

# IMPACT OF CLIMATE CHANGE ON INDIGENOUS PEOPLE: A STUDY ON RAJBONGSHI COMMUNITY

<sup>1</sup>Ananda Kumar Biswas, <sup>2</sup>Farah Naj Jahan

<sup>1</sup> Development Studies Discipline, Khulna University, Khulna, Bangladesh

Email: [ananda.ku.mds18@gmail.com](mailto:ananda.ku.mds18@gmail.com)

<sup>2</sup> Alagappa University, Karaikudi, Tamil Nadu, India

Email: [farahnajjahan@gmail.com](mailto:farahnajjahan@gmail.com)

## Abstract

Climate Change is one of the most concern issues in the world. The effectiveness of climate change on humanity and biodiversity is increasing at an alarming rate. People of low line countries in the world are worried about climate change. In Bangladesh, Climatic impacts on livelihood, biodiversity, and the environment are increasing. Some environmentalist was explained their opinion; they concern about the alarming change of climate. Indigenous communities in the world are more worried and conscious about the changing weather rapidly. Indigenous peoples are going to more vulnerable than others people in the world from climate change. Changing livelihood patterns, cultural aggregation, losing their tradition and language are influenced by climate change. Climate change creates social vulnerabilities, economic dependence, and poverty. About 15 percent world's poor are indigenous people. Most of the people are staying below the poverty line. Economic crises among indigenous people are increasing at an alarming rate because of environmental degradation. They lost their indigenous knowledge to cope with an adverse environment. Rights of indigenous people are decreasing day by day. In Bangladesh, 45 different indigenous groups are living both CHT and plain lands. According to BBS, about 1.8 percent of indigenous peoples are living in this country. This study has been conducted on the Rajbongshi community in the Magura districts. *Rajbongshi community* is one of the minor indigenous groups in Bangladesh. This study found that the Rajbongshi community lives beside the river bank and remote areas in the Magura district of Bangladesh. 28.7% of Rajbongshi people are illiterate, and 33.3% are directly involved in catching fishes for livelihood. Their economic status isn't good enough for climate change. Because day by day, all water bodies lost their flow and bio-diversity.

**Key Words:** Climate change, indigenous people, vulnerabilities, indigenous knowledge, adaptation

## Introduction:

Climate change is one of the most burning topics in the present world. Climate change has been created from high temperatures. Low line countries in the world are concerned about climate change because their existence falls in the treaty. The world is undesirably worried about climate change like Bangladesh. Because of her geographical location, Bangladesh has been located in environmental disaster-prone areas (Pender, 2010). Every disaster attack, frequently like climate change, is the major ecological factor in our country's effectiveness. Bangladesh has an extremely high population density, a low natural resource, and a high incidence of natural disasters; it has an outstanding natural beauty like the Sundarbans. Therefore, Bangladesh is known worldwide as one of the most vulnerable countries that negatively influences climate change and climate variability. The people of the country are living below the poverty line along with illiterates. Climate change is a very negative impact on the poor and vulnerable groups like indigenous people. The effects of climate change primarily focus on Bangladesh's geographic situation, Geo-morphological disorders, and poor development activities (Gunter *et al.*, 2008).

Moreover, the economic condition of Bangladesh has depended on agriculture; most of the people are directly dependent on agriculture. Agricultural sectors are more affected by climate change because of the increase of salinity, heavy rainfall, flood, cyclone; drought is directly related to agricultural production. The coastal areas and delta region life are the most affected area, although the entire country is located climate change risk zone (Maleya Fundation, 2014). Most of the coastal regions and large rivers are generally affected by climate change. The people of these areas are very adversely

affected by climate change. The impact of climate change is increasing at an increasing rate. The adverse effects of climate change on Indigenous people all over the world (AIPP, 2015). Unfortunately, they lose their livelihood, culture, language, profession, land, and indigenous knowledge (Barkat, 2014 a). In Bangladesh, the climatic impacts on coastal belts are very noticeable, but hill tracts are also affected by climate change (National preparatory meeting COP 21). The people of these areas are also very vulnerable. Indigenous peoples settled in the hills and plains in our country. The Chittagong Hill Tracts (CHT), the situation about population density are very low in the hill areas on the other hand high population density in the plains. The total population of indigenous peoples is 1.5 million, which's 1.8 percent of the total population in our country (BBS, Census 2011). But Bangladesh Adivasi Forum counts the total number of indigenous people would be around 5 million, and the number of indigenous communities at least 45 with different cultures, languages, and lifestyles (Hassan, 2014).

The indigenous community is living in 48 districts out of 64; most of the communities living in the plains are directly related to agriculture and fishing (Roy, 2010). Climate change also affects indigenous culture, human rights, language, and migration (Macchi 2008). Indigenous communities have also traditionally played a significant role in environmental protection. Chakma is the largest indigenous group in our country, according to the ethnic law 2010 (Small Ethnic Minority Cultural Institution Act 2010"). Rajbongshi is one of the minor indigenous groups in our country (Biswas, 2005). They have a culture, lifestyle, indigenous knowledge, language being lost (Gupta, 2014). Historically, they were living Northern part of Bangladesh. Still, they live in Magura, Jessore, Foridpur, Manikgonj, Narayanganj, Satkhira, Jhenaidha, Kustia, Shylet, Mouloubibazar, Bagherhat, Khulna. Still, they also live in the river belt of our country because they are dependent on the river by catching fish and cultivating agricultural production.

In Bangladesh, climate change is an important reason directly related to the people of this country. Indigenous people are losing their livelihood pattern that's straight interrelated with the environment. Indigenous people are very much upset about their existence because of encroachment onto their old homelands by Bengali settlers and the effects of environmental degradation. Indigenous peoples are habitually situated in remote, rural areas, where they have faced a lack of infrastructure (Baird 2008). Traditional livelihoods of indigenous peoples were depending upon agriculture, fishing, and raising animals. Environmental destruction, therefore, is having a severe impact on their economies (Quader, 2008). The literacy rate of indigenous people is shallow. They know about their rights. Indigenous people in our country face problems with their land, rights, ownership, culture, and practice of their mother language (Adams, 2013). The health condition of indigenous people is not good enough because they don't know how to get medical services and biologically environmental dependent (IASG, 2014). If some people knew about way, but they were given high rate for taking this services. Climate change is the most considerable global health risk of the 21st century (WHO, 2009) and is increasingly documented as a public health priority (Mahmood, 2011). In this case, climate change is estimated to rise existing a new physical health risk on indigenous people (Green et al. 2012). Indigenous people are facing problems in policymaking because most of the policies are taken by the ruling party there is no consideration about the legal rights of indigenous people. The constitution of Bangladesh is not clear about the indigenous people's issues. There are remaining big problems about their identity as a Tribe, ethnic group, or Adivasi/ Indigenous people (The present Constitution, Bangladesh). Indigenous women are more vulnerable to climate change because they live in rural and remote areas along with illiterate. Indigenous children are also vulnerable (Larsen, 2003) the climate change and environmental degradation. Fifteen percent world's poor are indigenous people (Tomei, 2005). Poverty is one of the problems that are excluding indigenous people from society (Anaquot, 2008). Economic crises among indigenous people are increasing at an alarming rate because of environmental degradation. Indigenous peoples are straight collected medicine, food, wood, fuel, pulp, timber, and pole from the forest (Hassan, 2014).

**Broad Objective:** To show the impact of Climate Change on Indigenous People (Rajbongshi Community).

**Specific Objectives:**

- To explore the changing livelihood pattern due to climate change in Rajbongshi;
- To know the present socio-economic situation;
- To know their adaptive strategy/resilience capacity regarding climate change;
- To look into their indigenous knowledge for coping with climate change;

**Review of Literature**

Hasan (2014) delivered that climate change was adversely impacted on forest along with indigenous people. The ethnic or indigenous people were straight, dependent on forest resources or natural resources. But the present condition of natural resources wasn't good; thus, the dependent people had been facing the problem. His research area was CHT and Modhupur, where most of the indigenous people were living as well as depending on the forest. He expressed his paper, improper development policies, commercialization of the ethnic resources, unmanageable environmental degradation, and finally, Adivasi peoples themselves (i.e. Resource trade, Jum cultivation) causes significant deforestation hampering ethnic lives in forestlands. As a result, the patterns of livelihood of these people were changed, and they lost their culture and language. He was used qualitative and quantitative analysis on primary and secondary data. Some findings can help my research objectives because forestland is related to indigenous people habited. But I think a significant gap existence the relationship between forest and indigenous people. Bangle settlers are also responsible for forestland degradation. This research helps me to find out the rate of dependence among forest and indigenous people

Tebtebba Foundation (2009) introduced a basic concept on Climate Change impacts, including mitigation, adaptation measurement, women's status, and a brief description of the present world program and. The publication also contains the IP status of Climate Change. This paper showed the overall indigenous people situation in the world by climate change. This foundation was expressed the present condition of indigenous people in the world. The world indigenous people were facing unfavorable condition from climate change. Climate change is the ongoing process of the world. Every person was negatively affected by climate change, but indigenous people were very badly affected by climate change. In Bangladesh, people were negatively affected by climate change. In this country, indigenous people are living in CHT and the plain land. They were facing very many harmful problems. In this report, most of the indigenous communities were facing identity crises because of the ignorance of the government of Bangladesh.

Maleya Foundation (2014) experimented that Chittagong Hill Tracts (CHTs) is unique to Bangladesh. Most of the ethnic /indigenous community is living in these areas. Climate change was an ongoing issue in Bangladesh. The impacts of climate change on indigenous people were adversely affected; they lost their livelihood pattern, culture, land, language, tradition. In this research, the effects of climate change on women in CHT showed the women's vulnerabilities and risky by the climatic disorder. This research was qualitative-based. The target group was women who are the ages between 18 to 65 on the indigenous group. Women in CHT were facing a lack of food, poverty, lack of education, and health. Climate change was the number one barrier for women because women weren't fit for taking challenges. Climate change destroyed the market, natural resources, agriculture, household work. This research helps to achieve my research objectives. Because my research objectives are the same but location and group are different. This paper supports finding out the gender inequality among indigenous people that's absent in this above research.

Barkat (2014) wrote the whole situation of indigenous people and their economic condition. This paper was a treatise on understanding the political-economic essence of unpeopling of indigenous peoples. He said that indigenous people were backward because of their educational quality, health condition, and access to natural resources. Indigenous people in Bangladesh lived in CHT and Plainland. He expressed the total number of indigenous people in Bangladesh is very high, but our govt. was silent in this matter. This paper evaluated the present situation of indigenous people in Bangladesh. He suggested to govt. should have to take some initiative for the betterment of indigenous people. Because development is dependent on the inclusiveness of all country people, he mainly focused on the economic condition of indigenous people. This paper only analyzes the political, financial situation, and there are missing social and environmental factors related to indigenous people.

AIPP (2015) explained the present condition of Asian indigenous people in this report total. This report showed around 260 million people were directly interlinked with climate change. The effects of warming temperature, extreme weather events, increasing sea level, food shortage, imbalance of eco-system, environmental degradation, loss of indigenous knowledge and culture were related with indigenous livelihood. This report described the 14 countries' country papers explained in the COP 21 in December 2015. They spoke up their voice against climate change. AIPP is the platform where every indigenous community was placing their demand that's published in yearly. Every country has a unique strategy to maintain the climate change but it's very regretted that there were no specific plan

for indigenous people for each country. Indigenous communities were living in the hill tracts, plain land or riverside. But day by day they were coping with climate change by using some own made mechanism. In COP 21, indigenous community of Asia delivered the strong protection against developed countries in their activities. They were demanded the world temperature below the 1.5 C degrees. The fund of climate resilience should have increased for the indigenous people betterment. Clean Development Mechanism (CDM), REED+ were initiative that's the maintenance the whole world. The indigenous people of Thailand, Malaysia, Nepal, Philippines, Taiwan/china, Myanmar, were negatively affected from the climate change.

Biswas (2005) described that Rajbongshi community is the ethnic group in Bangladesh. They live in northern part of Bangladesh. But climatic migration was created the scatter of their living. They were living in river side. The main profession was catching fishes from the open water body or cultivating fishes and sold fishes. They were involving in cultivating agriculture, fishing and daily labor as an economic activity. He also focused the traditional songs and culture. Rajbongshi community also believed in different God. But most of the Rajbongshi are Hindu. The language of Rajbongshi is lost day by day along with culture and medical knowledge. In this research, we saw the body structure is changeable one area to another area. He said Rajbongshi people are not enough educated because of poverty, lack of consciousness. The education rate was below the 40% when this paper was writing. All over the country, Rajbongshi people are living (census 2001). In this census Rajbongshi people were shifting their profession day by day. The culture of Rajbongshi community was decreasing at a decreasing rate for poverty, other religion interfere etc.

Monwar et al. (2014) explored the indigenous adaptation practices to minimize the losses of climate change impact. This study was presented the community livelihood patterns, perception of climate change and indigenous coping strategies in flood plain areas especially at the haor areas. This study was used household survey, key informant interview, focus group discussion and participatory observation. The main objective in the study was found out the indigenous adaptation strategies that they practices in the locality. They got some information; day by day fishes lost their habitat for the environmental degradation. They explained the life style of haor areas of Bangladesh. Most of the people are directly depended on catching fish by using indigenous materials. In this study, some important points were missing like what types of materials they used to cope with climate change. Targeted people are not cleared in this study.

## **2.2. Theoretical Framework**

The theoretical framework is the consist of the concept, scholarly literature and existing theory that used in the study. In this study Vulnerability and adaptation is the main theory that related to climate change. Vulnerability research is critical because it provides an understanding of how communities will adjust to effect from climate change (Adger 1999). Climate change experts were using the number of different models of vulnerability. For Gunter *et al* (2008) the risk of vulnerability is openly affected by the risk of downgrading. He was using the concept of vulnerability developed by Allen Consulting Group which identifies vulnerability as a function of exposure, sensitivity and adaptive capacity, with an extensive discussion on how this relates to the Australian indigenous context. Adger defines two main factors of vulnerability: social and individual (Adger 1999) and notes that poorer people have fewer resources to adapt to impacts of climate change (Adger 1999). Adger (1999) was explained social and individual vulnerability as

- Social vulnerability: these are the institutional mechanisms for dealing with impacts from climate change, such as early storm warning systems.
- Individual vulnerability: access to resources and a diversity of income streams.

Entitlement is an important factor in vulnerability and adaptation models. Edgar was detailed, privileged as an underpinning tenet of security and vulnerability (1999). Entitlement describes ownership of the problem. Where a problem is defined by outsiders, communities have a reduced capacity to participate in seeking solutions for the problem or as have found, people who think they can make a positive change are more likely to contribute to making changes. Teka and Vogt (2010) include entitlement, along with willingness and ability, as one of the three main elements to participatory risk management. One participatory risk management tool developed specifically to provide an understanding of links between climate, livelihoods and specific project activities is CRiSTAL (Community -based Risk screening Tool - Adaptation and Livelihoods). CRiSTAL aims to provide project managers and planners a step-by-step process to

1. Assess the potential impacts of climate on local livelihoods.

2. Assess the sustainability a specific projects with regard to climate change and livelihoods.
3. Integrate changes to the project to facilitate adaptive capacity building within the community for dealing with climate impacts.

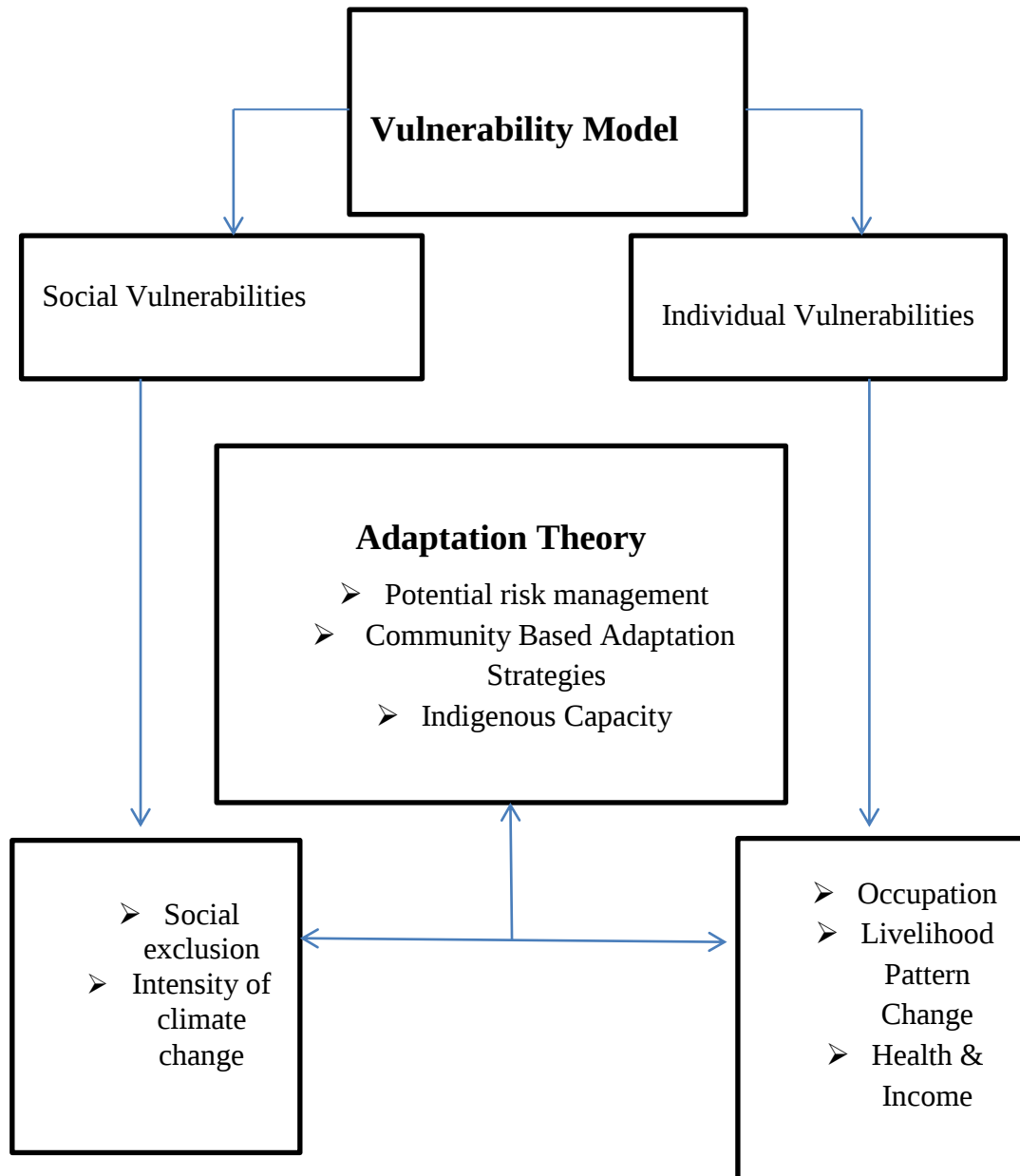


Figure No. Conceptual framework

### Research Method

This study was used mixed methods that are focused on field data. Qualitative and quantitative methods are used in the research. According to the study objectives the information has gotten importance from Rajbongshi community in Magura. Apart from them, male and female have contribution in primary data. Collected data have processed to compilation and analysis. Following

sources are used for primary and secondary data. To get the real situation of climate change on indigenous people. Data was collected from indigenous people who are negatively affected by climate change. Besides data about respective concepts will be collected by incorporating relevant items (variables) in the interview schedule and analyzing and interpreted using descriptive statistics to comprehend the study's objectives. For in-depth study, 4 case studies were incorporated.

Magura district was the study area. She has 4 upazillas such as Sadar upazilla, Shalikha, Mohammadpure and Shrepure upazilla. The study was conducted with 25 villages in four upazilla. In this district, there is huge number of Rajbongshi people lived. They are affected from environmental degradation. Sampling refers to collecting data from a selected part of the total population. The total number of households is the total population for the survey. Those means households are the units. The sample consists of those units from the total population, which are selected for data collection. The total population of Rajbongshi Community in Magura districts is not rigid. So the samples were fixed by the Snowball sampling method and data are collected from the Rajbongshi household in Magura districts. Snowball sampling is used when the total population is hidden that difficult for researcher to access.

Primary source includes the field where the incidence occurs. Through face-to-face interaction, primary data collected by the investigator conducting the research. Here primary sources were collecting among 60 Rajbongshi community peoples in Magura district of Khulna Division.

The study mainly was based on quantitative and quantitative data. The information gathered from the field has compiled by the different variables identified according to the study objectives. An interview schedule was using to write down the answers to the questions posed during an interview to the informants. The interview schedule has been developed and finalized through pre-test and ready for data collection.

Of 60 respondents, 34 are males and 26 are females. As there has been taken 4 upazillas there found 28.3% people are illiterate. 21.7% respondents are 38-47 & 58-67 years old.

After completing the field work and interviews, the data processing has been carried out. The researcher had to do transcript the qualitative data manually. As the respondents were mostly from rural areas and the illiteracy rate is so high firstly the transcription of the interviews was conducted in Bengali. Another part of this research has been conducted by quantitative question. Secondly the collected data was scrutinized and eliminated the irrelevant data following to be coded by giving the specific name of every variable. Some correlation between

In qualitative research, analysis frequently takes place at the same time as the data collection. In this study both qualitative and quantitative analysis has been followed. Data will be analyzed and interpreted by using different software like SPSS-20.0. Here descriptive (frequency distribution, percentage and different charts) statistics (correlation) were used.

Several ethical issues were faced when conducting the research and, therefore, preventive measures were taken in every case. Primarily, the informed voluntary consent was taken from the respondents. An option that researchers may choose is not to use any offending terms like "self-defeating" or "self-handicapping" (Martin et al., 2003). However, this practice is ethically unacceptable as the respondents' opinion and judgment should always be valued if possible. Hence, the respondents were informed of every aspect of this study beforehand. At every stage of the research, the utmost care was practiced to maintain the confidentiality and privacy of the respondents. Moreover, respect to the respondents and property rights have been considered an essential part of every effort. The research is pursued in such a way that it does not violate the respondent's interest and wellbeing. During the interviews, the proper care of not hurting any farmer's emotions was sincerely taken. For the same reason when the farmer's personal problems were referred to, we tried to understand from the context that whether they could tell us more, and when we felt asking questions about personal matters could have harmful effects on them, we stopped inquiring further.

## **Result and Discussion:**

### **Changing the Livelihood Pattern for Climate Change**

Climate change is the burning issues all over the world. Every person is affected by climate change in the world. Bangladesh is one of the most climate vulnerable countries in the world for her geographical location. In Bangladesh, climate change is negatively affected on people. Indigenous communities are living in Bangladesh. Most of the indigenous communities are adversely affected by climate change because of most of the community are depending on the environment for their livelihood. Rajbongshi community (for this study) is one of the largest communities in Bangladesh. Rajbongshi community was living in Bangladesh over a thousand years. For the purpose of the study

to explore the socio-economic condition of the present time of Rajbongshi community who adversely affected by climate change.

Table: Impact of climatic factors on Social life

|                                      |       | Number | Percent (%) |
|--------------------------------------|-------|--------|-------------|
| Social life change on climate change | Yes   | 59     | 98.3        |
|                                      | No    | 1      | 1.7         |
|                                      | Total | 60     | 100.0       |

Filed study has showed that the impact of climate change on social life was on going over the year. 98.3 % people's life was changed by the climate change. Changing their income, livelihood patterns, food habit, indigenous knowledge, materials, method and technique. 1.7% people of Rajbongshi community don't have any changes because of their living location. For this reason they have no change.

Mr. Kalidash says-

Day by day the lifestyle is changed by the environment. They don't have enough knowledge on climate change. But he realized the changes in his life and his surroundings. He saw the rivers are losing their flow; temperature is high, uncertainty of happening flood. Rajbongshi community was depending on environment. Most of the family is living on the river side. Last year he cultivated paddy on his own land, but the flood destroyed the crops. This flood made his life was vulnerable".

Impacts of climate change on Rajbongshi community were adversely affected because of the whole community is living depending on environment. Sometime climate change was changing their occupation. Because of people was living below the poverty line. Some time they were moving outside to cope with the changes.

#### **Intensity of Climate Change on Social Life**

Day by day the world is going worse in the environmental sectors. World temperature is increasing at an increasing rate. In Bangladesh, the intensity of climate change isn't good on people daily life. Especially indigenous people are very affected than other people.

Table: Impact of climate change intensity on social life

| Intensity Rate | Number of Population | Percent (%) |
|----------------|----------------------|-------------|
| Severely       | 9                    | 15.0        |
| Moderately     | 33                   | 55.0        |
| Slightly       | 16                   | 26.7        |
| No Impact      | 2                    | 3.3         |
| Total          | 60                   | 100.0       |

Field study has showed that the impacts of climate change intensity on social life were affected moderately because the 55.0% sample people was said when the field survey was conducted. 26.7% people are facing slight intensity from climate change. 15.0% people are tackling the highest intensity of climate change. When the field data was completed, 3.3 percent people have no impact on climate change because of geographical location.

#### **Gender Based Climatic Intensity on Social Life**

The impact of the intensity rate of climate change on social life is increasing day by day. Year after year the social life is going bad to worse for the changing of the environment. Women are facing lot of problems from climate change because of them staying the house and maintain the family.

Table: Climatic intensity on gender

|       |        | Climatic Intensity on Social life |            |          |           | Total |
|-------|--------|-----------------------------------|------------|----------|-----------|-------|
|       |        | severely                          | moderately | slightly | no impact |       |
| Sex   | male   | 4                                 | 19         | 10       | 1         | 34    |
|       | female | 5                                 | 14         | 6        | 1         | 26    |
| Total |        | 9                                 | 33         | 16       | 2         | 60    |

The completion of analysis, the intensity of climate change on women is facing more severe than mine. But Men are facing moderate problem from climate change because they are working on the outside.

Kamona Rani said her life story

"She doesn't know the meaning of climate change and its intensity of social life. But she realized the intensity of climate change in her life. Kamona was stopping her study and working day laborer when she was 14 years old. This time, her father was died from the thunder rain. This time her family was facing the unbelievable situation. After the married life, her husband was facing severe climatic intensity, but she had slight on her social life. Her husband was a fisherman, when summer seasons there is no available water in her locality. He was going to be an unemployed day by day. This time her husband was migrated to Dhaka for maintaining the family. He was failing to manage a job first time, but within some days he managed".

#### Impact of Climate Change on Occupation

Impact of climate change on indigenous people is increasing day by day. Climate change is forced to change their occupation. Most of the people are changing their occupation from climate change. In this study, two objectives aim to explore the changing pattern of livelihood and to know their present socio-economic condition. These two objectives are interlinked with the occupation. Climate change is adversely affected on occupation of Rajbongshi people. Most of Rajbongshi community people changed their occupation frequently to cope with climate change.

Table: Before the occupation of Rajbongshi Community people

| Sectors of occupation    | Number | Percent (%) |
|--------------------------|--------|-------------|
| Agriculture ( farmer)    | 3      | 5.0         |
| Service ( govt./private) | 1      | 1.7         |
| Business                 | 6      | 10.0        |
| Fisherman                | 20     | 33.3        |
| Day laborer              | 6      | 10.0        |
| Housewife                | 15     | 25.0        |
| Others                   | 9      | 15.0        |
| Total                    | 60     | 100.0       |

In the table the main occupation of Rajbongshi community was fishing, about 33.3 percent people are directly interlinked with catching fish both women and men. 25% of the women were engaged inside of the house, but they were making some homemade net. 10% people are connected with business and day laborer. 15% people are doing different types of work like rickshaw-puller, auto-van driver. Before the climate change impacts only one person was engaged in service sectors.

Table: Present occupation of climate change

|             | Number | Percent (%) |
|-------------|--------|-------------|
| Agriculture | 5      | 8.3         |
| Service     | 8      | 13.3        |
| Business    | 17     | 28.3        |
| Fisherman   | 6      | 10.0        |
| Day Labor   | 17     | 28.3        |
| Housewife   | 5      | 8.3         |

|        |    |       |
|--------|----|-------|
| Others | 2  | 3.3   |
| Total  | 60 | 100.0 |

The completion of field study and analysis the compare between the parent occupation and before occupation when the climatic intensity has been increasing. The present occupation of the study is a businessman and a day laborer, both are 28.3% before 10%. The fisherman is decreasing 33.3% to 10.0%. Increasing the rate of service sectors 1.7% to 13.3%.

Table : Correlation between Climatic factors and its impact on present occupation

|                           |                     | Climatic Factor | Impact on Present Occupation |
|---------------------------|---------------------|-----------------|------------------------------|
| Climatic Factor           | Pearson Correlation | 1               | .033                         |
|                           | Sig. (2-tailed)     |                 | .801                         |
|                           | N                   | 60              | 60                           |
| Impact Present Occupation | Pearson Correlation | .033            | 1                            |
|                           | Sig. (2-tailed)     | .801            |                              |
|                           | N                   | 60              | 60                           |

In the above table the correlation between climatic event/factors and its impact on present occupation. According to the Pearson correlation one tailed and two tailed, in the correlation result will be -1 to +1. If -1, there were no relation between the variables, in the opposite thing if +1; there was a good relationship with the variables. In the above table there was standing a relation. Climatic factors impacts on present occupation.

Susanto Biswas shared his occupation, changing story,

"Once upon a time he was a fisherman, he caught fish from open sources water bodies like river, canal. He has lived embankment of Fatki River; for these reasons catch fishes from the river easily. He maintained his family to sell fish in the village market. Day by day, the access of water bodies was restricted and the climatic factors like drought, high temperature, imbalance of environment, disorder of environment, loss of eco-system are negatively influenced to give-up the position. Once upon time he was a fisherman. He was living below the poverty line. He borrowed some loans from NGOs and started a shop. Now he is a community leader of Rajbangshi people".

#### **Impacts of Climate Change on Health Status**

High temperature, imbalance of environment, heavily rain, flood, and drought are creating the health vulnerabilities of the people. Indigenous people are affected badly by climate change. Most of the climatic factors are existing in Bangladeshi societies. The relationship between climatic factors and the health status of indigenous are focusing the impact of climate change on Rajbangshi community.

Table 4.7: Relation between climatic factors and its impact on health

|                 |                                   | Climatic Factor | Impacts on Health |
|-----------------|-----------------------------------|-----------------|-------------------|
| Climatic Factor | Pearson Correlation               | 1               | .046              |
|                 | Sig. (2-tailed)                   |                 | .728              |
|                 | Sum of Squares and Cross-products | 284.183         | 4.150             |
|                 | Covariance                        | 4.817           | .070              |
|                 | N                                 | 60              | 60                |
| Impacts Health  | Pearson Correlation               | .046            | 1                 |
|                 | Sig. (2-tailed)                   | .728            |                   |
|                 | Sum of Squares and Cross-products | 4.150           | 28.850            |
|                 | Covariance                        | .070            | .489              |
|                 | N                                 | 60              | 60                |

In the above table climate factors were impacted on health. Their relation was positive in this research. The value of the Pearson correlation was same. Both values were positive. When the climatic factors were impacted on health it was .046 and health sectors were affected from climatic factors is was .046. From the Focus Group Discussion, Mr. Monmoto Chowdhory described the health condition of Rajbongshi people over the years.

"Monmoto told from his realization, day by the environment was going to worse. Most of the climatic factors are attacked on the health of Rajbongshi community. Health diseases are increasing with the increasing of climate change. People aren't staying healthy life because of the climatic impacts on environment."

#### **Climate Change Promote the Health Diseases on Rajbongshi Community**

The impact of climate change on indigenous health is negatively affected day by day. Most of them are affected some diseases like asthma, skin diseases.

Table 4.8: Types of Health Disease

| Health Diseases | Frequency | Percent |
|-----------------|-----------|---------|
| Diarrhea        | 6         | 10.0    |
| Typhoid         | 2         | 3.3     |
| Dysentery       | 1         | 1.7     |
| Skin disease    | 13        | 21.7    |
| Asthma          | 20        | 33.3    |
| Others          | 2         | 3.3     |
| Don't suffer    | 16        | 26.7    |
| Total           | 60        | 100.0   |

In table we found the health condition of Rajbongshi people when they were facing to climatic factors. Asthma was increasing at an increasing rate in Magura district among Rajbongshi community. 33.3 % people were affected by this disease. Skin disease was also increasing in summer seasons (FGD, 2016). They said the radical change on environment was the main factors to affect asthma and skin disease. According to individual face to face interview, one person said, before 10-15 years, there were no existence asthma and skin disease. When they faced the climatic factors they were also used indigenous medical knowledge.

Usha Rani says-

"In the present time she was the various types of health hazard on her locality. People are negatively affected by climate change. She said 10 years before had no health disease but around 5 years she was severely suffering from Asthma. It was the common illness in her area".

#### **Adaptation Strategies to Protect Climate Change**

Climate change is making the climate vulnerability. Most of the people are affected from the climate change over the year. The impacts of climate change on peoples they changed their livelihood pattern. Income source is also affected from the climate change. In the family stage they protect climate change impacts on the some ways.

Table: Adaptation Strategies

|                             | Number | Percent (%) |
|-----------------------------|--------|-------------|
| Low food taking             | 13     | 21.7        |
| Stopping children education | 11     | 18.3        |
| Borrowing money             | 34     | 56.7        |
| Aid                         | 2      | 3.3         |
| Total                       | 60     | 100.0       |

In the field study, Rajbongshi people were taking some steps when the climatic factors entered in the locality. At first they suffered to the income stage. Most of Rajbongshi people below the poverty line in magura districts. Borrowing money from money lender or NGOs were the main sources to maintain the situation. Low taking food was the strategies to maintain the climatic vulnerabilities. Women were doing this work because of they were staying the whole time. Some parents did not afford to carry on their children education. This was the reasons to the highest rate of illiteracy. There was limited aid from govt. and some NGOs.

The analysis of FGD, Romen Biswas say-

"Climate change impacts on his income source, he was a fisherman. When the temperatures, imbalance of environment, losing the flow of Rivers, were increasing, the fishes are decreased. In this time he and his family were severely staying climate vulnerabilities. To adapt the climate change he took some initiative, he was borrowing money from money lender and removing the certain time climate vulnerabilities. This time he also stopped his child to go to school for education. Her wife and he were taking onetime meal in a day. This was the primarily adapt with climate change".

#### ***Migration for Climate Vulnerabilities Adaptation***

Migration is the one of the most important issues in present time. Most of the people in climate vulnerable prone areas are migrated from these places. World whole indigenous people are migrated from their indigenous living places. They are migrated and lost their indigenous culture, knowledge, language and tradition. They are negatively affected by climate change on social, cultural, economic and political factors. Day by day they are forced to change their original living places when they lived in the colonial period by climate change

Table: Migration Rate of climate vulnerabilities

|       | Number | Percent (%) |
|-------|--------|-------------|
| Yes   | 20     | 33.3        |
| No    | 40     | 66.7        |
| Total | 60     | 100.0       |

The migration rate was so much low in Rajbongshi community for his geographic location in the above table. Field study showed that 33.33 percent people were lifting their own village or land because of poverty, climatic factors, environmental disorder, created this poverty. People who didn't migrate were taking loans from the money lender and sometimes selling their own land.

After the completion of the field survey,

Monmoto Chowdhury was the leader of rajbongshi community, he says-

"Climatic factors forced the people to migrate one place to another place, he said when they lived in this areas around 500 years ago (heard from his grandfather). They are migrated from North Bengal, and they started to live in the riverside. About 10 years ago river erosion forced to him migrated."

#### ***Indigenous Knowledge for Coping with Climate Change***

Every indigenous community has some indigenous knowledge. Rajbongshi community has some indigenous knowledge, materials, techniques and method that helped to maintain their livelihood. When the climate change is increasing at an increasing rate, people of Rajbongshi community took some strategies to cope with the climate vulnerabilities.

Table: Indigenous knowledge using for adaptation

|           | Number | Percent (%) |
|-----------|--------|-------------|
| Yes       | 24     | 40.0        |
| Something | 16     | 26.7        |
| No        | 20     | 33.3        |
| Total     | 60     | 100.0       |

In the field survey showed, about 40.0% people are using some strategies for adapting climate change. About 26.7% people are using some knowledge to manage the climate vulnerabilities. Some people are no needed to take help from indigenous knowledge or they forgotten their indigenous strategies or techniques.

The completion of field survey, one Rajbongshi people described the indigenous knowledge for adapting the capacities of climate change.

"Rabongshi community has some unique knowledge how to manage the climate change factors. When the whole flood, they used some techniques for catching fishes from the water bodies. Most of the people of Rajbongshi community are directly or indirectly related to catching fish. When they were catching fish they used indigenous knowledge like homemade net, Ghuni (a Bamboo which is mechanism of catching fish), Beshal (which one made by net and Bamboo). Home made net is the environmental friendly because this net has no impacts on other species of fishes. They have some medical knowledge, such as when they attacked from favor, they used "Bashok" leaves for removing the favor, and they used need leaves for any types of worms".

#### ***Adaptation Strategies in Agriculture Sectors***

When climate change was forced to change their occupation and most of the people were changing their occupation. Agricultural is the largest sectors for removing the vulnerabilities that's from climate change. Rajbongshi community people changed their occupation on agriculture. They used some indigenous knowledge when they cultivate the land.

Table: Adaptive Strategies of Agriculture

|                                   | Frequency | Percent |
|-----------------------------------|-----------|---------|
| Cultivation of short hybrid Paddy | 17        | 28.3    |
| Crop diversification              | 34        | 56.7    |
| Others crops (vegetable, seeds)   | 9         | 15.0    |
| Total                             | 60        | 100.0   |

In the above table, they have limited land where they cultivated some crops. Sometimes climatic impact on agriculture sectors in badly. To mitigate the loss of agro loss, crop diversification was the main way according to the research, 56.7 percent people were change their previous crops. Cultivation of short hybrid paddy was 28.3 percent, this rate was decreasing, when the climatic factors attacked on the locality they hybrid crops was negatively affected. Farmers were also some others crops for maintaining the loss of the climatic factors.

The analysis of field data, According to Ashok Biswas,

"Rajbongshi people were cultivated the indigenous paddy but the production time and produce paddy was very low. To adapt the loss of climate vulnerabilities is interlinked with climate change for the betterment of the people. They changed their indigenous species of paddy. Now they are using the short time hybrid paddy, crop diversification and other crops for maintaining the climate vulnerabilities for short term".

#### ***Adaptation Strategies for Protecting and Cultivating Fishes***

Climate change destroys the eco-system, fish species are negatively affected from environmental degradation. Catching fish is the number one adaptation strategies of Rajbongshi community. When flood attacked on their locality, they caught fish and maintain to sell this fish. But day by day they lost their rights to catch fish in the open water body by the powerful people in the society. To protect the fish species the whole community was held for this fish when they face the climate risk. Rajbongshi community has taken some steps to protect fish when they will face climatic impacts.

Table: Strategies for overcoming loss of fish

| Name of intervention                             | Frequency | Percent |
|--------------------------------------------------|-----------|---------|
| Awareness and precaution                         | 29        | 48.3    |
| Promoting indigenous materials for catching fish | 13        | 21.7    |
| Protecting open water bodies                     | 1         | 1.7     |
| Changing species                                 | 13        | 21.7    |

|        |    |       |
|--------|----|-------|
| Others | 4  | 6.7   |
| Total  | 60 | 100.0 |

In the above table Rajbongshi people have taken some initiative to protect and promote in the open water bodies. They had done to aware and precut the way to catch fish. 48.3% people were directly involved with this initiative. Promoting indigenous materials for catching fish and changing the species were the second largest sectors that initiated by Rajbongshi community.

Form the FGD, Mr Gonesh said that "Fishes is the only way to go back the past. At the previous time their life style was better from the present time. Rajobongshi community was created an association to protect water bodies and cultivate fishes. They have been promoting the indigenous materials for catching fishes. Gonesh says, In the market current jal (net) destroys the indigenous fishes species. Powerful persons are also interlinked with destroying the fish species. But a homemade net is the best solution for protecting the vulnerabilities".

#### ***Government and Non-Governmental Organization Interfere to Protect Climate Change***

The impacts of climate change on indigenous people are increasing day by day. Every time their personal intervention isn't enough for protecting their livelihood, changing of life, indigenous knowledge and materials. Govt. is the key factors for protecting the climate vulnerabilities. They can take some initiative for protecting the condition of climate change. They can introduce the National policy for protecting indigenous people, financial help is helpful for short time betterment.

Figure: Any Financial Supports from Govt. & NGOs

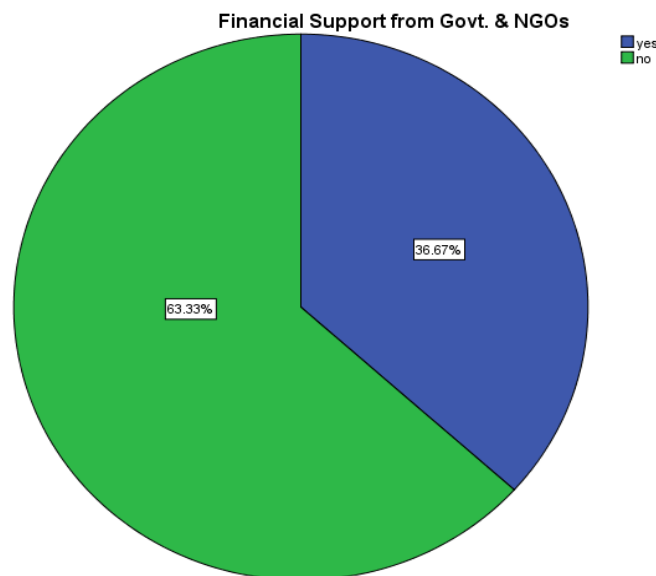


Figure: 4.1: Financial Supports from Govt. & NGOs

In the above graph, Rajbongshi people weren't getting any financial help from govt. and ngos. Some Ngos like Rova foundation was working with Rajbongshi people for the betterment of the community. 63.33% People of Rajbongshi community weren't any helped by govt. and NGOs. 36.67% people were some helped from GOs and NGOs.

From the completion of FGD, Monimala said that,

"When they faces the climatic vulnerabilities they didn't any help from govt. sides, that's needed for maintain the vulnerabilities in the certain times. Govt. financial support would be changed their life style, she believed. But now she didn't get any financial support from Govt.

#### ***Government Initiative for Climate Change***

The climate resilience fund is working for the betterment of climate vulnerable people. This fund is following through the govt. The international community is playing the key role of climate resilience fund. Indigenous people are more vulnerable in present time they lived very low standard of life for the climate change. Govt. imitative is needed for the betterment of the Rajbongshi people.

Table: Satisfied on Govt. initiative

|       | Number | Percent(10) |
|-------|--------|-------------|
| Yes   | 50     | 83.3        |
| No    | 10     | 16.7        |
| Total | 60     | 100.0       |

In the table govt. take some initiative for the betterment of Rajbongshi community. Open water body was free from all of you people. There were no embankment in the open water body because of fishes were moving. But govt. had some limitation because powerful persons were playing the illegal way to demand the ownership.

After the completion of filed study, Rajbongshi community wan to effectiveness of govt. work for protecting and promotion of open water bodies along with providing the identity. In 2010 govt. declared the 27 ethnic groups in Bangladesh, unfortunately Rajbongshi community was missing. This one is need for the betterment of Rajbongshi community people.

## Discussion

### Impact of climate change on social life:

- Changing the livelihood pattern for Climate change: 98.3% people are changed their life by the climate change.
- Intensity of Climate change in social life: 55.0% people are moderately affected on the intensity of climate change. Most of the people are severely affected by the climate intensity.
- Gender Based climatic intensity on social life: Women are affected severely by the climate change. They are suffering from climatic factors.
- Impact of climate change on the Occupation: The present occupation of the study is a Businessman and day laborer both are 28.3% before 10%. The fisherman is decreasing 33.3% to 10.0%. Increasing the rate of service sectors 1.7% to 13.3%.
- Impacts of climate change in Health status: there are positive relationship between the climate change and the health status of Rajbongshi community. They are suffering from the climatic factors. 33.3% people are suffering Asthma. 21.7% people are affected in Skin diseases.
- Impacts on their income: The analysis of the data, the income of the Rajbongshi community people are decreasing because of climate change. The whole people of Rajbongshi community are facing the undesirable condition of climate change.

### Adaptation Strategies:

- ❖ Family and income strategies for maintaining the climate change: 56.7% people are taking lone from the money lender to maintain the family when they faced the climate change. Some time they stopped their children education and influenced to go to join work.
- ❖ Migration for climate vulnerabilities adaptation: 33.3% people are migrated and adapted with the climate vulnerabilities.
- ❖ Indigenous knowledge for coping with climate change: 40.0% people were directly using the indigenous knowledge and 26.7% people are directly but sometimes they used indigenous knowledge when the climate change attacked on this locality. They used some indigenous knowledge, materials, technique and method for facing climate vulnerabilities.
  - ✓ Homemade net, Ghuni (a Bamboo which is mechanism of catching fish), Beshal (which one made by net and Bamboo are using for catching fishes.
  - ✓ "Bashok" leaves for removing the favor, and they used need leaves for any types of worms, when they faced health diseases.
  - ✓ They used indigenous knowledge for farming.

- ❖ Adaptation strategies in agriculture sectors: People are changing their occupation. Agriculture is the one of most valuable sectors in the world. 56.7% people were changing their crops diversification because of climate change.
- ❖ Adaptation strategies for protecting and cultivating fishes: Day by day loss the open water bodies along with the fishes species. They tried to creating awareness among the people to adapt the climate change vulnerabilities.

### **Case Studies Regarding the Impacts of Climate Change**

#### **Case Study- 01**

Kalidash Rajbongshi who is the member of rajbongshi community. He is a 56 years old. He was born in Kanainogor at Mohamadpure Upozila in Magura district. In Kanainagor, he is living with her family. He was complete his study on primary and stopping to go to school because of poverty and he was the elder sons. His parent was so poor that they couldn't able to continue his education. He was going to catch fish when he was 8 years old. Day by day Kalidash was going to be a fisherman and maintain his family. When he was caught fish, the entire society was neglected and humiliated this fishing profession. Sometimes he faced embarrassed situation. When he was 25 years old, he caught enough fishes from nearby river, day by day the flow of river was decreasing at a decreasing rate. When he was 30 years old the river didn't provide enough fish after the years. He caught the fishes by using homemade instruments and sold in the village market and earned money. He had gotten some knowledge from his father, grandfather and his community members. Sometimes he caught fishes with a group of rajbongshi people and shared the profits. They caught fishes in open water body. In this time every open water body control under rajbongshi community. He was married when he was 32 years old. He had a wife and two sons, his sons were married and lived in another place. His son was also a fisherman. Now he was the head of his nuclear family. Fishing is the only one profession to survive his family. By selling fishes was the main income source, he was earn around 36 thousand in a year without any capital there was no risk. But in present time income is increasing with capital investment and risk. They were borrowing money from different NGOs and money-lender. When was 40 years old, he was badly realized what will be waited for his family because open source water bodies were illegally owned by the powerful persons. Climatic impacts like droughts, high temperature, imbalance of eco system were destroyed the water bodies. Fishes and hydrophytes were died. Fish living placed were negatively affected by these types of climatic factors. For that moment, he changed his profession fisherman to day labor, and buying fish from depot and selling in the village market with limited profit sometime they lost their capital. Kalidash saw the past condition of Rajbongshi community. From his statement, Rajbongshi people are illiterate, and they have no future plan. Most of the rajbongshi people are directly involved in fishing; fishing is the main occupation in his areas. When they were catching fish they used indigenous knowledge like homemade net, Ghuni (a Bamboo which is mechanism of catching fish), Beshal. In present time the lack of water bodies like river, baor, kanal, they shifted their profession like farmer, day labor, migrant.

#### **Case study -02**

Monmoto Chowdhory was school teacher who is 60 years old. He lived in Sorbosangda at Shalika in Magura districts. He has 5 members in his family. His family totally educated. He is the leader of Rajbongshi Development Organization. His father was a fisherman and he was 4 children, Monmoto was the most little children of Srekanto Chowdhory. Srekanto chowdhory was trying to the betterment of his child. But he was totally failed his two sons and one daughter wasn't going to school because of poverty. Monomoto was continuing his study by catching fishes and day labor. When he was 20 years old, he was facing undesirable situation. He lost his father. By that time SSC from fill-up was ongoing. Primarily he decided to give –up all hope but his mother borrowing money from money-lender with high interest. Finally he was sitting in the exam and got first class. He was the first person who's passed SSC exam in his locality. His two brothers and mother were working hard to pay this money along with interest. After some days he got a job in primary school, his family was going as usual because it wasn't enough for whole family. Monmoto was married when he was 33 years old. He saw the bad condition of his family and the Rajbongshi community in his areas. His all neighbor was directly related with catching fishes and sold in the market for controlling the family. They were catching fishes in *Fotki* River without any obstacles. For his time only Rajbongshi and Malo community were catching fishes and selling in the market. They caught fishes with using indigenous technique and materials everything was homemade. When they came back home, they were singing some Rajbongshi song. This time they

were happy because there was no risk to loss capital. They cultivated crops like paddy, jute, vegetables along with culturing fishes in their ponds. This year he was lost around whole crops and two cows were died for flood. It was undesirable but he faced easily with his knowledge. In this year they were badly affected by flood. Drought was destroying crops and increasing the production cost of product. In his areas, flood, drought, high temperature were creating the vulnerabilities. When they were staying in vulnerable situation, they were borrowing money, shifting profession and migrant to town. Some families left Bangladesh in case of unable to pay borrowing money. Monmoto said climatic impacts destroyed their culture and environment. Present time they were shifting their indigenous knowledge

### **Case Study-3**

Kamona Rani Biswas is a 35 years old who lives in Rajapure at Sreepure in Magura districts. Her father was a fisherman and mother was a housewife. When she was married, she was 17 years old. She is a house wife. Her husband is a day laborer. She has two sons. Her education qualification is class eight. When he was 12 years old, he faced a flood. Everything was under the water. Her family was surviving by eating one time in a day. In 14 years old, his family was migrated to her mother father-house because of poverty. In this place she saw the Rajbongshi songs and culture. But he realized the present time this song and culture was lost because of poverty, people motivation and modernization. After married, her husband was a fisherman but degradation of environment created to shift his profession. When he was a fisherman, they had taken 3 times meals in a day. But in present they took 2 times meals in a day. When he was catching fish from river, there was no need to capital, he used indigenous techniques. Her sons weren't continuing the study. They joined a shop and a hotel to support the family. Sometime she worked in others houses for removing the poverty. When the rainy seasons they couldn't go outside and staying below the poverty line. In summer seasons high temperature also created something. When they faced poverty, they borrowed money from NGOs and maintain the situation. They believed the god who saw everything and everything was happened by his order. When they faced illness they were trying to remove by using indigenous methods like worship on specific god.

### **Case Study -04**

The person who was the leader of Rajbongshi community was Susanto Biswas. He is now 45 years old. He lived in Kuciyamura village in Sadar upazila in Magura. He was a businessman. He has two daughters who are going to school. Susanto, lead his community for the betterment, was doing his responsibility. Susanto was organized association in his area. Protecting their identity, culture, indigenous knowledge, strategies, methods and techniques. Rajbongshi community in his locality, they were staying backward in education. The life style of Rajbongshi community wasn't good at all. The educational status of Rajbongshi community was very low than other community. In this area all Rajbongshi people are Hindu religion. The main occupation of Rajbongshi community in Kuciyamura village is fisherman. They caught fishes from the Fotki River. In rainy season, indefinite increasing of water flow and created the flood. This time the fisherman was getting more fishes from the river. In this time they used indigenous materials like homemade net, Ghuni, Vashal etc. to catch fishes. These materials were very low prices but they made it in a group. But the price of fishes was very low in this time. Agriculture was the second sector where Rajbongshi people were engaged. Day by day, the migration rate was increasing because they changed their occupation and moved to town. Susanto was taking a loan from Krishi Bank and starting the business. For the nuclear family, the cost of family expenditure was very low. After starting business, he was engaged in fishing. Once upon a time, he was facing the unfavorable situation; he lost his all fishing materials in the river. His wife took loans from local NGOs with high interest. This time he and his family took one-time meal in a day. He took some money from his relative to manage the situation. After all, he was getting rid of all barriers. But most of Rajbongshi people were facing this bad situation.

## **Chapter Five: Recommendation & Conclusion**

### **5.1. Recommendations:**

According to the opinion of the People of Rajbongshi community

**5.1.1. Ensuring the open water bodies for the Rajbongshi community:** Rajbongshi community losses to access to catch fishes in open water bodies. Before 10 years they have been catching fishes from the Kanel, Haor, rivers. But the present time they deprived the access. If Govt. takes proper action against the powerful persons in the society, they will be changed their living of standard.

**5.1.2. To include the constitutional declaration:**

In the ethnic Cultural Act.2010, Govt. of Bangladesh was declared 27 ethnic groups get some benefits from the govt.

**5.1.3. Governmental concern on Rajbongshi community people:**

Government of Bangladesh they aren't concern about the protection of Rajbongshi community. Day by day Rajbongshi people are humiliated from other communities.

**5.1.4 To take proper step for protecting Rajbongshi culture:** The ignorance of the culture of Rajbongshi community has been lost.

## **5.2. Conclusion:**

Indigenous people are negatively affected on climate change. The world is going to worse day by day. Climatic impacts on world indigenous people are creating the vulnerabilities. Indigenous people have some knowledge and culture that's easy to identify from other people. Rajbongshi Community is one of the largest indigenous communities in Bangladesh. Rajbongshi people are affected from climate change. Most of the Rajbongshi people are fisherman, they catch fishes from the open or closed water bodies. In this study indigenous knowledge are focusing. In this study, we get some important issues from Rajbongshi community. Rajbongshi community had some cultural songs and knowledge, but they lost day by day. This study is focused on their adaptation strategies by using the indigenous knowledge.

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