International Journal of Inclusive Development, Volume 1, No. 2, December 2015, pp. 29-37

Understanding Disaster Risk Reduction: A Study on Knowledge, Attitude and Practices of Eight Aila Hit Villages of Hingalganj Block, North 24 Parganas, W.B.

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Abstract

On May 25, 2005 in Indian sub-continent hit with a super cyclone, namely Aila causing soil erosion, contaminated water and loss of community assets, degraded environmental conditions many parts of India including Sundarban delta. We all know that it is virtually impossible to prevent occurrence of most natural disasters but it is possible to minimize risk and coping capacity through Disaster Risk Reduction (DRR) programme. The present study is based on 8 villages in two panchayats in Aila hit areas, namely Jogeshganj and Kalitala panchayat of Higalganj Block in North 24 Paraganas in West Bengal with a view to assess the Knowledge, Attitude and Practices (KAP) of people living in the area so as to develop disaster risk reduction programme in Aila heat areas of Sundarban.

Keywors: Disaster Risk Reduction (DRR), disaster preparedness, mitigation, early warning, Aila, United Nations International Strategy for Disaster Reduction (UNISDR), Hyogo Framework for Action (HFA) etc.

Conceptual Understanding

In January 2005, the World Conference on Disaster Risk Reduction (DRR) adopted the "Hyogo Framework for Action 2005-2015: Building the Resilience of Nations and Communities to Disasters" (ISDR, 2005). It is a global blueprint for DRR efforts. The goal of Hyogo Framework for Action (HFA) is to substantially reduce disaster losses, in lives and in the social, economic and environmental assets of communities and countries by 2015. The HFA has been already adopted by 168 governments including India. The HFA included references to the importance of early warning, DRR and encouraged the development of early warning systems that are people cantered. To promote a common understanding and application of disaster risk reduction concept and assist disaster risk reduction efforts of authorities, practitioners and the public, the United Nations International Strategy for Disaster Reduction (UNISDR) has developed the UNISDR Terminology on Disaster Risk Reduction and this UNISDR Terminology is relevant for to the establishment of the community based early warning systems (Phaiju, Bej, Pokharel and Dons, 2010). HFA provides a strong basis for priority actions by governments and governmental organizations as well as by local, regional and international non-governmental organization.

Goal of HFA: There are three strategic goals of HFA are integration of disaster risk reduction into sustainable development policies and planning, development and strengthening of

institutions, mechanisms and capacities to build resilience to hazards and incorporation of risk reduction approaches into the implementation of emergency preparedness, responses and recovery programmes. Five Priority Actions given by the HFA are ensuring disaster risk reduction (DRR) as a national and a local priority with a strong institutional basis for implementation; identify, assess and monitor disaster risks and enhance early warning; use knowledge, innovation and education to build a culture of safety and resilience at all levels; reduce the underlying risk factors and strengthen disaster preparedness for effective response.

As India is one of the signatories of HFA, it is desirable that the country should have responded to achieve as Hyogo Frame of Acton pledged for. It is understood that the India has passed law on NDMA (National Disaster Management Act 2005) but the action strategy seems to far from reality (Gazette of India, 2005 December 26). As per the guideline National Disaster Management Authority (NDMA), at national level there is National Disaster Managing Committee and Prime Minister is the chairman of the committee, each state constituted State Disaster Managing Committee with chief Minister as chairperson, and district level DM or Collector is the chairperson in each District Disaster Management Authorities and each Block level there is Disaster Management Officer. The act mandates to prepare disaster management plan at block, districts and state level and execute it. Government of West Bengal has formed a disaster management department and designated officers at block and district level to prepare and execute disaster risk reduction plans (WBDMD, n.d.). We all know that it is virtually impossible to prevent occurrence of most natural disasters but it is possible to minimize risk and coping capacity through Disaster Risk Reduction (DRR) programme. The present study is based on 8 villages in two panchayats in Aila hit areas, namely Jogeshganj and Kalitala panchayat of Higalganj Block in North 24 Paraganas in West Bengal with a view to assess the Knowledge, Attitude and Practices (KAP) of people living in the area so as to develop disaster risk reduction programme in Aila heat areas of Sundarban and at what extend the government responded to their problem.

Methodology

Objectives of the Study

The main objective of this study is to assess knowledge, attitude and practices (KAP) of villagers on Disaster Risk Reduction (DRR). The specific objective of the study are to assess the present area and its characteristics, specially demography, etc. to Identify the present understanding of villagers on DRR and also to know the initiatives of different stakeholders working area in terms of practices and actions at the grass root level.

Universe

The study was mainly confined to 8 villages in two panchayats (Jogeshganj and Kalitala). The selected villages were chosen from Jogeshganj G.P and Kalitala G.P, four villages from each panchayat. The villages under Jogesh ganj G.P were Jogeshganj Dakshin Para, Madhabkanti Dakshin Para, Pashim Hemnagar and Hemnagar Purbapara and villages from Kalitala GP were Dakshin Kalitala, Dakshin Samsernagar 1, Haidaskati, Uttar Samsernagar-1.

Tools of data collection

1. **Household Survey** method is followed with households on the subject.
2. **Focus Group Discussion (FGD),** which was conducted with villagers. Interview with some key informants like Gram Panchayat members of respective villages, SHG leaders from the villages were also included.

To conduct data collection both through household survey and FGD with different groups, the design of the questionnaire and FGD checklists focused on the following points.

- General knowledge on DRR and climate change on understanding of hazards, risks and vulnerabilities; knowledge of early warning, etc.
- Community practices related to DRR on mitigation measures (Homestead raising, protecting water resources, safe storage of food, disaster resilient constructions, reforestation, etc); prevention activities at

community level; dissemination of early-warning, adjustment of livelihoods to changing climate patterns. Awareness of DRR-related services available such as existence of resource people/groups on DRR; shelter; NGOs.

Sampling

The KAP study is based on purposive sampling technique. In each cluster or village an equal no of households have been selected from house listing from eight villages, selected 10 household from each village covering eight villages. So, it covers 80 samples in two panchayats, 40 from each panchayats. A sample selected from the list of household survey with the help of Andrewspally Centre for Integrated Development (ACID)—a grass root level NGO assisted by an international organization called FADV for selecting eight villages from their operational villages. PLA method is also used with FGD as tool applied to observe the challenges/ problems of the villagers.

Defining Key Term

1. Hazard—is a dangerous phenomenon condition that may cause loss of life, injury or other health impacts, property damage, loss of livelihoods and services, social and economic disruption, or environmental damage, etc.
2. Vulnerability—is the characteristics and circumstances of a community, system that makes it susceptible to the damaging effects of a hazard. There are many aspects of vulnerability, arising from various physical, economic, and environmental factors. Examples may include poor design and construction of buildings, inadequate protection of assets, lack of public information and awareness, limited official recognition of risks and preparedness measures, and disregard for wise environmental management.
3. Disaster—is a serious disruption of the functioning of a community or a society involving widespread human, material, economic or environmental losses and impacts and which exceeds the ability of the affected community or society to cope by using its own resources.
4. Disaster Risk Reduction (DRR)—is the concept and practice of reducing disaster risks through systematic efforts to analyze and manage the causal factors of disasters, including lessened vulnerability of people and property by wise management of the land and the environment, and by improved preparedness for adverse event. At the community level, preparedness can be improved through appropriate technologies and practices for safety, protection, safe storage facilities for seeds and harvest, livestock shelters and safe and hygienic food preparation practices, high raised water points etc.
5. Disaster Management—the activities of disaster management have undergone a paradigm shift. The earlier it is mainly focused on relief or charity but now the emphasis based on relief and rehabilitation has gone to a more comprehensive approach to preparedness and mitigation. Three fundamental aspects of disaster management programme are disaster response, disaster preparedness and disaster mitigation. In case of disaster response an application of current technology can prevent much of the death, injury, physical and economic disruption. Likewise in second category of services is disaster preparedness—which is an ongoing, multitask activities like assessment or evaluation of the risk in the area, adopt standard measure, organize communication, information and warning system, and other resources are available, develop public education, coordinate information sessions with news media. Besides a clear mechanism for coordinating other sectors relating to health measure should also be prepared along with emergency preparedness. The third area is disaster mitigation. It is virtually impossible to prevent occurrence of most natural disasters but it is possible to minimize or mitigate their damage effects. Mitigation measures aim at to reduce the vulnerability of the system, for example structural quality of houses, schools, public or private houses, water supply, sewerage system etc. Ensure adequate and safe drinking water, adequate arrangement for shelter, providing food protection measures, promoting personal hygiene, source of livelihood.
6. Aila—It is relatively a strong cyclone caused damaged in Bangladesh, Odissa and west-Bengal.

Information on Disaster in Study Area

India has been traditionally vulnerable to natural as well as manmade disasters. Few major disasters that India has experienced in the recent

past were the super cyclone in Orissa and the earthquake in Gujarat, earthquake in Nepal, and Aila in Bangladesh, Orissa and West Bengal. Aila is a strong tropical cyclone, heated on May 25, 2009 causing damage in the area; it caused extensive damage in India and Bangladesh. As of 27 May 2009, 330 people have been died by Aila, and at least 8,208 more were missing, while about 1 million people were homeless. Health officials in Bangladesh confirmed a deadly outbreak of diarrhoea on 29 May, with more than 7,000 people being infected dying. In Bangladesh, an estimated 20 million people were at risk of post-disaster diseases due to Aila (NASA, 2009). Due to Aila heat in Sundarban Delta, specially Hingalganj lead to soil erosion contaminated water including drinking water, loss of community assets and it may degrade the environmental conditions in such a manner that it can lead to diarrhea, cholera, dysentery, typhoid, other diseases, influenza, loss of soil fertility due to saline water etc.

The present study has a great significance because it is covering 8 villages in two panchayats—Jogeshganj and Kalitala to assess awareness, knowledge and attitude of the villagers on DRR specially to response to disaster prevention, mitigation and preparedness along with resilient livelihood activities.

Study Area

It is located in Sundarban, covering in one side Bangladesh and other part in North 24 Paraganas in West Bengal, well known as tiger reserve forest and the area is prone to flood and cyclone. Soil erosion and salinity has made the lives of the people miserable in Sundarban.

Fig. 1: Map of the study area

The study area specially two Gram panchayat of Hingolganj Block of North 24 paraganas is vulnerable to flood in almost every year and was affected by super cyclone called Aaila in 2009.

Profile of Hingalganj Block

Hingalganj is an administrative Block under Basirhat subdivision of North 24 Parganas district in the state of West Bengal. There are three Police Stations which share their jurisdiction under Hingalganj Development Block. They are Hingalganj Police Station,Hasnabad Police Station and Hemnagar Coastal Police Station. Headquarters of this block is at Hingalganj which is surrounded by rivers on all sides. Hingalganj is located at 22°28′15″N 88°58′38″E. Hingalganj community development block has an area of 230.40 km. Gram panchayats of Hingalganj block are Bishpur, Hingalganj, Rupamari, Dulduli, Jogeshganj, Sahebkhali, Gobindakati, Kalitala and Sandelerbil. The Panchyats are divided is three different islands. The main island consist of Hingalganj and Sandelerbill GP, another consist of Rupamari and Bishpur GP and the other consist of the rest five GP's naming Dulduli, Sahebkhali,Jogeshganj, Gobindakati and Kalitala.

Demographic profile of study villages

A household survey conducted by ACID—an NGO in study villages shows that the area is predominately inhabited by Hindu households which constituted 98.75% and rest is from Muslim community i.e. 1.25%. According to its report the numbers of SC, ST and OBC population constituted 87.41%, 6.14% and 6.25% respectively. The major source of income in the area is mainly daily labourer, followed by farming, fishing, private job, self-employed, daily labourer. The report also reflects that a sizable number of people living Below Poverty Line (BPL) categories in our study area. There are 46.60% households who belong to BPL. The majority of the people living in the area are mostly owned by *Kutcha* house with thatched roof. A smaller in number is found possessing *pucca* house. The survey report also reveals that 58.1% are living in *Kutcha/Thatched* house and 28 are homeless families which is 0.7% and 432 families i.e. 11.3% are living in hut houses and only 9.1% live in *pucca* house. As the source of employment is limited in the area the people

are migrating to other areas and reports shows that 1007 people migrated from 12 villages to outside places like Chennai, Kolkata, Andaman and Karnataka (S. Pal, 2015).

Profile of the respondents under KAP study

Education of Respondent

The level of education as observed in the study area was relatively low. A majority of the respondents, 83.75% attended up to Upper Primary level; only 6.25% of the respondents had attended up to secondary level and 6.25% from H.S and above level of education (Table 1).

Table 1: Level of Education of the respondents

Level of Education	No of respondents	Percentage
Illiterate	3	3.75
Primary	67	83.75
Secondary	5	6.25
Higher Secondary	1	1.25
Graduate & above	4	5

Occupation of respondents

The analysis of the occupation of the household members provided an interesting insight (Table 2). The highest percentage was composed of cultivators with about 60% that too pretty cultivation possible in rainy season as the area is saline prone. Daily Labours accounted for 33.75 percent of the respondents and only 2.5% were fishermen and 3.75% were service man

Table 2: Occupation of respondents

Nature of Occupation	No of respondents	Percentage
Daily Labour	27	33.75
Cultivation	48	60
Fisherman	2	2.5
Service	3	3.75
Total	80	100

Religion

In study area 98.75% of the respondents were Hindu and 1.25 percent are from Muslim community (Table 3).

Table 3: Religion of respondents

Religion of the respondents	No of respondents	Percentage
Hindu	79	98.75
Muslim	1	1.25
Total	80	100

Housing

Only 2.25% of the households are living in Pucca houses, rest are living in Kutcha houses either made up with bamboo stick or mud wall (Table 4).

Table 4: Housing pattern

Nature of House	No of respondents	Percentage
Pucca house	2	2.25
Katcha house made up with bamboo/ mud wall	78	97.75
Total	80	100

Knowledge on various types of disaster

In this section, knowledge levels are explored in key dimensions of DRR such as hazard, risk and vulnerability as well as early warning systems.

Table 5: Knowledge on types of hazards occurred in the area

Knowledge on disaster	No of respondents said yes (%)	No of respondent said No or No reply (%)
River Erosion	80 (100)	0 (00)
Earth Quake	46 (57.5)	34 (42.5)
Fire	13 (16.25)	67 (83.75)
Cyclone	38 (47.5)	44 (55)
Tidal Surge	60 (75)	20 (25)
Salinity	7 9 (98.75)	1 (1.25)
Water logging	48 (60)	32 (40)

The above table (Table 5) presents the different types of hazards identified as the most common in the area by respondents of the household survey. River Erosion, Tidal surge and salinity of ground water common hazard identified by the households followed by Cyclone/Tornado. Flood with 100% respondents and some respondents expressed that earthquake (57.5%) and Fire (16.25%), tidal surge (75 %), Cyclone (47.5%) and water logging (60%)

was also relevant to the area. It is important to note that all the respondents surveyed expressed their opinions on this particular question.

Problem faced

Respondents reported that during disaster they face problems related to food crisis, living condition, cooking, toilet, communication, drinking water, diseases, disruption of education, damage of crops and problems related to loss of life. All respondents feel the problem of safe drinking water during disaster. Diarrhoea, Dysentery, infections and cold and flu are the common diseases outbreaks during disaster (Table 6).

Table 6: Problems faced during Disaster

Problem during disaster	Respondents said yes	No of respondent said No/ No reply
Food Crisis	75 (93.75)	5 (6.25)
Living problem	75 (93.75)	5 (6.25)
Cooking problem	80 (100)	0 (00)
Unemployment	65 (81.25)	15 (18.75)
Toilet problem	78 (97.5)	2 (2.5)
Communication	78 (97.5)	2 (2.5)
Safe drinking water problem	80 (100)	0 (00)
Increase diseases	71 (88.75)	9(11.25)
Educational problem of children	70 (80.75)	10 (19.25)
Damage of crops	79 (98.75)	1 (1.25)
Cause death of some person	59 (73.75)	11 (26.25)
Death of animals	79 (98.75)	1 (1.25)

Opinion on source of early warning

Regarding the overall understanding of the early warning system 93.75% of the respondents receive advance forecast or early warning signal before disaster. 51.25% of respondents revealed that they get early warning signals primarily through TV and Radio, 6.25% from newspaper report, 7.5% through mobile news, 5 percent from NGO/ CBO workers and 30% did not respond to this question and said somehow they survived (Table 7).

Table 7: Opinion on source of early warning

Source of early warning	No. of respondent	Percentage
Radio/TV	41	51.25
Newspaper	5	6.25
Mobile	6	7.5
NGO/CBOs/Officials	4	5
No response	24	30
Total	80	100

Knowledge on precautionary measures

As many respondents felt that there is a need of precautionary measures before the disaster, like keep safe community shelter in the area (93.75%), like to raise toilet and latrine in their area (58.75), lift tubewell (52.5%) to protect from contaminated water, need for dry food (63.75), need also mobile cooking stove (62.5), need first aid box (50%) and 12.5% felt for rescue kits or life jacket (Table 8).

Table 8: Precautionary measures needed before disaster

Precautionary measure	No. of respondents (%)	No. of respondent did not reply (%)
Keep safe community shelter	75 (93.75)	5 (6.25)
Raise toilet & latrine	47 (58.75)	33 (41.25)
Lift tube well	42 (52.5)	38 (47.5)
Dry food needed	51 (63.75)	29 (36.25)
Mobile cooking stove	50 (62.5)	30 (37.5)
Candle stick	49 (61.25)	31(38.75)
Safe drinking water	47 (58.75)	33 61.25)
First aid box	40 (50)	40 (50)
Rescue kits/life jacket	10 (12.5)	70 (87.5)
Banana tree fleet	40 (50)	40 (50)

As a precautionary measure respondents mostly recognized keeping children, person with disability and older people in safe place and keep ready dry food, keeping portable stove, candles and matches, important documents such as certificates and dry foods have also been prioritized by the respondents (Table 9).

Table 9: Precautionary measures needed during disaster

Precautionary measure	No. of respondents	No. of respondent did not reply
Raise house	47 (58.75)	33 (41.25)
Prepare community safe shelter	41 (51.25)	39 (48.75)
Keep children and disable in safe place	51(63.75)	29 (36.25)
Raise toilet/latrine	47 (58.75)	36 (41.25)
Dry food needed	51(63.75)	29 (36.25)
Mobile Cooking Stove	50 (62.25)	30 (37.75)
Banana tree raft fleet	49 (61.25)	31 (38.75)
First aid box	40 (50)	40 (50)
Strong Pillar to tight house	34 (42.25)	46 (47.75)

Opinion on the need of the area

A look into the need of the villagers was also taken into the consideration. A series of opinion given by them is given below (Table 10). It shows that they are aware about the needs and problems of the area. As per their opinion on multiple answers, it is clear that they have given a number of needs in their priority list, like safe flood shelter (51.25), water and sanitation (58.75), check soil erosion (51.25), need for finding gaps in early warning (58.75), wanting resilient activities in farming (62.25),organic farming (42.25), need for Disaster Management Committee (50) and awareness on disaster preparedness plan (61.25).

Table 10: Opinion on important needs of the area

Opinion of different need	No. of respondents (%)	No. of respondent did not reply (%)
Safe Flood shelter with sanitation	41 (51.25)	39 (48.78)
Water and sanitation	47 (58.75)	33 (41.25)
Check soil erosion	41 (51.25)	39 (48.75)
Storage of pond water, check damps	51(63.75)	29 (36.25)
Find early warning gaps	47 (58.75)	36 (41.25)
Resilient activities in farming	50 (62.25)	30 (37.75)
Awareness on preparedness plan	49 (61.25)	31 (38.75)
Disaster Management Committee	40 (50)	40 (50)
Organic farming	34 (42.25)	46 (47.75)

Institutional knowledge on DRR

The respondents emphasized that they gained some knowledge on disaster issues through the media like newspaper, radio and television. Most teachers interviewed for also had declared having never participated in training on disaster-related topics. All the participants in the FGD expressed a strong interest in receiving training on disaster-related issues.

Risk assessment process

School children and key informants declared having never been involved with risk mapping exercises and not being aware of the existence of a village profile. It is the recent one that one organization called ACID started giving them this knowledge.

Fig. 2: Hazard mapping by the villagers

Major Findings

West Bengal is covered under National Cyclone Risk Mitigation Projects implemented by Government of India with support from World Bank. However, in reality disaster preparedness at community level depicts a poor picture. We observed through FGD and data the followings:

1. They have knowledge on disaster in their area but the early warning received from block authorities circulated by GP officials through microphone was not always in time. The vulnerable communities like children,

women, and people with disabilities do not always receive the early warning in time.

2. Access to safe shelters remains a major challenge during flood and cyclone in the area. Flood shelter is the necessary requirement of the area to accommodate more than 50 families at a time and it should have basic facilities like water and sanitation. There are places where there is no flood shelter. School complex is used by them during the time of emergency.
3. Food, water and sanitation remains a major challenge for the affected people and the challenge is more for children, women and other vulnerable groups.
4. Transportation and communication remain as major problems during emergencies and also during disaster as even day to day life in the study area.
5. The entire crop is damaged during the disasters. Further saline water has damaged agriculture land and made it inappropriate for any cultivation.
6. Erosion is the major challenge for these two GPs. A lot of land has been eroded during last one decade. The latest being half of a village eroded due to flood just a month ago.
7. The stakeholders like PRI and block officials have very limited knowledge about DRR.
8. Lack of disaster preparedness measures at household and community level which increases the vulnerability of children, women and other vulnerable groups and the potentiality of losing the important documents and assets increase.
9. Communities under study villages had no disaster management committee earlier and task forces to respond to any kind of disasters. Recently Village Disaster Managing Committee (VDMC) formed by the intervention of Andrewspalli Centre for Integrated Development (ACID—a grass root level NGO with financial assistance of FADV)

Recommendations

1. There is a need of flood shelter to give protection of life in the area.
2. There is need of storage of pond rain water to facilitate leaching of excess salts beyond root zone. Not a single drop of rain water should be allowed to flow down the land surface.
3. Collecting excess of runoff water in surface structures such as farm pond, check dams could be the early solution to create some irrigation facilities particularly for winter season crops.
4. The cow dung is not available in the area as they have lost most of their animals and the land could be visualized without grass. So, there is great scarcity of organic manures which could otherwise act as ideal ameliorant for salinity problem of the soil.
5. There is no such facility like demonstration/ farmers' meeting regarding modern method of farming, soil testing facility, seed production, manure utilization etc nor the training in the area is available till now.
6. A majority of them are living with daily labour, fishing activities and during rainy season it is a serious problem for them, therefore, there is a need to create an alternative source of livelihood..
7. Study of effectiveness early warning system is necessary and also to identify gaps in early warning and recommend appropriate community based early warning system which can reach different sections of the society.
8. A household preparedness guideline is necessary which will include preparedness for prepositioning of food, shelter, water and sanitation, protection of valuable equipments, house, live stocks and assets, rescue and evacuation of vulnerable members in the family and first aid.
9. Village level disaster management committees and task forces on early warning, search rescue evacuation, relief, first aid and psychosocial counseling should be constituted in all villages.
10. Plantation work to protect land from erosion and reduce the impact of cyclonic storms and hazardous. There have some efforts made by Sundarban Development Authority but we observe that there is a need to promote mangrove plantation in 12 wards in 2 GPs to prevent erosion and impact of cyclone.
11. Small scale mitigation measures like high raised tube well platform, high raised small approach roads to the shelter, ramps for accessibility of children and persons with disabilities and small scale irrigation cannels should be promoted.

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