**Conference on Global governance and Expertise in Policy Making, University of South Wales, UK. 14th September, 2018.**

# Impact of climate governance in increasing resilience among cyclone sidr and aila affected people in bangladesh

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## ABSTRACT

This paper discusses climate governance policies in Bangladesh and investigates to what extent are those policies contributing to increasing resilience among cyclone Sidr and Aila affected coastal people of Bangladesh. Climate governance has emerged in recent years in order to address the governance challenges within climate change programmes and policies and to reduce the vulnerability of disaster victims by engaging with multiple stakeholders from both government and non-government institutions with specific objectives to ensure governance issues and ensure use of funds for most vulnerable communities. In other words, it is the rule making decision, making mechanisms and modes within a given system or society that determine how institutions' interest are articulated, coordinated and negotiated; how power and authority are distributed, controlled and exercised and how resources are accessed, allocated, used and exchanged; and how conflicts are mitigated or resolved to enable and sustain effective climate change mitigation and adaptive response. This study draws on structured interviews of 285 affected villagers and data were collected using questionnaire survey and data were analysed by using frequency distribution, confidence interval test, cross tabulation and chi-square tests. The results show that climate governance does not have much contribution in increasing resilience among the cyclone Sidr and Aila affected vulnerable of Bangladesh. More specifically, the results show that only about 12% houses are pucca in Sidr affected areas and 16% houses are pucca in Aila affected areas. Likewise, the cross tabulation results show that more than 77% of respondents have very low level of resilience to cyclone and more than 95% of respondents have vulnerability between very low to moderate level. About 79% of respondents have a very low level of resilience in terms of cyclones and more than 71% in terms of building capacity to resilience. This study makes significant contribution to the body of knowledge by investigating the impact of climate governance policies in increasing resilience among post-cyclone Sidr and Aila affected people of Bangladesh.

# 1. INTRODUCTION

Climate change is one of the most serious environmental issues that the people of the world are facing nowadays. It is considered as the biggest global health threat of 21st century and increasingly being recognised as a public health priority (WHO, 2009). There is a consensus among the policy makers, practitioners, academics, and climate scientists that climate change will increasingly compromise the lives and livelihoods of millions of people around the world and will pose a critical threat to physical, social, cultural, human, and the overall development of any nation (Rahman, 2012; Barua *et al*. 2014). It is a cross-cutting development issue that affects every aspect of sustainable development (UNDP, 2016). It is a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods (UNFCC, 1994). Climate change is warming the planet, altering weather patterns, increasing the severity of floods and droughts, raising sea levels, acidifying the ocean, melting sea and land ice, threating plant and animal species, and affecting the spread of diseases (UN, 2016). These emerging climate impacts are already jeopardising other stresses of sustainable development plan, ranging from land degradation to resource depletion. Climate change is affecting developing countries as well as developed countries but developing countries bear the brunt of climate induced vulnerability.

Bangladesh as a developing country is prone to climate change. Climate vulnerability and change are critical development issues for Bangladesh. It is ranked first in the world in terms of climate vulnerability, six globally in terms of human exposure to floods and cyclones and third out of 76 countries in terms of tsunami (Islam *et al*.2018). In most years between 30-50% of the country is affected by floods and cyclones and climate change is projected to change the intensity and frequency of natural disasters, exacerbate the extent of flooding, the impact of cyclone related vulnerability, and negatively impact agricultural productivity, infrastructure and development prospects (GOB, 2009). Bangladesh government as well as the international organisations have provided humanitarian assistance to reduce climate vulnerability. Despite their assistance, the climate vulnerability among the disaster victims of cyclone Sidr and Aila affected is very high. A study conducted by Islam *et al*. (2018) shows that more than 75% of respondents are very vulnerable to disaster resilience. However, there are many studies on climate change and its impact but study on climate governance and its implications is comparatively limited. More often than not, little is known about climate governance and its implications in increasing resilience among disaster victims who have

been affected by climate change. Therefore, this paper will address the following research questions:

*1. What are the climate governance policies in Bangladesh? To what extent are those policies contributing to increasing resilience among the post-cyclone Sidr and Aila affected vulnerable coastal people of Bangladesh?*

This study fills the gap and brings insights into the body of knowledge by investigating the implications of climate governance in increasing resilience among the disaster affected coastal Bangladeshi people. Finally, this study identifies policies of climate governance in Bangladesh and investigates to what extent are those policies contributing to increasing resilience among cyclone Sidr and Aila affected areas of coastal Bangladesh.

## 2. IMPACT OF CLIMATE CHANGE IN BANGLADESH

Bangladesh is a disaster prone country in the world and is very vulnerable to climate change. The effect of climate change in Bangladesh is very obvious as a form of loss of lives, properties, affecting livelihoods, destroying housing sectors; displacing people from their lands and migration are some vivid example of climate shocks and stress (Rahman, 2017). In Bangladesh, tropical cyclone and storm surges are quite common and the region is considered to be one of the most vulnerable and disaster-prone area in the world (Ali, 1999; Wisner *et al*.2004; Paul *et al*. 2010; Dasgupta *et al*. 2010; Paul and Dutt, 2010). Moreover, as a result of the effect of climate change, Bangladesh is devastated by floods, cyclones, tornadoes, earth quakes and tsunami. Among the climate hazard, cyclone is the most serious problems that destroy lives and properties of Bangladeshi people. Therefore, this study will mainly focus on the impact of cyclone disasters as a climate hazard specially cyclone Sidr in 2007 and cyclone Aila in 2009. On average, 12-13 depressions are formed and at least one powerful cyclone strikes Bangladesh per year (Paul 2009; Dhakal & Mahmud, 2014). Cyclones cause extensive damage to human lives and properties, create great economic losses, and severely damage the housing sector limiting the people's ability to cope with the post-disaster period and to rebuild their houses for recovery.

Table 1 Cyclone severity and deaths in Bangladesh 1911-2016

| Year | Number of death | Wind speed | Severity index |
|---|---|---|---|
| 1911 | 120,000 | n.a | n.a |
| 1965 | 36000 | 210 | 5 |
| 1970 | 300000 | 223 | 6 |
| 1991 | 138866 | 225 | 6 |
| 2007 | 4234 | 250 | 6 |
| 2009 | 3363 | 95 | 4 |
| 2010 | 26 | n/a | n/a |
| 2011 | 13 | n/a | n/a |
| 2012 | 133 | n/a | n/a |
| 2013 | 50 | n/a | n/a |
| 2014 | 20 | n/a | n/a |
| 2015 | 117 | n/a | n/a |
| 2016 | 86 | n/a | n/a |

Notes: n/a = not available

Source: WHO, 2012; CRED, 2017 [Access 20.02.2017]

According to the above table 3.2, the most severe cyclone that struck Bangladesh was cyclone in 1970 with a wind speed of 223kph that killed 3 lakh Bangladeshi people. The cyclones that struck Bangladesh severely were in 1911, 1965, 1970, 1991, 2007 and 2009 (Shaw *et al*. 2013; Ahmed and Charlesworth, 2015). The 1970 cyclones in Bhola hit the entire coast of the Bay of Bengal with a storm surge of 10m high, which led to a total death count of about 300,000 (Khalil, 1992; EMDAT, 2015). It was the most devastating cyclone recorded and one of the deadliest natural disasters in modern history (Hossain *et al*. 2008).

The recent cyclones that struck Bangladesh is cyclone Sidr 2007 and Aila in 2009. Cyclone Sidr hit coastal Bangladesh on 15$^{th}$ November 2007(Paul, 2009; Nadiruzzaman, 2012; Kelman *et al*.2016; Mallick *et al*.2017). This was a category 4 storm and it swept across the western coast and ripped through the heart of the country with 155 mph (248kph) winds triggering up to 20 feet high (6m) tidal surges, breaching coastal and river embankments flooding low-lying areas and causing extensive physical destruction (GOB, 2008; Paul, 2009; Nadiruzzaman, 2012). Cyclone Sidr tremendously affected the southwest coast of Bangladesh and approximately 2.3 million households and about one million people were affected severely. The number of deaths caused by Sidr is estimated at 3,406 with 1,001 missing and over 55,000 people sustaining physical injuries (GOB, 2008).

Cyclone Aila, a category 1 storm, affected the coastal districts of Bangladesh especially Khulna and Satkhira. It occurred on 25th May 2009 (IFRC, 2009; UNDP, 2014). Despite being category 1, Aila brought heavy rains and storm surges that combined with high tides to breaching flood protection embankments, affected the housing sectors. The government of Bangladesh reported that 3,709,334 people have been affected in 15 coastal districts, with 325 dead, 1131 missing, up to 230,208 houses reportedly destroyed and 3,150,18 houses partially damaged (IFRC, 2009; Roy *et al*. 2009).

Table 2 Damages and losses due to Cyclone Aila

| Area affected | Khulna Districts | Satkhira Districts |
|---|---|---|
| Number of affected population | 152496 | 158622 |
| Number of affected households | 41043 | 33740 |
| Number of fully damaged houses | 23820 | 45722 |
| Number of partially affected houses | 18620 | 21128 |
| Fully damaged educational institutions | 9 | 10 |
| Partially damaged educational institutions | 70 | 141 |
| Embankments fully damaged (km) | 22 | 20 |
| Embankments partially damaged (km) | 58 | 66 |

Source: Action Aid et al. 2009

To mitigate climate hazard, Bangladesh government endorsed Paris agreement in 2015. The Paris Agreement is a unique opportunity for Bangladesh to combat against climate change.

## 3. CLIMATE GOVERNANCE IN BANGLADESH

The term climate governance is a relatively new concept in disaster management research. It has been initiated by International Centre for Climate Change and Development (ICCCAD) IN 2013. The climate change governance programme was designed to address the governance challenges within climate change programmes and policies by engaging with multiple stakeholders from both government and non-government institutions with specific objectives to ensure governance issues and ensure use of funds for most vulnerable communities. It refers to the key structural and process values, such as transparency, accountability, participation and deliberation as well as attention to efficacy and problem solving oriented (Rahman, 2017). In other words, it is the rule making decision, making mechanisms and

modes within a given system or society that determine how institutions' interest are articulated, coordinated and negotiated; how power and authority are distributed, controlled and exercised and how resources are accessed, allocated, used and exchanged; and how conflicts are mitigated or resolved to enable and sustain effective climate change mitigation and adaptive response. Therefore, from the above definition, it can be argued that climate governance is a set of rules and regulations which are suggested by local government and other national and international organisations in order to reduce the impact of climate hazard. Bangladesh government has undertaken some policies as actions which are given below:

The climate change governance policy of Bangladesh is a 10 year programme which is between 2009-2018. Its aim is to build the capacity and resilience of the country to meet the challenge of climate change and its vulnerability and the needs of the poor and vulnerable including women and children, will be mainstreamed in all activities under the Action Plan (GOB, 2009). The policies of combatting climate change in Bangladesh comprises of six pillars.

**Pillar 1: Food security, social protection and health**

Climate change is most likely to affect most vulnerable people in our society. Therefore, government climate change policies are to ensure food safety, safer housing and employment services. However, the main aim of this programme is to increase the resilience of vulnerable people including women and children through development community level adaptation strategies, livelihood diversifications and development of climate resilient crops.

**Pillar 2 Comprehensive disaster management**

The purpose of this pillar is to strengthen government's capacity to deal with frequent natural disasters and ensure that appropriate policies, laws and regulations are in place and to establish community based adaptation programmes and establish them in each of the disaster prone areas of the country.

**Pillar 3: Building resilient infrastructure**

Activities under this programme involve building climate resilience infrastructure such as cyclone shelter and building resilient houses.

**Pillar 4: Increasing the knowledge base**

The aim of this phase is to undertake research programmes in order to estimate the likely scale and timing of climate change impacts on different sectors of the economy to inform planning future investment strategies so that Bangladeshi organisations and general people are aware about latest research, lessons and technologies are available in this country.

**Pillar 5: Mitigation and low carbon development**

Under this phase, Bangladesh government will ensure a low carbon development and will play a role in reducing carbon emission. The activities under this pillar involve developing a strategic plan to lower greenhouse gas emission.

**Pillar 6: Capacity building and institutional strengthening**

The aim of this pillar is to strengthen the capacity of government ministries and other agencies, civil society and private sector organisations.

# 4 METHODOLOGY

This study is based on quantitative research approach. The methodological considerations are explained below:

**i) Study area and location**

The location of the study area of this research is based on Satkhira and Bagerhat districts of Bangladesh. Both Satkhira and Bagerhat are the southern districts of Bangladesh which are severely affected by cyclones Sidr 2007 and Aila 2009 (Mallick *et al*. 2017)).

**ii) Parameters and variables**

This study has employed quality of accommodation; respondents' level of resilience in withstanding cyclones and respondents' level of vulnerability to identify to what extent are climate governance policies are contributing to increasing resilience of disaster affected

coastal Bangladeshi people. The variable quality of accommodation has been measured by using binary yes/no questions, and respondents' level of resilience and level of vulnerability have been measured by employing five point Likert scale from 1 to 5 where 1= very low to 5 = very high.

**iii) Method of data collection and data analysis**

Data in this study were collected by employing questionnaire survey. A questionnaire survey design provides quantitative or numeric descriptions of trends, attitudes or opinions of a population by studying a sample of that population (Creswell, 2014). The questionnaire in this study was designed in Likert Scale format with some questions about their demographic information. The questions for the structured interviews were made based on the following categories; personal information (including age, gender, monthly income and employment status), quality of their accommodation, level of their vulnerability and level of their resilience in withstanding future cyclones. Data were analysed by using SPSS version 21. In SPSS, frequency distribution, 95% confidence interval, cross tabulation and chi-square tests were employed.

## 5. ANALYSIS

This study employed some descriptive statistics to obtain the frequency distributions, cross tabulation and chi-square tests. These were used to investigate the relationship between variables. 95% confidence interval test was employed to compare the sample mean with population mean to identify the mean score of different variables used in this study. For example, 95% confidence interval was employed in this study to explore the mean score of respondents' level of vulnerability and resilience in withstanding cyclones by using Likert scale from 1 = very low to 5 = very high. If the mean score of their level of resilience is above 4.00 which means their level of resilience in withstanding future cyclone is very high.

## 6 RESULTS AND DISCUSSION

This section of this study analyses quantitative data by using frequency distribution, chi-square test and one sample t-test. The results of quantitative data analysis are given below:

**i) Demographic profile of the respondents**

As shown in table 3 below, this section summarises data on age, gender, occupation and monthly income, and employment status of the respondents.

Table 3 Frequency distribution results of the respondents

| *Age* | Frequency | Percentage |
|---|---|---|
| 15-25 | 38 | 13.33% |
| 26-35 | 96 | 33.68% |
| 36-45 | 86 | 30.17% |
| 46-55 | 28 | 9.82% |
| 56-65 | 29 | 10.18% |
| 66-75 | 8 | 2.82% |
| *Gender* | | |
| Male | 227 | 78.80% |
| Female | 58 | 20.20% |
| *Employment status* | | |
| Unemployed | 227 | 80.00% |
| Employed | 25 | 8.70% |
| Self-employed | 28 | 9.70% |
| House wife | 2 | 0.70% |
| Pensioner | 3 | 1.00% |
| *Monthly income* | | |
| 500-1000 | 9 | 3.30% |
| 1001-2000 | 33 | 11.00% |
| 2001-3000 | 54 | 19.00% |
| 3001-5000 | 104 | 36.00% |
| 5001-9000 | 63 | 21.70% |
| 9001-20,000 | 22 | 7.50% |

As can be seen from Table 3, the age group that represents majority of the respondents is the 26-35 group, representing a third of the respondents. Furthermore, the table 3 also shows the ratio of male and female respondents. Of the 285 respondents, 227 are male and 58 are female and the percentage of male and female is 79.6 and 20.40 respectively which shows majority of the respondents are males. This is because of the cultural difficulties associated with getting female household members to participate in the survey.

Furthermore, the data also shows that most of the respondents are unemployed that represents about 80.0% of the total respondents, more than 9% are self-employed and about 9% of respondents have job opportunities.

Table 3 also shows that more than 33% of respondents earn between 500-3000 BD taka which is equivalent to £5 to £30. Similarly, the income of 46% respondents is between 3001-

6000 BD takas, 17.20% earn between 6001-10,000 and 2.80% respondents earn between 10001 to 20,000. The data displayed on table 3 also shows that the median income of the total respondents is 5000 BD takas monthly which is equivalent to £50, and only 1% respondents earn between 15000-20000. Furthermore, 80% of the total respondents earn between 500-6000 which actually shows the acute poverty of the coastal people of Satkhira and Bagerhat in Bangladesh.

**ii) Quality of respondents' accommodation**

To explore the quality of respondents' houses, disaster victims were invited to complete a questionnaire. Table 5.3 shows that in both cyclones Sidr and Aila affected areas, most of the houses are kutcha and tin-shed houses that represent more than 25.30% and 23.30% in the Sidr area and 29.62% and 35.55% in the cyclone Aila area respectively.

Table 4 Frequency distribution of quality of respondents' housing

| Variables | Frequency | Percent |
|---|---|---|
| **Sidr affected area** | | |
| Kutcha house | 73 | 25.30% |
| Pucca house | 34 | 11.80% |
| Detached house | 13 | 4.50% |
| Tin-shed house | 67 | 23.30% |
| Temporary fragile house | 19 | 6.60% |
| **Aila affected area** | | |
| Kutcha house | 40 | 29.62% |
| Pucca house | 22 | 16.29% |
| Detached house | 15 | 11.11% |
| Tin-shed house | 48 | 35.55% |
| Temporary fragile house | 10 | 7.40% |

Table 4 also shows that only 11.80% houses in Sidr area and 16.29% in Aila areas are Pucca and 9.20% and 7.43% houses are fragile in Sidr and Aila areas respectively.

**iii) Respondents level of resilience in withstanding cyclones**

The 95% confidence interval results in table 5 show that disaster victims are very vulnerable in all the aspects of vulnerability reduction factors of resilience to cyclones, building capacity to resilience, reducing underlying risk factors and strengthening disaster preparedness for effective response to disasters.

Table 5 Results of 95% confidence interval of factors determining respondents' vulnerability

| Respondents' level of resilience | Mean | Confidence interval | Lower bound | Upper bound |
|---|---|---|---|---|
| Resilience to cyclone | 1.31 | 95% | 1.23 | 1.4 |
| Building capacity to resilience | 1.36 | 95% | 1.28 | 1.45 |
| Reducing underlying risk factors | 1.30 | 95% | 1.21 | 1.38 |
| Strengthen disaster preparedness for effective response | 1.29 | 95% | 1.2 | 1.37 |

Table 5 shows that the mean score of resilience determining factors is 1.31 for resilience to cyclone, 1.36 for building capacity to resilience, 1.30 for reducing underlying risk factors and 1.29 for strengthening disaster preparedness for effective response. The average mean value of resilience to withstand disasters is below 1.40 which represents their vulnerable condition and inability to prepare, cope, and respond to disasters.

A chi-square test along with cross tabulation were employed to examine the relationship between the two categorical variables of access to resources which has two categories 0 = yes and 1 = no and respondents' level of resilience which has 4 categories. The cross tabulation results in table 6 show that more than 77% (220) of respondents have very low level of resilience to cyclone and more than 95% (272) of respondents have vulnerability between very low to moderate level. Table 6 also shows that about 71% (202) of respondents have very low level of vulnerability in response to building capacity to resilience, more than 76% (219) to very low level of vulnerability to risk reduction and about 8% (22) to disaster preparedness.

Table 6 Level of resilience determining factors and access to resources: chi-square tests

| | | **Access to resources** | | |
|---|---|---|---|---|
| **Level of resilience determining factors** | | No | Yes | Total |
| *Resilience to cyclone* | Very low | 220 | 6 | 226 |
| | low | 47 | 1 | 48 |
| | Moderate | 5 | 6 | 11 |
| | Total | 272 | 13 | 285 |
| *Building capacity to resilience* | very low | 202 | 4 | 206 |
| | low | 62 | 3 | 65 |
| | moderate | 7 | 6 | 13 |
| | very high | 1 | 0 | 1 |
| | Total | 272 | 13 | 285 |
| *Risk reduction* | very low | 219 | 5 | 224 |

| | | | | |
|---|---|---|---|---|
| | low | 48 | 2 | 50 |
| | moderate | 4 | 5 | 9 |
| | high | 1 | 1 | 2 |
| | Total | 272 | 13 | 285 |
| *Disaster preparedness* | very low | 222 | 2 | 224 |
| | low | 43 | 4 | 47 |
| | moderate | 5 | 5 | 10 |
| | high | 1 | 1 | 2 |
| | very high | 1 | 0 | 1 |
| | Total | 272 | 12 | 284 |

| *Summary of Chi-squares* | *Value* | *df* | *Sig.* |
|---|---|---|---|
| Resilience to cyclone | 65.694a | 2 | .000 |
| Building capacity to resilience | 54.955a | 3 | .000 |
| Risk reduction | 66.073a | 3 | .000 |
| Disaster preparedness | 70.456a | 4 | .000 |

The Chi-square results in table 6 show that chi-square value is 65.694a for resilience to cyclone, 54.955a for building capacity to resilience, 66.073a for risk reduction and 70.456a for disaster preparedness and level of significance is .000 for all of the reduction factors. This result indicates access to resources has significant association with the resilience determining factors in terms of disaster victims' ability to increase resilience, and withstand future disasters effectively to avoid vulnerability. This result is consistent with the findings of (Wisner *et al*. 2004; Paul, 2010; Islam, 2011 and Mallick *et al.* 2011) that disaster victims are vulnerable in terms of resilience to cyclones, building capacity and preparing for effective response due to their low level of access to resources.

**iv) Respondents' level of vulnerability**

To explore respondent's level of vulnerability, coping capacity and resilience, a five point Likert scale was introduced. Respondents were asked to rank the level of their vulnerability on the scale ranges from 1 to 5, where 1= very low, and 5= very high. According to their responses, the level of their vulnerability is summarized in table 7.

Table 7 Respondents level of vulnerability

| Respondents' level of vulnerability | Mean | Confidence interval | Lower bound | Upper bound |
|---|---|---|---|---|
| Acute poverty | 4.17 | 95% | 4.07 | 4.29 |
| No access to resources | 3.5 | 95% | 3.41 | 3.59 |
| No permanent jobs | 3.45 | 95% | 3.36 | 3.53 |
| Very susceptible to disasters | 3.6 | 95% | 3.54 | 3.76 |

| | | | | |
|---|---|---|---|---|
| Lack of assistance from local and international stakeholders | 3.35 | 95% | 3.25 | 3.44 |

Table 7 shows that the level of a disaster victim's vulnerability is very high in all the determinants of vulnerability. The average mean value of the factors that determine the level of their vulnerability is 3.61, which indicates that disaster victims are very vulnerable in their current houses. Poverty is the main barrier for them as its mean value is 4.17.

Table 8 Respondents' level of vulnerability

| Respondents' level of vulnerability | Very low | Low | Moderate | High | Very high |
|---|---|---|---|---|---|
| Acute poverty | 3.80% | 2.80% | 6.60% | 45.10% | 40.30% |
| No access to resources | 3.50% | 3.50% | 38.20% | 48.30% | 5.20% |
| No permanent jobs | 2.80% | 5.20% | 40.60% | 46.20% | 3.80% |
| Very susceptible to disasters | 3.50% | 4.90% | 30.90% | 42.40% | 16.70% |
| Lack of assistance from local and international stakeholders | 3.10% | 7.60% | 41.70% | 43.80% | 2.10% |
| Coping and adaptive capacity | 82.30% | 12.80% | 3.50% | 0.30% | - |
| Resilience to cyclone | 78.50% | 16.70% | 3.80% | | |
| Building capacity to resilience | 71.50% | 22.60% | 4.50% | 0.40% | |

As shown in table 8 that more than 45% of the respondents have high level of poverty, 48.30% had no access to resources, 46.20% had no permanent jobs, and 42.40% have high level of vulnerability in terms of susceptibility to disaster. Table 8 also shows that the coping and adaptive capacity of disaster victims is very poor and 83% of respondents are very dissatisfied in terms of coping and adaptive capacity. Furthermore, table 8 shows that the level of respondents' resilience is very low. About 79% of respondents have a very low level of resilience in terms of cyclones and more than 71% in terms of building capacity to resilience. This finding is quite consistent with the result of Tobin (1999), Wisner *et al.* (2004) and Cutter *et al*. (2008) that the degree of disaster losses or potential losses is largely determined by the level of vulnerability and the level of resilience is determined by the adaptive measures undertaken to recover from the uncertainty.

**v) Conclusions**

The central research questions of this paper were 'what are the climate governance policies in Bangladesh and to what extent are those policies contributing to increasing resilience among the post-cyclone Sidr and Aila affected vulnerable coastal people of Bangladesh? To achieve the results of the central research questions and main aim of the study, this paper has

examined the impact of climate governance in augmenting resilience among disaster affected coastal vulnerable people of Bangladesh by employing three variables which are respondents' quality of accommodation, level of their resilience in withstanding cyclones and level of their vulnerability. The results show that climate governance does not have much contribution in increasing resilience among the cyclone Sidr and Aila affected vulnerable of Bangladesh. The results in table 4 show that in both cyclones Sidr and Aila affected areas; most of the houses are kutcha and tin-shed houses that represent more than 25.30% and 23.30% in the Sidr area and 29.62% and 35.55% in the cyclone Aila area respectively. The results in table 5 show that the mean score of resilience determining factors is 1.31 for resilience to cyclone, 1.36 for building capacity to resilience, 1.30 for reducing underlying risk factors and 1.29 for strengthening disaster preparedness for effective response. The average mean value of resilience to withstand disasters is below 1.40 which represents their low level of resilience and inability to prepare, cope, and respond to disasters. The cross tabulation results in table 6 show that more than 77% (220) of respondents have very low level of resilience to cyclone and more than 95% (272) of respondents have vulnerability between very low to moderate level. Table 6 also shows that about 71% (202) of respondents have very low level of vulnerability in response to building capacity to resilience, more than 76% (219) to very low level of vulnerability to risk reduction and about 8% (22) to disaster preparedness.

Furthermore, the average mean value of the factors that determine the level of their vulnerability is 3.61, which indicates that disaster victims are very vulnerable in their current houses. Poverty is the main barrier for them as its mean value is 4.17. The frequency test results in table 8 shows that the level of respondents' resilience is very low. About 79% of respondents have a very low level of resilience in terms of cyclones and more than 71% in terms of building capacity to resilience.

Finally, from the data analysis of this study, it can be argued that climate governance policies and actions plan which were undertaken by Bangladesh government were not effective in augmenting disaster victims' resilience in withstanding future cyclones because they are very vulnerable and their resilience capacity is very low as well which can exacerbate their capability to tackle future cyclones.

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