

Climate Change, Disaster and Gender Vulnerability: A Study on Two Divisions of Bangladesh

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Bangladesh has become synonymous for climate change induced natural disasters. The environmental consequences of climate change affect men and women differently. Research reveals that disasters reinforce, perpetuate and increase gender inequality, making bad situations worse for women. People of all classes especially the poor are the most vulnerable group to experience those disasters. In addition to that, compare with the men, poor women are seriously affected by climate change-induced environmental degradation and natural disasters in Bangladesh. This paper tries to explore the condition of women during disaster, their special vulnerabilities and coping mechanism during disastrous situation. Both secondary and primary data have been used and analyzed to identify their overall condition during hazardous situation. The study indicates that women are affected more severely but they endure their vulnerability surreptitiously and hardly show any remonstrance. These imply that the effects of climate change-related events on women are quite conspicuous compared with their male counterpart.

Keyword: Disaster, gender vulnerability, violence, feminization of poverty, women's health, food intake, mortality

Background of the Study

Climate change is causing more severe and more frequent storms and drought, resulting in changes in timing which brings about changes in the pattern of seasonal cyclones, seasonal diversity and quantity of rainfall which cast havoc on agricultural production. This unwelcome variation in seasonal cycle combined with environmental degradation like deforestation, soil erosion, and desertification have had a very negative repercussion on the global standards of health and livelihood. This particularly affects poor countries, where, ironically, people emit the least per capita, but pay the highest price for the emissions of wealthy, high-emitting countries. Just as climate change unequally impacts wealthy and low income countries, as well as the rich and poor within countries, it is also unequal in terms of gender. Emerging evidence shows that women and girls will experience even greater inequality through the impacts of climate change. It has been well-documented that women are differentially impacted by disaster. We know that women suffered disproportionately in nearly all disasters: elderly women died at higher rates than older men in the European heat wave in 2003; women vastly outnumbered men in tsunami deaths in 2004; women outnumbered men in cyclone deaths in 1991 and 2007 in Bangladesh, and the list goes on. A study of

4,605 natural disasters found that disasters shortened women's life expectancy significantly more than men's (encouragingly, this association was reduced where women's status is more equal). Many women are made vulnerable by their lack of access to sources of emergency information, as well as their lack of decision-making power in disaster prevention and preparedness programs; they are also often excluded from disaster recovery operations and from planning at the national level.

The concept of vulnerability has been the focal point of much importance in the evolving discourse about the consequences of climate change and adaptation strategies. Some studies arrive at the conclusion that effects and repercussions of extreme weather related- disasters are gender-biased and that woman experience greater impacts and higher vulnerability than men. This does not mean that men are not affected or that all women are in weaker positions than men regarding vulnerability under disaster induced environmental situation.

Rationale of the Study

Bangladesh is recognized as one of the most disaster-prone countries of the world and is extremely vulnerable to climate change. Although the extreme weather events in Bangladesh include droughts, earthquakes, riverbank erosion, and landslides, floods

and cyclonic storm surges are the major killers that cause the most direct and indirect damage in the country. Due to climate change, these events are becoming increasingly frequent and intense, resulting in significant human and economic losses.

Bangladesh is among the poorest and most densely populated countries in the world. She has alluvial soil with floodplain, making it especially vulnerable to flooding disasters. Even in a normal year, almost half of country undergoes flood and inundation bringing flood related risks, and more than ten million people live in areas of high risk, lead landless, impoverished fishermen, and tenant farmers remain most exposed to natural hazards. Poverty and scarcity of land have forced millions of poor people to live in the vulnerable position who are adversely affected by climate change related disasters.

Bangladesh, in particular, is threatened by devastating floods and other damages from monsoons, melting glaciers, tropical cyclones that originate in the Bay of Bengal, water contamination and ecosystem destruction caused by rising sea levels. The population of Bangladesh, which stands at 142 million today, is anticipated to increase by approximately 100 million people during the next few decades, even as the impact of climate change and other environmental factors steadily render the low-lying regions of the country uninhabitable (Joehnk, 2007; Barnett, 2001).

Tropical cyclones hit the coastal belt at least once a year, causing rainwater floods, salt-water incursions into the land territory and wind damage. Since the 1991 cyclone disaster, the country has witnessed many more cyclonic disasters. As the floods, cyclones and other natural disasters are featuring more frequently than ever, marginal economical activities like fishing and other agriculture are being seriously hampered and this also explain why subsistence economic groups are quickly losing their livelihood and base security.

The vulnerability of women in Bangladesh is much higher than men during these disasters due to their poverty, their attitudes, social norms, and their marginal position in the social system. National policies, institutional frameworks and adaptation measures are also responsible for placing women in vulnerable positions.

Objective of the Study

This paper will primarily explore the gender vulnerability as the context of natural disasters caused by climate change, as the focus will fall on the south-western coastal belt and northern region of Bangladesh. In this paper we begin to sketch some

questions which arise from a concern to understand the tripartite interaction of gender, livelihood and climate change in the broader context of social change.

This paper therefore raises three questions with the potential to extend the literature on gender and climate change:

- To analyze the impact of climate change on women health
- To assess the experiences and gender specific contributions of women during disasters
- To analyze existing state interventions to address the issues relating to climate change and gender during disaster

Research Methodology

This study completed mainly on the basis of Content Analysis, where secondary data were the predominant source of information. Data were drawn from relevant books journal, articles, archival records, formal studies and reports, public documents, newspapers, internet websites etc. Besides, 120 household samples and 8 case studies (for in-depth analysis) were selected from the two major disaster-prone divisions; Barisal division particularly Bauphal upazilla in the Patuakhali, Amtali and Taltali upazilla in Barguna, Bhola sadar upazilla in Bhola districts (the southern part where cyclone, tidal surge, water logging, flood occur frequently) and Rajshahi division especially Sirajgonj sadar upazilla in Sirajgonj district (the northern part where flood, river erosion are prevalent). These sites were selected following purposive sampling procedure from the disaster prone areas.

The data were collected from May 20, 2011 to July 10, 2011 through face to face interview. Proportional percentage has been sorted out to give the research a proper logical quantitative ground. Participants or respondents were women, adolescent girls and women with disadvantageous position (excluded women, elderly women, widow, the disabled) etc. The questions were asked based on mid and post disastrous precarious health condition especially skin, water and vector-borne diseases. Even mortality of women and adolescent girl, the bitter experiences at workplace, subjection to violence, state interventions during and after disasters, their restricted access to resources, power structures, education, and relief system were given maximum coverage in those questions asked. The study based on the review of the questions and the feedback from the respondents, considers possible ways to address or mitigate the vulnerable or destitute situation of women.

Climate

The concept of climate consists of the statistics of temperature, humidity, atmospheric pressure, wind, precipitation, atmospheric particle-count and other meteorological elemental measurements in a given region over long periods. Climate and weather are two contrary states of which, weather represents the present condition of these elements and their variations over shorter periods.

According to American Meteorological Society Climate (from Ancient Greek *klima*, meaning inclination) is commonly defined as the weather averaged over a long period. The opinion of American Meteorological Office about standard averaging period of climate is 30 years, but other periods may be used depending on the purpose. Climate also brings into accounts above average statistics such as the variations of the length of day and year.

The Intergovernmental Panel on Climate Change (IPCC) glossary definition is: *Climate in a narrow sense is usually defined as the "average weather," or more rigorously, as the statistical description in terms of the mean and variability of relevant quantities over a period ranging from months to thousands or millions of years. The classical period is 30 years, as defined by the World Meteorological Organization (WMO). These quantities are most often surface variables such as temperature, precipitation, and wind. Climate in a wider sense is the state, including a statistical description, of the climate system* (Climate, 2013).

Disaster

The term 'Disaster' can be more easily conceptualized than they can be defined. It is defined differently by different scholars: to some 'disaster' is a summative concept' or a 'sponge word'. Ian Burton et al. (1978) have defined in their book 'The Environment as Hazard' that disaster is a 'collective stress situation', while Quarantelli, and Dynes (1977) identified it with 'social crisis period' in their writings 'Response to Social Crisis and disaster' (Annual Review of Sociology' 3: 23:49). Disaster is a severe, relatively sudden and unexpected disruption of normal structural arrangements within a social system over which the system has no firm control. According to Turner (1978) in his book *Man Made Disasters* 'disaster may also be viewed as a significant departure from normal experience for a particular time and place'. Disaster is also viewed as a mental construct imposed upon experience. So, the concept of disaster based on the number of deaths, the value of property destroyed or the decreased in per capita income does not suffice for comprehensive

understanding of its whole range of meaning. The symbolic component requires knowledge of the sense of vulnerability, the adequacy of available explanation and the society's imagery of death and destruction (Barkun, 1977, p.221).

Vulnerability

During the 1970s and 1980s an alternate discourse emerged, but this model known as classic is problematic as it inevitably leads to the oversimplification and neglect of significant components of disasters. In particular, the social structures that produce inequalities of gender, ethnicity and class (among others), in turn, produce vulnerability to hazards (Blaike et al. 1994; Hewitt 1997). According to Blaike et al (1994: 10) disasters are produced by the complex mix of social, political, and economic forces that produced vulnerability of people to hazardous environments. Therefore, while hazards are natural, disasters only strike when it has an effect on vulnerable people (Cannon, 2004).

The term *vulnerability* is defined as 'the characteristics of a person or group and their situation that influence their capacity to anticipate, cope with, resist and recover from the impact of a natural hazard' (Blaike et al, 1994; Fordham, 1998). Vulnerable groups are often categorized under age, class, ethnicity, gender and physical or mental disability. Depending on the nature of the hazard and the socio-cultural context, different groups are more vulnerable than others.

Climate Change and Disasters

The global climate is changing and it is likely to change further over coming decades due to increasing concentrations of 'green house gases' in the earth's atmosphere caused largely by human activities. This will result in greater variations in weather patterns, a greater frequency of extreme weather events such as floods, cyclones, droughts and tropical storms, and gradual rises in average temperatures and sea-levels. Bangladesh is extremely vulnerable to climate change impacts because of its geographical location, high population density, high levels of poverty, and the reliance of many livelihoods on climate-sensitive sectors, particularly rural agriculture and fisheries.

These impacts will be falling more heavily on the women and girls of Bangladesh

Global warming has significantly increased temperature in our world. Sometimes this global warming melts the glaciers of Himalayan and the low lying countries like Bangladesh, Maldives, and Myanmar etc. faces flash floods.

The projected sea-level rise (SLR) along the coastal areas of Bangladesh will be about 88 cm by the year 2100. If it comes true, a majority of the low-lying non-embanked coastal areas may be completely inundated. There will be increasing risk of coastal salinity (both soil as well as surface water, including drinking water from wells). SLR will cause shoreline retreat, resulting in increase in basin area, which contributes to increasing the cyclone path length. This will allow the cyclone.

With the sea-surface temperature consistently increasing, the vacuum created in the air and also brings about storms, cyclone, tornado, tidal surge etc.

As the climatic change occurs frequently and drastically, natural disasters happen. Natural disaster brings drought, famine, flood and food insecurity problem. So females are exposed to sufferings from many malnutrition problems.

The deficiency in nutrition in the females of Bangladesh leads inexorably towards their infertility. Their menstruation age fluctuates and causes reverse gynecological complication regarding bearing of child.

The overall disaster scenario in Bangladesh is gradually changing for the worse. The country has been facing yearly troubles like floods, droughts, cyclones, landslides and earthquakes etc., on the one hand, and epidemics, fire, conflicts, communal riots etc., on the other. Because of geographical and meteorological extremities and specificities socio-political and cultural diversity, women are more vulnerable and in a more precarious situation.

The most vulnerable points of Bangladesh are the coastal areas-the southern coast and south-western region in general. Cox'sbazar, Barisal division and Khulna division are more vulnerable to cyclones in particular; northern region is drought-prone and also flood-affected; Chittagong or hilly zones are vulnerable to land-slide; and sometimes Dhaka-northern and southern parts- suffer from periodic events of earthquakes.

The impacts of climate change magnifies many risks to which women in developing countries are exposed, constraining and undermining the centrality and at times the significant role that women perform in the cohesion, integration and well-being of their families and communities, and in their contribution in preserving the integrity of ecosystems.

In order to assess viable strategies of adaptation, some factors need to be carefully considered: how vulnerable people are to climate change impacts and how resilient they are to those impacts without experiencing corresponding fall in living standards. Relevant to these considerations are knowledge of their income level and income disparity, as well as medical and health status. A survey ranging from educational facilities of the disaster-affected

population in addition to taking stock of resources of their natural milieu will prove beneficial in the assessing task.

Climate Change, Disaster and Women Vulnerabilities: Analysis

The climate variability has pushed women into a vulnerable and marginalized position in Bangladesh. For the analytical purpose, I have already mentioned that climate change itself does not directly affect the women, but the disasters especially natural disasters and man-made disasters like socially constructed system have made the situation possible where climate change plays a key role in instigating the vulnerabilities. This work examines the relations between extreme weather related disaster and gender-bias in the social vulnerability. These are part of the gendered impacts of climate change together with its consequences on women's health, agricultural livelihoods, water access and use, wage labour, migration and conflicts related with the deterioration of the environmental conditions (Brody et al., 2008).

WHO notes, 'women and children are particularly affected by disasters, accounting for more than seventy five percent of displaced persons. In addition to the general effects of natural disaster and lack of health care, women are vulnerable to reproductive and sexual health problem, and increased rates of sexual and domestic violence. Moreover, gender roles dictate that women become the primary caretakers for those affected by disasters- including children, the injured and sick, and the elderly- substantially increasing their emotional and material workload. Women's vulnerability is further increased by the loss of men and/or livelihoods, especially when a male head of household has died and the women must provide for their families. Post disaster stress symptoms are often but not universally reported more frequently by women than men' (Dasgupta et al., 2010, p. 6). Aspects of gender specific vulnerabilities are:

Women's health, food intake and mortality

Women's health is a factor to sustain in climate induced changes. Women of all ages are more calorie-deficient than men, and the prevalence of chronic energy deficiency among women is the highest in the world (del Ninno et al., 2001). Poor health and calorie deficiency make women vulnerable during climate indeed catastrophes. Women also receive less and poorer-quality healthcare in comparison with men. Bangladesh is one of the few countries in the world where men live longer than women and where the male population

outnumbers the female (Asian Development Bank 2001). These conditions have complicated women's adoptive capability and capacity to cope with disasters and other adverse climatic changes. For example, the 1991 cyclone in Bangladesh killed 138,000 people, many of whom were women and older than 40 years (Cannon, T., 2002).

The statistics of mortality and morbidity rates of environmental disaster point to a staggering disproportion and discrepancies in terms of their impacts on the gender/sexes. The vulnerability of women and children to the disaster and post disaster casualties is 14 times greater than those of men (Araujo & Quesada-Aguilar, 2007). A case in point is the cyclone and flood of 1991 in Bangladesh when the mortality rate of women increased fivefold compare to that of men (Rohr, 2005). Three times more women were killed compared to men in the Asian tsunami of 2004 (Revathi, 2007; UNEP, 2005; Dasgupta et al., 2010: 79). And another scenario of extraordinary vulnerability of women is the 71 per 1000 of mortality rate of women within the age range of 20-44 years whereas men belonging to the same age range register the rate of 15 per 1000 (Aguilar, 2006). Startling as it is more women than men died in Asiatic Tsunami in 2004. Even in the country like the USA hurricane Katrina in 2005 brought the biggest survival obstacles for her population mostly failed to a shuttering extent by the female section of the society especially of Afro-American origin (Araujo & Quesada-Aguilar, 2007; Dasgupta et al., 2010: 64).

Consequently the majority of women do not know how to swim. Also the kind of clothes women wear could restrict their mobility and thus a quick escape during an emergency situation can become difficult (Mehta, 2007, p. 9; Dasgupta et al., 2010: 65). Other factors contributing to higher mortality rates among women during disasters are:

- Women have limited access to information such as early warning systems. The majority of women are left aside from most information lines.
- Poor construct and insecure housing system constructed to the increased mortality rate of women. The poor- infrastructures which happened to be the residence and working place of poor women account for a substantial portion of their mortality rate.
- Some gender based and culturally assigned roles like poor decision making and weak bargaining power of women coupled with rigid patriarchal social norms, mores and value systems do not allow women to save themselves in disaster situations (Nelson et al., 2002: p.55; Aguilar, 2006; Dasgupta et al., 2010: p.65).

In the aftermath of environmental disasters, the health condition of women deteriorates alarmingly. Firstly, one prominent cause of their falling post disaster health status is the fact that community looks

at the health and hygienic needs with cold indifference and perennially avoid addressing the issue of providing institutional assistance in their most trying and vulnerable moments. Secondly, socialization factors such as the neglect of these basic needs among women play an important role in determining their health condition.

Women are more prone to nutritional deficiencies because they have unique nutritional needs (especially when they are pregnant or breastfeeding), and in some cultures are lower on the household food hierarchy. In some regions, women's nutrition is particularly precarious. In South and Southeast Asia 45 to 60 percent of women of reproductive age are underweight and 80 percent of pregnant women have iron deficiencies (FAO, 2000; Davis, I. et al., 2005).

Social taboos about menstruation and norms about appropriate behavior have contributed to health problems for young women in disaster situations. A study reported that during the 1998 flood in Bangladesh there was an increase in perinea rashes and urinary tract infections in adolescent girls because they were not able to properly wash and dry their menstrual rags (WHO, 2005).

It is commonly found that the pregnant, breastfeeding and menstruating women are at risk of compromising their health after disasters. Scarcity of suitable places for babies' breastfeeding, proper sanitary materials such as women's underwear pose great hazards for women during and post disasters health condition. Besides, as these articles are usually distributed by men and that there in inadequate number of female doctors or even health attendant complicate the overall health situation beyond control (Dasgupta et al., 2010: 62).

The list of essential goods that are found insufficient goods and services include medical care like contraceptives but control pills etc. This increases the likelihood of sexually transmitted diseases.

Another problem in refugee camps is the common absence of culturally appropriate hygienic facilities for women and men, which may worsen the health and security situation for women especially adolescent girls. Lack of privacy at latrines, unavailability of separate toilets, showers, and tents for women and men and adolescent girls are some unresolved issues that culture has always failed to come up with fail to address (Mehta, 2007, pp. 11-12; Dasgupta et al 2010, p. 66).

Water is another source of health hazards for women. Women frequently use water to care for children, the elderly and the sick, as well as to carry out many household tasks. Women and girls carry the highest risk of getting in contact with polluted water and falling sick during and after disasters (Nelson et

al., 2002: p.56; Mehta, 2007: p.12; Dasgupta et al., 2010, pp. 65-66). Water-borne diseases might be expected to be more widespread among women, who are nutritionally disadvantaged.

The health problem of the respondents consequently occurred during disaster. From the collection of primary data it is seen that 63.33% of the respondents suffer from various diseases like cholera, malaria, typhoid, jaundice and many epidemics etc. during a disaster. Only few of the respondents opine that they suffer from single disease. But it is quite a concerned issue that all of the respondents suffer from disease.

Working load in the family and their burden

Due to extreme weather events and the loss of economic activities in the primary sector like agriculture, cultivation of cereal and livestock farming women experience a significant increase in their workload after disasters. Besides, girls and women have to perform their home duties such as preparation of food, fetching water, collecting firewood and waste disposal. Moreover, household workload can increase to such a degree that girls could be forced to leave the school to help with domestic chores during and after disasters.

Women show a higher economical vulnerability than men. In general, women have lower average literacy and education levels, limited access to gainful employment and weak or no control over local (environmental) resources, especially land ownership and legal access to water supply systems (Dasgupta et al., 2010, p.67).

Women also experience restrictions in their mobility as workforce, due to their roles in supplying and caring for the extended family.

The unequal impact on women is not only evident in major disaster events--it also affects everyday life and opportunities. In many low-income countries, women already work more hours each day than men (a study in rural Cameroon found that women work more than 64 hours a week, compared to men's 31 hours). The Food and Agriculture Organization of the United Nations (FAO) estimates that women produce 60-80 percent of food grown in the developing world-- often small scale crops critical to their family's sustenance. Women and girls are responsible for collecting and carrying water--a time consuming and physically demanding task in places where wells are not easily accessible. In some places, this work takes hours each day, and as communities cope with the effects of changes in climate, demands on women's time and workloads are likely to increase.

Like many other traditional societies, women in Bangladesh are involved in domestic household as well as farming activities to lead their livelihood. However, climate induced environmental and socio-economic changes have increased their burden and hardship. It is evident that floods increase women's domestic burden. The loss of utensils and other household essentials is a great hardship, and floods also undermine women's well-being in general because of their dependence on economic activities linked to the home (Khondoker, 1996). Losses of harvest and livestock have a disproportionate impact on women, many of whom rely on food processing, cattle, and chickens for their cash income. Fetching water becomes much more difficult for these women, and the water they fetch may be contaminated.

Nasreen points out that to cope with the natural calamities like flood women have to bear more physical burden than men due to gender specific tasks like procuring food and cooking, providing drinking water, storing fuel and child care. During floods women protect households, their children, their aged relatives and livestock and other belongings. Women sell assets, adjust their work, cooking and consumption patterns, use common village resources and their social networks, provide primary health care to the sick members in their households, and undertake gainful or income-generating activities which give their lives a purpose and a chance for self-fulfillment. Their role, however, was largely unrecognized (Dasgupta et al., 2010).

Most of the respondents of these sites say that women are most responsible to collect drinking water. Their percentage is 72.5%. Only 27.5% of the respondents say that their husband and others collect drinking water during disaster.

Access to economic security

Women have limited access to resources in social networks, transportation, information, skills (including literacy), control over land and other economic resources, personal mobility, secure housing and employment, free from violence and decision making power. These are essential in disaster preparedness, mitigation and rehabilitation (Dasgupta et al., 2010: 95).

Enarson has determined four types of economic impacts of the disaster on the women's participation in economic life. First, women become economically insecure after a disaster. Second, women's responsibility and workload increase. Third, women's working conditions deteriorate. Fourth, women take considerably more time to compensate for the economic losses caused by the disaster compare to that of men (Enarson, 2000; Dasgupta et al 2010, p.141).

Compared with men, women are poorer, have less access to developing entrepreneurial skills, less ability to access financial resources like credit, savings or pensions, less ability to buy and own land, are paid less if paid at all, and their income is less secure.

Over 95 per cent of female-headed households in the Asian region are reported by the Asian Development Bank to be below the poverty line. Women's income is more likely to be derived from the informal sector, which is often the worst hit by disasters and the least able to recover from the effects of disasters due to low levels of capital accumulation, and weaker access to credit and information.

Access to help

Women face some barriers to get adequate aid and access to compensation benefits from aid agencies at different levels. Cultural barriers can discourage women to present compensation claims for damages resulting from weather-related disasters (Dasgupta et al., 2010, p. 68).

Social problems

Bangladesh is exposed to several disasters such as flood, cyclone, drought, tornado, cold wave, earthquake, drainage congestion/water logging, arsenic contamination, salinity intrusion etc. but the nature, season and extent of the hazards are not the same in all cases (Nasreen, 2010, p. 233).

Cyclones and floods are frequent phenomenon in Bangladesh caused by natural and human activities. In 2007 almost the whole country (46 out of 64 districts) was inundated due to flood and in 2007 and in 2009 about 10 districts was destroyed due to cyclone 'Sidr' and 'Aila' respectively. Millions of people were marooned. Flood devastated houses, infrastructure; flood, tidal surge and cyclone destroyed agricultural activities, crops, livestock, fisheries, forests. Number of death from water borne diseases, due to snake bites, drowning and lack of medical facilities were more than the previous floods. Women felt insecure at homes and in flood and cyclone shelters. They became victims of violence and faced several other gender-related problems (Nasreen, 2010, p. 234).

It is far reach to get aid and relief for vulnerable and destitute women those who mostly need it. Due to lack of communication and transportation facilities women without men, pregnant or elderly women fail to receive relief though women's names are listed.

Women face number of problems due to their gender identity (Nasreen, 2003). Throughout the lifecycle poor women suffer more than men from poverty, hunger, malnutrition, economic crises,

environmental degradation and disaster related problems. They become victims of violence and political instability. Seventy percent of women and children are suffering from nutritional deficiency and almost 30 percent suffer from calorie deficit which are seen in pregnant and lactating women (UN Gender Development Index, 2003, Nasreen, 2010: 237).

The situation is worse for female headed households. In Bangladesh 20-30 percent households are female headed and 95 percent of these are considered to be below the poverty line (BBS, 2002). These female headed households are vulnerable during and aftermath the disasters, and their sufferings are also prevalent in deplorable.

Violence

During disaster violence against women are common phenomenon. Most women and girls have suffered some form of violence in or throughout their lives. The physical and emotional violence occur within the households and in the flood and cyclone shelters or refugee camps.

Women are at higher risk of violence during and after disasters. Disasters in socially and culturally diverse regions often have witnessed an increase of eve-teasing, domestic and public sexual harassments and violence against women and girls. Asian tsunami (Oxfam, 2005), the Hurricane Katrina and the earthquake of 2005 in Kashmir (Mehta, 2007: p.16) evidenced such a phenomenon. Infrastructure conditions in refugee camps may expose women and girls to sexual violence, for example long ways to toilets or showers and deficient closing mechanisms of tents are the predicaments to women's safety and security (Dasgupta et al., 2010: 69). Moreover, violence against women is common all over the world. Such violence increases whenever there is a crisis such as war or natural disaster (Nasreen, 2010, p.239). It has been reported that during flood, number of robbery increases because of the isolation of community. Incidents such as rape or abduction of young girls and women (by the robbers) also occur during flood (Dasgupta et al., 2010, pp. 240-241).

Feminization of poverty

The effect of global climate change is undoubtedly having a far reaching impact all over the world. Compounded by extreme weather events and the rate of alarming frequency at which they are happening has presented the issue of global climate change in a graver and more serious perspective than ever. Thus, these impacts are expected to be more keenly and unnervingly failed in the life of poorest people in the

so-called developing and industrial countries of the world. It is now a quite established fact that the environmental consequences of climate changes pose to different scenarios for men and women in terms of the disaster induced impact failed in their lives. This also includes the undeniable fact of the feminization of poverty. The majority of world poorest are women. And this is why they are disproportionately more vulnerable and susceptible to the adverse impacts of climate change (Skutsch, 2004; Dasgupta et al, 2010, p.62).

Poverty is a key factor affecting people's ability to provide adequate self-protection during disasters. Poverty leads to poor women and men being unable to make choices that might improve their socio-economic conditions, and protect natural resources (Dankelman, 2002, p. 12). More than 45 per cent of people live under the poverty line, where 30 per cent live under absolute poverty (BBS, 2008). The report of Asian Development Bank suggested that over 95 per cent of female-headed households are below the poverty line (Asian Development Bank 2001). Poverty engulfs both men and women but women are most affected due to their position, role, and attachment to the environment. The quality of housing, a location on raised ground, adequate storage for food – all are crucial to self protection, but are more difficult for poor women to achieve.

Their inability to secure themselves

Women's mobility is restricted as a result of their responsibility for their children and extreme love of her family and also her kids. Their clothing restricts their mobility in floods, and in addition, women are less likely than men to know how to swim. It is estimated that 90 per cent of the victims of the 1991 cyclone disasters were women and children (Schmuck, 2002). Socially constructed roles and responsibilities are also responsible for their vulnerability.

Lack of education

Disaster impact itself can also be an obstacle to gaining more education particularly for girls and women. During disaster or even after a disaster or other stressful impacts, many girls are forced to drop out of school to help with domestic chores or to save money (Davis, et. al, 2005). Lower levels of education reduce the ability of women and girls to access information, including early warning mechanisms and resources, or to make their voices heard. This poses an extra- challenge when women want to look for their livelihood strategies. Education does not necessarily mean formal education, but it may be knowledge about technology, information, access to information

and other means of knowledge. In river basin and coastal areas, and many remote rural areas, people seldom get access to information or education opportunities and women are even more vulnerable and deprived due to their economic and social restrictions. In river basin areas of Sirajgonj many villages have disappeared due to river erosion. For this reason the people of these areas including women and girls have to move or migrate from river basin area or char islands to cities or towns. These reasons are responsible for their lacking of formal school education or early drop-out. As a result they cannot get modern technological facilities like meteorological forecasting and distribution of food and clothing during disasters like flood and cyclone.

Unequal power relation

Unequal power relations between women and men lead to different access to environmental resources and opportunities for income diversification, showing that environmental vulnerability and, indeed, security, affect women and men differently. Needless to say those Women in Bangladesh get less opportunity in the decision making process and access to resources to shape their own future development. Therefore, environmental changes badly affect them, particularly poor women, as they do not have any means to face and mitigate challenges imposed by hazards.

Limited sheltering place

It is evident that due to flood and cyclone disaster, women and girls have limited access to shelter like flood and cyclone shelter during disasters. Women do not get out their home during these disastrous periods for danger and insecurity outside home. It reveals that most of the respondents- 37.5% -take shelter on the embankment and school during a disaster. Only 14.17% of them go very far way during a disaster.

Respondents sell their property during disaster

The collected primary data depicts the respondents' state of selling their property during a disaster. About 66.67% of the respondents say that they do not have own property to sell but they are concerned to sell their property. Only 10% of them have their property but said they are not concerned about selling their property.

Security condition of the respondents during disaster

During disaster the women, girls and babies are socially insecure. The babies can not avail of their

mothers' milk for her limited lactating power. The fertile mothers do not get enough and sufficient food to get their nutrition. It reveals that most of the respondents, about 65 percent think that they feel insecure during a disaster. 2.5% of them don't care of anything.

Gender stereotypes

Women are affected through extreme weather events and their negative consequences in different ways and to a greater extent compared to their male counterparts. Women experience deterioration both in their health condition and in their general work conditions, including a drastic increase of their workload. In many ways they are at disadvantageous positions by the distribution of aid/assistance and compensation benefits due to gendered socialization and institutional bias against women (Dasgupta, et al., 2010, p. 70). Women become more vulnerable during economic crises because of the patriarchal socio-economic structures. For example, many employers consider women as secondary income earners, thus they become the first group who get sucked when the economic conditions deteriorate. Besides economic disadvantages, women also suffer from structural adjustment policies of the IMF implemented by developing countries (Dasgupta et al., 2010, p.90). Economic crises and natural disasters, which are endemic to developing countries, significantly contribute to expansion of poverty.

Thorat (2008:75) mentioned that 'Gender and disaster are generally treated as a post-rehabilitation issue. It is regarded as a complex yet dynamic set of social relations, which needs to be catered to during the response phase soon after a disaster' (Dasgupta et al., 2010, p.169).

Social Role, Attitudes and Patriarchy

The negligence of women in matters of their taking food is well-established. Women, particularly mothers, eat less during shortages of food which is seen to be caused by social factors. It is frequently occurred in rural areas in Bangladesh that tradition, social norm, attitudes of family members and patriarchy force women to eat after men. As a result, they are deficient in food and calorie intake.

Women are likely to suffer increased mental strain, and bear the brunt of certain social constraints; for instance, they are shamed by using public latrines, or being seen by men when in wet clothing (Rashid & Michaud 2000). The social and institutional barrier of women's mobility also keeps them in vulnerable

positions as they do not move easily to find a livelihood or way of life.

During cyclones and flood, women are handicapped by fear of the shame attached to leaving the house and moving in public. Societal attitudes restrict interaction between men and women, making women more reluctant to congregate in the public cyclone shelters (raised concrete structures that protect from wind and flood) where they are forced to interact with other men.

Role of Women during Disaster

Women and girls play vigorous roles before, during and after disasters. Women's active involvement enhances the potential effectiveness of disaster prevention or mitigation measures. Since they have diverse experience about their household and their surroundings, they can contribute to the process of assessing vulnerabilities and capacities. To protect the children, the elderly and other vulnerable groups, women's participation is most common and effective. Again, when the community is threatened by any disasters-natural or man-made, and evacuation becomes necessary, it is the women who come forward for planning. Women also play key roles in the planning and implementation of physical measures to mitigate disasters. Women preserve fuels, matches, dry food (such as rice, peas, puffed rice, flattened rice and molasses), ropes and medicine at home and prepare portable mud stoves for future use. Women often collect firewood to store in dry places for later use. They also store fodder for domestic animals, seeds, blankets, valuables etc. They are the first to provide nursing care for the injured whether it is a flood, earthquake or cyclone, before any official relief work begins. Women and girls are also involved and served in search and rescue activities.

In the rural areas, women generally take care of poultry and other small assets and when a disaster occurs, they sell these in order to meet household financial needs. Selling other valuables, mortgaging, or borrowing against assets, or borrowing from neighbors are other common strategies for survival. And if doing all these things does not ensure survival, they take up various professions such as brick breaking, sewing, jute bag making, ash selling, fish and vegetable vending, selling rice cakes and also serving as domestic help. None can deny the necessity of reconstructing and developing physical infrastructure of the community after a disaster, and women and girls are seen to take equal parts as men in these activities. But women do far more than only this for their community.

Role of Women in Disaster Mitigation

Women's effective role playing can be considered at different phases of disaster i.e., before, after and during the incident. At the first stage, they may be engaged in organizing women members from different strata of a particular community. In the second stage, they can take lead through pursuing training and education, for their family, neighborhood and community. During disaster, they can take part even in relief work, providing nursing, medicines and caring for children and the aged. At that time women are most effective and active in preparing food and equal distribution among the affected people. From the experiences of our daily lives, it can be said that women are most generous and rational in distributing anything, especially food and timely care including reproductive health services for females. This quality may be applied to financial matters particularly in hazardous condition (Dasgupta et al., 2010, p.170).

Lessons

From the analysis the following are the major concerns for women's vulnerability due to climate induced natural and environmental changes:

- Post-disaster mortality, injury, and illness rates which are often (but not universally) higher for girls and women;
- Economic losses that disproportionately impact economically insecure women (e.g. agricultural losses of women farmers, the destruction of women's home-based businesses, limited access to post-disaster economic aid);
- Work load changes increase women's responsibilities in the domestic sphere, paid workplace, and community through the disaster cycle of preparation, relief, reconstruction, and mitigation;
- Increased rates of sexual and domestic violence against girls and women in disaster contexts because women lead their life in most insecure position during and after disasters;
- Destitute, low-income, and economically insecure women face the most adverse conditions because they lose their works and livelihood during and after disasters;
- Women in subordinated racial/ethnic/cultural groups are placed in vulnerable situations having less scope and opportunities to face and mitigate the challenges.

Conclusion

It is undeniable that children, the old and women, the marginalized, and the minorities are the worst victims

of disasters due to their lower status in society. Women are more vulnerable to climate disasters than men through their socially constructed roles and responsibilities, and their relatively poorer and more economically vulnerable position, especially in the developing world like Bangladesh. Gender inequalities with respect to enjoyment of human rights, political and economic status, land ownership, housing conditions, and exposure to violence, education and health (in particular reproductive and sexual health) - make women more vulnerable before, during and after climate change-induced disasters. Therefore, access to land, improve livelihood, proper access to information and education, community development among women, self dependence, women empowerment and women increased participation in decision making must be ensured in Bangladesh to face vulnerability, climate change and different disasters induced from climate change. Since the frequency and impact of climate-related disasters increases, we must commit to build a culture of disaster mitigation and prevention which is founded on the specific needs, voices, roles and potential of women, men, boys and girls.

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