

## **Gender Specific Vulnerability in Climate Change and Possible Sustainable Livelihoods of Coastal People. A Case from Bangladesh\***

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### **ABSTRACT**

The paper addresses the gender specific vulnerability of coastal people in climatic hazards in Bangladesh. This study has been conducted by qualitative methods with some qualitative tools i.e. Key Informants Interview (KII) and Focus Group Discussion (FGD) to get the vivid and comprehensive views about gender specific susceptibility of climate induced hazards from social, gender, cultural and behavioral perspectives. The paper explores the gender specific vulnerability of climate change and possible sustainable livelihoods of coastal people in Bangladesh. This paper finds that climate change is not gender neutral. It affects men and women differently for their roles and responsibilities in the society. Women's roles are often confined to household labor such as looking after children and ailing people, as well as disaster specific roles such as saving properties from obliteration. These roles make women particularly vulnerable in natural hazards. By contrast, men's roles often include working outside and so are more likely to escape natural hazards. The paper also finds that woman's dependency on natural resources is severely affected by climate change variability which causes vulnerability to women in natural hazards. This paper outlines key considerations of gender and climate change that can help policy makers improve policy and implementation for the diminution of vulnerability of women in Bangladesh as well as developing countries of the world.

**Keywords:** Climate Change; Climate Change Impacts; Gender Division of Labor; Gender Specific Vulnerability; Coastal People.

### **RESUMO<sup>§</sup>**

***Vulnerabilidade específica de género na mudança climática e possíveis modos de vida sustentável de populações costeiras. Um caso do Bangladesh.***

*O artigo aborda a vulnerabilidade específica de género de populações costeiras no que se refere a riscos climáticos no Bangladesh. Este estudo foi realizado através de métodos qualitativos com algumas ferramentas qualitativas, isto é, entrevistas a informadores chave (KII) e Grupos Foco de Discussão (FGD), por forma a obter pontos de vista vivos e abrangentes sobre a susceptibilidade específica relativa ao género relativamente a riscos climáticos decorrentes de perspectivas sociais, de género, culturais e comportamentais. O artigo explora a vulnerabilidade específica de género às alterações climáticas e possíveis modos de vida sustentáveis de populações costeiras no Bangladesh. Conclui-se que a mudança climática não é neutra no que se refere ao género. Afecta de forma diferente os homens e as mulheres no que se refere aos papéis que desem-*

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\* Submission: 24 NOV 2015; Peer review: 30 DEC 2015; Revised: 7 FEV 2016; Accepted: 19 FEB 2016; Available on-line: 25 FEB 2016

§ Portuguese versions of title, abstract and captions by Maria Beleza on behalf of the Editorial Board



*penham e às responsabilidades que têm na sociedade. O papel das mulheres limita-se, muitas vezes, ao trabalho doméstico, tal como cuidar das crianças e de pessoas com dificuldade, bem como desempenham funções específicas em situações de desastre, como proteger bens da destruição. Essas funções tornam as mulheres particularmente vulneráveis em caso de ocorrerem desastres naturais. Por outro lado, os papéis dos homens muitas vezes incluem trabalhar fora e por isso são mais propensos a escapar riscos naturais. Conclui-se, também, que a dependência da mulher relativamente aos recursos naturais é gravemente afectado pela variabilidade da mudança climática, o que induz maior vulnerabilidade das mulheres aos riscos naturais. O artigo tece considerações sobre o género e a mudança climática, que podem auxiliar os decisores políticos a melhorar a implementação de políticas tendentes a diminuir a vulnerabilidade das mulheres do Bangladesh e de outros países em desenvolvimento.*

**Palavras-chave:** Alterações Climáticas; Impactos das Mudanças Climáticas; Divisão Sexual do Trabalho; Vulnerabilidade Específica de Género; Populações Costeiras.

## 1. Introduction

There is a growing international consensus that climate change is one of the most serious challenges to current and future sustainable development. Adverse impacts of climate change have already been observed on the environment, natural resources, food security, human health, economic activities, and physical infrastructures (Garai, 2014). The recent global assessment report on climate change inducing natural disasters of the United Nations shows that the number of natural hazards, economic losses and number of people affected are increasing at a rapid rate, faster than risk reduction can be achieved (UN-ISDR, 2009). Considering this issue, scientists and environmentalists express apprehension and propose different models for mitigating natural disasters and making sustainable development in the planet.

To many, Bangladesh is almost synonymous with disaster (Cannon, 2002). The UNDP has identified Bangladesh to be the most vulnerable country in terms of cyclone and the 6<sup>th</sup> most vulnerable country in terms of floods (Siddiqui, 2010). Reports published by German watch<sup>7</sup> and climate vulnerability monitors 2010: The states of climate crisis have also found Bangladesh as one of the most vulnerable countries (Ahmed 2012). Floods and cyclones in Bangladesh are also predicted to increase in frequency, severity, and duration and extent (Cannon, 2002). Climate change variability is expected to increase the severity of cyclones and the tidal surges by 2050, combined with an expected rise in sea level. Climate change inducing tidal surges are projected to inundate an additional 15% of the coastal area. Bangladesh has been incurring significant damages in terms of crops losses, destruction of roads and other infrastructure, disruption of industry and small scale entrepreneurs, and injures and losses in human every three to five years (Ahmed 2012).

Recently to address the challenges of climate change significant attention has been given to gender perspectives and the inclusion of women in disaster management and mitigation. It is widely understood that climate change shape men and women in diverse way due to the existing inequalities such as their role and responsibility in the society, and access to resources and

power relations that may affect severely to the ability to cope with the hazards of climate change (WEDO 2007, Canvajal *et al.*, 2008, BRIDGE 2008, IPCC 2007).

Gender differences in vulnerability to climate change related disaster is severe in Bangladesh. Like many other developing countries of the world, Bangladeshi women have limited access to resources and decision making power. They carry the major responsibility for household water supply, as well as, energy gathering for cooking and food security. As a result, women face multiple challenges in coastal area because their gendered labor roles are severely affected by climate change. This paper will shed light on the gender specific vulnerability of climatic hazards and possible sustainable livelihoods of coastal people in Bangladesh.

## 2. Climate Change, Hazards and Gendered Vulnerability

Climate change is one of the most important development challenges in recent time. Climate change requires immediate attention as it has discernable and indeed worsening effects on human communities (IPCC, 2007). The worsening effects of climate change affect women severely for gender differentiated attitudes of the people in the society. The gender differentiation is detected in every stratum of social institutions ranging from family to religious groups to caste systems, political and legal structures, economic and educational institutions and the mass media and so on. Gender differentiated attitudes creates gender inequality between men and women and constraints women to own her rights in the society. Moreover, socially constructed role and responsibility leads women to be much more susceptible than men to poverty. Furthermore, along with poverty, climate change intensified the existing vulnerability in terms of accessing natural resources, further constraints women's ability to adapt to climate variability and change.

Gender also intersects with other social categories. For example, women in developing countries rural areas depend on natural resources, such as water, and agricultural and forest products, for their livelihood, making them particularly vulnerable to changes in availability

and access. Climate change is widely anticipated to affect all these areas of women's life adversely (Terry, 2009). Along with rurality, poverty and social and cultural norms are also responsible for women's greater vulnerability. For example, religious taboos often restrict women from going outside. If women live in housing unable to withstand environmental hazards, their restricted movement would make them more vulnerable. For instance, following the cyclone and flood of 1991 in Bangladesh the death rate was almost five times as high for women as for men. Because like many other Asian countries women have never learned swim due to religious orthodoxy and cultural norms, consequently reduce their survival chances in natural hazards (Rohr, 2005). According to a recent report from the World Conservation Union / Women's Environment and Development Organization (IUCN/WEDO,) women and children are fourteen times more likely to die than men during disaster ((IUCN/WEDO, Broady *et al.*, 2008). One example is the Asian Tsunami of 2004 where the largest numbers of fatalities were said to be women and children under the age of 15 (Arora-Jonsson, 2011).

The absence of women in decision making power often magnify women's vulnerability during pre and post disaster periods since their needs and concerns are not represented and are often inadequately addressed (Garai 2014). Arora-Jonsson (2011), in reference to the Indian Government National Action Plan on Climate Change (NAPCC), states, "The impacts of climate change could prove particularly severe for women. With climate change there would be increasing scarcity of water, reduction of yields of forests biomass and increased risks to human health with children, women and elderly in a household becoming the most vulnerable" (Arora-Jonsson, 2011).

Terry Cannon (2002) in a study claimed that poverty accelerates women's susceptibility in climate induced natural hazards and gender plays a significant role in determining poverty. According to Asian Development Bank, over 95% of female headed household in Bangladesh live below poverty line and their number is 20-30% (Asian Development Bank 2001). Women headed households, as a result of divorce or death, face acute vulnerability during natural hazards (Cannon, 2002). According to a study 70% of the 1.3 billion people in the developing world living below the threshold of poverty is woman (Denton 2002, Rohr 2006). Another study of World Bank asserts that gender differences are greatest among the poorest families. Moreover, due to cultural norms, women of this poorest family eat last and least especially in Bangladesh like many other developing countries (Hemmati *et al.*, 2007).

Climate induced natural hazards have severe impacts on children, women and elderly people and people liv-

ing with disabilities (Chambers, 1989; Alenander, 1997; Dulal *et al.*, 2010; Garai, 2014). Climate change impacts are expected to have a disproportionate effect on women's economic activities such as countenancing barriers to do domestic activities, collecting foods, fodders and fibers that may also fall them vulnerability in their locality (Garai, 2014). Along with this, small community especially in coastal wetland area who depends on natural resources for their livelihoods i.e., fishing and hunting and collecting natural resources are in risk (Shah *et al.*, 2013).

Many of the regions of third world countries, women's literacy rate are very low due to their extensive domestic responsibility, ignorance of parents for education and financial inadequacy. For example, according to Bangladesh Bureau of Statistics (BBS) the literacy rate of Shymnagare upazila (sub district) of Satkhira district (study area) is 28% where male and female literacy rate are 38% and 17.4% respectively (BBS, 2006). The low literacy rate of women constraints their ability to adapt for and cope with the hazards that intensify their vulnerability (Ahsan *et al.*, 2014). Due to low literacy / illiteracy women find difficulty to understand how to manage disaster during emergency periods. For example, they cannot understand the meaning of warning message of upcoming hazard, so they cannot take initiative to minimize loss.

### 3. Theoretical Framework

The concept of vulnerability may be defined as the proportion of human lives, assets, and economic activity that could be affected in a given place should a given disaster occur. The calculation of different levels of vulnerability is made by combining the probability of a destructive event with the level of exposure of lives and assets to that hazard' (Trujillo *et al.*, 2000).

Vulnerability is applied as a core concept in disaster risk in the study of livelihoods and poverty, food security and climate change (Miller *et al.*, 2010). Adger (2006), and Gallopin (2006) identify, amidst the diverse interpretations of vulnerability, the key concepts of exposure, sensitivity, coping and adaptive capacity as underpinning many dominant approaches. Moreover, Downing *et al.* (2005) identify the following common elements of most approaches to vulnerability: the threat, e.g., climate change; a place or sector, e.g., health outcomes; a socioeconomic group, e.g., the poor, and the consequences of outcomes of vulnerability, e.g., loss of livelihoods (Miller *et al.*, 2010). In this study, vulnerability means the way of economic activities, assets, and lives of women and men are affected due to climate change induced natural hazards in coastal area of Bangladesh.

Blaikie (1994) has developed a model named pressure and release model by which human vulnerability to

natural hazards are revealed. The Pressure and Release (PAR) model indicates that a disaster is the junction of two opposing forces' that are the process generating vulnerability and physical exposure to hazard. Increasing pressure may come from either side, but to relieve the pressure, vulnerability has to be reduced.

Blaikie presents three main levels of progression of vulnerability: (i) root causes, (ii) dynamic pressures and (iii) unsafe conditions. Root causes have indirect influences on vulnerability. These are economic, demographic and political processes within society that reflect the distribution of power in a society and its limitation bring vulnerability to the people during hazards. Dynamic pressures related to the root causes can form insecurity of resources and bring vulnerability to the affected people. For example, lack of local institutions, and skills, local markets causes vulnerability to hazards affected people of a particular locality. About unsafe conditions, Blaikie asserted that it is a specific form in which people's vulnerability is expressed in time and space in conjunction with hazard (Blaikie, 1994).

#### 4. Methodology

The present study is qualitative in nature. The data were collected from primary and secondary sources. Primary data were collected from eight villages of two unions namely Burigoalini and Gabura of Shymnagar upazila under Satkhira district in Bangladesh (Figure 1).

The logic behind choosing this area as study area is that it is one of the most vulnerable zones of natural disasters. The type, intensity and frequency of natural disasters such as cyclone, tidal surge, soil salinity, and flood are common phenomena in this area. Moreover, being located adjacent to the Bay of Bengal and Sundarbans (Mangrove forest), people's vulnerability also increased to a great extent. Therefore, considering all the above traits, Shymnagar upazila was selected for this study. In addition to this, simple random sampling was adopted for selecting unions and villages of this study.

Each man and woman (age 15-70) who lives in the selected area is the unit of the study. Some qualitative tools i.e., Key Informants Interview (KII) and Focus

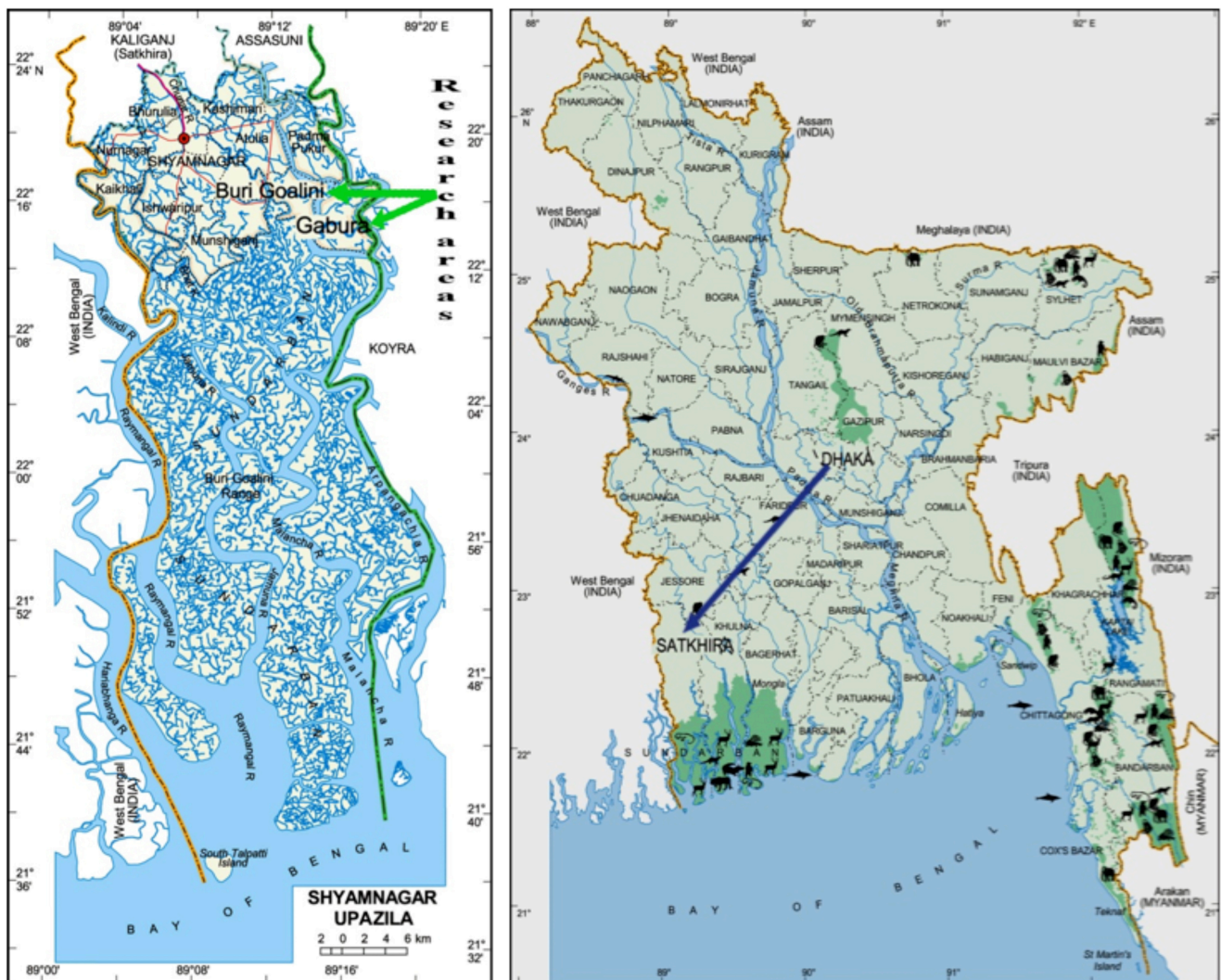


Figure 1 - Maps of Shymnagar upazila in Satkhira districts of Bangladesh



Group Discussion (FGD) were adopted to get the astute and inclusive views about vulnerability of women in climatic hazards and possible sustainable livelihoods of coastal people. By using KIIs, this study was able to discover the challenging conditions of the most vulnerable disadvantaged people i.e. women from social, gender, cultural and behavioral perspectives.

At the same time, FGDs were adopted to get an in-depth and insightful view about the nature of vulnerability and coping strategies of coastal people during, pre, and post disaster periods. To fulfill this purpose, two FGDs, and two KIIs in each eight villages of two unions (total 16 FGDs and 16 KIIs) were adopted of which men and women respondents were equal. Total 12 respondents of heterogeneous occupations were selected by using purposive sampling for each FGD groups. Along with chief researcher, a research assistant was present in the FGD meeting who wrote down the information which was come out from the discussions. To conduct KIIs, especially knowledgeable persons such as teachers, union parishad chairman, members, NGO workers, were given priority. After conducting this study, data were processed and analyzed manually. This field work was conducted between August and September in 2012. The study therefore aims at to assess the gender specific vulnerability and possible sustainable livelihoods of coastal people in climate change variability by applying qualitative method.

Secondary data were collected from several Bengali and western literatures, research papers, newspapers, magazines and so on to enrich the study.

## **5. Results**

### **5.1. Decision Making Power**

We found that women face difficulty to take decision independently in household level. The inherent causes of this are the cultural norms of our society and women's economic dependency in the family. For this why, many times in disaster period women cannot take decisions, what she should do. For example, she may wait for her husband to do something to combat disaster. Consequently, residing in flimsy housing structure many times women face vulnerability in hazards. In addition to this, traditionally being income earner men always take decision in the family, so women's decision making power cannot flourish in the society.

### **5.2. Dynamic Pressure**

Our study revealed that the people of the affected area face dynamic pressure during the climatic hazards. Due to poor communication and management system they cannot co-ordinate with local institution and local market and face severe scarcity in term of foods, pure drinking water, raw materials and other emergency needs of their family in hazards periods.

The female-headed households become more vulnerable in this situation because they have to manage both inside and outside tasks of their family. For example, beside managing household chores, women have to manage daily commodity (i.e., foods, drinking water, etc.) which become difficult for them to do in hazards periods. Moreover, they face difficulty to shift their family members in safer place due to religious orthodoxy. However, male can do this task in the hazard periods properly (Table 1).

### **5.3. Women in Risky Situation**

The study findings indicate that women living in the coastal belt area face very risky situation, because many of them cannot get information, being confined to house. Moreover, many of them cannot know how to swim and are incapable to cope with the hazards. The majorities of people in the coastal area are poor, so the housing structures of this locality are mostly made with mud/soil in the wall and thatched or tin on the roof. These building materials may collapse during storms and floods, trapping and potentially killing people inside. The role of women often confines them to indoor spaces, leading to increased vulnerability to this type of danger (Table 1).

### **5.4. Education, Information and Decision Making Power**

Majority of the respondents of the case study villages agreed that a greater proportion of women in the study area are illiterate than men and their educational opportunities are often limited due to their cultural expectations and their extensive domestic role and responsibility. Moreover, religious regulation leads to girls being restricted from attending school. For this why, they are deprived of education in their locality. Being illiterate, women fail to develop skill and awareness to face disaster in their everyday life. Moreover, they find difficulty to attend different disaster management training and implement it during hazards due to their illiteracy. They also often fail to acquire certain skills that would help increase their resilience to this impact. As a result, women easily fall to vulnerability during natural disaster.

### **5.5 Poor Disaster Management System**

The findings of the study indicate that embankment of the coastal belt is not effective enough to protect the flow of water. Moreover, there is not enough forest around the coastal belt that protects the flowing wind and water during the natural hazards. Many a time the weather forecasting and warning system of the affected area is not working well, so many people unable know about the hazards in proper time. For example, in remote area, due to poor communication system the an-

Table 1 - Key social indicators of gender vulnerability in climate induced natural hazards

*Tabela 1 - Principais indicadores sociais de vulnerabilidade de gênero em riscos naturais induzidos climaticamente*

<b>Gender specific vulnerability during and post-disaster periods</b>		
<b>Social indicators</b>	<b>Men</b>	<b>Women</b>
Decision making power	Core decision maker in household affair for being sole income earner.	Hardly take decision due to possessing limited property.
Nutritional status	Affliction from malnutrition.	The affliction of malnutrition rate among women is higher than men because they eat less than men due to deficit of foods in the family.
Security status	Worried about female members in family.	Feel insecure during and post disaster period in terms of eve teasing / sexual violence etc.
Diseases/injures	Suffering from different diseases such as diarrhea, cold fever, skin diseases, along with injures due to natural hazards.	Skin diseases, dysentery, diarrhea, injuries are common among women.
Unhygienic environment	Man stay less time in Unhygienic environment inside the house due to working outside.	Women have to stay in this unhygienic environment to look after children, elderly people and domestic properties.
Drinking water	Think collecting water is a female's duty.	Women have to go to distance places to collect water and often face vulnerability during disaster
Interactive activities	Have outer exposure to other people.	No scope to interaction to outer members during and post-disaster periods.
Religious restrictions/burden	Have no restriction to go outside.	Face restriction to go outside even for earning money for livelihoods.
Biological activities	Have to do this on open place, especially road side in post disaster periods.	Women face insecure and shame to do biological activities outside the fragile home ground in disaster periods.
Risky environment	Male can move to this environment carefully.	Females face problems to move in risky environment, i.e., in slippery and muddy road, strong current of water.
Coping capability	Can cope/adapt in hazardous situation easily.	Cannot cope/adapt with hazardous situation easily.
Sexual harassment	Do not face this problem.	Frequently face this problem during hazardous periods.
Flimsy housing structure	Are less vulnerable as they are outside during disaster for earning.	Have to stay all the time in house to look after baby and doing other activities.
Warning message	Get easily the message about the upcoming hazards.	Have less scope to get outer information especially warnings message and other forecast due to their confinement in household chores.
Belief in fate	Go to cyclone center.	During disaster do not want to go to cyclone center believing that God will save them in house.
Secure place	Easily go cyclone center during disaster.	Feel embarrass to go cyclone center (in mass people) during disaster periods due to religious orthodoxy.
Medical facilities	Have to go far distance to receive medical treatment. Feel comfortable to take treatment from faith healer.	Face difficulty to take treatment going far distance / city. Females also go faith healer for treatment due to their availability and low cost.
Educational facilities	Being far distance to educational institutions male go school/college by riding bicycle.	Parents refuse to send their daughter to school due to being far distance. Thus due to illiteracy girls remain less skillful to combat disaster.

*Source: FGDs and KIIs*

nouncement of upcoming disaster is not done well. Moreover, cyclone center of the belt area is not sufficient to accommodate comparing all the affected population. However, some of the cyclone centers are far distance from the affected area, so many of the people cannot take shelter in the cyclone center during the emergency periods.

About the disaster management system, the study indicates that compared to males, females are more aware about this. They know how to save the household properties and reduce the losses during hazards but sometimes to save this they fall at risk in disasters.

### **5.6. Nature of Challenges of Women, Children, Disabled and Elderly People**

A large proportion of the respondents agreed that those who were injured or died in the natural disaster are mostly women, children and disabled people. The study indicates that pregnant women are the most vulnerable in disaster because in this time they cannot move from the house as the environments around them are risky. Moreover, the slippery and the muddy roads are risky for them to move swiftly for safe place (Table 1). In the same way, children, disabled and elderly people also face great difficulty during natural hazards. The findings indicate that during tidal surges or flash floods, they cannot cope with it easily and become vulnerable during the natural hazards.

### **5.7. Income and Occupational Challenges after Natural Hazards**

The findings of the study indicate that climate change greatly hampers the economic activities of women. They are confined to house as the economic sources have reduced and become jobless. Different natural hazards contribute to demolish natural resources, i.e., forest creepers, roofs, tubes from the forest, roots, honey, fuel woods and mineral water that are the gathering resources for women in the coastal belt. Moreover, women in the coastal area who depend on collecting fishes and prawns in the river cannot collect that sufficiently as natural hazards contribute to massively obliterate their reproductive capacity. The findings also indicate that women failed to do agro-based processing activities such as harvesting crops, boiling paddy, drying cereals etc. during the disaster periods (Table 2). Women also face problems moving to the flooding kitchen garden for preparing foods, cleaning utensils, and other household activities. All of these challenges contribute to make woman vulnerable.

Men also lose their income and occupation sources due to climate change and migrate to adjacent districts for income (Table 2). Many of the people bound to change their occupational sources and try to find out other sources and lead a very miserable life in the locality.

### **5.8. Livelihoods at Risk**

The study findings indicate that the natural resources that women are more dependent on are at greater risk from climate change. Due to the severity of salinity in river water increased, the reproductive capacity of fish species decreased to a great extent. As a result, fishermen cannot get fishes in their expected level. In the same way, women who collect prawns (pona) and larvae in the river cannot get that sufficiently (Table 2).

Moreover, frequent tidal surges and flash floods disrupt the embankment and enter saline water to their community and create scarcity of pure drinking and irrigation water. This saline water inundates crops land and threatens food security of the locality. Women also struggle to get their traditional food sources in this situation. Women as well as men are forced to change their occupations and searching for new income sources for maintaining their livelihoods.

## **6. Discussion**

The people of coastal area in Bangladesh frequently face with natural hazards. In the hazards, some of the affected people can get resilience easily but many of them cannot adapt because of their scarcity in material and non-material resources. Material resources may be land, livestock, crops, reserved foods, cash money, household security, raw material and so on. On the other hand, non-material resources include coping strategies, skillfulness, disaster management techniques, personal relationship, flow of information, social network etc. The access of these resources is based on social and economic relation particularly the social relations of production, gender, ethnicity, social status and age (Denton, 2002). Moreover, proper access of this resources influence affected people to overcome the hazards quickly. The affected people can borrow/collect money, foods and other material from their relatives, neighbor or other groups and cope with the hazards. They can also get it as relief from Government and NGOs as coping mechanisms for resilience in natural hazards. Women also can cope with this hazard by being members of the NGOs and lending money and taking training about disaster management.

In the coastal zone of Bangladesh, women are vulnerable group in the hazards period for gendered division of labor, unequal access of natural resources, lack of decision making power and patriarchal domination upon women. Moreover, women are gradually separated to the nature as natural resources are severely affected and diminished by climate change as well as hazards. So government should take necessary steps to protect the existing resources. Women should be given the freedom to access the existing natural resources in the coastal belt. Also, government should ensure the augment/growth of resources in coastal area along with

Table 2 - Key economic indicators of gender vulnerability in climate induced natural hazards in the study area

Tabela 2 - Principais indicadores econômicos de vulnerabilidade de gênero em riscos naturais induzidos pelo clima.

<b>Gender specific vulnerability during and post- disaster periods</b>		
<b>Economic indicators</b>	<b>Men</b>	<b>Women</b>
Productive activities	Face problems to crop productions in salinity farms.	Find difficulty to do agro based activities in home-stead garden.
Food preparation	Take no responsibility.	Fall vulnerability for preparing food during hazards due to scarcity of resources.
Employment opportunities	Limited scope to find job during and post disaster periods.	No scope to get job in disrupted situation.
Domestic chores	Feel no interest to do domestic chores thinking it women's works.	Like other time, women perform all domestic works in disaster periods including cleaning houses, collecting water, managing fuel woods, preparing foods etc. that make them easily vulnerable in hazards.
Wages	Men get wages according to their works.	Women are paid less for the same work.
Availability of work	Can go distance place in search of work after disaster periods.	Cannot go distance place in search of work due to their physical constraints and religious taboos.
Fish production	Due to severity of salinity in water, people largely depend on aquaculture instead of fishing in rivers.	Women cannot get enough prawn (pona) from the river.
Salinity intrusion	Face vulnerability in agricultural activities by growing paddy, wheat, jute and so on, because salinity hamper the productions.	Face problems to do horticultural activities in home-stead garden.
Livestock rearing	Face problems for rearing cows, goats, buffalo and so on, due to scarcity of animal fodders.	Fall in distress position by producing hens, ducks, and so on for lack of fodder and living place.
Cleaning and washing	Take no responsibility.	Face problems to clean clothe in saline water. Muddy wall of housing structure is also damaged due to salinity in soil of the house.
Homestead foods	Men depends on women for this.	No scope to collect homestead foods such as forest creepers, roofs, tubes and related forests products.
Saving domestic materials	Males remain outside in disaster periods for breadwinning.	Face vulnerability in disaster periods for saving livestock, children and other domestic products.

Source: FGDs and KIIs

the equal access of the existing material and non materials resources for both men and women to bring sustainable livelihoods in the coastal area of Bangladesh.

For effective disaster management, people should be undergone intensive training especially women to reduce losses in term of live saving, and other resources. Due to cultural norm, women are unable to acquire certain skills to resilience in hazards. For example, women are much less likely than men to have learned to swim that can have extreme effect, after the flood and cyclone of 1991 in Bangladesh. The death rate for woman was nearly five times more comparing for man in that hazards (Brody, 2008).

The coast of Bangladesh constantly faces different natural hazards, so the main priority should be to heighten and broaden the embankment adjacent to the river/sea.

According to most of the respondents, the height of this embankment must be at least 10 feet and in broad 6 feet from the sea level to protect the entrance of saline water into the locality.

Different types of trees should be planted surrounding the embankment/dam, then it can reduce soil erosion and prevent the tidal surges during the hazards. In addition to this, a committee should be formed for the purpose of monitoring the status of embankment especially in rainy season, so they can inform the authority to patch up it when they find any fault/leakage through the embankment.

## 7. Conclusion

Bangladesh is one of the worst victims of climate change in the world (Islam, 2011). The people of the



coastal area face many natural hazards all the year rounds. However, women, due to their gender specific roles in society, are often more vulnerable to natural disasters related to climate change. As women constitute half of the world population, so neglecting them real development cannot be gained. Women's participation in climate change decision, the enhancement of institutional capacity to mainstream gender issues in global and national climate change, the development of gender policies, gender awareness, internal and external gender capacity and expertise therefore should be assured. Moreover, the traditional assumption towards women as unworthy and incapable of engaging in environmental management and climate change should be avoided, because historically women are the natural resources managers and effective agents for disaster management. Greenbelt movement in Kenya and Chipko movement in India may be best example for this. So government as well as policy makers should formulate policy and implement it to ensure gender issues to reduce vulnerability in climate induced natural hazards and bring sustainability in the coastal area of Bangladesh.

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