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## **SOCIAL RESPONSE TO EXTREME WEATHER EVENTS: SOME EMPIRICAL EVIDENCES FROM INDIA**

### **Introduction**

In the wake of climate change discourse being underplayed at myriad levels, the holistic spatio-temporal perspective of anthropology befits its objective and unbiased analysis. The climate change discourse is underplayed at various levels. The first level is the scientific community, largely represented by the IPCC which is trying to collect evidence for establishment of a scenario for fueling socio-political dialogue on supposedly curbing the adverse impacts of the climate change. The environmentally conscious non governmental organizations, especially INGOs are quite vocal in addressing the climate change issue with particular focus on pressurizing the rich and powerful to dole out commitment for a fair and just system essentially tilted towards the weak and powerless. In annual COP meetings, they are in a position to hold parallel conferences for presentation of alternative and 'just' science and policy for the benefit of the mankind. The third and the most important group is what is called as the 'party' – the government and other such national and multi-national bodies which are required to take necessary actions for mitigation of the adverse climate change impacts. The climate change science, economics and politics is largely an outcome of the aspirations and interests of these players rather than any objectively derived axioms.

The role of anthropology in addressing the issue of climate change should actually come very close to the perspective of the INGOs as anthropology's first and foremost commitment is towards the underprivileged and the marginalized sections of the society. Anthropological perspective differs from the views and orientations of INGOs as these international bodies are sometimes accused of acting as undercover for the vested interests. With the aim of anthropology as described above, it stands for and advocates two aspects, namely mitigation of adverse climate change impact through corrective actions in the social and material aspects of the vulnerable communities and through

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strengthening and supporting the indigenously evolved knowledge and material culture helpful in addressing adverse climate change.

There is observable linkage between the weather related extreme event and climate change since climate change entails change in the temperature arising due to emission of the greenhouse gases. The rise in temperature is directly related to weather related extreme events such as floods, droughts, storm surge, heat wave, etc. Recently released UNISDR and CRED report (2015) informs us that the weather related disasters accounted for nearly ninety percent of the total extreme events in the last twenty years. Secondly, two types of extreme events namely, floods and storms accounted for majority of the disasters (floods – 47 percent and storms 40 percent). It clearly shows that the world community has to withstand the adverse effects of floods and storms in the coming future as there is not only going to be increase in the number of such extreme events but also in the intensity and impact of such extreme events. Finally, Asia and developing countries are going to be the main theatre for such disasters and these disasters are primarily going to affect the poor and marginalized communities.

The present paper is based on the European Union funded Euro-Asian integrated project Microdis focusing upon examining the social, economic and health impacts of extreme events, namely, flood, storm and earthquake. The University of Delhi, being one of the partners in this multi-country project, studied communities inhabiting the banks of river Ghaghra in Bahraich, Uttar Pradesh for investigation of flood impact and Gosaba Block of Sunderbans in the state of West Bengal to study the impact of cyclone Aila. The paper discusses the findings of the study based on mix methods investigation involving quantitative and qualitative investigation for examining the impacts of flood and cyclone.

### **Social Impact of Bahraich Flood**

With nearly forty million hectares of area prone to floods, its management is almost a regular programme in many states of India. A review of various steps taken for flood protection and mitigation indicates a lack of holistic approach towards the problem of floods in India. The primary emphasis of the government policy and programmes with respect to flood control has been in identifying engineering solutions comprising of constructing dams and embankments. What is missing or not properly appreciated in this approach is the fact that the floods mainly affect people who are not hapless victims but active survivors? Their ingenuity, creativity and capacities are not generally assessed and supported in the flood management programmes. The social dimension of the flood management which exists in the form of people's daily struggle and adjustment in negotiating and traversing such difficult conditions as floods are not considered worthy of attention. Quite naturally then, flood management has been streamlined in the form of standard

protocols involving evacuation, temporary habitation, fast food distribution and distribution of relief and compensation which both the government and affected people have accepted as the natural response to a flood. Year after year, flood management has been practiced in a routinized fashion as a bureaucratic exercise, grossly overlooking and negating the social aspect of the flood disaster. Social impact assessment is one area which needs attention from the various governmental agencies. There have been a number of studies mostly abroad and more recently in India, which lay emphasis on the social impacts of flood disasters (Tapsell *et al.*, 2002; Fordham and Ketteridge, 1995, Guha-Sapir *et al.*, 2006).

Developing conceptual model of social impact of extreme events/ disasters is a complex exercise. Arguably more so than in other areas such as economic, political, psychological impacts (Nigg, 1996). Social impact is a vast area, the boundaries of which are hard to define. The basic parameters underlying social impacts are vulnerability and resilience. It is useful to note here that vulnerability relates to the attributes persons and communities have, while resilience relates to the behaviour they engage in. The concept of vulnerability denotes much more than an area, nation's or region's geographic or climatic predisposition to hazard (Lindell & Prater 2003).

The idea that disasters are simply unavoidable extreme physical events that require purely technocratic solution is still emphasized within the United Nations and multilateral funding agencies such as the World Bank. Far from being discredited, such views have proven surprisingly enduring and are very influential at the highest levels of national and international decision making. Proponents of vulnerability as a conceptual explanation, on the other hand, take the position that while hazards may be natural, disasters are generally not. The emphasis, instead, is placed on what renders communities unsafe, a condition that depends primarily on a society's social order and the relative position of advantage or disadvantage that a particular group occupies within it.

Vulnerable populations are those at risk (Blaikie et al, 1994) not simply because they are exposed to hazard, but as a result of marginality that makes their life a permanent emergency. This marginality, in turn, is determined by the combination of a set of variables such as class, gender, age, ethnicity and disability (Wisner, 1993) that affects people's entitlement and empowerment or their command over basic necessities and rights as broadly defined (Hewitt, 1997, Watts, 1995, Akerkar *et al.* 2016).

Vulnerable populations are created by particular social system in which the state apportions risk unevenly among its citizens and in which society places differing demands on the physical environment (Canon, 1994; Wisner 1993; Hewitt 1995). Central to this perspective is the notion that history prefigures disasters; that populations are rendered powerless by particular

social orders that in turn are often modified by that experience to make some people even more vulnerable in the future (Blaikie *et al.*, 1994). For instance, poverty is determined by historical process that deprive people of access to resources, while vulnerability is signified by historical processes that deprive people of the means of coping with hazards without incurring damaging losses that leave them physically weak, economically impoverished, socially dependent, humiliated and psychologically harmed (Mackie, 1961).

The capacity to adjust to threats and to mitigate or to avoid harm is called resilience. Thus resilience could be understood in terms of 'reaction' of the population/group towards a hazardous situation. Anderson (1968) argues that a person's reaction to hazard is not random, unordered and wholly immediate but follows from the principle cognitive, affective and evaluative schemes salient and relevant to definition of the situation in the victim's culture. In effect, he argues that people respond to what those events mean and represent to them within their interpretive schemes. Moreover, these previously devised and transmitted assimilative schemata provide societies with the means of recognizing threatening situations before individuals actually experience them (Keesing, 1952).

Where the risk of hazard is greatest, it should be considered an aspect of the environment with which local cultures will reach permanent accommodation so that a 'culture of disaster' develops. The more a threat is perceived as chronic, the greater the integration of that conception will be within the interpretive framework as a 'normal experience', what Anderson refers to as the 'normalization of threat', and one which can then be transmitted to others as part of that culture's body of knowledge. Indeed, cultures are likely to have in-built coping mechanism with which to deal with such recurrent extreme ecological processes (Johnston & Selby, 1978).

The social impact of floods in Bahraich district was intensively studied to understand, the vulnerability, resilience and response of the community. For the purpose of this study, four villages experiencing floods and four villages which are unaffected by flood due to embankments were chosen. Many interesting facts came to light from the study. Firstly, in the flood exposed villages, the major impact of floods was the destruction of the livelihood forcing people to adopt suitable strategy so that they are able to cope up with the economic deficit caused due to floods. In event of evacuation due to floods, the relief is distributed under strict bureaucratic norms but the official help takes time to settle and therefore people have to make their own arrangements for manning the home and hearth. The immediate action by the families consists of seeking help in the neighborhood. Neighbors play a very important role in helping by sharing precious resources at the time of need. According to people, the caste people or relatives are secondary to the neighbors who are very crucial to the adjustment during the time of crisis. Besides seeking help from neighbors and friends, people also seek loan from the moneylenders at

considerably high rate of interest. Finally, the cases of out migration to the nearby cities is another important action that people take to overcome livelihood crisis. Besides economic impacts which are primarily in the form of livelihood disturbance and asset loss, the social impacts include many other aspects such as socio-structural or social capital impacts, socio-political impacts, socio-demographic impact, socio-cultural impacts, etc. which need to be studied in details. However, the impacts can be further sub-divided into chronological sequence as well (Tapsell, 2002):

- (a) Situation before flooding
- (b) During floods
- (c) After the floods

Before the flooding there is little awareness or expectation of the risk of serious flooding. Although people may have experienced past flooding, as the flooding in Bahraich are almost annual events with variable intensity and so there is some kind of complacency as people accept it to be tolerable. The general tendency is to depend upon the government agencies to provide information on the risk. During the flood people are generally shocked at the power, speed and depth of the flood waters. The main concern of the people remains the risk to life from flooding. Lack of any concrete planning about the relocation site, the people fail to take any action even if they have received the warning. According to one informant, "the government announces that the flood water will come and we should leave our houses but the question is what should be done and where should we move with our house".

The warnings received by people allow them to save a few possessions. Apart from this, there is little people can do. People do get some help from emergency services, friends and neighbours, but many people help themselves. After floods, there is potentially large scale damage to property. The most important losses are irreplaceable personal items and memorabilia. For those who are evacuated from their homes, the experience is stressful. Those saved from being evacuated face months of living in damp and/or dusty conditions and are surrounded by empty properties. Another aspect in terms of impact on social life due to flooding relates to the time people take off from their work to recover from a flood. This causes problems for them, not least through the loss of income, but for some people, especially the male members of the household going to work offers some respite in the flood recovery process. Furthermore, during the recovery process people have to 'fight' for assistance provided to them. This aspect needs to be understood against the backdrop of social differentiation and stratification that exists in societies.

After the floods, people become more apprehensive about the safety of their homes in future. They feel that their homes are no longer a safe refuge (Joshi & Urfat 2006). Homes no longer have the same meaning for people as

they did before the flooding (Joshi *et al.* 2010). Also, the general feeling among people prevails that various local authorities did not respond adequately when they were needed the most. The general perception is that the authorities, including the environment agencies have no real commitment to flood prevention.

As far as vulnerability of different group in a community is concerned, it is true that certain groups within the community affected by floods suffer more pronounced effects than others. These groups need particular support and consideration.

The floods are perceived to have significant impacts on children, woman, the elderly and disabled, both physically and psychologically. Floods seem to have differential impacts upon men and women (Wind *et al.* 2013). Women are seen to be particularly affected by the flooding, both physically and psychologically, although this may go unrecognized. Another area of vulnerability that needs to be addressed here is that parents can be ignorant about how to deal with children after flooding.

Disaster and their aftermath can have significant impacts upon people's relationships both within the household and with those outside (Margolis, 1973; Oliver Smith, 1973). As Tapsell *et al.* (2002) point out people also speak of positive changes in relationship with their partners as a consequence of the flooding, but some mentioned relationship problems in their households and in the community due to the stress of the flooding and the recovery process. When people were asked what had been the most devastating aspect of the flooding at a personal level, responses varied from citing financial impacts upon households, to 'lost' time, disruption of family life, losing everything that people had worked for and the loss of sentimental possessions (Smith & Freedy, 2000; Van *et al.* 2005). Some people referred to the feeling of powerlessness and helplessness and not being able to do anything to stop the flood and save their homes. (Wallace, 1956 & Waddell, 1974). In addition, gender based violence is another significant and yet still under-reported impact of flooding. Additionally, in a patriarchal agriculture based society, the loss or inundation of fields would mean that the men are not able to contribute to the home management and the entire burden of running house falls on the women. Men, under such circumstances, can at best temporarily migrate outside to contribute to the household budget.

Recovery from disaster always tests social as well as physical strength (Fordham & Ketteridge, 1995). Right after an extreme event, the community develops a sense of unity. The common problems of recovery and reconstruction take precedence and there is temporary suspension of conflicts and disputes. The re-emergence of community conflict is a sign that the recovery is complete (Quarantelli & Dynes, 1997). The areas of conflict may be different than before the disaster but the re-emergence of complaints often signifies the return of normalcy.

In developing countries floods have distinctive long term effects. They can be divided into three categories; (1) Consequences for human health including death, physical injury, disease transmission, malnutrition and loss of morale; (2) consequences for agriculture, and (3) impacts on housing and infrastructure, family dynamics, and other social impacts. The duration and significance of the impacts depend on the levels of resources available to easy recovery and on the scope of the devastation (Alexander, 1993).

The attempts to undertake social impact assessment of floods had been less. But nonetheless there is certain landmark attempts made to understand the social impacts of floods in the Indian context. One such is made by a team in Nagapattinam districts in Tamil Nadu, one of the districts hit by Tsunami (Guha Sapir *et al.*, 2006). The study reveals a number of vulnerability factors which may place individuals at greater risk of death and injury during natural disaster such as tsunami, for example, age, gender, ability to swim, a lack of warning or preparedness and distance to sea.

Young children and frail elderly fall into the vulnerable group as they lack the developmental capacity or strength to escape the hazard. Some elderly people in addition to their weaker physical strength may also be vulnerable to heart attacks under stressful condition. Gender can be another factor which makes a particular group vulnerable (Fordham, 2003). Males or females may be at risk during different natural disasters for different reasons.

According to Guha-Sapir *et al.* (2005), numerous studies have found that higher mortality rates from natural disasters tend to occur in areas with the lowest socio-economic conditions. The literature on earthquake risk factors suggest that individuals with lower socio-economic status may be more at risk of dying due to their greater exposure to environmental risk factors such as poor housing. The same is true for flood disasters as has been indicated by research on tsunami hit Nagapattinam district.

Another aspect of vulnerability is the lack or inadequacy of disaster warning system. Most lethal flood disasters tend to be those that hit with little warning, such as flash floods and storm surges (Greaves, 1973; Scudder, 1962).

In the Indian context one more aspect of vulnerability could be delineated and that is caste. There are some earlier studies that took this aspect into consideration such as some studies on earlier famines. Another aspect related to caste system is the jajmani system in India which also needs to be studied in the light of changes that are caused in the system due to such natural disasters. Also more studies should now focus on the aspect of resilience. Resilience per se can be understood at two different levels. One is at the cultural level (Anderson, 1968) and another one is at the level of different aids provided by the external agencies to mitigate the ill effects of disastrous events or to avoid harm thus making people less vulnerable ( Del Ninno et al

2003). At the cultural level there are different mechanisms that help in resilience- this includes for example the displacement of the community from the site of the flood as a part of their seasonal migration; or as a part of their routine activity in a flood prone area alternative modes of subsistence making people less dependent upon a single mode at the time of disaster, inter-ethnic economic transactions that maintain the flow of goods and services at times of disaster. When we are talking about external agencies helping in resilience, then we are basically focusing on the various aids provided by government and non-governmental organizations during a disaster situation and various development programs that are initiated after the disaster event that make people equipped to face similar situation in future.

Studies done in the flood prone areas of Uttar Pradesh (UP) in India has revealed that important social institutions like family and marriage are adversely affected by the floods. Two studies in two different districts of UP namely Badaun and Bahraich have revealed that people living in the flood prone areas of these districts face problem in the marriage of male members of the society, since no one in and around the area is willing to give their daughters in the flood prone areas because of the problems that they have to face during each flood in the area. These problems include- lack of proper place for women to carry out their daily necessary activities like bathing, etc. This has given rise to a new trend of buying wives from Bengal and Bihar for 10,000-12,000 rupees and bringing them to the village. It has also been found out that sometimes all the adult marriageable brothers of the house consume the so called "marriage". In other place like in the Silauta village of Bahraich district, this acute shortage of females for marriage has led to sexual frustration among the males and this has given rise to increase incident of rape in the area. The out migration of male member of the family leads to important changes in the power structure of the patriarchal family where women take the driving seat of running the family. In such a situation, the task of normative socialization of children gets disrupted, sometime even dropping out of children from the schools.

### **Social Impact of Sundarbans Cyclone**

The social impact of cyclone Aila was assessed exactly after one year of its occurrence. A cluster survey undertaken in the Gosaba block of south 24 Pargana of West Bengal revealed that the cyclone had differentially impacted the inhabitants of cyclone affected areas.

The main source of income of the people was put under two broad categories that were later compared in order to interpret the impact of cyclone *Aila*. Sources of income were tabulated under the before and after categories. Significant impact of *Aila* can be observed by glancing through the two groups of data (Refer to Table 1). The main livelihood in the area is daily wage labor, which accounts for more than half of the population (51.3% before *Aila* to



58.8% after *Aila*), next to which is agriculture, a major occupation of a large proportion of the population. However, according to the data it decreases prominently post-*Aila* (30.6% to 23.6%) as opposed to daily wage labor which depicts increase of the similar proportion.

This can be understood in the light of the fact that agriculture was adversely affected due to salt deposition in the land by tidal surges, which flooded the area, and this salt affects land fertility, therefore there is considerable decrease in the crop production. The salt deposition has resulted in an agrarian crisis and continuous rainfall is the only way in which it can be overcome.

Owing to reduced agriculture there was an evident occupational shift from agriculture to daily wage labor and other alternative means. Horticulture does not figure as a major source of income and there seems to be no change in it post-*Aila*. Aquaculture or more accurately pisciculture suffered severe setback, in terms of reduction in the amount of fishes in the house ponds and also in the rivers that led to a decrease in the source of income from 4.5% to 3.9%. The cause of this sudden drop is because of the increased salinity of water where fresh water fishes cannot sustain, though there are few species that may survive in salt-water, but salt water based aquaculture has not gained momentum so far.

Animal husbandry was unaffected, however it is noteworthy that there were no cattle left in Gosaba, they perished in the cyclone. There is a correlation between disappearance of cattle after *Aila* and salinity of land as it is incapable of providing animals with fodder or grass. Hence there is acute shortage of milk in the area, which has in turn resulted in regular use of powdered milk, even to feed the infants. Small businesses (e.g. tea shops, vegetable and fruit shops, fish/sea food markets etc) have incurred heavy losses (from 6.1% to 5.6%), some have shut down permanently, especially those established along the banks of rivers closest to the mangroves and the sea in villages like *satjelia*, *pakhiralaya*, *dayapar*, *kumeermadi*, etc. Minor or no impact was registered in the areas surrounding Gosaba *bazaar*, as it is slightly elevated in terms of ground level. Fixed salary occupation remained unchanged as all the government agencies shut down temporarily, the fixed salary of government staff or private staff remained unaffected. Honey collection shows minor improvement post-*Aila* (0.1% to 0.3%), which can be attributed to the sustainability efforts undertaken by the forest reserve in *Sajnekhali* in providing regular license to honey collectors to enter the forest after the cyclone *Aila*. The category of *others* in the table involves occupations like personal tutoring, land tilling, artisanship, handicrafts (wax painting and cotton weaving), etc. This category has definitely registered some increase (4.5% to 5%) post Cyclone *Aila* as people who have lost other means of income have involved themselves in such jobs in order to sustain themselves and their families.

### **Thematic Analysis of Social Impacts of Cyclone Aila**

Several themes emerged in the study of social impact indicating severe economic deprivation and poverty, migration and psychosocial impacts. Migration in Gosaba according to many respondents increased after cyclone *Aila*. A social worker and engineer of Rangabelia Tagore Society, a NGO that was actively involved in the area for relief and rehabilitation during the Cyclone *Aila* impact phase, gave a rough estimate of about 50%.

“For the last one year nothing could be cultivated. The salinity of the water and soil has increased. Almost 50% of the people have migrated. But the funding has increased. Some people have taken advantage of it. It happened at all the levels; foreign organizations have made it a business. Only a small percentage of relief reached here.”

The above statement from the respondent not only criticizes the system of relief distribution but it also focuses on a phenomenon of increased migration being directly proportional to increased funding. The fact remains that while the funds remain stable majority of population migrates thereby increasing the funds per person. It was quite obvious that those that migrated did not get relief. Sudden migration is quite unlikely in majority of cases. Those that migrate are more likely in need of safe shelter and protection than better livelihood opportunities. This migration is temporary and the family returns to resettle in the area. Long term planned internal migration with the intent of asset enhancement takes places only after a period of time, post-disaster, when the members find it difficult to sustain due to lack of resources.

In a FGD conducted with van-pullers, migration was a preferred coping strategy by nearly all of them. A 32 years old van-puller responds

“I am interested in moving out, I would rent a room. If I move out there would be a number of opportunities. Outside vegetable business is very popular. After *Aila*, like others, I have more needs too. Earlier after our daily expenditure I was able to save 10-20 Rupees per day but now it is impossible for me to save even this much”.

Another respondent of about the same age said

“Earlier every family was able to cultivate some land. They would save grains for the coming 6-8 months. Now, I have no choice but to go out. It would be impossible to start a business after buying 10 Kathas of land in the village itself. I have small family so I can manage moving out”.

Several factors contribute to the process of migration, poor socio-economic status being one, closely followed by limited resources to earn, involuntary factors like natural disasters that reduce the asset accumulation and also loss of accumulated assets. Migration is a means to acquiring more assets based on the existent human capital. Below are the trends of migration within one year of cyclone *Aila*. The table shows around 28% of the population being involved in migration. While a majority chose to stay back in their homeland citing a number of reasons like inability to work outside, no willingness to

leave ancestral land or family, looking for alternative means of income etc. In order to avoid complete displacement of the family to some other place, some of the family males have practiced circular migration i.e. the movement pattern is rural to urban for varying time frame and then they regularly return to their homeland (Ellis Frank, 2003).

In a FGD with the Fishermen and Honey-Collectors of village *Sonaga*, features of circular migration were brought to light, many of the fishermen move to cities like Delhi, Calcutta to work as a daily wage laborer in the off season.

“I went to Kolkata after the Cyclone and worked for 2-3 months, I could only save 1000 Rupees to bring back home, rest all the money was spent in my own expenditure. We do all sorts of work in the off-season, what to do? Our condition is very bad, some work under the 100 day schemes as well.”

The savings from these wages are brought back to the family. It may not always be the head of the household who moves out to earn, there are times when adult or adolescent family members initiate the process of migration within a household.

There are other aspects to migration as well, not always do the limited resources trigger migration. A woman working in the Batik printing workshops of *Rangabelia Mahila Samiti* moved to Gosaba after suffering years of physical and mental violence and tyranny from her husband and his family. She was forced to return to her parents after the birth of a girl child, a reason for increased mutiny.

“After Aila I was with my parents but I suffered a lot, though there was scarcity at my family also I was still better off, later my maternal aunt who also works here at the Mahila Society brought me with her, I underwent 3 month long training and started working here. I am sure I will be able to save enough to sustain myself and my daughter.”

Summing it up, in terms of migration, it is clear that lack of sustainable livelihood has led to intensive migration. As the headmaster of Rangabelia High School commented

“People are not able to feed their children in Gosaba. They are going out to look for jobs. There are no job opportunities for them even at Kumeermadi and Mollokhali. There is no labour. They have to move out to places like Chennai. Intelligent students have left Gosaba for good job. Vocational training is there at this school and Gosaba High School, but no one stays here after the training.”

A combination of lack of sustainable livelihoods and vulnerability of any community to such natural hazards exposes the social profile of a community. Clearly enough *Aila* affected regions have found migration as one of the preferred coping strategies, much of the migration has been to metropolitan cities of India as employment opportunities are plenty. However this discourse on migration leads us to another theme that is insecurity largely related to

migration. As is evident in migration, the need for new resources takes people away from home but not always do they manage dignified income earning opportunities. Forced by the impact of disaster not only do adult males migrate, at times adolescent males and females also migrate. The headmaster of the Rangabelia School brought forth information in this regard

“The drop-out is high in class 11<sup>th</sup> because after passing out secondary exams they [children] move out of the village in search of better employment to sustain their families.”

According to many respondents the rate of male migrants is higher but female migrants are on rise as well. Women who have lost earning members of the family or their means to earn post disasters have either relocated themselves in urban areas or have at least migrated to urban places to work. The vulnerability of such adolescent and women migrants is high in terms of exploitation and forced employment. There have been cases of family losing all contacts with their children as they were forced into labor and denied contacts with their family. Such information was evident in FGD with women of the block.

“What a man can do, a girl cannot. Men can live freely but women have some restrictions. If a woman does so, she has to face the problem and people are scandalized. We have faced this kind of problem, we had nothing to earn and I had to do it.”

However insecurity does not always arise from migration, there are other contributing factors such as instances of looting of relief material and exploitation of the poor which become extremely frequent especially during shortage of relief and resources. According to a travel lodge owner in a Dayapar, who witnessed violence during relief distribution it was a time when people were ready to resort to violence in order to gather relief for their family.

“People used to come in helicopter and provide us with drinking water. We used to fight with each other in order to get enough for family consumption.”

People who did not lose their houses or ponds would sometimes restrict others to use their facilities. The ones, who had lost their house and basic necessities, were found reluctant in seeking favors from them, as they feared exploitation. Vulnerability to exploitation at every step is again a by-product of lack of sustainable livelihood. Economic constraint is one of the prominent constraints emphasized repeatedly with the loss of livelihood means. Post cyclone *Aila* people incurred heavy losses; there was both human resource loss and asset loss (both tangible and intangible). Increased salinity of soil and water bodies led to loss of both crops and fishes. According to farmers and agricultural labors, the land fertility is completely at the mercy of rainfall. There is no honey in the forest as the land is unable to produce flowering crops to provide for nectar for honeybees. Fishes in the rivers and the ponds have marginally reduced due to salt accumulation, which has in turn affected the fish trade unfavorably. Not only did the disaster delimit the livelihood options of people

in *Sundarbans*, it left many in extreme levels of poverty. There was shortage of relief supplies and resources, as many NGOs could not reach the affected areas, leaving many families hungry and thirsty for days together as claimed by many respondents. People had no other choice but to drink water from the pond, which led to fatal enteric diseases. One such agricultural laborer from *Malopada, Arampur* described the miserable condition of his family during *Aila*

“Since we had nothing left after cyclone Aila, we had to cut down our daily food consumption. We would avoid eating food thrice a day and would consume it only once or twice.”

A majority of the population owns mud houses, which completely demolished in the heavy rains and floods that followed the cyclone. People had hardly any time to carry their belongings when they fled their houses. They took shelter in school buildings, hospital, block development office and Tagore Society complex, where they stayed for 2-3 months. During this time, most of them were without any means of income and were being provided resources by relief agencies.

People in Gosaba generally have multiple means of income but with *Aila* ruining a major chunk of their livelihood i.e. agriculture and fishery, they had few alternatives. The condition of economic liabilities is such that a female respondent working at Rangabelia Mahila Samiti as batik worker could not get married.

“My family income is very less; my father is a gharani (helps in Mud house construction). I am now of marriageable age but my family is unable to meet with the dowry demands after cyclone Aila. I am trying to save money in a recurring deposit account for my marriage.”

The people experienced changes in gender equation during the phase of recovery in terms of their livelihood skills. If men and women had culturally and socially assigned roles before any disaster, the dynamics changed post disaster. Each member in the household struggled to his or her respective abilities despite the culturally prescribed roles. Within their society the course of action is determined not just according to their abilities but gender as well. Women are more culturally bound than men in south Asian communities as was the case in Gosaba. Post disaster women migrated for work, they worked in cooperative societies/ NGOs to sustain their families and but all of it remained socially sanctioned. Any act beyond the limits of impressed social roles was regarded disrespectful; they are expected to act within these boundaries. Certainly with added responsibilities came added vulnerabilities. A respondent who was pregnant at that time, had to take care of her family's needs in the absence of her husband who was stranded in their lodge.

“Even though I was 6 months pregnant at that time, I was the only one capable of taking care of the rest of the family. We had no food and safe drinking water and my husband was in our tourist lodge. I had three more

members in the family to look after, other than me. My mother-in-law and I set up a hearth in the school building where we took shelter in those days, and we were harassed to cook for many others also, I suffered from diarrhea, the smell of the waste lying around made me sick a number of times.”

During such difficult times, with shortage of food and drinking water and children suffering from diarrhea, women would stand in long queues to get safe water from the launches (ferries) that would come to their village once a day. Sometimes they had to move to far off places to fetch water and food being provided by some NGO or the government while the men in their family looked for means to earn. Though the role of men in such emergencies becomes increasingly livelihoods based, women also contribute economically while also taking care of family. For *Bir Sardar*, a van puller and a performer from *Jetirampur*, income contributions from his wife helped them in times of need

“While the embankment was being repaired after the Cyclone, I worked with others as a labor under the 100 days employment programme. I would till the land, collect garbage to earn a living. My wife would make earthen pots and sell them at Rs 4 per pot. This was our only income”

Common opinion were shared by many fisherman/honey-collector from the village *Sonaga*

“We earn our living by fishing and honey-collection in the peak season, but in the off season most of us are involved in daily labor or 100 days employment scheme and the women in our family go fishing for Baghda (a variety of prawn found near the mangroves), which we sell in the market. We get good rates for Baghda. I think women are much better in coping with disasters”

Evidently these experiences of men give us an insight into the dynamics of gender, wherein women and men both involve themselves in income-generating means based on their capabilities. This role of women not only helps in building up financial assets and recuperating the household but it also accords some degree of experience and power in decision-making. Though in most cases there is unequal distribution of authority within a family or household, increased liabilities on women do not always subjugate them but strengthens them with knowledge and conscious decisions.

Disasters are a traumatic phase for an individual and also the complete household. Disasters cause acute mental and social stress. Psychological impact of any disaster of such intensity is long lasting. However a matter of concern is the lack of a counselor or therapist in almost all disaster prone areas of the country. Though critical to the well being of an individual, not much importance is associated with the psychosocial well being of the victims of disaster. One always requires some social support, especially in times of disasters, as was the case with the woman and her three children at *Vidhwapada, Arampur*,

“When Aila struck us, my husband was in Andaman, I was all alone with my children, I had limited money and if it were not for the support of my neighbors

I would not have survived the disaster. I am very satisfied with the community support.”

When faced with disasters victims suffer from depression, shock and trauma. Much of it is borne in the loss financial capital and even human resource loss i.e. to say death of a member of family. One of the best-employed coping strategies in such disturbing phases is collectively carrying out daily chores to combat stress. Community support in times of emergency is one of the most viable resources in fighting collective stress. As one of the agricultural labors explains the system of loan and debt, he also puts forth the spirit of community living and social bonding.

“In our society, if one suffers from some illness or is in need of loan, they get it from their neighbors and in return they work for the neighbors or simply return the money without any interest rate when it is convenient.”

Lack of sustainable means of earning can cause utmost anxiety especially to the individual responsible for her/his household. People make the best use of their human capital in such condition but failure in accessing resources leads to impatience and nervousness. According to a fisherman, the responsibility of his family was the only cause of stress but it also motivated him to work hard to sustain his family.

“Immediately after the Cyclone, I had to sustain my family in every way possible. It did not matter if I earned 2 Rs or 5 Rs a day. This was a shock. There is enough mental stress and I don't say that it is only me, everyone is suffering from anxiety, no one is better than the other and we are all trying our best to be normal.”

Feelings of empathy and inter-personal bonds among neighbors, between employees and employers, community leaders and people contribute to minimizing stress levels in the population while adding to community resilience.

### **Social Impacts of Extreme Weather Events**

The social impacts of extreme weather events are going to be quite complex and variable. The variable impacts will manifest differently on the rich and the poor with poor being in less advantageous position than the rich. This has been especially marked by a number of authors. For example, according to Pittock (2009), “In general, in today's climate, extreme climate events such as floods, droughts and storm surges cause far more deaths in poor countries than in rich ones” (p 119). The poor will not only be dying in large numbers but they will be more vulnerable to the economic, social and political aftermaths of the extreme weather events. Firstly, the poor generally inhabit the less protected areas such as low lying or marginal areas prone to floods and thus would face the brunt of the extreme events more than the affluent section which has the necessary resources to inhabit relatively safer areas. Secondly, the poor being occupying the vulnerable areas will suffer

from proportionately greater asset loss than the rich. The recovery for the poor will take longer time than the rich as they would lack in insurance and other safe alternatives. Thirdly, the delay in recovery would have its mental health consequences with poor facing more anxiety and stress.

The social capital of the poor in general is better and this fact needs to be considered quite carefully in the programmes aimed at post disaster response or disaster mitigation. In general, the modern day disaster managers do not pay adequate attention to the existing resources and capacities and start as if every thing has to be done afresh. The assessment of a priori capacities of the people, especially the poor and its mainstreaming would go a long way in managing weather related extreme events. In the words of Giddens (2009), "Even in the most deprived conditions, poor people are not normally without resources – they have assets and capabilities that can help develop resilience. Adaptation policies should as far possible focus on strengthening that resilience. For instance, traditional systems of adaptation to climate variability include switching crops, social network of support and assistance or collective saving mechanisms" (p. 179). A case in point will be the manifestation of the invisible savings at the household level in wake of recent demonetization. Especially with the Indian home maker women, the surfacing of the family savings unknown to other members was a revelation to the economic managers. Such assets in the form of social, economic and political capital need to be identified, supported and mainstreamed in disaster mitigation and management initiatives.

The key therefore lies in reducing vulnerability and increasing resilience through greater reliance on the existing resources and capacities over which the disaster mitigation and response should be built. We need to create a system which is less dependent on outside resources and support. The strengthening of local community at micro level will go a long way in climate change adaptation as well. As has been rightly said by Adger et al. (2009), "Building resilience and the capacity to adapt to climate change promotes flexibility, learning and protection of ecosystems from shifting into ultimately undesirable states and provides common good resources to cope with change in general as well as direct social and environmental benefits." (p. 2). The people of Bahraich and Sundarbans represent communities with endless possibilities. They are waiting to be considered as active survivors rather than passive victims. The respective state governments need to look at disaster mitigation and disaster response, not merely as relief distribution and bureaucratic norm fulfilling exercise but as opportunity in strengthening the local community by recognizing its capacities and assisting it in better preparing for adaptation and recovery. Management of extreme weather events and climate change are not two separate activities but are closely integrated. Thus, disaster mitigation and disaster management is equivalent to climate change adaptation.



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**Table 1**  
**Main Source of Income before and after Cyclone Aila**

<i>Main Source of Income</i>	<i>Before Cyclone Aila</i>	<i>After Cyclone Aila</i>
Agriculture	30.6%	23.6%
Horticulture	0.4%	0.4%
Aquaculture	4.5%	3.9%
Animal husbandry	0.4%	0.4%
Small business	6.1%	5.6%
Fixed salary	1.9%	1.9%
Daily wages	51.3%	58.8%
Honey collection	0.1%	0.3%
Others	4.5%	5.0%
Missing Response	0.1%	0.1%
<b>Total</b>	<b>100%</b>	<b>100%</b>

**Table 2**  
**Migration Trend**

<i>Migration in the household after 1 year due to Cyclone Aila</i>	<i>Percent</i>
Migrated	<b>27.9%</b>
Did not Migrate	<b>72%</b>
Missing Response	<b>0.1%</b>

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