya for many respondents. It was also seen that there was a large population among the respondents in the study area whose first language is Urdu as they are from Muslim community. There are also Bengali speaking people in these areas among the respondents. The majority of respondents are from Hindu religion followed by Muslims. There is no other religion practiced in this area or among the respondents of this study.

The ratio of married persons is high among the respondents. Most of the married persons are interviewed in the affected area. They seemed to have better knowledge and understanding on the subject. Views of young people, separated, divorced and widows were also taken wherever possible. Ratio of women separated from their husbands is very negligible.

Disaster experience: The severity of flood was very high. People living in the flood prone area and having their main occupation agriculture which is generally the trend suffered a lot during this flood. In the quantitative study a comparison was made among 3 disasters i.e. Cyclone 1999, flood 2006 and flood 2008. A large number of the respondents have experienced more than two or three disasters. There are also respondents who have experienced more than 5 disasters. It shows that there is frequent occurrence of disasters. The impact of flood was very severe for most of the people who experienced it. To the people of coastal Orissa, the devastation of 1999 super cyclone was more severe. Flood 2008 comes next in terms of severity and destruction. 2006 flood also caused damage to agriculture land and physical infrastructure but the impact was less in comparison to the other two disasters.

During disaster people felt insecure of their survival. They were not prepared to face the sudden occurrence of extreme event. Some of the people moved to safer places with their families whereas many stayed back in the village. Few people were separated from their families for several reasons as the roads were cut off, they could not reach the village etc. There seem to be very negligible incidence of injury during disaster.

At the time of disaster many people were present at home. People were also quite unaware of the severity and took the warning casual as usual. Many people were moving in the public conveyance or carrying goods or moving here and there. Some people were at their workplaces. The schools were closed after the warning. Thus no person was there in the school. During flood all the family members were under one roof, helping each other in shifting belongings and old persons. In the presence of all the family members there seem to be increased coping mechanism and resilience. In

some other households the male members migrated to other states in search of work.

Displacement: During the last disaster people preferred to stay and fight back disaster instead of moving to a safer place. Some people moved to higher places, neighbours roof top with all their belongings and returned back as soon as the flood water receded. The number of persons displaced during disaster is comparatively less. This also can be said that people had a casual approach towards the severity of disaster.

Many of the affected families went to their relatives and friends for taking shelter. Poor families suffered a lot and remained in their makeshift houses till the flood subsided. Some people also took the benefit of temporary shelter of Government and other relief agencies. Very few were accommodated in the community centre as there was not enough space for many.

Warning and response: Most of the respondents had received warning before occurrence of flood 2008. There was a centralized system of warning in place and the warning was made on time. Mass media and Local government played important role in disseminating the information. Warning received from NGO, relatives and neighbours could be a secondary source who received warning initially from the government and mass media. A large section of the respondents said that the warning was very clear. It was surprising to see after receiving a clear warning most of the respondents did not take any action for their own safety. This shows a clear casualness among people towards disaster and response towards warning.

Coping strategy: The flood was an extreme event of trauma for many respondents. People used their religious belief as coping strategy. In the post disaster situation people received mutual support from the family and outside. The support received from spouse, children and relatives were of immense help to cope with the post disaster trauma. The support received from government and NGOs in various forms also helped people to recover from their condition.

Occupation: Agriculture activity is the primary occupation of most of the respondents. Flood caused massive loss to the standing crop and most of the agriculture lands were inundated due to gushing of flood water. So the primary occupation of farmers was affected due to disaster. The dependency on occupations like house work, unskilled labour and other allied activities increased in ex-ante disaster situation. Walls cracked and houses damaged so there was urgent need of repair and thus the demand for unskilled labour increased. The skilled labour occupation comes down due to lack of gainful employment within and outside village in ex-ante situation. As the primary occupation was affected during post disaster situation people moved out of the village to work on daily wage. So the ratio of other activities increased in ex-ante situation.

After flood people suffered from various common ailments so the health practitioners played a major role in addressing health need in ex-ante situation. The community gathered strength to fight back the disaster situation through increased resilience and coping mechanism in ex-ante disaster situation. The ratio of secondary occupation like housework, farming, unskilled labour and SHG activities decreased in post disaster situation as the entire village was flooded with water which did not subside for 4-5 days.

Economic impact: Most of the respondents were of the view that their economic condition has got worse after the disaster. Very few people had improved economic condition after the flood. It shows that the respondents of the later category do not share the same livelihood pattern and socio economic status or their livelihood/trading gets augmented due to disaster.

The major portion of expenditure of the people is mainly on food & medical. Expenditure for education comes second and next come clothing, fuel, transport, communication, electricity, house rent. Least are the expenses for tax payment, repayment of loan, life cycle rituals etc. Expenditure for fuel, medical, transport, communication, and repayment of loan increased largely after the flood. To meet these expenditure people curtailed their expenses on clothing, electricity, education etc in the post disaster period. However due to price hike and added burden on the

household expenditure remains almost the same. It is noticed from the data collected that the medical expenditure rose drastically i.e. 5 times during the post flood period in comparison to the pre flood time.

Before the flood the highest income of the respondents was from service sector following to that of daily wage labour (Others- as there are many sources included), Agriculture is another major source of income for the people in this area. Following to the above sources industrial activities, rent and interest also generate some income which contributes to the total income of the family. In the post flood period there was a drastic fall of income in agriculture and industrial activity. But income from daily wage has increased as there was a need of repair and recovery in the affected areas.

Drinking water and sanitation: Most people in the affected area used to use tube well/bore well water during pre disaster period for drinking and cooking purpose. The usage decreased after disaster as most of the tube wells were inundated in flood water and were defunct. Protected dug wells, community taps remained under water for 4-5 days causing damage to the machineries so usage decreased in post disaster situation.

People used to use the public pond for bathing before disaster which increased after disaster. Very few people were using private bath rooms before disaster and which further decreased. This is clear that due to damage of house during disaster the bathrooms were no more there in these families as they were temporary structures or were built at the place where flood water entered and damaged them. After disaster a lot of people also depended upon the open community tube well and river/canal for bathing purpose.

Due to poor sanitation awareness most people preferred for open defecation before disaster. It even increased in the post disaster period. Lack of interest, awareness, and traditional mindset at the individual level is the major cause behind this preference. In addition People also depended upon Government support for setting

up toilet facility. Even if some families having toilet facility the members prefer to go for open defecation.

Morbidity pattern: Most of the respondents were suffering from diarrhoea, malaria, chikungunya and respiratory infections due to water contamination and improper living. Apart from this the other common diseases are seen are dysenteries, typhoid, jaundice, conjunctivitis, skin infection, asthma, measles and psychiatric diseases during post disaster situation. It has been checked to a great extent after GO/NGO intervention in the affected areas. Chronic diseases like Hypertension, diabetes, asthma(COPD) ,cardio vascular diseases, and psychiatric disease (Neurosis, psychosis, schizophrenia, alcoholism) were noticed at the community. There were regular diagnosis and treatment by doctors. Some of them also suffered from cancer, leprosy, pulmonary TB, Anaemia and stroke and getting treatment in regular interval of time.

Detailed Analysis of Tables:

DEMOGRAPHY

1. Sex wise category of the respondents

Sex	No. of respondents	%
Male (1)	410	54.08
Female (2)	348	45.92
Total	758	100.00

The above table shows that ratio of female respondents are less than the male respondents. During the interview the participation of male members of the family was more than the female members. However the ratio varies among different age group of respondents due to various factors.

2. Age Composition of Household Population

Age	MALE	FEMALE	TOTAL	%
0-5	148	126	274	5.97
6-14	445	398	843	18.36
15-34	859	848	1707	37.17
35-44	362	302	664	14.46

45-59	295	289	584	12.72
60 & above	291	229	520	11.32
Total	2400	2192	4592	100.00

The table indicates that the ratio of female members to the male members in the household is less in all the age groups. In the age group of 15-34, & 45-59, there seem to be little difference between number of male and female members. This is very important to mention here that the above age groups are generally the population of the couples which are to be more or less equal in number (male and female). But 0-5 and 6-14 are the children and adolescents of those areas determining and having major impact on sex ratio. This shows that boys are preferred to girls. Population distribution of male and female in the age group of 60 and above shows, that the male members are having more years of life expectancy than the female members.

3. Age Composition of the Respondents

Age	MALE	FEMALE	TOTAL	%
18-30	49	97	146	19.26
31-45	137	153	290	38.26
46-60	121	71	192	25.33
61 & above	103	27	130	17.15
Total	410	348	758	100.00

The middle aged and elderly male members were available in the village and consider themselves to be more informative and exposed to the disaster related problems. They are generally the head of the house holds. This is the reason for which there is more number of respondents in this category. The female members in this age group are generally less educated and are part of the joint family. They hesitate to talk in front of their in-laws and other male members in the village. The female respondents are more in the age group of 18-30 and 31-45 as they are more educated and are exposed to the community due to their involvement in SHGs. The female enumerator's presence in the team of survey was also a key factor of involvement of female respondents of this age group in more number.

4. Caste Composition of the Respondents

Caste	No	%	Caste name/Remarks
General	209	27.57	Upper Castes like Brahmins, Karan and Khandayats
OBC	212	27.97	Middle order Chasa, Gauda, Badhei and Teli
SC	161	21.24	Pano, Kandara, Dhobi, Keuta, Gokha, Chamar, Bhoi
Non Caste	176	23.22	Non-Hindu Muslims
Total	758	100.00	

The ratio of Other Backward Caste people, like chasa, Gauda, Badhei and Teli is high in comparison to General, scheduled caste and non-caste population. The ratio of SC population is lower than the other. The upper caste population like Brahmins, karans and khandayats are deprived from Government quotas and reservations, whereas the OBC and SC population is entitled for all the privileges of the Government schemes and benefits. However the socio-economic condition of the SC and non caste is much inferior to the upper caste. The benefits do not reach the lower caste people.

DISASTER EXPERIENCE

5. Number of Disasters experienced by the respondents

No. of natural disasters experienced	No of respondents	%
Experienced 1 Disaster	01	0.13
Experienced 2 Disasters	286	37.74
Experienced 3 Disasters	262	34.56
Experienced 4 Disasters	136	17.94
Experienced 5 Disasters	73	9.63
Total	758	100.00

From the above table it is seen that maximum number of the respondents have experienced more than two (37.74%) or three (34.56%) disasters. There are also respondents (9.63%) who have experienced more than 5 disasters. It shows that there is frequent occurrence of disasters.

6. Opinion Regarding Severity of Natural Disasters

Type of Natural Disasters	Scale of severity							
	Severity-1 (Very Severe)		Severity-3 (Moderate)		Severity-4 (Not Severe at all)		TOTAL	
	No.	%	No.	%	No	%	No	%
Flood (2008)	642	84.7	113	14.9	3	0.4	758	100.00
Flood (2006)	12	1.58	143	18.87	603	79.55	758	100.00
Cyclone (1999)	751	99.08	7	0.92	-	-	758	100.00

The impact of flood was very severe for most of the people who experienced it. 84.7% people from the respondents said that the impact of flood 2008 was very severe to them. For only 14.9% of the respondents the severity was moderate and 0.4% respondents felt that the impact was not severe at all. To the people of coastal Orissa, the devastation of 1999 super cyclone was more severe. Flood 2008 comes next in terms of severity and destruction. 2006 flood also caused damage to agriculture land and physical infrastructure but the impact was less in comparison to the other two disasters. A high number of respondents constituting 79.55% of the total respondents said that the impact was not at all severe whereas only 18.87% felt that the severity was moderate and 1.58% said that the impact was severe.

7. Disaster Experience/ Feelings.

Type of experience	No of respondents		Total	
	Yes	No	Number	%
Felt that my life was in danger (A)	655 (86.41)	103 (13.59)	758	100
Left home with family (B)	279 (36.81)	479 (63.19)	758	100
Separated from my family (C)	44 (5.80)	714 (94.20)	758	100
Injured (D)	16 (2.11)	742 (97.89)	758	100

Family member was injured (E)	25 (3.30)	733 (96.70)	758	100
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During disaster majority of people felt insecure of their survival which was 86.41%. They were not prepared to face the sudden occurrence of extreme event. Some of the people moved to safer places with their families (36.81%) whereas others (63.19%) remained in the village. Few people were separated from their families for several reasons as the roads were cut off, they could not reach the village etc. There seem to be very negligible incidence of injury during disaster.

8. Number of family members displaced

Response	No of Members	%
Yes (1)	1530	33.32
No (2)	3062	66.68
Total	4592	100.00

Some people moved to higher places, neighbours roof top with all their belongings and returned back as soon as the flood water receded. This constituted 33.32% of people in the respondent's families. The ratio of persons displaced during disaster is comparatively less. This also can be said that people had a casual approach towards the severity of disaster.

9. Shelter taken by family members after the disaster

Shelter taken after the disaster	Members	%
Relatives/friends (1)	769	16.75
Temporary Shelter by Govt (4)	125	2.72
Temporary Shelter by NGO (5)	149	3.24
No shelter, No evacuation (11)	339	7.38
Other (96)	148	3.22
Not Applicable (97)	3062	66.68
Total family members	4592	100.00

The ratio of people who did not displace was much higher. Many of the affected families went to their relatives and friends for taking shelter. Poor families suffered a lot and remained in their makeshift houses till the flood subsided. Some people also took the benefit of temporary shelter of Government and other relief agencies. Very

few were accommodated in the community centre as there was not enough space for many.

10. Warning received

Warning received	No of respondents	%
Yes (1)	733	96.70
No (2)	25	3.30
Total	758	100.00

A large number of respondents said that they have received warning before occurrence of flood. That means there was a centralized system of warning in place and the warning was made on time. Only 3.30 % of the respondents said that they did not receive the warning which means that they missed this information or were not attentive to any information or they were out of the village.

11. Source of warning

Source of warning	No of respondents	%
Relative (1)	25	3.30
Friend/ acquaintance (2)	09	1.19
Neighbors (3)	30	3.96
Stranger (5)	00	0.00
Police/ Army (9)	00	0.00
Local govt (7)	97	12.79
State /National govt (8)	00	0.00
NGO (10)	13	1.72
Mass Media (11)	516	68.07
Multiple source	43	5.67
Not Applicable (97)	25	3.30
Total	758	100

From the above table it is clear that Mass media and Local government played important role in disseminating the information. Warning received from NGO, relatives and neighbours could be a secondary source who received warning initially

from the government and mass media. Warning spreaded well as people received it from multiple sources.

12. Clarity of the warning Received

Clarity of the warning	No of respondents	%
Clear (1)	696	91.82
Not Clear (2)	37	4.88
Not Applicable (97)	25	3.30
Total	758	100.00

A large section of the respondents admitted that the warning was very clear. It was not clear only for a small section which consists of only 4.88% of the respondents.

13. Action taken on warning.

Action taken on warning.	No of respondents	%
Yes (1)	485	63.99
No (2)	248	32.71
Not Applicable (97)	25	3.30
Total	758	100.00

It was surprising to see after receiving a clear warning a large number of respondents i.e. 32.71% did not take any action for their own safety. This shows a clear casualness among people towards disaster and response towards warning.

SOCIAL CORE

14. Feeling of Traumatic Stress and Religious belief to Cope

Scale	Trauma Felt		Religious Belief as Coping Strategy	
	Number	%	Number	%
Scale 1- Not at all	24	3.17	31	4.09
Scale 2- To some extent	72	9.50	53	6.99
Scale 3- Moderate	108	14.25	92	12.14

Scale 4- To a great extent	185	24.41	164	21.64
Scale 5- Extremely	369	48.68	412	54.35
No Response	00	00	06	0.79
Total	758	100.0	758	100.00

The flood was an extreme event of trauma for large number of respondents (48.68%). Whereas for some respondents the trauma experienced was moderate and was manageable (14.25%). For very few respondents there no trauma at all (3.17%). A large number of respondents used their religious belief as coping strategy (54.35%) whereas only 4.09% of the respondents did not resort to religious belief as to their coping strategy.

15. Source and Scale of Mutual Support Extended

Different sources	None		Some		A lot		Total	
	No.	%	No.	%	No.	%	No.	%
Husband /wife	45	5.94	392	51.71	321	42.35	758	100.00
Children	64	8.44	419	52.28	275	36.28	758	100.00
Other family (e.g. grandparents, cousins)	83	10.95	446	58.84	229	30.21	758	100.00
Friends	111	14.64	441	58.18	206	27.18	768	100.00
Governmental organizations (e.g. Panchayat, Police)	87	11.48	513	67.68	158	20.84	758	100.00
Non-governmental organizations (e.g. Religious organisations,	300	39.58	379	50.00	79	10.42	758	100.00

NGOs)								
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In the post disaster situation people received mutual support from the family and outside. As many as 42.35% respondents said that they received lot of support from their spouse followed by 36.28% from children and 30.21% from family. 20.84% said that they received lot of service from government. The response towards support received from non government organizations was 10.42%.

16. PRE-DISASTER and EX-ANTE Disaster Main Occupation

Main Occupation	Pre-disaster Occupation		Ex-ante Occupation	
	No.	%	No.	%
No Occupation (1)	75	9.89	86	11.35
Unskilled Labour (2)	108	14.25	110	14.51
Skilled Labour (4)	31	4.09	31	4.09
House work (5)	273	36.02	268	35.36
Farmer (6)	148	19.53	143	18.87
Student (7)	12	1.58	11	1.45
Teacher/Health Worker (8)	11	1.45	11	1.45
Police/Army (9)	2	0.26	2	0.26
Civil Servant (10)	19	2.51	19	2.51
Manual Labour (11)	5	0.66	5	0.66
Small Trader (12)	22	2.90	22	2.90
Private Employee (13)	12	1.58	9	1.19
Other (96)	40	5.28	41	5.41
Total	758	100.00	758	100.00

Agriculture activity is the primary occupation of farmers which is higher in pre-disaster situation. Later on the flood caused massive loss to the standing crop and most of the agriculture lands were inundated due to gushing of flood water. So the primary occupation of farmers was affected due to disaster. The ratio of occupations like house work, unskilled labour and other allied activities increased in ex-ante disaster

situation. Walls cracked and houses damaged so there was urgent need of repair for resettlement. The ratio of skilled labour occupation comes down due to lack of gainful employment within and outside village in ex-ante situation. Occupation ratio of teachers, health workers and civil servants was high during the pre-disaster situation. It comes down in ex-ante situation as schools and offices remain closed for more than 15days in the affected area. As the primary occupation was affected during post disaster situation people moved out of the village to work on daily wage. So the ratio of other activities increased in ex-ante situation.

17. PRE-DISASTER and EX-ANTE Disaster Secondary Occupation

Secondary Occupation	Pre-disaster Occupation		Ex-ante Occupation	
	No.	%	No.	%
No Occupation (1)	551	72.69	564	74.41
Unskilled Labour (2)	54	7.12	49	6.46
Skilled Labour (4)	06	0.79	06	0.79
House work (5)	59	7.78	60	7.92
Farmer (6)	54	7.12	46	6.07
Student (7)	01	0.13	00	0.00
Teacher/Health Worker (8)	01	0.13	01	0.13
Police/Army (9)	00	0.00	00	0.00
Civil Servant (10)	00	0.00	00	0.00
Manual Labour (11)	06	0.79	06	0.79
Smalll Trader (12)	03	0.40	03	0.40
Private Employee (13)	00	0.00	0	0.00
Other (96)	23	3.30	23	3.03
Total	758	100.00	758	100.00

The ratio of skilled labour and persons working as tutor remained same in both pre and post disaster situation. After flood people suffered from various common ailments so the health practitioners played a major role in addressing health need in

ex-ante situation. The community gathered strength to fight back the disaster situation through increased resilience and coping mechanism in ex-ante disaster situation. The ratio of secondary occupation like housework, farming, unskilled labour and SHG activities decreased in post disaster situation as the entire village was flooded with water which did not subside for 4-5 days.

ECONOMIC CORE

18. Scale of impact on the economic condition of the respondents

Scale of impact	No of respondents	%
It got much worse	300	39.57
It got worse	379	50.00
It remained the same	77	10.16
It improved	1	0.13
It improved a lot	1	0.13
Total	758	100.00

A majority of the respondents i.e. 50% have said that their economic condition has got worse as an impact of disaster. Whereas less than 1% has said that the condition has improved after the flood. It shows that the respondents of the later category do not share the same livelihood pattern and socio economic status or their livelihood/trading gets augmented due to disaster.

19. Monthly Household Expenditure during pre and post ante disaster.

Items of Expenditure	Total Monthly Expenditure (IN INR)	
	Before	After
Food	1675243	1675700
Clothing	205551	195994
Fuel	147315	154440
Electricity	57849	55020
Medical	2724240	11309760
Education	228720	205265
Transport	73100	78535

Communication (Telephone, internet, postal expenses)	53470	52895
House Rent	41330	40880
Tax payment	9181	11156
Repayment of loan	20505	24870
Life cycle ritual/ Occasions	52582	52650
Total	5289086	13857165

The major portion of expenditure of the people is mainly on food & medical. Expenditure for education comes second and next come clothing , fuel, transport, communication, electricity, house rent. Least are the expenses for tax payment, repayment of loan, life cycle rituals etc. Expenditure for fuel, medical, transport, communication, and repayment of loan increased largely after the flood. To meet these expenditure people curtailed their expenses on clothing, electricity, education etc in the post disaster period. However due to price hike and added burden on the household expenditure remains the almost the same. It is noticed from the data collected that the medical expenditure rose drastically i.e. 5 times during the post flood period in comparison to the pre flood time.

20. Annual Income of the respondents from different sources during pre and post ante disaster.

Sources of income	Before disaster	After disaster
Agriculture & allied activities	5745200	2844800
Industrial activity	226800	169200
Services	15828000	15828000
Rent	11800	10300
Interest	13800	9400
Others (Daily wage)	6720000	7051200
Total	28545600	25912900

Before the flood the highest income of the respondents was from service sector following to that of daily wage labour (Others- as there are many sources included), Agriculture is another major source of income for the people in this area. Following to the above sources industrial activities, rent and interest also generate some income which contributes to the total income of the family. In the post flood period there was

a drastic fall of income in agriculture and industrial activity. But income from daily wage has increased as there was a need of repair and recovery in the affected areas.

HEALTH CORE & EXTENDED

WATER AND SANITATION

21. Primary Source of drinking water before and after disaster

Sources	Pre disaster		Ex ante	
	Respondents	%	Respondents	%
Tap in house (1)	5	0.66	2	0.26
Community tap (3)	9	1.19	5	0.66
Tube well/ borehole (2)	709	93.54	453	59.76
Protected dug well (4)	20	2.64	12	1.58
Unprotected dug well (5)	13	1.71	6	0.79
Surface Water (9)	2	0.26	280	36.94
Total	758	100.00	758	100.00

93.54% of people used tube well/bore well water during pre disaster for drinking and cooking purpose. The usage decreased to 59.76% after disaster as most of the tube wells were inundated in flood water and were defunct. Protected dug wells, community taps remained under water for 4-5 days causing damage to the machineries so usage decreased in post disaster situation.

22. Household Sanitation and Individual Personal Hygiene

Bathing Place	Before disaster		After Disaster	
	No	%	No	%
Private bath room (1)	180	23.75	79	10.42
Open Community Tube well (2)	100	13.19	97	12.80
River/Canal (3)	183	24.14	154	20.32
Surface Water Public pond (96)	295	38.92	428	56.46
Total	758	100	758	100

38.92% of people used the public pond for bathing before disaster which increased to 56.46% after disaster. Nearly 23.75% of people used private bath rooms before disaster and decreased to 10.42% after disaster. This is clear that due to damage of house during disaster the bathrooms were no more there in these families as they were temporary structures or were built at the place where flood water entered and damaged them. After disaster a lot of people also depended upon the open community tube well and river/canal for bathing purpose.

23. Type of Toilet Facility Available

Facility Available	Before Disaster		After Disaster	
	No	%	No	%
Flush toilet with septic tank (Indian) (2)	145	19.13	59	7.78
Ventilated Improved Pit (Western Style) (3)	8	1.06	7	0.92
Soak pit/Hole with upper part hardened (Traditional) (4)	43	5.67	16	2.11
Open hole/ No facility or bush or field or river (Open air defecation) (7)	550	72.56	672	88.66
Not recorded (96)	12	1.58	4	0.53
Total	758	100	758	100

72.56% people preferred for open defecation before disaster. It even increased to 88.61% after disaster. Lack of interest, awareness, and traditional mindset at the individual level is the major cause behind this preference. In addition People also depended upon Government support for setting up toilet facility. Even if some families having toilet facility the members prefer to go for open defecation.

MORBIDITY PATTERN.

24. Morbidity Pattern

Morbidity Pattern N=4592	Number of persons Suffered
Diarrhoea	587
Dysenteries	80
Typhoid/ Paratyphoid	45

Jaundice/Hepatitis	17
Conjunctivitis	11
Skin infection	57
Respiratory infection	679
Asthma attack	69
Malaria	457
Measles	6
Psychiatric disease (PTSD depression,	12
Others (with Chickungunia symptoms)	1032

Most of the respondents suffered from diarrhoea, malaria, chikungunia and respiratory infections due to water contamination and improper living. Apart from this the other common diseases are seen are dysenteries, typhoid, jaundice, conjunctivitis, skin infection, asthma, measles and psychiatric diseases during post disaster situation. It has been checked to a great extent after GO/NGO intervention in the affected areas.

25.Chronic Diseases Diagnosed by Doctor

Chronic Diseases N=4592	No. of respondents
Hypertension	72
Diabetes	41
Cardio Vascular Disease	14
Stroke or seizure	16
COPD or chronic asthma	28
Malnutrition/ Anaemia	7
Pulmonary TB	5
Leprosy	3
HIV/AIDS	0
Cancer	2
Psychiatric disease (neurosis (psychosis, schizophrenia, alcoholism	9
Others	39

Most of the respondents are having chronic diseases like Hypertension, diabetes, asthma(COPD) ,cardio vascular diseases, and psychiatric disease (Neurosis,

psychosis, schizophrenia, alcoholism) and who have been regularly diagnosed by doctors. Some of them also suffer from cancer, leprosy, pulmonary TB, Anaemia and stroke and getting treatment in regular interval of time.

Summary of preliminary analysis of data for Control group:

Demography: Similar to the areas exposed to flood 2008, in the non exposed areas there were less female members in comparison to the male. During the study in the control group the numbers of male respondents are more than the female respondents. Though the study team were having sufficient representation of women interviewers when they reach a house hold male members tend to answer the questions. Wherever the male members are absent in the family response from women members were received easily.

Occupation: Most of the respondents are engaged in house work. A large number of respondents were women who were engaged in the house work only. There were respondents having no occupation and unskilled labourer in these areas. There were also respondents who practice craft work. In police and army also there are many respondents who were covered under the study. The manual labourers and skilled labourers were also the respondents.

Economic Condition: The maximum expenditure of people in the Control group was incurred in the food section. People were also spending much amount in Medical, education, clothing and transport. In the deficit time they also take loan and a major portion of their income goes into repayment of loan or its interest. Expenses pertaining to life cycle rituals were also very important and they used to cover large portion of the income.

The highest income in these areas comes from industrial activities. Next source of income is agriculture and allied activities. People also depend largely on the daily wage basis labour work to earn their income. Income from service sector is also a contributing factor to the income in many families.

Drinking water and sanitation: Most of the respondents used to get their water from the community taps. Few people had taps in their own houses. Some respondents said that they get their water from tube wells or bore holes. There were also protected dug wells in the village from where 4.41% respondents get water. The majority of the respondents were of the view that people go for open defecation to the bush, fields or areas near to canal and river. Some people had piped sewer system. Very few people were using ventilated improved pit/hole.

Morbidity pattern: During the study time it was seen that there were many cases with the symptoms of Chikungunya and malaria. As per the respondents this is a changing disease pattern in this area. During the flood there are many diseases seen in the affected area and gradually they get transmitted to the people in the non affected areas. They also said that there are large number of cases of Dysentery, diarrhea and respiratory infection. As per the respondents these are the season specific diseases.

DEMOGRAPHY

1. Sex wise category of the respondents

Sex	No. of respondents	%
Male (1)	483	59.19
Female (2)	333	40.21
Total	816	100

During the study in the control group the numbers of male respondents are more than the female respondents. Though the study team were having sufficient representation of women interviewers when they reach a house hold male members tend to answer the questions. Wherever the male members are absent in the family response from women members were received easily.

2. Marital Status of Respondents

Marital status	No. of respondents	%
Married (1)	748	91.67
Unmarried (2)	3	0.37
Separated (3)	0	00

Divorced (4)	6	0.73
Widow (5)	59	7.23
Total	816	100

Most of the respondents in the control group are married. There were also interviews in the houses of widows and divorced persons. There were very few respondents who were not married. The basis of taking response was from the member of the household who is active and leads the family affairs.

3. Occupation of Respondents

Occupation	Main Occupation		Second Occupation	
	No.	%	No.	%
No Occupation (1)	111	13.60	690	84.56
Unskilled Labour (2)	119	14.58	19	2.33
Craft and related work (3)	88	10.78	12	1.47
Skilled Labour (4)	28	3.43	9	1.10
House work (5)	318	38.97	68	8.34
Farmer (6)	11	1.35	1	0.12
Student (7)	00	00	00	00
Teacher/Health Worker (8)	00	00	00	00
Police/Army (9)	64	7.85	00	00
Civil Servant (10)	1	0.12	00	00
Manual Labour (11)	76	9.32	17	2.08
Total	816	100	816	100

Among all, most of the respondents are engaged in house work. As shown in the first table there were 333 women respondents. These women respondents are mainly the ones who are engaged in house work. There were respondents having no occupation and unskilled labourer in these areas. 10.78% of the respondents are engaged in craft work. In police and army also there are many respondents who were covered under the study which is 7.85% of the total respondents. There are manual labourers and skilled labourers who comprise 9.32% and 3.43% of the total respondents respectively.

ECONOMIC CORE

4. Monthly Household Expenditure during pre and post ante disaster

Items of Expenditure	Total Monthly Expenditure (IN INR)
	Currently
Food	1,87,88,640
Clothing	25,20,420
Fuel	14,06,880
Electricity	7,95,396
Medical	30,91,416
Education	26,98,980
Transport	10,90,680
Communication (Telephone, internet, postal expenses)	5,70,960
House Rent	3,04,800
Tax payment	20,940
Repayment of loan	4,53,600
Life cycle ritual/ Occasions	2,10,720
Total	3,19,53,432

The maximum expenditure of people in the Control group are in the food section. People also spend much amount in Medical, education, clothing and transport. In the deficit time they also take loan and a major portion of their income goes into repayment of loan or its interest. Expenses pertaining to life cycle rituals are also very important and they take a large portion of the income.

5. Income of the respondents from different sources

Sources of income	Amount in INR
Agriculture & allied activities	1,16,76,484
Industrial activity	1,97,64,600
Services	7,18,800
Rent	14,400
Others (Daily wage)	1,88,74,920
Total	51049204

The highest income in these areas comes from industrial activities. Next to industrial activities the source of income is from agriculture and allied activities. People also depend largely on the daily wage basis labour work to earn their income. Income from service sector is also a contributing factor to the income in many families.

HEALTH

WATER AND SANITATION

6. Primary Source of drinking water .

	Respondents	%
Tap in house (1)	77	9.44
Tube well/ borehole (2)	56	6.86
Community tap (3)	646	79.17
Protected dug well (4)	36	4.41
Unprotected dug well (5)	1	0.12
Total	816	100.00

Most of the people who responded the questionnaires get their water from the community taps i.e. 79.17% of the respondents. Only 9.44% respondents have taps in their own houses. 6.86% of the respondents get their water from tube wells or bore holes. There are also protected dug wells in the village from where 4.41% respondents get water.

7. Type of Toilet Facility Available

	No	%
Piped sewer system (1)	294	36.03
Septic Tank (2)	1	0.12
Ventilated improved pit/hole (3)	70	8.58
Open hole/Soaked pit(4)	33	4.05
Bucket (5)	84	10.29
No facility/bush/field/river(7)	334	40.93
Total	816	100

Most respondents said that they go for open defecation to the bush, fields or areas near to canal and river. This constitutes 40.93% of the total respondents. 36.03% respondents said that they have piped sewer system. 10.29 people were of the response that there is use of bucket for defecation purpose. 8.58% people were of the opinion that they use ventilated improved pit/hole.

MORBIDITY PATTERN

8. Morbidity Pattern

Morbidity Pattern N=4692	Number of persons Suffered
Diarrhoea	21
Dysenteries	32
Jaundice/Hepatitis	2
Conjunctivitis	9
Skin infection	7
Respiratory infection	19
Asthma attack	16
Malaria	52
Measles	6
Psychiatric disease (PTSD depression,	8
Others (with Chickungunia symptoms)	462

During the study time it was seen that there were many cases with the symptoms of Chikungunya and malaria. These are two vector borne diseases. As per the respondents this is a changing disease pattern in this area. During the flood there are many diseases seen in the affected area and gradually they get transmitted to the people in the non affected areas. They also said that there are large number of cases of Dysentery, diarrhea and respiratory infection. As per the respondents these are the season specific diseases.
