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HAZARDS, VULNERABILITIES AND RESPONSES OF CHAKMA INDIGENOUS
PEOPLE: A CASE STUDY FROM RANGAMATI DISTRICTS IN BANGLADESH IN
THE PERIOD OF COVID-19 PANDEMIC

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PhD

The Hong Kong Polytechnic University

2022

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Hazards, Vulnerabilities and Responses of Chakma Indigenous People: A Case Study from
Rangamati Districts in Bangladesh in the Period of Covid-19 Pandemic

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A thesis submitted in partial fulfillment of the requirements for the degree of Doctor of
Philosophy

June 2021

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Hazards, Vulnerabilities and Responses of Chakma Indigenous People: A Case Study from Rangamati Districts in Bangladesh in the Period of Covid-19 Pandemic

Abstract

Climate change is the culprit of many natural hazards today. Indigenous people often rely on local resources for maintaining their subsistence, but extreme climate changes pose serious challenges to their livelihood. In addition, these people have limited access to governmental supports during and after severe climatic events, while facing social exclusion and discrimination. This project is an attempt to investigate the effects of natural hazards on indigenous people at hill tracts area in the eastern part of Bangladesh. To conduct this study, a critical ethnographic approach is employed, together with participant observation, in-depth interview, and focus group discussions. The findings of the study demonstrate that indigenous people experience severe vulnerability due to climatic hazards that damage their traditional housing structures, slash and burn cultivation (Jhum), and other invaluable materials in the family, along with disrupting the natural environment on which they depend for their subsistence. However, to cope with the adverse environment, they develop their own strategies such as making alternative housing structures, adjusting their cultural practices, and reducing the dependence on natural resources. The fieldwork was conducted in the period of Covid-19 pandemic from 2019-2020. I examine how the coping strategies of indigenous people have been complicated by the COVID-19 pandemic. There are very few empirical studies about indigenous people in Bangladesh. This work will help fill this lacuna by uncovering the distress and vulnerability of indigenous people, while informing policies to help disadvantaged communities.

Key words: Climate change extremities, Covid-19, vulnerabilities, indigenous people, coping strategy, resilience and adaptation.

Acknowledgement

I show my heartiest compliments to God for offering me strength and wisdom to complete the work.

Research is always a tough but spine-tingling task. It broadens outlook and develops insights to researcher in different issues. The process of Ph.D. and the writing of dissertation are gigantic tasks which is impossible to perform without the assistance and support of some kind hearted persons in the realm of academic sphere. First and foremost, I would like to express my deepest appreciation to my chief supervisor Dr. KU Hok-Bun, Ben, for his scholastic supervision, discussion, encouragement and guidance from the genesis of this research project to its completion. Dr. KU Hok-Bun, Ben, is one of the smartest, positive, encouraging and cooperative educators I have ever seen and his wise and innovative mentorship has helped to motivate this work and boost my confidence throughout. He is such an educator and mentor who can turn any stressful and hard-working task to an enjoyable task by his positive and encouraging attitude with the student. Most probably, it can be best acknowledged his contribution by uttering this words that I would be feeling proud if I could supervise student in the ways, he has supervised me.

I owe my thanks to my past co-supervisor Dr. Katy Lam who offered many constructive suggestions to develop my proposal and also want to thanks my current co-supervisor Dr. Zhan Yang for her invaluable suggestions during my confirmation and post-confirmation field work seminars which helped to enrich my research works.

I especially want to thanks Dr. Stan Wong for providing his valuable lecture series in different time in my Ph.D. study which was helpful to me and also appreciate his constructive suggestions during post-confirmation field work seminar which helped to reshape my writing in the dissertation. I would like to express my profound gratitude to Dr. Alex Cockain, for his skillful teaching and cordial supports to develop my insights and extensive learning about the qualitative research in social sciences. I am also thankful to Dr. Timothy Sim, for his constructive suggestion to develop my proposal before submitting my application to the Hong Kong Ph.D. Fellowship in Hong Kong.

I also thanks to CHENG Fanny and HUI Shirley for their administrative supports as they constantly help research students like me to any problems related to course works and other Ph.D. related problems with great care and patients.

I am incredibly fortunate to get an opportunity to study at the Department of Applied Social Sciences in The Hong Kong Polytechnic University from where I have acquired extensive knowledge in research methodology and sociological theory which I can implement in my working place in Chittagong university and in my research activities. I wish to greatly acknowledge the support of the Hong Kong Polytechnic University for offering me two

scholarships; one is Studentship and another one is International Postgraduate Scholarship (IPS), without which it would be impossible for me to pursue my higher study in Hong Kong.

I would like to express heartiest respect and deepest gratitude to Dr. Rangalal Sen my teacher in Dhaka university for encouraging me to pursue higher education in abroad. During his staying in Chittagong to his daughters' house for getting better treatment, I had got the opportunity to meet him several times and got inspiration for development my insights with sociological theory and research.

I would like to thank Professor Dr. Khondokar Mokaddem Hossain for his excellent teaching skill and guidance to develop interest to me about the field for environmental sociology and encouragement for higher education in abroad. I am also thankful to Professor Dr. Mahbuba Nasreen for her guidance and motivation to me about learning sociological theory and environmental sociology.

I would like to thank to Professor Dr. Md. Mashiur Rahman for inspiring me for higher education and motivation in teaching profession. Especial thanks also go to Dr. Debasish Kundu for his arduous encouragement and guidance for higher study in abroad during the early of my carrier.

I would like to acknowledge the contribution of my colleague Professor Dr. Indrajit Kundu for his insightful suggestions to select my field sites and develop my research proposal during my stay in Chittagong university. I would like to express especial thanks to my student Amlan Chakma for supporting me throughout the fieldwork during this pandemic situation. Without the cordial help of him, it would be very difficult to finish the project in due time. I also thank another colleague Mr. Basu Mittro Chakma for helping me giving information about their community and also supporting in field sites. I must thank to Dr. Sumon Gunguli for helping me to manage a proof reader for checking the careless and minor grammatical errors in my dissertation.

I would like to especially thanks to my father and mother who teach me from the childhoods and encourage me for higher education all the time. I am also grateful to my grandmother and parent-in-law for their inspiration and emotional support. I am immensely thankful to my wife who sacrifices a lot for me. She also always supports me psychologically during my hardship and encourage me to complete the work in due time. I dedicate my work to her.

Last but not least, I would like to express my heartiest gratitude to the peoples of indigenous community who took care and support me throughout the ethnographic field work in pandemic situation. I owe my greatest debt to these peoples who must remain anonymous in this research.

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List of Abbreviations

ADB	Asian Development Bank
BGB	Bangladesh Border Guard
BRAC	Bangladesh Rural Advancement Committee
BRDB	Bangladesh Rural Development Board
CBA	Community Based Adaptation

CHT	Chittagong Hill Tracts
DC	Deputy Commissioner
EM	Ecological Modernization
FEMA	Federal Emergency Management Agency
FGD	Focus Group Discussion
HEP	Human Exceptionalism Paradigm
IPCC	Intergovernmental Panel on Climate Change
IBK	Indigenous Biocultural Knowledge
NEP	New Environmental Paradigm
NGO	Non-Governmental Organization
PAR	Pressure and Release Model
PCA	Principal Component Analysis
PPE	Personal Protective Equipment
PSP	Participatory Scenario Planning
SVI	Social Vulnerability Index
UNDP	United Nations Development Programme
UNICEF	United Nations International Children's Fund
UNISDR	United Nations International Strategy for Disaster Reduction
UP	Union Parishad
UP	Upazila Parishad
USD	US Dollar

Some Terms in Local Language

Adam-Bon	One types of lockdowns to control epidemic
Akti Bari Akti Khamer	One house and one farm land project initiated by Government of Bangladesh
Ava Pira	Name of contagious diseases in Chakma language,
Bihar	Buddhist temple
Bodhya	Faith healer
Bon Badsha	God of forest/land
Biju	Largest religious festival in Chakma community
Bhanta	Religious leader
Bikash	A medium transferring money through mobile network

Dali	Ritualistic function for sacrificing animal to satisfied God
Full Biju	Springtime festival
Furomon	Largest hill in Rangamati
Ganga	Goddess of the river
Headman	Chief village leader
Jhum	Slash and burn cultivation
Karbary	Village leader of Chakma community
Kabiraj/Bodhya	Faith healer
Khash land	Government owned open land
Machang	Traditional house of Chakma community
Machan Ghor	Bamboo-wooden made loft room to look after jhum cultivation
Nappi	Dried and fermented fish
Pahar	Hill
Pajontone	One kinds of mixed food made with vegetables and dried fishes in Biju festival
Ranya/old jhum	Unused land after jhum cultivation
Sora	Canal/ lowland/small river
Santhee Bahinee	Separatist groups resist against mainstream people in the past
Settler	Mainstream peoples who come in CHT from other parts of Bangladesh for living permanently
Tabij	Amulet
Tontro-Montro	Black magic/ pishogue
Tin	Material used in roof top to protect sun ray or rain in the house
Tuloshi leaves	Basil leaves
Unnamesh	A welfare organization in indigenous community
Vikkhu/Vanta	Religious leader in Chakma community
Well	A source of pure drinking water emerge from canal water

Chapter 1: Introduction

Over the last few decades, climate change problem has become a grand concern across the globe and a strongly felt imperative is to find a speedy and sustainable solution to overcome it (Kodirekkala, 2018). In the developing countries, the gradual increase of diverse and intensified effects of climate change contribute to create a major threat in the twenty-first century. Moreover, the trend of global climatic events is to be continued and the intensity, severity, and frequency of climate induced natural hazards also seem to be increased in future (IPCC, 2007).

Alike many developing countries in the world, Bangladesh is very much susceptible to climate variability. The United Nations Disaster Program (UNDP) has declared that in the name of cyclone, Bangladesh is considered the most susceptible regions and in terms of floods, considered the 6th most susceptible country in the world (Siddiqui, 2010). Bangladesh is thought the most hazards prone/stricken country in Asia and Pacific region. Roughly, 10 million people from the total population of 160 million, are directly or indirectly got affected by climate induced natural hazards (Riddell, 2014). Moreover, within the population who are most affected by this climatic extremity are indigenous people, but this people are seldom considered in the governmental supports and development activities and are repeatedly disregarded by the national community (Baird, 2008). In this context, the concern is on rise that Bangladesh like some other developing countries, faces acute scarcity in terms of economical, technical, and institutional capacity to tackle or minimize the severe impacts of climate change, and receiving effective policy to the development of this marginalized community (Ahmed et al., 2017; Beg et al., 2002; Bewket, 2012).

In Bangladesh, indigenous people especially those who live in remote area as well as in Chittagong Hill Tracts (CHT) area face severe vulnerability in climate change extremity. Climate change impacts severely on their lives and communities are generally anticipated due to their location in vulnerable and fragile environments, including small islands, high altitude considers margins and mountain based poor communication system. Indeed, indigenous and marginalized people directly exposed relentless climate change extremity due to their continuing reliance upon resource-based livelihoods (IPMPCC, 2011). These indigenous people are also considered to possess a special socio-economic and cultural

conditions which differentiate them from other people of the national community and whose status are followed wholly or partially by their own customs or traditions or by special laws or regulations (Uddin, 2016). Except some indigenous people in Chittagong Hill Tracts, other indigenous people in Bangladesh live side by side with the Bengali majority people throughout the country. Most of the ethnic groups have their own language but many of them also know Bengali language to communicate with Bengali people.

Indigenous communities always maintain an intimate relation with nature as they largely rely on forest-based natural resources for maintaining their livelihoods. As an example, it can be said that they gather honey and timbers from the forest and directly or indirectly rely on natural resources that are gradually being susceptible to the effects of climate change as well as global warming. Even sometimes, it is found that indigenous people's life, their existence is very much in risk due to climatic extremity. Moreover, being living in very remote area from the center, this people are bound to rely on natural resources for their livelihoods and having poor economic condition, this people have very limited access to local political activities and decision-making power. Therefore, this people can rarely get governmental supports as well as local administrative welfare supports during or aftermath their distress in their locality. Moreover, they are the most frequent victims of different types of extreme climatic events due to their fragile living conditions, poor monetary status, illiteracy, and solely dependency on forest-based resources.

Indigenous people in Bangladesh largely depend on nature for their cultural practices such as marriage ceremony, medical treatment of family members, child rearing, living styles and food habits etc. centered linking to nature but it is in great threat now because of the intensive climate change variability. Moreover, a large proportion of people of this community are living on the edge of existence. In addition, indigenous people experience severe disparity and exclusion in every stage of their lives by the mainstream society especially in extreme climatic events and post-hazards periods in terms of receiving emergency supports, medical facility, relief, getting access to natural resources, decision making power etc. (Baird, 2008).

In the recent year apart from climate induced natural hazards, indigenous people also face the severe impacts of Covid-19 in their locality. Alike the global community, this virus is new to them, so they are very much worried about the pandemic situation. This virus

not only affect them by getting infection but also by the lockdown which barrier their traditional subsistence and traditional way of life (Carmen,2020; Chakma,2020).

Throughout the history, indigenous people are habituated to live in communal way that means they always work cooperatively and after the work (in leisure time) they also gossip in group and participate different cultural activities due to having strong bondage and integration among the member in the community. Apart from this, their way of life such as religious festivals, marriage ceremony, burial functions, harvesting activities, slash and burns (Jhum) cultivation etc. are also done in collective ways, those are now restricted due to pandemic situation and it severely affects their psychological and physical health as well as traditional culture (Hennin,2020:39).

However, Indigenous and marginalized people, are not likely the victim of Covid-19 and climate change extremity but their accumulated and experienced knowledge make them excellent observers of environmental change and its impacts. Experiences and connection with this environmental events, variability, shifts and trends are integral part of their ways of life (IPMPCC,2011; Ahmed,2017). Indigenous peoples use different coping mechanisms to get rid of severe effects of climate change and implement local response to the pandemic. Though indigenous people have not much knowledge regarding the severe impacts of climatic events and pandemic but they may possess extensive accumulated practical knowledge for adaptation to the environment. These practical experiences contribute to help them mitigating their susceptibility to the severe effects of events and make resilience their lives for survival in adversity (Ahmed,2017). In their life long process, sometime they success and sometime they face difficulty to overcome the vulnerability to make resilience their lives from the climate change extremity and epidemic situation.

In recent year, there is a widely discussed opinions among the researchers/scientists that bottom-up approaches of climate change adaptation are more effective than top-down approaches (Garai,2017). This research project is an endeavor to investigate the impacts and vulnerability of climate change on indigenous people, along with finding out the adaptation strategies that indigenous people adopted due to climatic extremity. This study also investigates the local responses of Covid-19 in indigenous community especially in CHT. Therefore, this research project sheds light on vulnerability, resilience, and adaptation of indigenous people to the adversity in eastern part of Bangladesh.

1.1. My Previous Research Relating to the Current Project

In my previous study, I investigated how climatic events affect the subsistence of in-shored people in Bangladesh. From the study findings, it was revealed that the people who live in coastal belt area experience diverse challenges because of climatic extremities. These challenges include threat of food security, poor socio-economic condition, reduction of employment opportunity, expansion of different disease, changing of income sources, insecure life and lack of sustainability in livelihoods. Moreover, due to their limited access to information of upcoming hazards in right time, they easily fall in the extreme vulnerability of climate induced hazards (Garai, 2014). In an another research, I investigated how climate change induced natural hazards affect gender, especially how women experience severe susceptibility in climatic extremity in Bangladesh, along with find out possible sustainable livelihoods of these people. The study findings indicate that due to the gender division of labor, illiteracy, confining in household chores, and religious and social taboos in the society, women are considered the most susceptible in natural disasters in Bangladesh as well as in many developing countries (Garai, 2016).

In addition, recently in a study I presented some local strategies for disaster risk reduction and mitigation which local coastal people exercise during pre and post hazards periods in Bangladesh. Government and policy makers can include this strategy in comprehensive disaster management policy (Garai, 2017). Mass media can be an effective instrument of hazard prevention and mitigation in coastal areas. Recently, in a study I analyzed how mass media plays a great role to disaster risk reduction and mitigation through awareness building and other initiatives (Garai, 2018). Furthermore, I have conducted another study in six coastal points in Chittagong zone and found that along with climatic events, the gradual outgrowth of industries in the adjacent area severely affects the water body as well the livelihoods of the peoples of that particular area. Therefore, people faced difficulty to maintain their lives in terms of income opportunity, sustainable livelihoods, food security and other aspects of that affected area (Garai et al., 2018). All of these effective prior projects/publications have influenced me to conduct further study to investigate the vulnerability and adaptation strategy of indigenous community in Bangladesh. Moreover, having vast first-hand experiences of conducting research in this relevant field and having a constant integrate communicating network with this vulnerable community inspire me to draw an insightful sketch of vulnerability and to develop a framework of coping strategy and adaptation process of indigenous community in hill-tracts area of Bangladesh.

1.2. Rationale of the Study

Along with huge population, the geographical position and absolute poverty contribute to create Bangladesh one of the most affected and susceptible regions in the world in terms of climate change induced natural hazards. Intergovernmental Panel on Climate Change (IPCC), demonstrates that the people of a group/community who reside in remote area and whose livelihoods generally rely on natural resources especially forest-based resources and fishing associate to “high risk group in the context of climate change” (IPCC, 2007). The people of indigenous community are generally fall in this high-risk group.

In the existing literature, it is generally found that climate change research mainly pinpoints on economic affairs, for example water, agriculture, infrastructure, settlement or other sectors, however not focused on peoples, groups/community or livelihoods etc. (Baird, 2008). Major climate change reports such as IPCC reports and different countries climate change adaptation and other international documents evidence the shortage of research on this vulnerable group. The influential Tyndall center conference started their report by highlighting that indigenous people across the globe are seldom deliberated in the academic, public and policy discourses on climate change (Salick and Byg, 2007). Despite the clear acknowledgements and occasional reporting by the academia, development specialists and international organizations that the people of indigenous community are in worst condition than other community in climate change, but very few studies so far undertaken to uncover the susceptibility of indigenous community in the world.

In Bangladesh, the proportion of indigenous people is very small comparing to the total population but still many of these people are living in different groups and sub-groups and becoming fragmented across the country. This is likely to commit them susceptible to disparity and negative socio-economic and religious prejudice (Pender, 2014). Being an indigenous group, this people are extensively misinterpreted with the mainstreaming Bengali community and are repeatedly disparaged with Bengali community and experience disparity and elimination in the society.

Moreover, in recent outbreak of Covid-19 in indigenous community make them more susceptible as they are not familiar about the virus. The pandemic situation not only affects their traditional way of living but also stops their income generating activities in CHT along with the impacts of climate induced hazards.

Finally, it is crystal clear that indigenous community are the most affected victims of climate change extremity and other hazards but still very few contemplations is conferred to their improvement and survival. Considering the above-mentioned criterions, my proposed research will shed light on the effects and susceptibility of climate change on indigenous community and their coping and adaptation strategies which may facilitate government as well as policy makers to elevate this community to the mainstream society.

1.3. Broad Objectives

To find out the impacts and vulnerability of climate change extremity as one of the natural hazards on indigenous people in Bangladesh

Specific Objectives

In order to explore the impacts of natural hazards on indigenous people in Bangladesh, I intend to:

1. examine the ways in which indigenous peoples' culture, religion, and way of living are endangered due to climate change extremity and Covid-19 pandemic situation;
2. examine the nature of experiences of managing natural resources and coping strategies of indigenous people in Bangladesh;
3. explore the types of social exclusion and discrimination indigenous people experience during the post-disaster period in terms of relief distribution, foods, and so on;
4. explore the impacts and vulnerabilities of Covid-19 on indigenous people and their responses to this disaster/pandemic.
5. Reflect the mainstream development of Bangladesh.

1.4. Research Questions

Following the above-mentioned research objectives, these research questions are to be integrated in the research project as:

- 1) What are the phenomenon of natural hazards in Bangladesh?
- 2) What are the impacts and vulnerabilities of natural hazards like climate change events and environmental degradation on cultural and traditional life of indigenous people?
- 3) What are the coping strategies of indigenous people in climate change extremities for adaptation and resilience in natural hazards?

- 4) What are the impacts of Covid-19 on indigenous people and how they can respond to the pandemic?
- 5) What are the implications of this study to the development of mainstream people in Bangladesh in general?

1.5. Outline of the Dissertation

This research project is an attempt to find out the impacts and vulnerability of climate induced natural hazards on indigenous people, together with finding out the adaptation strategies that indigenous people implement in climate change extremity. This study also examines the impacts and vulnerabilities that indigenous people experience and their responses to the Covid-19 pandemic in indigenous community. The first chapter of the dissertation highlights the backgrounds of the climate change induced natural hazards and indigenous peoples in Bangladesh and discusses the rationale of the study together with the study objectives and research questions. The second chapter discusses the existing literature both on empirical and theoretical aspects of different hazards, environmental degradation etc. and also focuses on different approaches and concepts of environmental sociology related to the current project. In the third chapter, I discuss the methodology and the techniques that I implement in the field for data collection in detail. I also highlight the critical ethnography and the rationality of using this approach in this project together with expressing my positionality about the present research. In the fourth chapter, I discuss about the climate change extremities and environmental degradation and show how these events affect the culture and traditional way of life of indigenous peoples in CHT. In the fifth chapter, I highlight the coping strategies and resilience of indigenous people in adverse situations and show how their culture and traditional life influence adaptation in adverse situations in indigenous community. In the sixth chapter, I focus on the major impacts and vulnerabilities that indigenous people experience during the pandemic situations. I also highlight indigenous peoples' perception towards Covid-19 and their responses to overcome the pandemic situation in their community. The seventh and the last chapter of this dissertation summarize the main findings and make a conclusion about the study. In the conclusion, I highlight that throughout the history indigenous people develop their local strategies and combat any kind of hazards in their own ways and try to adapt to the adverse situation in a collective way. In this chapter, I also discuss about the implications of this study to the development of mainstream people in the Chittagong Hill Tracts area.

Chapter 2: Literature Reviews

2.1. Empirical Literature Reviews

In the existing literatures so far, I find the studies on indigenous people about climate change impacts and vulnerabilities in Bangladesh are not extensive. Moreover, this literature hardly focuses the vulnerability and coping strategies of indigenous people in comprehensive way. This project is an attempt to explore the vulnerability and coping strategies of indigenous people in climate change extremities. In the recent years alike the world community, the indigenous people of CHT also face the impacts of Covid-19 in their community. This study thus also tries to find out the impacts and local responses of Covid-19 in indigenous community.

This study defines the term “indigenous peoples” a group or community who possess a close relation with the natural settings and who are often considered as the ‘first people’ to live in a specific locality. For example, Chakma community in Hill Tracts area of Bangladesh and Sami of the Arctic. In climate change extremity, indigenous people faced severe vulnerability (Ferdous,2011; Pender, 2014; Gunter et al.,2008). Pender (2014), highlighted that indigenous communities are the worst victim of climate change. About the suffering of indigenous people during hazards, some incidents of the world are found in his study that are Flood of 1998 in the Slovakian community of jarovnice and hurricane Katrina in Neo-Orleans in 2005. This study pinpointed that a large number of indigenous people in Bangladesh are living with vulnerability in terms of economic status, day laborer or hunter-gathers, along with living in fragile housing structure with few assets. However, to solve this problem, this study recommends indigenous’ people to involve adaptation and disaster management process (Pender, 2014). Moreover, Suriya Ferdous (2011), in a study demonstrated about the inspection and perception of climate change impacts on livelihoods of native indigenous people residing in Kaptai national park, Bangladesh. The study findings highlighted that more than half of the respondents perceived that weather condition is changing, temperature is soaring up, rainfall patterns and other climatic condition is changings in that site which extremely affect their crops growth, food security, biodiversity and their livelihoods as well (Ferdous, 2011; Pender, 2014).

Reporting on research guided in the Hill Tracts area of Chittagong, Gunter (2008), claimed that along with tribal people (marginalized people) non-tribal people are also severely affected by climate change-induced natural hazards such as cyclone, drought,

landslide, flash flood and so on of that particular area (Gunter et al., 2008; Ferdous, 2011; Pender, 2014). Similarly in another study Ahmed et al., (2017) demonstrated about the understandings of indigenous people in Bangladesh regarding the effects and causes of climate change and their knowledge level to manage forest resources and different coping strategies, they adopted in climate change extremity. Using purposive sampling with in-depth interview on two indigenous communities namely, Khasia and Tripura, this study delineates that two indigenous community have different believes about the perception of climate change and they use different strategies for coping with the environment following their believes and practices. The strength of this study is that it delineates how indigenous people can cope with the environment by using forest resources in their locality (Ahmed et al., 2017; Ferdous, 2011).

Climate change has a close relation with the socio-demographic aspects of indigenous people such as age, education, gender, and occupation of a particular community. A study conducted by Huda (2012), delineated that climate change susceptibility and perception influence socio-demographic aspects of a particular indigenous community such as age, gender, occupation, mass media, amount of land, education, income level and so on. Following the interview method, this study explored that indigenous people perceive that climate is changing over the years. The study further argued that age, education, occupation, availability of mass media, income level etc. are significantly associated to the understanding of climate change as well as climatic hazards. Moreover, education was found the best predictor of climate change perception of that particular area.

Rachel Baird (2008), argued that across the world indigenous people experience severe impacts and vulnerability by climate change. The author disputes that along with facing severe effects of climate induced hazards, indigenous people also experience disparity and exclusion from the mainstream Bengali society. The study clearly delineates that how disparity against them influence their adaptation procedure in climate induced hazards and receiving emergency needs/supports from the local government during emergency periods (Baird, 2008). Other study of IPCC (2007), evidently conceded that indigenous community are the most risky and susceptible group in climate change. The report argued that the severity of climate change impact is likely to be perceived utmost not only by the marginalized, but also with specific portions of other people i.e., children and the elderly people, physically challenged people, indigenous people, and recently migrated people who mostly depend on public supports and so on (IPCC, 2007). Similarly, Rebecca Tsosie (2007), demonstrated that native people face acute problems due to climate change variability and probes the ethical and legal arguments that

might be used to protect indigenous people from increasing severe harm of climate change. This paper also documented a historical overview of environmental justice claiming involving native people and protects their rights to access to the environment and natural resources. This study argued that the environmental justice movement was a good evidence in grassroots level to indicate that environmental change may abruptly affect the health and well-beings of marginalized and low-income community comparing to the mainstreaming society (Tsosie, 2007; Ferdous, 2011; Pender, 2014). From a report the writer Selvaraju (2006), indicated that indigenous community's understanding of climate induced hazards i.e., in droughts is changing now. The patterns of periodical typhoons and rainfall variability have altered, droughts have become much frequent, and crops failure, poor harvesting, expansion of different diseases in agriculture have increased to a large-scale (Selvaraju et al., 2006; Gunter et al., 2008).

Speranza et al., (2010) demonstrated that agro-pastoralists in Kenya use indigenous knowledge to monitor, minimize and cope to drought. This study also indicated that agro-pastoralists form a basic knowledge frame to interpret metrological forecast for their decision making in the locality (Speranza et al.,2010; Hiwasaki et al., 2014). By using target interview, group discussion, as a data collection method, this study found that agro-pastoralists use indigenous knowledge as exponent of rainfall variability and they rely on indigenous knowledge as they believe the effectiveness of its usage. This study blamed some other factors such as poverty, insufficient natural resources, and inadequate preparedness impact on drought and contribute to limit their adaptive capacity in that particular area. The strength of this study is that, it clearly identified the factors that hamper the adaptation procedure of agro-pastoralist and suggest solution for implementing indigenous knowledge-based forecasts on their decision-making patterns (Hiwasaki et al., 2014; Speranza et al., 2010). Through the life long process indigenous people develop their traditional knowledge about climate change variability, and perception and based on their locally perceived knowledge and practices of resources use. Indigenous people used this traditional ecological knowledge for adaptation to adverse situation and to monitor the changing environment of their community (Leonard et al., 2013; Speranza et al., 2010). In a research project with the adoption of ethnography and mixed methods, Leonard et al., (2013) argued that indigenous people capture the detailed information about their local environment to monitor their natural resource usage and management and develop their own cultural values, tradition and worldviews with this knowledge. Along with resource management, this indigenous knowledge - Miriwoong traditional ecological knowledge also used for natural hazards management and preparation for adaptation in their

community. The findings of the study indicated that like other Australian aboriginal community Miriwoong people follow different strategies to adapt with climatic events such as sharing resources among group, migration, fire management, and practicing harvesting etc. This study also demonstrated that archaeological, anthological and historical evidences prove that indigenous community possess absolute level of resilience and adjustment to environmental change and inconstancy (Leonard et al., 2013; Speranza et al.,2010).

Moreover, about highlighting the significance of indigenous and local knowledge, Hiwasaki et al., (2014) in their study claimed that it may contribute as a key factor for making resilience of indigenous community as well as coastal people to different natural hazards and the impacts of climate change but not yet implemented properly in collaboration with scientific way. This study tries to link indigenous and local knowledge with science and technology before implementing it in disaster mitigation, preparedness and climate change adaptation. In order to do this, a diverse group of people such as scientists, community experts, practitioners, policy makers etc. work together by undertaking observation, validation and documentation of local and indigenous knowledge which are then recruited for integration with science. This integrated knowledge makes indigenous community to enhance their capability for resilience and adaptation against the impacts of climate change extremity (Hiwasaki et al., 2014). Similarly, the resilience of a community can be developed in disasters/climate change extremity by implementing updated, innovative and old technology and knowledge combinedly (Ellen, 2007). Moreover, it was widely recognized throughout the world that the collaboration and integration of tribal and local knowledge with technology and science can contribute to make an effective strategy to combat climate change induced hazards (Mercer et al.,2010; Mercer et al.,2009) and climate change resilience and adaptation strategies (Armitage al., 2011, Speranza et al.,2010). Along with local knowledge, the latest technology and scientific assessments, can provide indigenous community and policy makers a comprehensive knowledge that can enable them to make resilience and adaptation in climate change extremity. Walshe and Nunn (2012), delineated the significance of indigenous knowledge and scientific knowledge as it played a great role in evacuating villagers for the survival in the 1999 tsunami in Vanuatu and in the Solomon Islands in 2007 respectively.

Throughout history, indigenous people can adapt to climate change extremity and overcome vulnerability through their cultural adaptation procedure (Kodirekkala,2018; Leonard et al., 2013). Kodirekkala (2018) demonstrated in a study that climate change affects indigenous people and through cultural adaptation especially using cultural components,

indigenous people response to these impacts in their locality. This paper asserted that Konda Reddis people shift from Jeelugu (fishtail) to tati (Palmyra pal) for their socio-cultural and economic dependence and follow traditional knowledge for their adaptation in climate change events (Kodirekkala, 2018). The author claimed that mainstream discourse undervalued the local knowledge, and undermine the vulnerability of indigenous people but indigenous people can adapt to climate change extremity through cultural adaptation. The study indicated that Konda Reddis indigenous people have deep knowledge about local environment that influence them for effective adaptive capacity by overcoming climate change risk. Traditionally, they grow various types of crops for the purpose of minimizing the risk of crop failure caused by various climatic events. During the harvest failure and food crisis due to climatic events i.e., cyclone, drought etc. they change their cultivation methods and rely on alternative foods i.e., the forest foods - Jeelugu, from which they extract starch and prepare porridge for their survival (Kodirekkala, 2018).

Pointing out the adaptation policy of indigenous people in North East Arnhem Land (Australia), Petheram et al., (2010) directed a research on two community to understand the insight of indigenous people (Yolngu people), their observation, preferences and strategies to climate adaptation in climatic extremity. Workshops and in-depth interview were used as the methodology in this study indicated that ecological landscape is changing in the locality due to growing mining industries, development of tourism and climate variability. Findings of the study indicated that over the last five years strange change were observed in the ecological landscapes and they are worried. The study also demonstrated that indigenous people criticize the government due to the imposition of top-down governing structures and domination by mining industry to this people and they feel a sense of disempowerment, that contribute to create inability to participate in adaptive capacity. The strength of this study is that it focused on people who have intensive reputation and clean image in the community and strong trust in government are seem to be capable to adapt in the adverse situation in the community than groups of people who have limited respect and faith in authorities. This study also focused on social capital i.e., ‘staying strong’ and kinship supports that help community members (i.e., sharing foods among kin and bartering items etc.) to survive in climatic extremity (Petheram et al.,2010).

For the conservation and management of global ecosystems, indigenous knowledge as well as indigenous people are widely encouraged to include in management system (Ens et al., 2015; Hiwasaki et al., 2014; Speranza et al.,2010). In this context, Ens et

al., (2015) pinpointed that some colonized countries such as USA, Newzeland and Australia are taking some programs for involving this people in the management system but referred it as challenging for setting up the priority and preference of management procedure of indigenous and non-indigenous people in balanced way. Researcher used Australia as a case study site and examined the previous documentations about using Indigenous Biocultural Knowledge (IBK) and measured their significance to ecosystem management. The findings of the study indicated that indigenous IBK has great contribution to biological and ecological conservation that might include fire management, endangering fauna and rights of water and planning. The core strength of the study is that it focused the significant of IBK that can not only help to the ecosystem management but also protect indigenous people from the severe effects of climate change and keep them close to nature (Ens et al., (2015). Moreover, regarding the effects and vulnerability of climate change on indigenous people, Green et al., (2009) claimed that the indigenous community who are depend on natural resources but have least access to these resources face significant social, economic and environmental impacts and become vulnerable to climate change extremity. Furthermore, the predicted sea level rise may responsible to destruction of environmental and community resources, damage of cultural heritage sites, inability to maintain the quality of life and making a comfortable environment for the expansion of different diseases and invasive weeds, pests (Green et al,2009; Ens et al., 2015).

Indigenous people faced substantial risk and uncertainty to their health because of the impacts of climate change and extremity (Ford et al.,2018). Community Based Adaptation (CBA), a new coming top-level approach need to employed for research process to formulate health policy and managing the risk of this vulnerable and marginal community. Through the incorporation of practical knowledge of interdisciplinary and the multi-nationals tribal health adaptation to climatic events, researchers can evaluate the strength, difficulty and potentiality of health related CBA study in the local setting of indigenous community. CBA as an approach that can help to co-generate knowledge about the vulnerability of health due to climate change, resilience, and adaptation procedures, capacity building and decision making (Ford et al.,2018). Similarly, Flynn et al., (2018), highlighted about the Participatory Scenario Planning (PSP) approaches for studying climate change impacts, vulnerability and adaptation of indigenous community. Using systematic review as a method and reviewing more than 43 peer review and grey literature revealed that only half of the reviewed studies utilize climate projection and community participations are different, raising the concern that the key future

drivers of climate change are not fully accumulated. For conducting PSP, it is often found as challenging to engage community members intensively in the climate change adaptation process and resiliency. Local indigenous cultures, values, and belief system need to carefully consider to take preparation for overcoming the future climate impacts and making resilience of indigenous community (Flynn et al., 2018).

Jacob (2010), in a study claimed that indigenous people around the world throughout their life and human history depends on fishing, hunting animals and collecting plants to fulfil their food requirements and nutritional subsistence. In recent time, it is found that the subsistence practices of indigenous culture are markedly different from dominant market-oriented culture where sustenance is provided to those who are outside of the wage economy. Survey method was used to conduct this study revealed that though the static people maintain their unique tradition cultural practice by fishing salmon fish in Fraser River for thousands of years, still because of the implication of climate change and larger environmental alteration affect their food sources and traditional practices, in that particular community. The findings also indicated that climate change extremity affect to maintain their traditional reliance on ecosystem service that alter their lives and livelihoods in that particular area (Jacob,2010; Kodirekkala,2018). About highlighting the severe effects of climate change extremity in recent year, Willox et al., (2012) demonstrated that with the gradual increasing effects of climate change surrounding the planet, the intensity of exposure also increased to the people about changing weather condition, wildlife and plants, quality of foods and water conditions, and to the access and availability of their locality. This overall environmental change can affect human health in different ways including increasing the risk of water and food produced diseases, intensifying and extending of vector-borne diseases, increasing physical injury and mortality rate due to climatic extremity and increasing vulnerability to psychological and emotional health challenges (Willox et al. 2012; Durkalec et al.,2015; Bowles, 2015). Though climate variation is a global phenomenon, human-beings are experiencing climate change vulnerability in a particular place, so a sense of place, place-related, and place-affiliated identities can be considered an effective factor for climate change adaptation and resilience. By employing in-depth interview and questionnaire as data collection methods, this study illustrated that climate change affects place attachment negatively. Climate change disruption on different activities such as hunting animals, fishing, plundering, trapping and moving and changing local landscapes may subsequently effect on physical, psychological and emotional health and well-being (Willox et al., 2012; Bowles, 2015). In the similar way,

Durkalec et al, (2015) highlighted about health of indigenous people, climate change dimension of human and place-based dimensions of health in the context of environmental role in Inuit health in climate change. By drawing health geography and population health approaches, this study investigated the relation of major elements such as the natural environment-sea ice- and different aspects of human health in an Inuit indigenous group in northern Canada. The findings indicated that the attachment of place is very conspicuous for understanding health comprehensively that influence of sea ice use for Inuit. It also indicated that climate change affects indigenous people's psychological, religious, social, and cultural health of that particular area (Willox et al., 2012; Durkalec et al., 2015). Moreover, all over the world, poor socio-economic conditions may contribute to ill health of disadvantaged and marginal population and as a contributing factor of poverty, illiteracy, malnutrition, higher exposure of different health risks are liable (Bowles, 2015; Willox et al., 2012). Though these factors are less widely recognized to impede physiologic and social adaptations to novel health stressors, but may affect to human's coping strategies with the increasingly important health stressor of climate change. Furthermore, this may provide a typology of health adaptation that are mostly physiologic, household, personal, community and state level adaptation. This framework is able to evaluate the effects and vulnerability of climate variations on health adaptation of indigenous community especially for those who possess low socio-economic status in Australia (Bowles, 2015; Willox et al., 2012).

Aswani and Lauer (2014) demonstrated that many a time it become critical for indigenous people to detect and respond to any sudden natural hazards that may contribute to undermine the resilience of ecosystem and endangered people's sustainable livelihoods. This study mainly focuses to explore the capability of indigenous peoples to detect the sudden environmental and ecological change due to large-scale environmental hazards. By analyzing the result of marine surveys coupled with the root socio-ecological knowledge of the affected area, researcher explore the level of capacity that indigenous people have to recognize the ecological change in the environment prior and after the hazards events such as earthquake and tsunami. The findings of the study indicated that indigenous community have the ability to detect the change of ecological environment over time but this detection level is different over time in the findings of marine science surveys and local ecological knowledge sources (Aswani and Lauer, 2014). In another study, Williams (2012), argued that anthropogenic carbon contamination and climate change have massive and demolishing effects on indigenous community especially those who rely on natural resources for maintaining their livelihoods.

Moreover, due to these catastrophic hazards, many indigenous communities faced severe vulnerability and lose their traditional homeland and cultural practices (Williams,2012; Green et al,2009; Ens et al., 2015). The strength of this study is that author critically examined the effects of climate variations on indigenous community and access the basic rights prevail to those groups to seek redress. The author also critically highlighted the major philosophical, historical, and organizational impediments of the western juridical tradition to safeguard and affirm the rights of indigenous community (Williams, 2012)., Bardsley and Wiseman (2012), argued that climate change risk severally affects indigenous people especially some of the most marginal people for their livelihoods and long-range constant progression. A comprehensive evaluation of climate change impacts and susceptibility for the alinytjara wilurara natural resources management territory, highlighted on Anangu pitjantjatjara lands to analyze the impacts, vulnerability and adaptation options of the indigenous community. The study also indicated that along with climate change, some other complex issues may add the challenges i.e., fire, flood, and regional environmental resource management especially related with invasive species. The strength of this study is that it clearly identified what types of risk may arise within socio-ecosystems and in what way climate change interact with such system. Moreover, this study gives prioritize to find out factors of socio-economic risks and assess climate change vulnerability (Bardsley and Wiseman, 2012).

Nursey-Bray and Palmer (2018), argued that the people of indigenous community are severely affected by climate change, so culturally appropriate, place-based developing tailored solution is necessary for the resilience and development of indigenous people. Though culturally and institutionally fit value-based climate change management still challenging but this study tries to explore the coping mechanisms that are needed to help indigenous driven adaptation initiatives if different cultural barriers are accounted. This study indicated that the adaptation procedure of indigenous people depends on close connection to traditional land together with cultural values, historical experiences, collective action and culturally responsive climate governance of that particular area (Nursey-Bray and Palmer, 2018; Kodirekkala,2018; Leonard et al., 2013). Moreover, Permanent Forum on Indigenous Issues (PFII) (2008), in a meeting in Inter-Agency Support Group on indigenous issues were very concerned about the effects and susceptibility of climate variations on indigenous community, their traditional and local knowledge and related biological and ecological diversity. It addressed indigenous peoples as the world's most poverty stricken and marginalized people who frequently endure the brunt of the massive catastrophes of climate

change and envisage the severe climate crisis. It concluded with the most advanced scientific research that climatic events may severely affect the health of traditional lands, water and other natural resources on which they rely for survival and may endanger by immediate climate induced extremity. An immediate and unprecedented efforts and interventions are required from the scientist and other human community to control this and awareness building is needed among concerned human beings (PFII,2008).

2.2. Theoretical literature reviews

In the literature of sociology of environment, there exist ample of sociological theories which deal with environmental crisis, global warming as well as climate change impacts and adaptation. Many of these paradigms clearly delineate the nature, causes, and consequences of anthropogenic environmental crisis and climate change along with showing the ways to fix the problems with solutions. Theoretical perspectives can help researchers to get a comprehensive understanding about how, why and in what way environmental crisis as well as climate change induced hazards occur in the planet and how it affects human beings/indigenous people, along with showing different mitigation and coping strategies to adapt in adversity. Some of the paradigms/perspectives of environmental sociology are discussed below;

In environmental sociology, humanity, society and nature are the fundamental components and they are intimately related to each other. As such, environmental sociologist's prime objective is to develop a critical and comprehensive understandings of the complex interactions/relations between societies and their respective components of the environments (Marsh et al., 2009). The term 'environmental sociology' can be defined by exploring two ideas that are sociology and environment. In general, sociology tries to find out a way to understand and perceive the social world. The study of sociology helps people to understand different social issues such as social institution, organization, inequalities, and human interaction and so on. On the other hand, 'environment' comprises all the materials of the world that are ranging from the most remote objects to the very small things of our everyday life such i.e., air, water, soil etc. For the study of environmental sociology, sociologists first and foremost see the relation between human and environment assuming that this relationship can help them fully to understand about human and environment. (McCarthy and King, 2009).

To understand society and nature as well as environmental crisis, different theorists provide different perspectives/approaches in the existing literature. It is interesting to

mention that contemporary sociologists can get inspiration and a good understanding for the engagement to environmental topics in the canon of classical sociological theory, are Durkheim, Weber and Marx. These classical thinkers contribute their writings about nature and society but much of these were very often implicit and ambiguous, and were subject to theoretical controversies and scholarly debates during the periods of their writings (Hannigan, 2006:5).

Among the three classical figures in sociology, Durkheim's contribution as a commentator about environment is most probably considered very thin. Very often, it is found that Durkheim use biological concepts and metaphor to explain his societal transformation theory. In this context, he utilizes the popular Darwinian model of evolution theory (Hannigan, 2006). Durkheim in his famous work, 'The division of labor in society' (1893) demonstrated that due to the gradual soaring up of complex division of labor, mechanical solidarity turns to organic solidary with the evolution of modern state. About this theory of Durkheim, Catton (2002:92) argued that it was certainly a good endeavor for effective solution for the so-called ecological crisis of the soaring up population and the gradually increasing scarcity of resources. Moreover, it would have been disastrous if every member in the society confined to agricultural activities, rather than engaging other activities, as society become larger and denser. Furthermore, specialization in occupations might lessen the competition over arable land and increase productions of technological innovation (Hannigan, 2006:6) but Durkheim mistakenly assumed that Darwin's notion about the reduction of competition of scarcity resources due to the increasing diversity in the planet.

Max Weber may be considered second sociological pioneer whose work has ecological relevant components. Initially, weber in his theory, demonstrated two types of rationality that are intensification rationality and the magnification rationality, (Murphy,1994). According to his prescription, conducting anything excessively on the basis of dispassionate calculation may contribute to create some unexpected and negative effects. Moreover, if we applied it to the case of natural environment, this may be termed as ecological irrationality. It can be found in different destructive consequences ranging from disasters i.e., industrial pollutions, such as discharging toxic chemical, waste, to nuclear accidents (Hannigan, 2006:8).

About environmental degradation, Marx and Engels were marginally concerned in the nineteenth century but their contribution about analyzing the social structure and societal change has great influence to develop new contemporary theories of environmental sociology.

Marx and Engels in their theory argued that social conflict creates two principal groups that are capitalist and proletariat. Capitalist society alienates ordinary people (workers/commoners) from the nature as well as from their jobs. Best example can be given the capitalist agriculture system that accentuates profit from the earth for the benefit of human beings and land (Hannigan, 2006). During the eighteen and nineteenth centuries, due to the industrial revolution, rural workers/farmers were forced to remove from the land and bound to live in polluted and crowded urban area for industrial work while agricultural land lost its natural utility (Parsons 1977:19). To sum up, it is said that along with resources depletion, over population, alienation of general people from natural environment, capitalism is responsible for all unsocial activities in the world. However, to overcome this problem, Marx and Engels highlighted to overthrow the dominated capitalistic mode of production, and to establish a humane, logical, environmentally connected social order (Lee, 1980 cited in Hannigan, 2006). They also wanted to deploy humanization of nature to reduce natural species that are harmful for human beings (Dickens, 1992).

Along with the capitalist, contemporary Marxist theory blames state in fostering ecological destruction. According to this theory, politicians and bureaucratic administrators work in favor of capitalist and employers. Moreover, both politicians and capitalist investors possess the same ideology to expand capitalist accumulation and economic development for development in the society. This trend is not only observed in global level but also in local community (Hannigan, 2006).

Though Marx's theory has great power for ecological analysis in the nineteenth century, but it is not out of criticisms. For example, Marx and Engels aspiration is to build a new relationship between society and natural environment but it is totally unclear what types of relation should be built up. Moreover, the term 'humanization of nature' in this approach pointed that people should form cooperative understanding and empathetic relation with nature. However, the main query that arises is that whether this new form of understanding would be used mainly for emancipation of human or whether it would be used for 'egocentric' form to enhance powers and capacities of non-human species. Observing this, Martell (1994), claimed that Marx is too much complicated and contradictory to understand ecological theory of environmental protection (Hannigan, 2006).

Alike the emerging environmental movement, during the first decades of environmental sociology, researchers focused primarily air and water pollution, solid and

hazardous waste dumping, urban decay, and fossil fuel dependence etc. Moreover, at this stage, most sociologists focused on people's attitudes toward problems and the impacts of those problems on demographic trends (for example trends in health and mortality (Honnold and Nelson,1979). However, due to the intensification of academic and mass consciousness regarding the environmental issues, researchers' perceptions of the complication of environmental troubles raises. Moreover, the currently existing hazards are complex and risky in terms of social, political and technological aspects and difficult to detect due to its long-range impacts and attributable to multiple causes (e.g., Environmental racism, rain forest destruction, ozone depletion, technological accident and climate change and so on (Kaprow,1985). Furthermore, capitalist production constantly seeks to expand to attract the attention of the nascent environmental sociology community in the 1980s. Consequently, in order to explore the increasingly complex relationships between environment and societies, social scientists try to develop a number of specialist lenses. Allan Schnaiberg (1980), has developed such a lens to explore this relationship.

The "treadmill of production, is a concept introduced by Allan Schnaiberg (1980), which puts emphasize on the propensity of capitalist production and incessantly quest for expansion (McCarthy and King, 2009). According to this perspective, it emphasized on growth encourages to huge resource consumptions, consequently increases generation of wastes and pollutants (from the processing of productions in industry and from consumption) (Buttel and Humphrey,2002). Further, Schnaiberg argued that the treadmill of production has a great connection to ecological crisis, as it accumulates resources from the nature and contributes to create pollution in the environment. Only by technological change or social-structural changes, this incorporation of the growth-environmental degradation relationship of Schimberg's concept of the treadmill of production may not readily be extruded over the long term. As it is not supported by formal Marxist logic, the concept of environmental degradation of Schnaiberg's perspective is very much similar to James O'Connor (1994) (Neo-Marxist) perspectives what he termed as the second contradiction of capital (Buttel, 2010).

Another perspective in environmental sociology about environmental protection as well as environmental crisis is Ecological Modernization (EM) theory. Ecological modernization (EM) is a perspective that aims to economic growth and environmental conservation in a combined way for more progress. For this why, EM theorists demonstrated that following the advanced framework of industrial economy, the goals of economic growth

and ecological protection can be integrated and performed (Spaargaren and Mol 1992, cited by Marsh et al.2009).

According to Brundtland report, ecological modernization looks similar to sustainable development, aims to overcome possible ecological crisis keeping same time the flow of modernization (Hannigan, 2006). German writer, Huber (1985), is the pioneer of this model who highlighted ecological modernizations as a historical stage of contemporary world. According to him, a mechanical society can be developed in three stages that are as follow: 1) 'the mechanical progress, 2) the formation of mechanical society; and 3) the shifting of ecological system to super industrialization system, and it has become possible due to the invention and diffusion of new technology such as microchip technology' (Huber,1985, cited in Hannigan, 2006). To illustrate the matter, it can be said that the new clean technologies and greater energy efficiency can address energy crisis, reduce toxic waste, recycled higher level of materials, while genetically modified crops can solve the problems of hunger. In the late twentieth century in Western Europe, EM as a theory, sought to take account patterns identified for the improvement of environmental quality (Marsh et al., 2009).

However, there is a strong debate about EM perspective that is mainly related to the progress of nature in the twenty-first century especially to the questions of the growth and the action of technology as well as the state. Moreover, ongoing debate of the topics of EM perspective is whether capitalism can overcome the environmental challenge and the extent to which sustainable economic growth is possible. This questions actually raise for the following reasons: i) Still now the innovative new technologies, for example, clean technology and energy have not been sufficiently explored; ii) Environmental degradation such as waste and contamination have effectively been exported; iii) Across the globe, the progress of EM is not yet satisfactory and uniform; iv) At macro level, government policy still very often short-term such as to tackle crisis; v) Alliances between government and industry may hinder new approaches to formulate policy; vi) Much reliance on industry's ability to produce a technological 'fix'; vii) Evidence shows that having scant of information, risk assessment and managerial capacity to accommodate EM; viii) In order to encourage EM, new approaches to policy are required; ix) Until to get better solutions by technology, behavioral changes are required (Marsh et al., 2009).

Though EM as a perspective is criticized by scholars, but it clearly focuses the science, modern technology and the government as key institutions for the progress of

environmental reform. It also highlighted the role of innovators, entrepreneurs and others as agents for ecological restructurings.

In the realm of environmental sociology, another important set of theoretical perspectives emerge to address the intersections of science and risk analysis. According to Ulrich Beck (1999), in the modern age, people feel increasingly at risk, due to a large part of environmental degradation (McCarthy and King, 2009).

'Risk Society' refers to an era in which the bad sides of progress increasingly become the focus of social debate (Beck 1995:2 cited in Marsh et al., 2009: 423). Michael Bell analyses Beck's concept of the risk society, as "a society in which the central political conflicts are not class struggles over the distribution of money and resources but instead non-class-based struggles over the distribution of technical risk" (Bell, 1998). Beck's (1999), theory highlighted that we are now at "a phase of development in modern society in which the social, political, ecological and individual risks created by the momentum of innovation increasingly elude the control and protective institutions of industrial society" (McCarthy and King, 2009).

Moreover, while some of the scholars like Mol, demonstrated that science and technology gradually improve the environmental conditions, Beck in his theory investigates how risks and especially the social stresses associated with our perceptions of risks are fostering a deterioration in our everyday life. According to Beck, 'risk society' can be explained as an epoch of contemporary society in which dangerous events occurred due to the growth of mechanical society become predominant (Beck, 1999:74).

Though 'risk society' is an important approach to assess the environmental crisis in the contemporary planet, but it is also criticized by different scholars as well. Lidskog (1993), in his comments of 'Risk society' claimed that Beck himself makes confusion of his theory, delineating that the universe is gradually going to the verge of danger due to the increasing global hazards. Moreover, simultaneously, argued that risks are entirely culturally constructed and for this why do not exist beyond our perception of them. Another scholar Bluhdorn (2000:86), criticized the inconsistency of Beck's theory highlighting that Beck were seemed largely confused and indecision about defining the environmental risks whether it is empirical reality and cultural construction. As a matter of fact, Beck's entire risk society thesis would have a massive implication for the efficacy, if it is questioned Beck's explanation that the effects of 'real' risk has hugely soared up in the late modernity (Hannigan, 2006).

Moreover, due to the inconsistency of Beck's theory to this point gleams far reaching confusion among the actors of the sociological analysts and that of the environmental agents in environmental sociology. HEP/NEP perspectives of Catton and Dunlap epitomes of this, but it also follows some other writings as well such as critical realist perspectives of Martell, Benton, Dickens and other British sociological scholars. These thinkers are seeking to bring back nature to the society- nature relationship (Hannigan, 2006).

In risk society thesis, Beck continually interweaves descriptive and prescriptive dimensions. As a matter of fact, that he is seen very much proactive for ameliorating a specific vision of an 'environmentally logical' or 'environmentally enlightened' society (Barry 1999). However, the answer from Beck of this criticism is not logical and convincing. He does not think any contradictions between delineating a world where risk is diffusive and probably apocalyptic if it is seen that these risks are 'specifically open to social definition and construction' (Beck, 1992, cited in Hannigan, 2006: 24).

Along with these paradigms, in the literature of environmental sociology as well as environmental studies, there exist different concepts and perspectives which are very much effective to understand the nature of relationship between human beings/indigenous peoples and environment during the period of environmental crisis. These concepts can help to comprehend the impacts, and vulnerability that human beings/indigenous peoples experience during environmental crisis as well as climate change extremity along with providing an understanding about how they make resilience and adapt to this situation to overcome adversity.

2.2.1. Vulnerability

About the environmental risks and natural hazards, the literature of vulnerability is growing extensively as this concept has a significant role to measure the extreme impacts of climatic events and possible adaptation procedures to reduce, protect, and manage the risks of these magnitude hazards (Platen-Hallermund and Thorsen, 2013: 157). For studying climate science and analyzing policy making and implementation, vulnerability is a dynamic and largely used concept (Fussler and Klein, 2006). Vulnerability may be defined in different ways to study environmental threat and stress. According to the Intergovernmental Panel on Climate Change (IPCC) (Second Assessment Report), vulnerability can be defined "the extent to which climate change may damage or harm a system; it depends not only on a system's sensitivity but also on its ability to adapt to new climatic conditions". Here 'sensitivity' means to the level

where a system may respond to a changing condition of climatic events (Kelly and Adger,2000).

Collins English Dictionary (1986), explains vulnerability as, the “capacity to be physically or emotionally wounded or hurt”. The word, ‘vulnerability’ derives from the Latin *Vulnus*, meaning ‘a wound’, and *vulnerare*, ‘to wound’. More specific way, it can be said that the word ‘vulnerable’ originates from the late Latin *vulnerabilis*, and it is enlightening. Historically Romans were seen to use this term- *Vulnerabilis* to explain the condition of soldiers lying wounded in the war ground to indicate that they were injured and had the risk for further attack. In the literature of climate change vulnerability, in classical sense vulnerability refers mainly the previous damage (subsisting wound) and it may not be the future threat (any further attack). Paradoxically, vulnerability of any particular individual or groups of a particular climatic events is generally determined by their existing condition/status and their capability to respond for adaptation of this adverse condition, rather than to consider what will occur or will not occur in the near future (Kelly and Adger,2000).

Socio-economic status and environmental factors are two important indicators to measure the vulnerability of different social groups or marginal people affected in climate change events. Socio-economic indicators are found widely popular and cited literatures in climate change study that may include level of scientific and technological development, institutions, infrastructure, social structure and political conditions (Deressa et al., 2009; Kelly and Adger,2000). Moreover, the environmental factors primarily comprise with climatic variability, physical environment, soil composition, and water supply for irrigation (Deressa et al., 2009; O’Brien et al., 2004). This socio-cultural, economic as well as environment attributes contribute to create multitude vulnerability to different groups/communities and different regions (Maiti et al., 2015).

According to Nyong et al., (2008) in the recent literature of climate science, two explicit types of vulnerability can be identified that are notably bio-physical vulnerability and social vulnerability (Nyong et al.,2008). Bio-physical vulnerability preliminary demonstrates the eventual effects of a hazardous situation and it is mostly counted about the level of damage faced by a system due to the occurrence of climatic hazards in any particular region (Maiti et al., 2015). On the contrary, social vulnerability may be recognized as a particular state of human community who experience climatic stress in their way of life and respond to it for adaptation (Vincent,2004, Adger,1999; Nyong et al.,2008). Researchers are very much inclined

to do these types of study/analysis for the purpose to contribute to the information about different aspects human society, community, infrastructure, for the welfare and planning and for integrative decision-making process. (Maiti et al., 2015). Moreover, Blaikie et al., (1994) also clearly differentiates the term-biophysical and the social aspects, and define vulnerability in social aspects as “the capacity to anticipate, cope with, resist, and recover from the impacts of natural hazard”. To Blaikie et al., (1994), the biophysical component, for the measurement or the exposer is not generally counted as their statement of the term of vulnerability. They further argued that the definition of vulnerability must always been to link to a distinct disaster or types of disaster, so that susceptibility and exposure may be remain intimately related. The benefit of defining vulnerability in this way may help to develop a policy-relevant framework that can provide an effective case specific interventions for increasing the capacity of affected people to response the stress can be evaluated (Blaikie et al.,1994).

Cutter (1996), reviewed natural hazard related literature of vulnerability and demonstrated three basic conceptualization of vulnerability that are vulnerability as a prior-existing condition, tempered response vulnerability and vulnerability as a hazardousness of a particular region. Moreover, McLaughlin and Dietz’s (2008), in their review of vulnerability literature referred five distinct categories of vulnerability that are biophysical, politico-ecological, human ecological, political economy and constructionist. They criticize other vulnerability approaches and claimed their approach as evolutionary citing that it can avoid the pitfalls of other perspectives. They further asserted that other approaches are based on assumptions of essentialism and nominalism which are not much effective comparing to their approach. In the same way, Eakin and Luers (2006), indicated that vulnerability may be characterized in three ways that are political economy or ecology, risk hazard, and ecological resilience. In their review, the main focal point was the emerging challenges of recent vulnerable studies that are multiple stressors, insecurity, uncertainty, concerning about equality and justice etc. Along with this, some other issues have emerged in recent time in climate change research of vulnerability that is how vulnerability should be treated. More generally vulnerability should be treated whether as a process or an outcome or as status (Adger,2006, Pelling,2003). Moreover, Adger,(1999) indicated that the socio-economic and political status of marginalized people and social inequality contribute a significant role for measuring vulnerability. In this case, dependency on resources, poverty, access to resources and diversified income source are considered influential component of social vulnerability (Adger,1999). Along with this, physical condition is also considered as an important indicator

for vulnerability study because physical/environmental and social change are highly interlined and it is gradually changing. To assess vulnerability of any community of any particular locality, researcher should examine physical vulnerability along with socio-economic susceptibility (O'Brien et al., 2004).

Another important approach for analyzing social vulnerability and managing natural resources in different social groups is the environmental entitlements approach (Leach et al., 1999; Mearns et al., 1997). This approach also follows different socio-economic indicators for measuring vulnerability where individual, groups or household are capacitated to use different existing wealth/materials. Adger, (2006; 270) defined entitlement as 'potential existing resources of individual in a community that is produced by themselves with mutual cooperation'. This framework actually tries to understand social vulnerability in terms of lack of entitlements and also explore the underlying causes of vulnerability by giving especial focus on the production, access to and distribution of entitlement and their status over a distinct time-frame. The political and socio-economic factors may designate the vulnerability of that particular community as in what constructed way they practice to access and distribute existing resources. This constructive system of accessing resources is called the 'architecture of entitlement'. In order to get an idea about the degree of social susceptibility of a particular community or household, this constructive system is very helpful. According to this approach, vulnerability of a household or community in climate change stress can be determined/understood if they have little access to the entitlement because of diplomatic and socio-economic causes or there is found a large proportion of damage or limited quality of entitlement (Adger and Kelly, 1999; Adger et al., 2003; (Platen-Hallermund and Thorsen, 2013). Moreover, Brooks et al., (2005) constructed a framework of susceptibility and coping strategies following eight variables that are health related i.e. prevalence of infections and mortality; education related i.e., Illiteracy rates; geographical related i.e., coastal area; ecological i.e., forest resources; infrastructure, governance and modern technologies. According to Confalonieri et al., (2011), Brazilian Institute is familiar to use three indicators for measuring climate change vulnerability that are economic, demographic and health factors. They developed vulnerability index in their region by giving special focus on socio-economic and demographic indicators from their research findings along with environmental information and epidemiological information of their regions.

Human society or natural environment may experience potential damage due to vulnerability. In climate change research, though researchers normally used exposure,

resistance and resilience as the base of vulnerability measurement but there are exquisite differences between connotation and measurement. Different researchers use vulnerability in different ways; to illustrate the matter, Cutter et al., (2000) demonstrated it as the threat of exposure, but some other see it as an indicator to suffer that may include resistance, resilience and recovery from climatic events (Mujabar and Chandrasekar,2011). Apparently, vulnerability is a region-based problems of particular people or community, so spatial solution may be an effective tool to overcome vulnerability. Moreover, though there is ample of research on specific elements of vulnerability such as natural environment, social system exposure, risk estimation and prediction etc. but often researcher face lacking skill to assimilate all the information connecting together to deal with vulnerability. Simultaneously, in local area vulnerability assessment very often largely constraints due to unavailability of sufficient relevant data and other logistic supports (Cutter et al., 2000).

Coastal community social vulnerability index (CCSVI) is a framework constructed by Bjarnadottir et al., (2010) which tries to measure the impacts and vulnerability of climate change induced Hurricane in coastal belt area. This extensive social vulnerability index is a scenario-based approach which primarily accounted age, gender, and race for conducting a Principal Component Analysis (PCA). For minimizing different social factors, PCA is used for example percentages of women, percentage of African American to a very small number of key social factors e.g., ethnicity, race, gender etc., and it has significant influence for vulnerability in coastal belt region. PCA tries to assess vulnerability on the basis of social composition of different region using place-based social parameters that is considered more representative then index for vulnerability study in climatic events.

In the same way, following the approach of (McCarthy et al., 2001), Nguyen et al., (2017) tried to represent a dynamic concept of Social Vulnerability Index (SVI). This approach comprises with the important variables that are exposure, sensitivity, and adaptive capacity. Here ‘Exposure’ refers ‘the level in which a process is exposed to significant climatic alteration (McCarthy et al., 2001). In this approach, researcher shows by exposure the degree that the population of a particular area exposed to a climatic stress (Nguyen et al., 2017). In the SVI, the second concept is ‘sensitivity’ which denotes the level in which a process is beset severely or beneficially, by climate change induced inspiration (McCarthy et al., 2001). More specifically researcher in this approach used sensitivity to refers the degree where a particular group of people (i.e., women, children, disabled, elderly people, farmers etc.) are vulnerable to climate change extremity (Nguyen et al., 2017). Moreover, ‘adaptive capacity’ in this

vulnerability index follows the availability of natural resources and capacity that a particular community possess to reduce risk and adversity of a particular event (UNISDR,2004).

Blaikie et al., (1994) in their Pressure and Release model (PAR) showed human susceptibility to natural disasters in climate induced extremity. The pressure and release model highlighted that natural hazard is the knitting of two antagonistic forces' that are comprised by the process generating susceptibility and physical exposure to hazard. However, the gradual soaring up of stress may emerge from any direction, but to overcome the stress, susceptibility required to be released.

According to Blaikie et al., (1994) there are three main levels of vulnerability that are i) root causes; ii) dynamic pressures; and iii) unsafe condition. 'Root causes' basically contribute to create vulnerability indirectly in the society. For example, different factors i.e., economic, demographic and political processes in the society influence in distributing power and unequal power distribution, and decision making may cause vulnerability to the people in climate change extremity. 'Dynamic pressures' which is also related to the root causes may bring uncertainty of accessing resources and consequently create vulnerability to the hazard affected people of a particular locality. To illustrate the matter, due to the scarcity of effective local institutions, skills, inaccessibility of local market may cause susceptibility to the people of a community. Finally, Blaikie argued that 'unsafe conditions also may form vulnerability in different time and space due to the climate change extremity (Blaikie et al.,1994).

Considering the aforementioned definitions, in this study, social vulnerability can be denoted as a particular state of human community as well as individual who experiences severe climatic stress/events, that is susceptible to fracture, depreciation, or harm in their way of life and respond to it for adaptation.

2.2.2. Resilience

The concept "resilience" roots from the Latin word 'resilire' that denotes "to back up, recoil, or leap or spring back" (Davoudi,2012). The term 'resilience' first used in physical sciences and later adapted in health professions (UNICEF, 2009). In physical sciences, resilience has the capacity of an elastic elements (i.e., from a blow) and salvation that energy as it springs back to its previous shape. This recovering capacity of elastic can be visualized as similar to a person's capability to bounce back after a jolting set back (Merriam Webster, 2017).

Resilience in the most rudimentary sense, can be denoted as the capability of an individual, organization or process to bounce back from adverse situation. In the broad sense, resilience may be referred as the ability of a process to imbibe iterative disorder so as to entertain indispensable form, processes, unity and feedbacks (Adger et al.,2005; Walker et al,2004). This is the concept that can be applied in diverse ways across different fields (Linnenluecke,2017). To illustrate the matter, in engineering and physical sciences, resilience focuses on denudation how materials or process can counteract, breakage or change (Pimm, 1984). Moreover, in ecology, resilience deals with studying the structure of ecosystem and factors that corrode their resilience, together with anthropogenic activities (Linnenluecke, 2017). In the literature of ecology, ‘resilience’ as a term started to use in the 1960s and 1970s, defined resilience as “a measure of the persistence of system and their ability to absorb change and disturbances and still maintain the same relationships between populations and state variables” (Folke,2006; Mayer et al., 2006). In psychology, the main focus of resilience study is to find out some philosophical explanations about finding out the causes of some individual’s capability to handle adversity better compare to some other individuals. (Linnenluecke, 2017; Luther et al., 2000). So, the term resilience denotes “the ability to bounce back serves an important function in responding to the stress and loss of overwhelming situation” (UNICEF, 2009). In this study, resilience denotes to the capability of individual, as well as group/community, to bounce back from extremity of severe climatic events/hazards and variability by using cultural components and utilizing existing natural and traditional resources of a particular affected area.

According to NATO (2008), resilience may be applied in two processes, that are i) Personal resilience ii) Collective or community resilience. Personal resilience can be denoted as “a persons’ capacity for adapting psychologically, emotionally, and physically reasonably well and without lasting detrimental to self, relationships or personal development in the face of adversity, threat of challenge” (NATO, 2008). This resilience particularly depends on how a person responds to the adversity; he/she faces during natural disasters. It generally depends on a persons’ individual characteristics, assemblage of knowledge, technique, efficiency and the qualities he/she possess in life experiences and circumstances (NATO, 2008).

Community resilience/collective resilience is a cumulative endeavor that mirror in what way community anticipates, ready up, respond and recuperate from distress and either perpetuate or recoup a positive trajectory following incarnate misery (Norris et al., 2008). According to Bruneau et al., (2003) Community resilience may be denoted as “the ability of

social units to mitigate hazards, contain the effects of disaster when it occurs and carry out recovery activities in ways that minimize social disruption and mitigate the effects of future earthquake” (Bruneau et al., 2003). Community resilience comprises with the following characteristics that are i) usage the properties of embonpoint (combating pressure without decadence), ii) superfluity (accessing to excess capacity and skills), iii) expedition (responding in right time and in accurate manner) vi) resourcefulness (assessing impediments and utilizing existing local and natural resources) (cited in Linnenluecke and McKnight, 2015). Hence, it can be described that community resilience shows the ways about how individual, organizations, groups/communities and regions respond to, cope with and get rid of hazards and climatic events (NATO, 2008).

2.2.3. Climate Change Resilience

The popularity of using of the term ‘resilience’ in climate change induced disaster research is relatively new and it is found in climate change hazards literature only before a couple of decades from now (Gallopín,2006). Timmerman (1981), was considered perhaps the maiden researcher who used the concept resilience in climate change research claimed that resilience is ‘the assessment of a processes or segment of a processes capacity to imbibe and recuperate from hazardous incident. Subsequently, ample of definitions and explanations of climate induced disaster resilience are prominence in academic literature. In this context, it can be referred the definition Wildavsky (1988), who demonstrated that disaster resilience is the way of acquiring capability to exploit opportunities, resist and bounce back from extremity. Similarly, National Research Council (2012), explained climate change induced disaster resilience as “ the ability to prepare and plan for, absorb, recover from, or more successfully adapt to actual or potential adverse events” (National Research Council,2012:16).During the period of hazards, resilience approach generally tries to give much emphasize on existing intrinsic resources and strategies that can apply its utmost capacity to respond to the risks for adaption in adverse situation (Marina et al.,2015). Moreover, in the definition of disaster resilience the Institute for Development Studies (1998) pointed out that disaster resilience is such an ability of individuals that can help them to cope with and recuperate from climatic strain and risks, that may comprise both short term or long-term adjustment to the new environment for their livelihood strategies. Adger,(2000) provided an explanation of climate change resilience from a perspectives of sociology. According to him resilience should be given prioritize on the abilities of individuals, groups as well as communities to adapt with adversity due to the climatic extremity and the change of social,

political or environmental atmosphere (Adger,2000). Along with this, some other researchers also put focus on strengthening community-based management, enhancing institutional capacity and skills and also strengthening adaptive co-management of a particular affected area (Olsson et al., 2004; Berkes et al., 2003). In addition to this, during the emergency periods or in climatic stress different members in the community including individuals, neighbors, GO and NGOs and other agency work in collective way staying in the existing cultural, economic and political subsystems. In this context, can be referred the name of Federal Emergency Management Agency (FEMA), which pointed out that for bringing resilience all aspects of a community should work together to prevent, impede, mitigate, respond to and overcome from risks and hazards. Here it is important for an individual to make prepared himself/herself to combat climatic stress and for getting collective effort all the members of a community work together to strengthen the capacity to ensure security and resilience of every member in natural hazards (FEMA, 2011: 23). Here different aspects of definitions of climate change resilience are presented in a table.

Table 2.1: Definitions of different forms of resilience

Authors	Definitions	Characteristics	Subject or level of analysis	Strengths and weakness
Timmerman,1981	Resilience measures the capacity of a process or part of a process to imbibe and recuperate from the incidence of a disastrous events	Mainly focuses on the capacity of a process	Ecological system	Focuses on capability to imbibe and recuperate, no indication of transferability
Walker et al.,2002	Capability a) to imbibe disorder, b) to self-establish, and c) to lessening and adjustment	Three forms of capabilities, i.e., capability to imbibe, to self-establish, and to adjustment	Ecological system	Focuses on capabilities; debate continued for time on capabilities and abilities
Adger,2000	The capability of a community or group to cope with exterior torments and disorder because of cultural, political and environmental alterations	Mainly focuses on the capability of a community or group in the context of torments and disorders	Social	Building resilience in the contexts of various forms of torments
Folke et al.,2002	The implicit capability of an ecosystem to sustain its intended ecosystem activities in the situation of fluctuating environmental and human uses	Representation of the capability of an ecosystem about the interaction with in human beings and the environment	Natural and human ecosystem	Representation of resilience in the context of nature and humans; still, fluctuations are observed in the process
Ganor and	Individuals' or community's capability to deal with the situation of	Focus on individual and community's	Community	Mainly focuses on resilience with

Ben-Lavy,2003	relentless, long terms torments; the capability to discover the intrinsic strengths and resources for the purpose of effective coping strategies and assess to adaptation and flexibility	capability to deal with stress along with evaluate the possible intrinsic strength that can contribute to help in adaptation in adversity		reference to individual and communities, still assessing intrinsic strength may be a huge challenge
Hyogo framework of action (UNISDR,2005)	The capability of a process, individual, community, or society, possibly exposed to hazards to adapt by obstructing or changing for the purpose to reach and sustain a receivable level of functioning and structure	Expansion on the capability to adapt, cope with, resist, or alter in order to stand a functional level	community	Keep concern with disaster resilience, though it is a broad approach
Resilience Alliance ,2006	The ability of a process to acknowledge and imbibe disorder while enduring change to keep originally the similar function, formation, and feedback and for that reason the same identity	Includes the definition of resilience by the Hyogo framework of action (2005) although Resilience Alliance (2006) added other forms of capacity	Community	Represent the variations of resilience, the capability to imbibe; still dispute continues the similar action, formation and identity in the rescue level
Frankenberger et al., 2007	Resilience means the united capability to respond to the adverse situation and change for sustaining function. A community with resiliency is able to respond to a disorder in such a mode that can tighten community bondage, resources, and capability for adaptation	Strengthen community capacity through bondage, resources and so on	Community and individual	Precise from the perspective of adverse situation and change
Cutter et al.,2008	The capacity of a social process to respond and recuperate from hazards, that comprises instinct conditions that permit a system to imbibe effects and adapt during a hazard as well as post-hazards, and adaptive process that may simplify the ability of a social process to reorganize, alter and lesson in response to a impendence	Related to the capacity to re-establish, alter and lesson in response to an impendence	Community	Focus mainly on two situations: response and recovery: still, less concentration is given to preparedness prior to hazards
Norris et al, 2008	Resilience is such a system which connects to a set of adaptive capability to a positive trajectory of activities and an adjustment after a disorder	Understands disaster resilience as asset of capacities of individuals and communities	community	Focuses on positive changes, although only post disaster
IPCC, 2012	The capacity of a process and its elements parts to relate, imbibe, accommodate, or recover from the impacts of a disastrous event in a well-timed and effective manner through protection, recuperation, or amelioration of its necessary vital structures and function	Defined on the basis of three types of ability, including anticipating, imbibing, and accommodating the effects of disastrous events	Community	Focus on two area: ecological and social, although there is limited discussion on the complex concept of abilities

DFID,2 011	The capability of households, groups/communities or countries to handle change by fostering or transforming living standards in the context of collision or torment i.e., cyclone, earthquakes, droughts, or violent frictions without compromising long time developments	Giving priority to the ability at different levels to handle change, for instance, countries, communities/groups and households	National community, and households	Giving focus on specific events, for example, earthquakes, droughts and frictions etc.
OECD,2 013	The capacity of peoples, communities/groups, countries and organizations to imbibe and recover from collision for positively adjusting and transforming the formation and means for living in the situation of long period alterations and ambiguity	Put emphasize to the ability for adaptation	National institutional, community, and individual	Tangible and precise approach, though this approach is criticized as ambiguity

Sources: Compiled from Walker et al. (2002); Folker et al., (2002); UNISDR (2005); IPCC (2012) cited in Al-Maruf, (2017).

Chapter 3: Methodology

3.1. Rationale for the qualitative approach

Qualitative research is considered as a term of broad umbrella that can follow a wide range of techniques with combination of different philosophies/paradigms. This method is generally used to get a deep and comprehensive perception of a particular research consignment embracing the philosophy of the study population and the condition where they exist or stay. Moreover, qualitative research is beneficial and helpful for investigating new topics or getting good idea about critical issues, for example exploring people's perceptions, beliefs, attitude, behaviors, etc. and figuring out the cultural and social norms and value of a particular community or society. This method also has the effective capability to investigate sensitive issues through rapport building and creating comfortable atmosphere for participant disclosure. Therefore, qualitative research is enjoyed the benefit of most effective methods for dealing 'why' questions to investigate and perceive different convention or 'how' questions that delineate/state the process of the convention (Hennink et al.,2011).

According to Bryman, the selection of qualitative approach as a method not only depends on technical issues but also philosophical issues related to research paradigms (Bryman,1984). "Paradigms are 'models' or frameworks for observation and understanding which shape both what we see and how we understand it" (Babbie,2007:32). In another way, paradigms can be defined as perspectives, or the process of thinking about the reality that shape 'the frame of our reference to incorporate or inspection and judgement' (Babbie,2007:32). For defining paradigm, Denzin and Lincoln (2008:31) referred the name of Kuhn (1970), and argued that paradigm is a "web that apprehends the researchers' ontological, epistemological, and methodological premises". As a set of fundamental belief underpinning in the research process, paradigm can be investigated on the basis of three fundamental questions of the researchers' response. That are - "what is the nature of reality (ontology)," "what is the nature of the relationship between the knower and known (epistemology)", and "How should the inquirer go about finding out the knowledge (methodology)" (Guba and Lincoln,1994:108).

According to Cotty (1998), "Ontology is the study of being. It is concerned with 'what is' with the nature of existence, with the structure of reality as such" (Cotty,1998). Ontology denotes our thinking about the nature of reality to looks like and our perception about the world, to illustrate the matter, the inquiry is 'what types of entity the human being looks

like' (Denzin and Lincoln,2008:31) or to ruminate 'the nature of occurrences or essence or social fact' (Mason,2002:14). The ontological position of this study is critical social theory as it deals with the nature of reality indigenous people face due to climate change extremity as well as pandemic situation. According to this perspective, this study will go through the indigenous peoples' experiences, perception, challenges, struggle, nature of reality and coping strategies in different extremities. Following this ontological stance, this study will see the changing and challenging status of political, social and cultural structure of indigenous community by exploring the struggles indigenous people face and criticizing the existing inequality and exploitation for liberating the feeble and powerless indigenous people.

According to Crotty (1998), "Epistemology is concerned with providing a philosophical grounding for dealing what kinds of knowledge are possible how we can ensure that they are both adequate and legitimate" (Crotty,1998). The task of epistemology is to find out consignment, as an example of 'to identify the relationship within the known and to the inquirer' (Denzin and Lincoln, 2008:31), and 'to investigate the wisdom or precedent of social fact that is represented' and 'the evidence that is calculated' (Mason,2002:16). The epistemological position of this study is critical social theory as it criticizes social, political, and other structure to generate knowledge to foster democratic society and liberates indigenous people from the adversity of climate change extremity and Covid-19. The main theme of critical social theory paradigm is to possess a strong position to social justice and to the transformation of existing social structure. Critical social theorists strongly belief that researchers should engage themselves to interrogate the existing power structure to transform and liberate the lives of those people who are exploited by these unequal social structures. German eminent political economists – Karl Marx, is the founder of this paradigm.

Finally, methodology which helps us about how to acquire wisdom about the universe (Denzin and Lincoln,2008:31) and how to gather information from the study area. This methodology is largely interwoven in the epistemological and ontological impersonation of our underly research.

Taking into consideration of above-mentioned issues, this study would like to undertake critical ethnography as a research method. Critical ethnography is a branch of ethnography in qualitative approach. Before the discussion of critical ethnography in detailed, here briefly delineate about ethnography.

Literally, ethnography refers the description of an ethnic group or community. Along with an effective method of qualitative data collection, ethnography is also considered a tool of strong epistemological significance for studying a particular community or group in a holistic manner. Ethnography can help to comprehensive understanding of multitude complex conceptual structure. Fieldwork is considered as the hallmark of ethnography, where researchers interact with participants for a long period of time in the natural settings to observe how they work and interact in their everyday life. Respondent's voice is considered as main source of information that can be granted to write or recoding, might be a compatible, affluent, clear and readable conversation (Boyle,1994).

Moreover, Hammersley and Atkinson (2007), delineates ethnography in this way, "In terms of data collection, ethnography usually involves the researchers participating, overtly or covertly, in people's daily lives for an extended period of time, watching what happens, listening to what is said, and/or asking questions through informal and formal interviews, collecting documents and artefacts - in fact, gathering whatever data are available to throw light on the issues that are the emerging focus of inquiry" (Hammersley and Atkinson,2007:3).

3.2. Critical ethnography

Critical ethnography is considered not only a data collection method but also an epistemological stance in qualitative approach. Critical ethnography in Madison's (2005) word, "begins with an ethical responsibility to address processes of unfairness or injustice within a particular lived domain" (Madison,2005:5).

This type of ethnography is political in nature, because it keeps emphasize to challenge the existing social, political and other structure in the society by searching the struggle of powerless and marginal people with an aim to change the society. This form of ethnography based on critical social theory aim to critique and alter social structure 'to emancipate well-beings from the miserable conditions that subjugated them' (Horkheimer,1982:244 cited in Savin-Baden and Major,2012). Moreover, to define critical ethnography, Fontana and Frey (1994), demonstrated critical ethnographers as "culture workers attempting to broaden the political dimensions of cultural work while deflating existing oppressive systems" (p.369).

Different social issues such as poverty, inequality, sexism, racism etc. are major issue for the exploration of critical ethnography. In critical ethnography, researchers many a time collaborate with respondents along with being conscious about their biases and

interpretations (Savin-Baden and Major,2012). According to Madison, a critical ethnographer should ask the underlined questions during his/her study:

- 1) “In what way researchers evaluate and reflect upon their intention, objectives and analytical frame?
- 2) By which way do researchers prophesy impacts or assess their own potentiality to do damage/harm?
- 3) By which way do researchers produce and sustain a conversation of co-operation in their study project within themselves and others?
- 4) How much local specific story is pertinent to the explicit meanings and functions of human position?
- 5) By which way, through what intervention and what location, researchers work will render greatest contribution to equity, liberty, and justice?”(Madison,2005:4).

Along with considering the nature, characteristics, merits and philosophical stance of critical ethnography, the current study chooses this approach for several reasons. First of all, this approach can clearly help to identify what types of vulnerability indigenous community experience due to climate induced extremity and the exploitative behavior of mainstreaming society during and after natural hazards. This approach also helps to identify what types of impacts indigenous people experiences due to outbreak of Covid-19 in indigenous community. Secondly, critical ethnography criticizes against the inequality, disparity and other types of partial activities, so by using this approach, it would be easy to get a good picture about existing inequality of social structure of indigenous community in that particular area. Thirdly, alike of ethnography, critical ethnography encourages researchers to immerse in natural settings for several months even years to observe participants’ behaviors, so this approach may help to understand how indigenous people cope with recurrent hazards, and during applying their strategies what impediments they face in their community. Fourthly, critical ethnography searches the struggle that participants face in the natural settings and tries to liberate people from the oppressed system. This approach can help to find out what types of struggle indigenous people do due to climate change extremity and other disasters, so researcher can focus on that to help them to overcome it. Finally, due to climate induced extremity, indigenous people face challenges to maintain their traditional life but cannot get supports from the mainstream society. This approach can help to identify the underlying factors of their miserable situation.

Therefore, it can be said that the above-mentioned factors together with to find out the answers to the objectives of this study influence researcher to choose critical ethnography to conduct this study.

3.3. Positionality and reflexivity

Critical ethnography always initiates with a moral obligation to protect injustice/iniquity or oppression of a special people or community in the society. By ethical responsibility, it means that researcher has a commitment to help participants to overcome their suffering which is founded on ethical incantation of people's liberty and well-being. Critical ethnographer tries to uncover the vague actions of dominance and hold to bring back equity and freedom of marginalized people in the society by criticizing and changing the political and social structure (Denzin 2001; Thomas,1993, cited in Madison, 2005).

Critical ethnographer generally studies different social problems i.e., inequality, dominance, repression, hegemony, victimization, power and empowerment and so on. For conducting this study, researcher was very much careful as this study would not make further vulnerable to the individual/community being studied. Thus, the ethnographer during his inquiry, gave active participation with intensive care in entering and leaving the site with reciprocal support to the participants. Researchers here were very much self-acquainted about their explanation considering that the explanation mirrors their own cultures as well as history. Moreover, the position of critical ethnographer in the study was reflexive and been self-acquainted about their activities along with being upfront in the described study report. This demonstrated that author, participants as well as readers can be able to identify biases and values, be acknowledged the views and can be differentiated among textual representations. In critical ethnography, researcher position is not considered as an "objective" investigator as in the realist approach. Critical ethnographers' non-neutral position in the research can help to advocate to transform or change the society where people are likely to be less exploited and marginalized. So, it can be said that critical ethnographic narrative should be a "messy, multilevel, multimethod" direction to interrogate full of incompatibility, imponderable and stress (Denzin,1997, as cited in Creswell,2005:441).

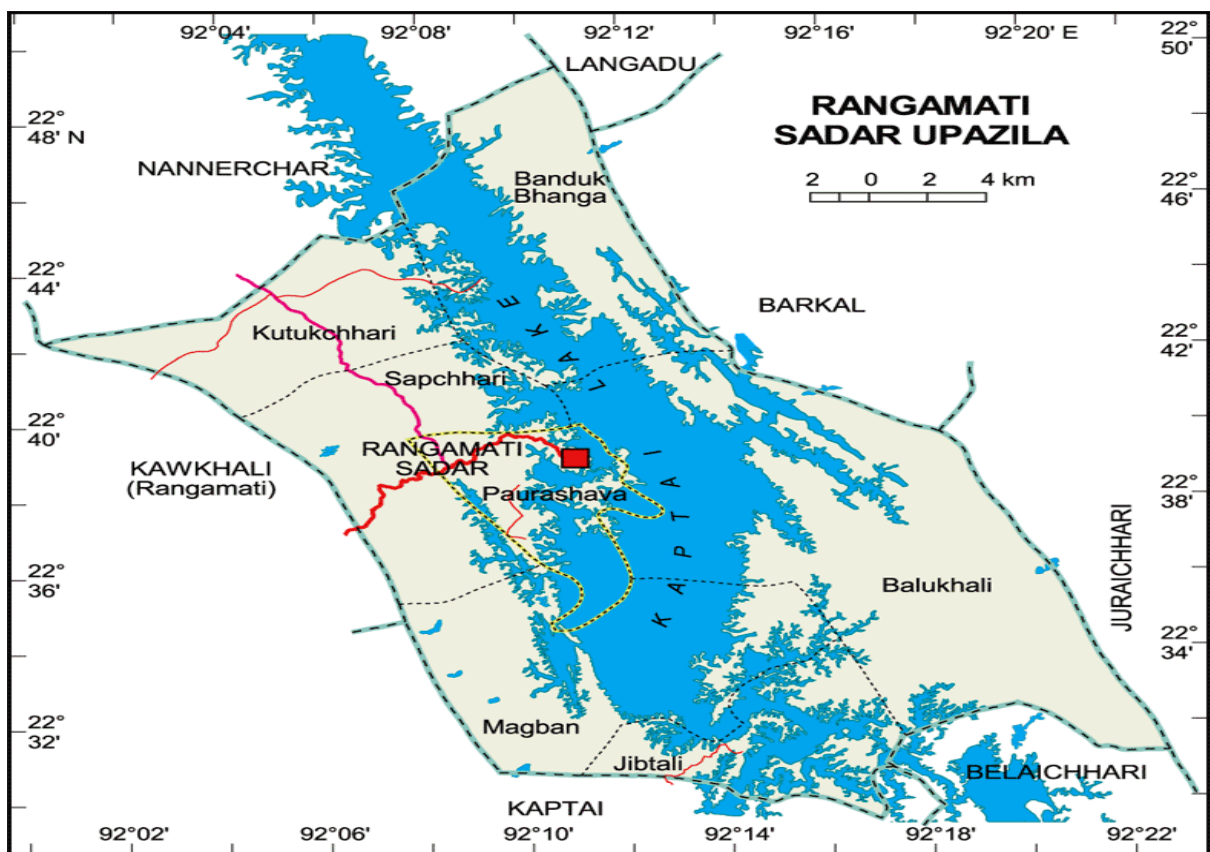
Along with positionality, reflexivity is also essential in any study process as it assists investigators to concede, experiment, and appreciate about their own communal background and impersonation that can interpose their research procedure (Hesse-Biber and Leavy, 2011). Reflexivity is "self-critical sympathetic introspection and the self-conscious

analytical scrutiny of the self as researcher. Indeed, reflexivity is critical to the conduct of field work; it induces self-discovery” (England 1994; cited in Savin-Baden and Major, 2013) In this study, researcher was reflexive by being very much self-critical and explorative to find out the ways of adaptive capacity of indigenous people and also was very much inquisitive to discover the underlying constraints that may hinder to achieve it along with finding solution. Researcher was very much sincere about his position and even curious to ascertain the underlying elements that triggers the climate induced susceptibility to indigenous people of that particular area. Through the implication of critical ethnography, researcher was very much curious to discover social, political and cultural structure of indigenous community where they struggle to cope with climate induced vulnerability. Moreover, to conduct this research, researcher was very self-critical and self-conscious analytical position to find out why indigenous people face severe vulnerability, experience exclusion, struggle to maintain traditional life, migrate other places etc. in that hill-tracts area.

3.4. Study settings

Study setting is an important element for conducting any study. The present study is guided at Rangamati sadar (sub-district) of Rangamati districts (Chittagong division) in Bangladesh. In Bangladesh, indigenous people are living in many parts of the country, but the people who live in this region are very much susceptible to climate change extremity. Chakma indigenous community is one of them who are directly exposed to climate change extremity due to their living on Hill slope and remote area from the center. Their traditional lives, culture, even their livelihoods/income sources are severely affected due to natural hazards. No other indigenous community is affected by climatic hazards like Chakma community due to their close link to the nature and huge dependency on forest based-resources for maintaining their livelihoods.

The logic of selecting this setting as study area is that it is considered one of the most susceptible area of climate induced disasters. The variety, frequency, and intensity of hazards such as typhoon, flood, soil salinity and landslides etc. are very usual events in this locality. Furthermore, for living on hill slopes and remote area, this community’s susceptibility also expands to large scale. Therefore, taking into account all these factors, the Rangamati sadar upazila (sub-district) is selected for this study.



Maps 3.1: Show the study sites at Kutukchhari and Sapchhari unions of Rangamati sadar sub-districts of Rangamati districts in Bangladesh

This study was conducted in Rangamati sadar upazila of Rangamati districts along with conducting approximately five (05) focus group discussion. This study also interviewed approximately 10 stakeholders such as upazila chairman, members, NGO workers, and other knowledgeable persons of that respective areas. Moreover, as this study had been used critical ethnography as research approach, researcher visited the field from October 2019 to March 2020 and June 2020 to October 2020 (due to outbreak of Covid-19 during field visit, after March 2020, researcher used both online and field visit for data collection).The performing field work in this study area was challenging for several respects: first of all, the communication process of that particular locality was not convenient as it is surrounded by different hills. Secondly, the people of Chakma community used their own language, so it was a big challenge for researcher to do meaningful interaction with the participants during the field visit. Thirdly, the study setting frequently faced different types of natural hazards i.e., cyclone, flash flood, excessive rainfall, landslides etc. so researcher faced difficulty to collect data continuously and needed to undertake several field trips. Fourthly, it was challenging to manage intended people for interview, as many of them refused to talk with researcher assuming as outsider. Fifthly, due to outbreak of Covid-19 and being imposed of lockdown in indigenous community, it was a great challenge to access to field sites and finish field work in due time. Finally, it was also time consuming and challenging issues to get appointments from different stakeholders such as union council chairman and other official persons of that particular area. However, researcher was very much determined about the field work and completed the field work effectively with great care.

3.5. Field work for data collection techniques: participant observation, in-depth interview and focus group discussion

3.5.1. Participant observation

In critical ethnography, field work is very important and an indispensable way to understand other people. For performing fieldwork in critical ethnography, participant observation is considered one of the main source of data collection. According to Schensul et al., (1999), Participant observation may be denoted as “the process of learning through exposure to or involvement in the day-to-day or routine activities of participants in the research area” (Schensul et al.,1999:91). Through participant observation, researcher can learn about the behavior of the individual in a community along with learning the social order and the cultural norms of that particular community (Hennink et al.,2011:179). Experience is very crucial for performing participant observation in any community (Arnould and

Wallendorf,1994). The firsthand expertise of researcher helps to draw personal knowledge that can contribute to create effective interpretation and analysis of the research findings. The most important thing in participant observation is that with the long-term participation and interaction with the respondents, a belief of “trusted person” will be developed among them in the study settings (Glesne,1999). Participant observation is considered holistic approach as Malinowski (1922) argued that during the fieldwork, ethnographer should keep patient in his activity and put concentration in every aspect of the behavior/task of the individual of a community. Moreover, ethnographer should refrain themselves from making distinction between the mundane and the extraordinary and keep them ready purposely “expect the unexpected” (Glaser and Strauss,1967).

Finally, about the significance of using participant observation Malinowski (1922) highlighted that “ ‘being there’ through participant observation gave me the ability to witness ‘on the spot’ the multitude of daily - and often unpredictable -activities, ceremonies, and transactions that naturalistically occur in the life of the wish granting community (e.g. the daily routines at work, the official and causal meetings or encounters between individuals and groups, the ways of preparing the logistics of events, the ways of performing during daily routines and extraordinary events, the emotional reactions and social interactions emerging during everyday life and special events)”(Malinowski 1922).

Considering the merits and usefulness of participant observation in critical ethnography, the current research has employed this method for data collection, because participant observation can help researcher to get a complete picture about the way of living of indigenous people, their behavior, the nature of vulnerability they face in climatic extremity, and the coping strategy they employ to overcome this hazard. Participant observation also can help researcher to get firsthand knowledge about the indigenous peoples’ survival experiences in climate change extremity and their way of life and traditional activities as well as the impediments that make their life more susceptible in climate change extremity.

Participant observation is such a method that comprises with two components that are participation and observation (DeWalt and DeWalt,2002). As a researcher of employing participant observation as a method, researchers’ role is to participate in the study setting in the one end and perform to observation on the other end. This performance is determined how researcher present himself to the community, what is his tasks, to whom he interacts and what he inquires to them (Singleton and Straits,2005) along with making relationship to the

community people to whom he was going to observe (Merriam,1998). Moreover, the nature and the context of observation determines what level of participation researcher adopted in the study settings. In this context, Spradley (1980) pinpoints four types of participations that researcher can adopt in the method of participant observation that are: i) Passive participation, where researcher are inactive in interaction and participation but active to note down the observations from nearby convenient position; ii) Moderate participation, where researcher partly involves in both participation and observation just like playing the role of both insider and outsider; iii) Active participation, where researcher actively participates in many tasks what he observes, does many tasks what others do for learning and practicing cultural rules and values of that particular community; iv) Complete participation, where researcher thoroughly engages in the study setting for observation through participation by living in the study setting for long time.

In the current study, researcher role was to follow the first three level of participant observations: passive participation, moderate participation and active participation. As a passive participant observer, researcher observed the study settings including the behaviors of individuals of Chakma community, their interactions with other members, their attitudes and daily activities for maintaining their traditional life etc. Researcher in this context was inactive and did not interact with the participants as it would create barrier to know the real situations of that particular area. As a passive participant, researcher tried to see what types of social components prevailed in that community and how it worked to make resilience to overcome vulnerability in adverse situation.

As a moderate participant observer, researcher interacted partly being not much active with respondents to get clarification when finding anything confusing to observe. In this observation, researcher tried to get as much as information in the natural settings without disturbing participants in their tasks by limiting interaction with the participants. Subsequently, researcher became familiar with the respondents by giving his identity and expressing the objectives and purpose of the research project. Moreover, ‘ice breaking’ and ‘rapport building’ were done and tried to ensure community members that they could believe him as a trusted person and accepted him as like as insider of their community though researcher was an outsider.

As playing the role of active participant, researcher worked like a native of the community to get the in-depth information relating to the objectives of the study. Researcher

participated to the work that indigenous people do in their everyday life, along with learning the culture, traditional practices and other rules of that community to get a good picture of that community.

As Dowler (2001:158) pointed out that “greater depth of understanding” and “the ability to study behavior in its natural setting” are considered two features of participant observation. Researcher through the active participation tried to immerse the activity of indigenous community to get the desired data by interacting, observing and participating actively with the community members.

According to Hennink et al., (2011) participant observer needs to invest a long period of time in the study area for developing intimate relation with the respondents whom he not sees before for getting detailed note of the study. As a faculty of sociology department of Chittagong University, Bangladesh, researcher have some students who belong to Chakma indigenous community. With the help of these students, researcher entered the community and introduced him with the community members. Prior to entering the field, students had given them indication regarding the objectives of the study and about the investigator. Students had played the role of gatekeeper, as researcher could get a lot of information from them about their community. As these students belonged to indigenous group, so researcher could not face much difficulty to enter the community as student accompanied with him. Community members easily trusted researcher due to the involvement of students in this process. Researcher/investigator had informed the objectives of the research project to the members along with informing them what he needed to require from them and what would be his tasks in their community.

As a critical ethnographer, researcher might not be in neutral position of that community as his sympathy goes to them due to seeing their vulnerability. Being a trusted person to them, researcher intended to explore the inherent causes of their sufferings in climate change extremity and how much support they get from the government and other aid organizations to overcome this. With the support of gatekeeper as well as the students, researcher was able to gain the faith to hear the hidden sufferings of these people along with seeing that with his sensory organs.

In the field work, researcher used the technique of walk through the space. According to Hennink et al., (2011) walk through the space is a technique where researcher walks with community member in the natural settings and collect information about the

surroundings relating to the study by interacting with the community members. Community members describe the social settings and different usual activities to the researcher. The Chicago school developed this technique which is usually a combination of ethnographic observation and the 'imaginary walk' (Blokland,2003).

This walk through the space can help researcher to get an overall picture about the social structure of the community along with getting the idea about the prevalence of coping mechanisms in that community. Their interaction and behavior with members of the community provide researcher a glimpse of idea about the nature and types of cultural components exist there. Moreover, the interaction with the gatekeeper as well as students contribute to help researcher how much support they get to overcome vulnerability through cultural adaptation. Also, researcher get information about the impediments they face to cope with extremity in their locality.

Researcher kept a field diary that helped him to keep record of thoughts and interpretations what was observed in the field. In the field diary, the notes were included feelings, emotion, hunches, idea, personal views, shocks even disgusting and annoying experiences observed in the field (Hennink et al 2011:197). The quality of field notes taking depends on experiences, accuracy, objectivity and the nature of completeness of the investigator. The investigation in the field was performed through the lens of researcher that contribute to create bias in some cases (DeWalt and DeWalt,2002). Therefore, researcher wrote down the feelings, experiences, thoughts etc. whatever he found relevant during the fieldwork. Researcher also noted down factual and personal data with preliminary analysis parallel during the participant observation. During taking notes, researcher followed the guidelines of Burgess's (1984) and took three (3) types of notes on the basis of field observation were: substantive notes, methodological notes and analytical notes.

In the substantive notes, researcher recorded the main observations/events and conversation chronology and that might include: i) place, time, date of the events; ii) descriptions of peoples behaviors, physical environment/natural settings etc. iii) sketch of the observed locations; iv) number of people participated and their characteristics i.e., age, gender, ethnicity etc.; v) notes of actual events that is held; vi) focus on the movement of people in the settings (Hennink,et al., 2011).

In the methodological notes, researcher might include: i) researcher roles as participant observer: how much influence and appropriate was researcher role to build rapport

and good relation with the participants ;ii) about the selection of research methods: what was the research method, how much rational for selection it, what was the outcome and how it would be implemented; iii) problems encountered during the implementation: what types of problems researcher faced and how it could be solved in the field.

In the analytic notes, researcher included preliminary analysis that could make easy to data analysis in the next stage. This might include: i) concise notes on substantive notes that might help to identify answer to sub-questions of the study; ii) explanation on the substantive and methodological notes; iii) identification of potential and knowledgeable interviewees of the study.

3.5.2. *In-depth interview*

In data collection process, in-depth interview is a one-to-one method where interviewer and interviewee involved discussion on specific topic in detailed. In-depth interview is considered as a “meaning-making partnership within the interviewer and the interviewees” which demonstrates that this interview is “a specific kind of knowledge-producing conversation” (Hesse-Biber and Leavy,2011:128). The interviewer and his/her respective participants therefore co-generate wisdom and interpretation in the study settings and contribute to co-construct reality (Hennink et al.,2011:109).

The logic behind choosing this method for data collection in my study was that, it is a strong tool for capturing the qualitative data by devoting respondents’ perception in their own voice (Frechtling and Sharp, 1997). Moreover, this method is more flexible and practical and not fixed to specific questions (Harolambos et al.,2013:922) that might help to get in-depth and vivid information about the susceptibility of indigenous people in climatic events and their coping strategies for adaptation to this adverse situation along with finding out the underlying barriers that make their life more susceptible. Furthermore, through in-depth interview, researcher learned respondent’s attitude, past, present and possible behaviors, emotion, motives and feeling about the problems they encounter in their locality which could not be possible to get with other methods (Harolambos et al., 2013: 922). Also, qualitative interview produces knowledge that is very much “contextual, philologic, conversational, and practical” (Kvale and Brinkmann,2009:18) Considering the above traits, researcher decided to choose in-depth interview to collect data in this research project.

In-depth interview is a method that depends on some predefined key questions where interviewees can get space for spontaneous conversation (Anderson and Jack,1991;

Rubin and Rubin,2005). Before going to the field for data collection, researcher developed an interview guide. This interview guides had been developed on the ground of the objectives, study questions and purposes of the research project. Following Hennink et al., (2011) “an interview guide is a list of questions used by the interviewer, mainly as a memory aid during the interview. As the name suggests, the interview guides simply guides the interview” (Hennink et al., 2011). After the completion of participant observation, investigator designed to conduct in-depth interview that helped to find more knowledgeable respondents for interview. For this purpose, during the participant observation, researcher had marked the more knowledgeable persons and the persons who were more fit to the objectives of the study. This endeavor would help to get more authentic and real information of the study. As the people of Chakma indigenous community live very remote area from the center, so the support from the students and friends might be again require to connect with them. Typically, before the starting of interview, researcher introduced himself to the participants along with explaining the purposes of the research project, what would be perform with the collected data, and the result/effects of the study. Moreover, researcher informed about the moral issues, i.e., secrecy and anonymity of the data to the interviewees. Moreover, permission had been sought for audio-recording, along with getting the permission to interview with them. The interview was started by asking some general questions as a part of rapport building and enabling interviewees to become comfortable in the interview setting and with the interviewer. These questions were generally demography related i.e., name, age, religion, education etc. and then moved to key questions relating to objectives of the study if it seemed that interviewees seem comfortable to answer the questions spontaneously.

During data collection process, researcher wore general dress which were more or less similar to the dress of Chakma indigenous people. This similarity in dress might help indigenous people to think researcher as a member of their community, so they could talk with researcher freely and researcher also easily do rapport building with them that could ensure to get authentic data from the field. Moreover, researcher conducted in-depth interview in the residence of indigenous people, so researcher could a get a good idea about the social settings and pictured the condition to what extent they were affected to extremity/disasters and how much they were able to overcome it. As the current research follows the critical ethnography as a research approach, researcher was in non-neutral position during the data collection process. Researcher explored the underlying factors of vulnerability of indigenous people in climate change and Covid-19 and also explored the nature of exclusion they experience from

the mainstream society. So, researcher took the position against these oppressions and tried to change/criticize the social structure by focusing the phenomena in their writings.

Along with indigenous people, in-depth interview was also conducted with upazila (sub-district) chairman, members, NGO workers and other knowledgeable persons. After completing the interview with indigenous people, approximately 10 interviews were conducted with these people to get an idea about their roles for the welfare of indigenous people. This interview could help to crosscheck the information getting from the indigenous community along with finding other administrative information of that particular area. This interviews also helped to get a good picture about what types of problems they faced during their activities for the development of indigenous people of that particular area.

3.5.3. Focus group discussion

Focus groups discussion may be denoted as a “research technique that collects data through group interaction on a topic determined by the researcher” (Short,2006:106). Focus Group Discussion (FGD) is considered an interactive discussion where generally focuses on a certain set of consignment. In FGD, researcher intends to obtain a wide range of views on specific topics by creating a comfortable environment for expressing the views of the participants. This discussion generally conducted on specific issues in interactive manner with a predetermined group of participants (Hennink et al., 2011). The focus group makes a suitable environment to identify socio-cultural behaviors or community practice as the member of the group validate the behaviors of the community or neutralize the extreme views that arise from the community discussion. The current study adopted FGD to get broad view about the effects and susceptibility of climate change on indigenous community. This method was also chosen to ascertain the information and drew together the actual data of the invaded people of that specific area.

For conducting this project, five (05) focus group discussion (FGD) was conducted: two FGDs were done with male indigenous people and another two were with female indigenous people and rest one with NGO workers, members and other volunteers of that particular area. Respondents were informed and invited formally before organizing the FGD. They were conversant regarding the purposes, objectives, and the outcome of the study project before organizing the FGD. Each FGD group was comprised with 8 to 10 participants with heterogenous religion, age, occupations and diverse backgrounds. Researcher had moderated the discussion in the group, and a research assistant helped researcher to write the

information that arise in the discussion. Researcher informed the group regarding the objectives, nature, and purpose of the study before starting the discussion together with ensuring the secrecy and anonymity of the respondents. The discussion was ended up when a common consensus would come among the members about the discussed issues.

3.6. Sampling procedure

According to Babbie (2004), “Sampling is the process of selecting a sub-set of observations from many possible observations for the purpose of drawing conclusions about that larger set of possible observation” (Babbie, 2004:160). In research process, as sampling is an important task including all scientific methods, the main focus of sampling should be the proportional representation. The main objective of standard sampling is to choose a few that can recount the universe (Babbie,2004:160). The current project purposes to assess the effects and vulnerability of natural hazards on indigenous people along with finding out the coping strategies in climate change extremity. This study also explores the impacts and vulnerability of Covid-19 on indigenous peoples and their response to combat it. Keeping mind this purpose, this study had selected approximately 55 (45 indigenous people and 10 stakeholders) respondents from Rangamati sadar upazila (sub-district) by employing purposive sampling. Purposive sampling can be defined as “selecting groups or categories to study on the basis of the relevance of research questions, theoretical framework, analytical framework, analytical practice, and most importantly the explanation or account which are researcher developing” (Mason,1996:94).

Purposive sampling helps to select relevant participants specifically to address the requirement of research objectives and goals. Each male and female indigenous people aged (15-70) who were affected by climate change induced hazards was the unit of study of this research. Covid-19 affected and non-affected indigenous peoples of the selected area were also included in the sampling list. The household leaders were given priority to choose as participant in the study and only one participant was taken in each household to avoid redundancy information. In case of stakeholders, knowledgeable persons such as upazila chairman, members, NGO workers were given priority and selected purposively for getting qualitative data from the study area.

3.7. Data analysis and interpretation

In qualitative research, data analysis is a process where researcher immerse in information to identify and interpret the experiences of respondents obtained in the research setting. This was an evidence-based empirical data of a particular issue, because researcher remained very close and discover the data from the field. By this immersion of data, researcher was capable to sort out the sole aspects of the respondents along with understanding their socio-cultural interpretation connected to conduct that might help to construct theory about people's actions or perceptions. Moreover, this plunge in qualitative data followed several analytic processes that were preparation, exploration and interpretation of data which contributed to make this data meaningful and evidence-based as well (Hennink et al., 2011).

In ethnography, data analysis follows description, analysis of themes and interpretation of participants researchers' (Creswell, 2005). Data analysis in ethnography starts immediately with the field work and it runs throughout the study even beyond. This data analysis comprised with the generation of themes and the interpretation of the procured data. In the beginning of the research, both the themes and interpretation of data were likely to be in a tentative form. This was a recursive process where themes, data interpretations and data gathering were likely to be evolve over time (LeCompte and Schensul,2010). Following this process, an impression and interpretation were made throughout the study and at the end a bulk of interpretation might be come when most of the data collection would be finished and an overall view of the situation might be emerged from the interpretation (LeCompte and Schensul,2010).

In addition to this, researcher began to analysis ethnographic field notes and transcription, in order to develop a theme from the obtained data. Coding was undertaken in this context which denoted to a consignment, subject, notion, thoughts, etc. that were explicit in the data. Through reading and rereading of the data, codes were identified which were essentially the information discussed by the respondents (Hennink et al., 2011). Coding was such a process that helped to categorize qualitative data for presenting the implications and describing of these categories. After that axial coding was taken to develop concept into the conceptual frameworks and finally suitable coding were selected systematically with respect to core concept (Bryman,2001).

Finally, a summary was noted down on the basic of each category and was justified following the underlined questions: How much the data well fit and reflect the

category? Is this category able to make sense? Is this category relevant to the main theme? Which patterns of data keep recurring? Can these data make conclusion? Researcher then found out a common theme after comparing and contrasting the themes from each transcribed notes and developed an overall theme which could best represent the experiences and responses of the respondents (Bryman,2001; Tuckett,2005).

3.8. Ethical consideration

Researcher begins and ends ethic in his/her research process. “A researcher personal moral code is the strongest defense against unethical behaviors” (Neuman, 1997). In every step of research process, researcher gets the opportunity to and contemplate on research activities and monitors his or her consciousness. It relies on the fidelity, honesty and the value of the researchers.

Ethnographic researchers face severe criticisms on ethical grounds due to their extensive participation and long-term staying in the field as a nature of the study. These researchers very often are required to explicitly answers the following questions: have the researchers clear understanding about their roles and responsibilities to the people they are researching? Do the researchers let their subject to know the participants properly? How much and in what extent a researcher is careful to get involved into participants private lives? In this current research, all of these issues were strictly maintained especially the ethical issues such as informed consent, providing information, and confidentiality.

During the ethnographic study, researcher was sincere to take permission from the gatekeepers as well as respondents and good relation was developed through rapport building. The nature, objectives and purposes of the study, were disclosed to the participants, along with seeking permission to the respective institutions such as local organizations and national levels. Moreover, the reflection of this research was uncovered at the beginning of the study about how the findings might benefit to the community members together with disclosing the outcome of the academic thesis for degree etc. Researcher also took the responsibility to reveal that this work would not harm or exploit the participants involved in the study along with ensuring them that secrecy and anonymity of the respondents were strictly maintained. In this case, all identifiable, sensitive, and confidential information were carefully handled or even removed from interview transcripts or quotations, so participants identity could not be identified from the documents (Hennink et al.,2011).

Chapter 4: Climate Change Extremities, Environmental Degradations and Its Impacts on Indigenous People

Conducting ethnographic fieldwork is always challenging to the researcher, especially if the participants find the researcher belonging to a dominant society in the country. Being a researcher of the mainstream society in Bangladesh, I understand that the indigenous peoples are being excluded by the mainstream society. Owing to this tradition, I have faced difficulties to start my fieldwork in Chittagong Hill Tracts area. I always thought how the Chakma community peoples (whom I would like to interview) could accept me. Would they think that I had desire to collect information for exploiting them? Would they accept me as a trustworthy person for their community and share their suffering about the Bengali community though I was a Bengali people? All of these questions were always moving in my mind before entering the indigenous community to conduct my ethnographic study. In the meantime, I was a bit relaxed having my student Amlan Chakma belonging to Chakma community always with me who helped me to build rapport with the indigenous people. During the first day of my ethnographic fieldwork, I introduced myself with the respondents and tried to understand their expressions about me. However, I had mixed experiences from them. One of the indigenous peoples assumed me as a NGO (Non-Government Organization) worker and went to their village for giving loans and collecting instalments. As I was discussing about climate change and disasters, one of the indigenous peoples assumed that I wanted to collect a list of affected peoples' names for providing relief. Meanwhile, my student explained them in Chakma language about my identity and purposes for going to their community. After learning about me from a Chakma people (Amlan Chakma) that I was a professor (Chakma peoples usually address a teacher as professor) of Chittagong university who wanted to conduct a research on the effects of climate induced hazards on indigenous people and desired to present the research in Hong Kong as my Ph.D. study, they became very happy and respected me a lot. They asked me to sit in a shop and also, offered me tea and biscuits. Then, they started to share their suffering from the environment as well as from the mainstream peoples. At first, they felt embarrassing to speak about the sufferings because of the Bengali peoples as I myself was a Bengali. But when I assured that they could keep me in their belief and share everything what was happening to them. Moreover, having my student Amlan Chakma with me gave them confidence that I would be a trustworthy person to whom they could share their sufferings. I

also tried to convince them by uttering the fact that I also belonged to minority people like them (in terms of religion) in Bangladesh who was occasionally experienced exploitation from Bengali Muslim in the society. When they heard that I was Hindu in terms of religion, they expressed that their religion (Buddhism) was also very much similar to mine and thus, they felt a sense of integrity. Expressing my identity in this way, I tried to be very close to the mind of indigenous people to obtain the authentic data of that community.

“In the disaster of 2017, I saved my life for a while. When our house was inundated by the flood water, with the help of neighbors, we tried to move household materials to another place as much as possible. First, I shifted my children from the house and kept them to neighbors’ house for their safety. Due to the disconnection of electricity, I thought the meats and fishes preserved in our freeze would be damaged. So, I planned to shift it to my father’s house which was few minutes walking distance from my house. Packing all meat and fishes in a bowl, I started to walk and after a while, I heard a loud sound nearly at a 10 to 15 feet distance. Huge lump of soil from the nearby hill was fallen down on the road which I had passed just few seconds ago. If I walked a little bit later, this huge lump of soil would fall on me and I might be crushed to death. I was completely lost of knowledge at that moment and only reciting the name of God. What I needed to do at that time could not understand. My whole body was trembling with fear and tension. The whole road was covered with hill’s soil both front and back sides of me and there was the possibility to collapse the hill again in any part in front or back of the hill and I might be crushed by it. As the backside road was filled with lump of soil, I stepped forward to my father’s house thinking that God helped me to survive from certain death. When I reached, I could not say anything and only crying and trembling in fear. I was totally disrupted psychologically and could not sleep in the night as the pictures of my children floated in front of my eyes all the time. Then I always felt the death driving me away as I assumed myself as dead. Now, I am practicing religious rules strictly and everyday go to temples for praying to God. I do not slaughter any animals and also do not rear any livestock after that in my family. My children were also psychologically affected seeing the flood and landslides in our locality. They were also frightened after seeing thunder storms and do not leave us in fear. We decided that if flood water enter in our house this year again, then we would leave that place and build our house near to our father’s house or father-in-law’s house to avoid the suffering from disasters.” This is a story told by an informant who suffered from climate change extremities. In this story, we can find the environmental crisis which

caused intolerable damage to the indigenous peoples. It is not an exceptional story; I often heard similar stories when I conducted my field work in indigenous community.

4.1. Change Weather Patterns and Seasonal Diversity in CHT

The evidence of climate change is the change in weather patterns. In my interview, the indigenous peoples told me how they observed, experienced and sensed the change in different dimensions including time of raining, temperature, color of clouds and so on. In Bangladesh, there are six seasons historically but these are not observed in recent decades.

Tables 4.1: Shows seasonal changes of weather patterns and its impact on nature and human

Seasons	Begins of season	Ends of season	Names of months in Bengali	Changes the time of climate/weather	Impacts on nature/human
Summer (<i>Grissho</i>)	Mid-April	Mid-June	<i>Boishak- Joishto</i>	Some years excessive heat and some year less heat; started either early or later some years; Intolerable temperature though uses AC & Fan;	Hamper agro-activities & productivities; Irrigation problems; Nor' wester & other deadly disasters occurred; Ice-melting and sea level rise;
Rainy season (<i>Borsa</i>)	Mid-June	Mid-August	<i>Ashar- Shrabon</i>	Rain is not occurred in time; Occurred either early or later; No rain or excessive rain; One season more to another season no rain;	Affect timely crop productions & yielding; Delay planting crops, trees etc. Excessive rain causes landslides; Flash flood damages crops & houses;
Autumn (<i>Shorot</i>)	Mid-August	Mid-October	<i>Vadro- Ashwin</i>	Not found this seasons every year; Sometimes works as late rainy season;	White clouds and gentle wind are not found; Stars are not twinkled in night; Black clouds fly in the sky & raining whole days; Lightening & thunder storms in the sky; Massive damages to life & properties; Intolerable hot winds seeming as fireball;
Late Autumn (<i>Hemonto</i>)	Mid-October	Mid-December	<i>Kartik- Ogrohayon</i>	No clouds & rain but lightening & thundering; Sometimes harvesting activities disrupt due to seasonal change	Cannot escape from thunder storm as occurs suddenly without rain; Thunder storm creates panic to life;
Winter (<i>Sheet</i>)	Mid-December	Mid-February	<i>Poush- Maagh</i>	Some years excessive cold and some year less cold; Winter comes either earlier or later;	Less yields of crops; Impedes the growth of species; Affects extremely nature and other species;

				Lasts winter longer time or less; Raining in winter and fall too much cold;	Afflictions of different diseases in the community;
Spring (<i>Boshonto</i>)	Mid-February	Mid-April	<i>Falgun-Choitro</i>	Occasionally, first half feels cold but second half feels hot	Too much hot; Scarcity of water here & there;

Source: Fieldwork

In the rainy season, raining is not found in due time. Rain comes either early or lately which profoundly affects the crop productions in agriculture fields. Same scenarios are also found in the winter and summer seasons vice-versa. In winter season, many often cold is not felt and it comes lately. In Bangladesh, only November and December are considered mainly as the winter months but many often cold is felt severely other than these two months which affect extremely the nature and other species. In winter season, throughout the time being, nature takes its new look; but when the winter does not appear in due time, that certainly shakes each element of the ecology. Similar incident is also happened in summer when it does not work in due time. About the seasonal change, one of the elderly Chakma indigenous people state – *“In our childhood, in autumn, we saw white clouds floating in the sky with gentle winds. In the night, we saw different stars twinkling and the whole environment looked very nice to enjoy. In recent times, we do not find white clouds in the sky rather than black clouds and it rains the whole day. We never imagined raining during winter, but we are now experiencing rain and severe cold due to climate change. The temperature in summer was always tolerable; but over the last few decades, we are facing intolerable temperature. Due to climate change, excessive heat melts down the ices of the Himalaya consequently giving rise to the sea level.”*

About climate change, another respondent quote, *“I do not know what is climate change. In our everyday lives, what we see bad in the environment is the curse of God. We do a lot of evil activities and that is why God provides us cyclone, flood, excessive heat and cold. We need to stop doing evil works and only then, God will be pleased with us and these environmental problems automatically will be stopped. God exists in the nature. In the past, people did not exploit nature and did not cut down trees excessively, so God was pleased. That is why we hardly experienced natural disasters earlier”*.

It has also been found that if rain occurs excessively in any year, then the next year rainy season may hardly afford sufficient rain and this is also true for summer in terms of temperature vice versa. In the recent years (last 7/8 years) in CHT, landslides, cyclone, thunder storm, flash floods etc. have been increased drastically comparing to the previous decades.

Moreover, recent disasters seemed very dangerous and destructive than the previous ones. Even, wind seemed very gentle and comfortable in the past, but now it seems intolerable assuming that it is nothing but the fireball that touches our body. In the past, we could take shelter under the big trees to avoid the sun shine/rays but now we cannot feel comfortable even under trees as there are no big trees in the locality. All of this is happening due to climate change.

The political trends in Bangladesh as well as in the world are not favorable for environment as these trends quest for profit ignoring the issues of climate change in the planet. Within a few years, the big trees, large bamboo bushes, dense jungles etc. has been disappeared from the forest. This causes imbalance situation in the ecology and environment in CHT. In 2017, indigenous people experienced great damage to the environment due to the climate change inducing hazards such as dangerous thundering and landslides and no union (small administrative region) was escaped from landslides due to heavy rain in CHT. This is happening due to the exploitation of nature, generation after generation. Hundreds and thousands of trees, densely bushes grow in the deep of soil which provide ecological balance to the environment, but now it is in the verse of existence. This makes ecological imbalance and climate change happening in the environment. The temperature increased to a great extent in the recent years is unbearable though people use electric fans and air conditioners. In the past, there was no electricity in the indigenous community but they did not feel discomfort because of temperature but now it is crossing the level of tolerability.

Political leaders should change their attitude toward environment. Otherwise, the universe will be uninhabitable in the future. About climate change, one of the headmen in indigenous community articulated – *“We were not very much aware about climate change in the past as the nature gave us everything whatever we needed, but over the last few years, we are observing that the nature is not in good position. Personally, I did not have much knowledge about climate change but after attending some seminars, I have gathered some knowledge about climate change and environment. The knowledge I have about climate change is experience-based rather than institutionalized. We, the farmers, hunters and gatherers experience some knowledge about nature through generation after generation and can perceive when summer, winter or rainy season, will come. On the basis of this, some proverbs, riddles, poems, novels had been developed in the community and people get to know in which months cyclone may occur and in which months drought may happen. But in recent time, weather is not working with those perceptions, i.e., rain does not come in due time and cold is*

not felt in due months etc. For this why, crops plantation, and other agricultural activities can't be done in right time which affects our social and cultural life. We are also facing different natural hazards for this environmental situation."

In the recent years, the new dimension of climate change is thundering and lightning which were not so severe in the past. In the past, only during raining, thundering and lightning was occurred, but now this has been changed a lot. Sometimes in the sky, there is no clouds but thundering is happening in the locality causing massive damage to both life and properties. During raining, people can take preparation for escaping from thunders, but if thundering is happened without raining, people cannot take preparation to take shelter to escape from thunder. So, this new form of thundering in the present time is creating panic to the indigenous as well as mainstream peoples in Bangladesh.

4.2. Climatic Events, Un-Environment Friendly Activities and Disruption of Environment in CHT

During our visit to the field sites by CNG, I found hills at both sides of the road seeming the road just like a rope that is spreading inside the hills. In both sides of the hills, there are huge number of trees standing on the top of the hills. I asked my student about the name of the tree as this tree was seemed to me quite familiar but I could not remember its name at that time. My students informed the name of the tree as sagwan tree. Throughout our trips, we only saw these trees in the hills both sides of the road but other trees were seldom found in the hills. I asked my student, why people plant these trees so much avoiding other trees? In our childhoods in the hilly pictures, we saw hill scenery where densely jungles were found and hardly could see the soil in the hill seemingly the green sheets cover the whole hills. However, in the real hills, I could not match the scene with the picture. So, I asked my student about the difference. He said that under the sagwan tree, no other trees can grow, so, you can see the soil in the hill as only sagwan trees are standing in the hills. He also informed that sagwan tree is not environment friendly.

Climate change is definitely not natural, but human made. In CHT, both climate induced and man-made hazards disrupt the environment severely affecting the life of natural resource of dependent indigenous people. Throughout the history, indigenous people maintain an intimate relation with nature and collect resources from the forests without endangering nature, but in recent years, with the touch of mainstream people (forest department), they are

planting sagwan trees and doing unsustainable activities in the nature, consequently, both human made and natural hazards have been occurred in the locality.

4.2.1. Mono-plantation of un-environment friendly trees in the CHT

Over the last few decades, the environment of Chittagong hill tracts area is gradually depleting due to some unsustainable activities. The businessman along with general people of this area are very much interested to plant sagwan trees in their land, especially in the hill land rather than planting other wooden trees. Many often, it is seen that people clean bushy jungles of their hill lands and wooden trees which are not only the sources of many wild foods, habitat of wild animal, but also sources of fuel wood used for cooking. People aren't also encouraged to do their traditional cultivation slash and burn (*Jum*) cultivation in their hill land. The inherent causes of planting sagwan trees in their land is the rapid profit accumulation. Sagwan trees comparatively grow quickly and can provide much profit earlier than any other trees in the hill tracts area. Moreover, the seedling of this trees is easily manageable and cheap for plantation along with less requirement of fertilizer and irrigation. About the economic benefit of this tree, one of the indigenous interviewees stated –

“We can earn a lot of money by selling sagwan trees as the wood of these trees have very demand in the market. Moreover, without costing much money for cultivating these, we do not need to wait much time for selling it in the market”.

Though sagwan trees are economically beneficial for people but it is very harmful for environment. They do not allow other trees to grow surrounding this trees in the land. As a result, under the sagwan trees, yield of different types of crops are not satisfactory. Moreover, this tree cannot reserve water underneath the soil, so soil erosion, scarcity of water, landslides etc. are frequently happening in the environment. About the scarcity of irrigation water, one of the respondents informed -

“In our childhood, we did not find any scarcity of water for irrigation as the sora/canal of the hills were always full of water. But when people started to plant sagwan trees and collect stone underneath the soil, the flow of water from the sora/canal are decreased and even, in the winter season there is no water for irrigation. If people stop planting sagwan trees and collecting stones under the soil, then we may get sufficient water for irrigation again.”

Table 4.2: Shows the benefits and demerits of plantation of sagwan tree in CHT

Plantation of Sagwan Tree	
Benefits of sagwan tree	Demerits of sagwan tree
Easily get seedlings	Un-environment friendly tree
Cultivation cost is very cheap	Other trees cannot grow under this tree
No need to irrigation	Cannot restore water under soil
Get profit within short periods of time	Cannot protect soil erosion
Wood is very expensive	Cannot protect landslides
Demand in market is high	No crop grows well under sagwan tree
Can grow in unfavorable environment	Has less contribution to ecology
Imported from Myanmar	Wild animals and other species cannot adjust under this tree

Source: fieldwork

For getting much profit, people cut down other trees and plant sagwan trees in the hills. Due to the adverse impacts of sagwan tree, other trees cannot grow underneath them. About sagwan tree one of the indigenous farmers demonstrated - *“If a sagwan tree is grown up, we can sell it at minimum 70 USD (1 USD=85 BDT) within 2/3 years; but in the same time, if we plant a Jamrul tree, we can get only 12 USD. So, why we would plant other trees? We need money for our family.”*

In 1985/86, Government of Bangladesh planned to undertake the project of sagwan tree in the hill in CHT for the first time. The department of forest took initiatives about this and brought the seedlings of sagwan trees from Myanmar. The seedlings of these trees can be produced very easily from the seeds of the trees. When the people of indigenous community found sagwan trees providing much profit compared to other trees in hill, they started to cut down wooden trees, bamboo bushes, banana trees, and jungles and plant sagwan trees in the hill. In the initial stage, the officers of forest department influenced indigenous people to plant sagwan tree in the hill and patronaged them for getting more profit. But it is contributing to create harm to the environment as well as ecology as sagwan trees cannot preserve water in the soil. So, the water of underneath of soil goes down further and makes scarcity of water in the locality. Before planting sagwan trees, people got water after digging two and half feet of soil but now water is not found even in more depth of soil. As a result, water is also not found sufficiently in the tube well. Though these trees are very harmful for environment, still no effective step has been taken by the forest department to stop planting these trees.

4.2.2. Relentless extraction of stones, cutting down of forests and hills disrupt environment

According to the interpretation of respondents' opinion, landslides are caused due to the climate change and environmental degradation. Excessive rains during the rainy season lose the soil composition causing landslides. Due to the increasing demand of woods and fuels for cooking and construction of residential houses, people indiscriminately cut down trees in the forest. Moreover, with the collaboration of local political leaders some greedy businessman extract stones underneath the soil. Consequently, landslides are occurred very often in the study area. This illegal stone extraction loses the capacity of soil to preserve water in the soil. That is why after a few months of rainy season, severe scarcity of irrigation water as well as drinking water are occurred. The sora/canal coming out from the top of the hills cannot flow water after few months of rainy season making a lot of problems for irrigation surrounding the hill side. This sora is not only the sources of irrigation water of that particular area but also the hub of taking bath and washing different materials of the villagers. This is also the sources of different fishes i.e., shrimp, crab, snail, etc. which is consumed by the indigenous people to maintain their lives. About the benefit of sora one of the interviewees mentioned-

“Sora/canal is the main sources of water for daily use of our family. Apart from doing bath, washing clothes and utensils, we use this water for irrigation in agriculture land. The well water inside the sora/canal is used for drinking water, but in recent time we cannot find sufficient water in the sora, especially in summer and winter. So, we are facing a lot of problems in our daily life. The political leader of our locality and some other greedy businessmen are responsible for this environmental problem”.

According to the interpretation of data, landslides cause massive destruction to the agriculture land owned by the indigenous people. The solid wastes including infertile soil, stones, sand and other substances of the hill fall down on the surface of cultivable land and it covers 1 to 3 feet above the surface of agriculture land and make the land unsuitable for cultivation. Because this stone mixed hilly soil cannot produce good harvest. Moreover, these landslides fill up the canal and alter the flow of water that come out from the hill. Consequently, indigenous people are not only deprived from cultivating crops from the land but also facing the problem of water. About the suffering of landslides, one of the interviewees states-

“We have two Bigha (66 hundredths) of land which was very fertile for producing any crops. We got sufficient crops (paddy) from this land and could maintain the demand of our

family for the whole years, but in 2017's landslides, this land totally went under stones and hilly soil of that particular area. We are poor people and do not have sufficient money to use labors or workers to clean the soil from our land. We are trying to remove these wastes with the help of our family members but we cannot remove properly. We are leading a very miserable life now as we cannot produce expected crops from the land”.

4.2.3. Maximization of profit and environmental degradation

Local political leaders are building brick kiln in residential area without taking permission from the government violating the rules of environment. In this case, they manage some illegal officers by giving bribe to local administrations. The reason of making kiln in this area is the availability of fuel woods with cheap rate from the forest. Due to this brick field, people indiscriminately cut down trees and sell it to this brick field which is liable for deforestation in Chittagong hill tracts area. Moreover, due to some illegal wood businessmen, trees are cut down indiscriminately in this locality degrading environment. Government as well as local forest department are playing indifferent roles in this context. In this milieu, one of the Chakma people utter –

“Capitalist minded people destroy our environment to earn more money without any thinking. They always prioritize their own interest. They are never concerned about the environment and also do not think that without environment, we cannot live a single moment. They do not consider that different species of the universe are under extinction due to environmental degradation. They only think how they can earn more money.”

Another knowledgeable indigenous respondent quote -*“Capitalist society do competition for maximizing profit by exploiting environment, for this why carbon-di-oxides are being increased eroding ozone layer. We can compare this with sun glass. When the dangerous sun ray comes from the sun, this sunglass protects us by obstructing harmful rays. Due to the exploitation of environment and production of huge fumes, this layer (sun glass like layer) is being eroded and dangerous rays of sun are coming to our environment. Capitalist society is liable for these problems.”*

Different capitalist companies make pesticides for killing insects in the environment ignoring the harmful effects of environment. These pesticides can clean a jungle within few hours after doing spray which took three to four days for cleaning in the past. These pesticides destroy not only the harmful insects but also the beneficial insects which are

important for environment. Government is indifferent about stopping the business of capitalists with this medicine that is highly responsible for the environmental degradation in the planet.

4.2.4. Climatic events disappeared fountain/sora/canal and create scarcity of water

Due to climate change, the temperature in CHT is increasing in summer and rain is also occurred irregularly in rainy season. One year people experience excessive rain but the following year rain is decreased a lot severely affecting the irrigation system of indigenous community. Indigenous people are generally dependent on sora/canal/jhorna for water for the usage in every sphere of their life. This fountain/canal/lowland/channel flows from the top of the hill and runs through the forestry and the community. The indigenous people use its water in case of bathing, washing, cleaning, drinking, irrigating crops etc. It can be called the sources of life of indigenous people. The flow of water in this sora is not found now like the previous times due to different factors.

First of all, plantation of sagwan tree affects the flow of canal. Sagwan tree is not environment friendly as it does not allow other plants to grow near this tree. Moreover, this tree cannot preserve water under the soil as well as in the hills. So, hills cannot flow enough water in the sora and consequently sora become dried within few weeks after rainy season. Secondly, stones and hilly soil have the capability to preserve water for long days underneath the soil, but due to some greedy persons, this stone is extracted excessively from the soil and it loses the capacity to preserve water for long days. Thirdly, deforestation is another cause of water scarcity in the indigenous community. Trees are the best sources for keeping the earth cool along with preserving water underneath the soil but indiscriminate cutting of trees make the earth warm and hot which is largely responsible for water crisis. Fourthly, hill slide is the cause of drying sora/canal in the community. Due to relentless cutting of hills, it easily collapses to the lower land and fills up the flowing place of sora/canal with sands, stones, dried leaves etc. having the canal dried within few days. Fifthly, siltation of soil from the community fills up the canal and it cannot store much water for long time or in summer season. Sixthly, indigenous people use sora for different purposes for long time but it is never dredged/excavated for making deeper. So, its water cannot stay long time in the canal.

About the impacts of climatic events and scarcity of water, one of the interviewees utter- *“In excessive heat, trees and crops are dried in Chotro- Boishak month (first half of March to first half of May) for want of water. In this time, canal/sora become dried and farmers get very little amount of water for irrigation. Canal water only lasts for two to three months*

and then dried after rainy season. It depends on raining. If it rains more, water prevails in canal for more days, otherwise, water cannot last more days. Due to scarcity of water in canal, well cannot provide us water as it is also dried.”

About the drinking water, one of the women Chakma respondents claimed-
“Normally, we drink well water as it is clearer and iron free, but for collecting well water, we have to walk through hilly pavement around 2 kilometers. Sometimes, we also drink tube well water though it has iron due to not getting well water. We bring well water through pitcher and after filtering, we drink it. Well is found inside the canal/lowland from where water is coming out. To ensure the cleanness of water and to protect from damaging of well, we encircle the ¾ feet of the well with clayey soil. In the well water, there is no mud or other wastes. In our community, around 100 families use well water, but in recent time we find problem for getting this water”.

Another respondent utters with great sorrow about the problems of drinking water. According to his words - *“We are facing problems of drinking water in the recent years. In the past, we drank well water, but flood water and landslides reduce the quality of well and thus, we cannot get water from well now. In the past, we did not worry about getting drinking water as we got well water, even after digging soil only one foot, we got water. But now, after digging more even ¾ feet, we cannot get water in the soil. In our village, only two tube wells are available and it is very difficult to collect water from those tube wells during flood time as road are inundated into the water. With the help of banana leaves or tin (material used in roof), we collect rain water and drink it during hazards time”.*

Throughout the history, indigenous people are habituated to use well water for drinking. In the modern age, they also use tube well water to fulfil their demand though this water may have iron and arsenic in their locality. However, in recent years, some indigenous people, especially those who have sufficient money excavate deep tube well though it is very expensive to make in hill tracts area. In this context, one of the solvent indigenous peoples indicated -

“To solve the water crisis in our community, with the help of three members, we dug a deep tube well. It took around two and half months to dig soil and cost 3,142 USD to complete the deep tube well. The cost is now reduced and 1,765 USD is enough to get a deep tube well. Before us, another person made this type of deep tube well for his family but he made it by his own cost”.

Apart from drinking water indigenous people also face crisis of irrigation water. About the scarcity of irrigation water for cultivation, one of the farmers said – *“Sora is our main source for irrigation in summer, but due to climate change and excessive heat, sora water is dried and we are facing scarcity of irrigation water. Government should dredge/excavate the canal as it is filled up by gathering siltation. I personally asked the member of our union parishad (UP) council (small unit of administration). She said that they asked ADB (Asian Development Bank) and after that ADB officials had already visited the place for dredging. They do not know when the canal will be excavated for preserving water, but they are waiting for that day”*.

4.2.5. Excessive rain overflows the filled-up canal/lowland and causes flood

Due to climate change events, excessive rain inundates the lower area of indigenous community. There are some large and small canals that are connected to the Karnofully river but all have almost become narrow and filled up by siltation. Excessive rain water cannot able to flow swiftly and clogs up the adjacent area and contribute to create flood. If these canals can be excavated, the water will easily flow and fall down to karnofully river and thus, flood problem can be solved.

About resolving the flood problem, one of the knowledgeable interviewee quotes – *“From the karnofully river to our community villages, the total distance is more or less 8 kilometers and the canal/lowland distance is the same. If this canal can be broadened and deepen through excavation, the flood problem can be solved to a great extent. For taking this step, government should be cordial and responsible for the sake of indigenous people. Only then, I think indigenous people can get relief from the suffering of flood”*.

Due to climate change, in CHT in rainy season, Chakma peoples experience excessive rain along with landslides. The water reservoirs in CHT get filled up by landslides and siltation which contribute to flooding. About the frequent occurring of the flood and canal excavation, the chairman of a union parishad of CHT quote- *“I have heard from the people that some villages in my union are inundated due to rain water. It may be happened due to the narrowness and poor canal system of that locality. The excavation of the canal would be difficult as the residences of both sides of the canal to be removed. In this case, cordial supports and awareness are important for solving the problem. Moreover, to excavate the canal, huge fund is needed, but that is not possible for us to afford right now. Upazila parishad (UP)*

(Administrative unit) and government should come forward with positive attitude, otherwise, it would be difficult to solve the problem”.

4.3. Climatic Events Disrupt Agricultural Activities and Yield Less Productivities

Along with depending on natural resources in forestry, the other things on which indigenous peoples depend most is agriculture. In the past, the soil of agricultural land was fertile. So, they could cultivate whatever they wish and used to get a bumper product. People did not need to use fertilizer and pesticides in their land. Along with cultivating different vegetables such as potatoes, eggplants, turmeric, ginger, chilly, etc. they could also plant different fruit trees having bumper harvest in their life. They never needed to think about the foods of their family, but the days has been changed in their community. Indigenous people cannot get sufficient crops from the land, even, by using fertilizer and pesticides. Without using fertilizers and pesticides, expecting crops is just a day dream to them now. About the crop production, one of the indigenous farmers articulate -

“We were never worried about the crops production in our land in the past as we got sufficient crops from the fields to maintain our family. We did not need to use fertilizers and pesticides in the past, but now without using it, we cannot get any crops from the land.”

About the poor crop productions, indigenous people blamed the greediness of some peoples. Due to the cutting down excessive trees and planting sagwan trees, the water level underneath the soil is going down hampering the quality of soil. Moreover, for getting much profit, people are cultivating same land frequently which is also responsible to worsen the soil quality along with the profound usages of pesticides and fertilizers in the land. Excessive heat and cold along with scarcity of irrigation water due to climate change are also liable for poor crop production.

About the usage of excessive pesticides in the land, one of the educated Chakma men reiterated, *“In the past, if we wanted to clean the jungle, we need to work 2/3 days, but now we can clean it within few hours by using pesticides, costing only 0.25 USD. We do not care how much harm we are doing to the nature and ecology by using these harmful pesticides. These pesticides may harm many beneficial pests which are important for nature as well as human beings as they contribute to balance the ecology. If government impose restriction on selling and using of pesticides, then the nature and ecology can be preserved, but administration is indifferent about the environment”.*

In the past, indigenous people had no idea/interest about saving money and other properties for future. They were the hunters and gatherers for maintaining their life, but with the contact of mainstream people, they are also getting the concept of saving money and accumulating profit. They never imagined to cultivate same land frequently to get more crops as they were satisfied with the crops if it is enough for the whole years. They only worked for few months for subsistence and when they thought that their cultivated crops are enough for whole year, they did not work in rest of the months of the year and enjoyed their life by gossiping, playing, visiting relatives' houses, performing religious activities and so on. The tendency of accumulating much profit in this globalized era are influencing them to work more in the land for crop production and other activities. In the recent decades, for getting much productions rather than using traditional methods, they use power tillers and pumps for agriculture land. Different NGOs are providing them training and logistic supports for working in land to get bumper productions. ADB has provided indigenous people five pumps for irrigation and three power tillers for ploughing land and encouraged them to accumulate profit from the land. This tendency of capital accumulation in indigenous people influences them to make pressure not only on land but also the forest resources of that particular area. Indigenous people along with some corrupted officials in forest department indiscriminately cut down trees; as a result, the water level in the soil goes down. Moreover, excessive heat due to climate change dried up the sora/canal that are flown from the top of hills. This canal/sora is only found 2 to 3 kilometers from the hill now and then disappeared due to scarcity of water. As a consequence, crop production along with other agricultural activities has become a great challenge in hill tracts area, now a days.

Due to climate change events, different types of diseases are also affecting the yielding capacities of crops. About the diseases afflicting to crops, one of the farmers reiterated – *“Due to natural hazards different types of crops such as ginger, turmeric, Coriander leaves, lettuce, lettuce leaves etc. are not produced well in the land. Last year, I cultivated ginger but faced losses in the production. In the past, if any ginger looked red (affected by diseases), we wiped it out. Then other gingers would remain well, but now this method does not work as all gingers become red gradually and rotten with no fragrance. How I can remove these diseases from the crops cannot be understood as I am using many medicines, but cannot get any positive result”*.

Flood is also a great challenge for agricultural activities in CHT. In rainy season, excessive rain contributes to create flood and inundates lower land, especially crops

land and massive destructions are happened to different crops in that area. Due to inundation, vegetables are also rotten and become unusable for eating. About the destruction of agriculture productions, one of the farmers claimed – *“Floods destruct our crops, vegetables etc. and do massive losses to our life. We cannot preserve our crops from the flood. However, if we can preserve some of the crops, we do not get the real prices. People do not want to buy crops that are damaged by hazards. Due to the hazards, sometimes we cannot get the expenditure that we invest to the crops land and thus, it has become a great challenge for us in this area”*.



Picture 4.1: Flood disrupts communication system in CHT



Picture 4.2: Flood damages crops lands in CHT

Indigenous people also experienced different human made hazards in their agricultural land. In 1960, due to the construction of hydraulic dam in Kaptai lake, hundreds and thousands of indigenous peoples were evicted from their lands and about 40% of agriculture lands (54,000 acres) were inundated under water. These lands were both in plains and hills where indigenous farmers could do both jhum cultivation and general cultivation. More than 18,000 families of 125 mouzas lost their houses due to this hazard and many of them had to migrate to nearby country such as in India. This human made hazard made indigenous farmer very much vulnerable in their life. Government announced that those who would face losses would be paid to rehabilitate in other places, but no positive initiative was taken to rehabilitate those peoples later. Government only provided 3 USD for the losses of agriculture land and 5 USD for the damage of household lands which were very little comparing to the real value of the land prices of that time. Moreover, all affected peoples could not get the money due to the mismanagement and corruption of official persons of the government.

4.4. Hazards Causes Immeasurable Damages to Properties and Chakma Peoples

“In 2017, when hilly flash flood water entered in our room, it made me surprised. I never thought that water might enter into a house so swiftly floating away everything in the twinkling of eyes. Three guests visited our house at that day. My wife was busy for cooking foods for the guests. Suddenly, the whole sky became densely dark with clouds and thunder storms were occurring frequently. Electricity was not in the room at that time. Total house looked very dark seeming that it was a very dark night. Rain started to occur and after few minutes later, suddenly, water started to enter our room. We had tried to stop the flow of water, but could not do that. Water first entered from the kitchen room, and then covered the whole house. Oven/stove was fired off and water was rising to the wrist of our body. In this time, we kept some clothes and some other valuables material to the sunset of the room to protect the destruction from flood water. Many plates, pitchers were floated away in the water. We cut the fence of the wall so that the water could go out quickly. When the water went down, the whole room was silted with wastes like mud, sand, rotten leaves etc. along with other places of the house. It took one week to clean the whole house. Now every year, flood occurs in our locality and finding no other way, we sold our agricultural land and made brick-built house to protect from the damage of flood water. We also made a small wall in front of the door so that flood water won't enter the room through the door.” One of the respondents, quoting this statement in the indigenous community who suffers from hazards every year in CHT but cannot find any solution to overcome this.

Climatic events bring unprecedented miserable situation to the life of indigenous people. In rainy season, excessive rain contributes to create flood which inundates the houses of indigenous people. Flood water damages the muddy houses and washes away all materials residing in the houses. Over the last few decades, they experienced flood in their locality; and so, they have an idea about how much feet the water rises in the house. So, they keep their valuable materials in a safest height to protect from the flood water. Male person with the help of other family members try to keep furniture to other house or upper place of the hill to protect from the damage of flood water. The lower land crops submerged under water are damaged which bring about a great problem to the poor people because they depend on this crop for maintaining their livelihood. Sometimes, they get some crops from those flooded land, but cannot get sufficient price in the market. Like many other climatic events, flood water makes immeasurable damage to the business of indigenous people. In this case, one of the small-scale businessmen mentioned-

“I had a poultry farm where 3000 hens were produced in 2017. A sudden flood caused massive damage to this poultry farm, as I only could save 600 hens with the help of friends and family members. Rest of the hens were washed away by the flash flood and we could not protect them. At that time, water entered about 3 feet of our house (room) and damaged our freeze, furniture, foods and other valuable materials. We had to spend two nights in the nearest schools with pillow and bed sheet which were dried. We also cooked food in the school taking rice and other materials from the house. When the flood water was removed from the house, it took two weeks to clean the house because wastes like sand, mud, water, etc. dirtied the floors and other area of the house. We used blade, axes, knives, broom, whisk etc. to clean the floor and repaired it with sand, cement etc. Female member in the union council helped us to clean the house but we could not get any support from govt. to overcome it. We took loans from different NGOs i.e., ASA, BRAC, PODOKHAP, Islami bank etc. with interest and it took 3 years to overcome the loss of 4,705 USD in the flood. We got some discounts from the loan in Islami bank but did not get discount from other banks. Meanwhile, I arranged a hotel where my wife cooked in that hotel to maintain our family, repay the loan and establish our family again. This year, I again built a poultry farm for small business”.

Flood water inundates kitchen and toilet of many families along with damaging living rooms. So, indigenous peoples face huge problems in their daily life. In this case, they need to go to neighbors' house to get supports for their daily activities in hazards. To protect their house from the flood water, rather than making the house with mud, they construct it with

brick, cement and sands or wood and tin as water cannot damage it. Moreover, they also make the foundation of the house with brick, sand and cement as it becomes strong enough to resist to enter water into the room. During the flood time or before the flood, they temporarily make small wall in front of the door as water cannot enter the room piercing the underground of the door. Some indigenous peoples those who have money build 3 to 4 feet long wall surrounding their houses' wall so that it can protect their room from entering water. However, those who have much money build brick-built house or shift their house in upper place such as to the pick of hill. Most of the time, indigenous people make their kitchen 4 to 5 feet high from the land by making a bamboo loft, so that during flood time, water cannot enter the kitchen room. Otherwise, they cannot prepare food during flood time. Along with making kitchen room in higher place, they also make a small room for storing fuels woods and use this fuel in rainy day for cooking. Otherwise, they have to cook food with wet fuels which is inconvenient for cooking. During flood, poor women face huge problems as they do not have reserved place to keep dried fuels for cooking.

About the flood occurring in the locality, one of the respondents reiterate – *“Over the last few years, flood is occurring in our locality. In the flood, the two sides of sora/canal are eroded due to heavy current of water, so many families like us who are living close to sora plant bamboo bush to the edge of sora to protect the erosion of soil. This bamboo bushes become large and expand to the canal and restrict the flow of water which increase the possibility of flood in the locality. The flood water damages the trees such as coconut, Betel trees, mangoes, jackfruit etc. in our houses and weakens us economically. We need to make a bamboo loft of 4 to 6 feet high to escape the flood water in our room and need to sleep in one bed with father, mother, children, and other persons which are very irritating to us. We have not much money to migrate to other places to escape from the flood”*.

About the new experience of flood, one of the newly married bridegrooms said – *“In my father's house, we never experienced flood in our life, but after getting married no more than one year, I experienced the negative effect of flood. We had vegetable garden in the yard of the house where we plant, eggplants, Venti, papaya, onion, Coriander leaves, lemon trees, etc. and many of these vegetables were damaged in the floods. The bushes of eggplants become red as water harmed its branches. Due to the inundation of our house more than one week, our freeze, gas cylinder, wooden furniture, six sacks of paddy etc. were damaged. We could not move a single step comfortably, even we needed to use other family members' toilet*

and kitchen as our toilet goes under water. We also need to collect water from other place as our tube well also goes under water during flood”.



Picture 4.3: Flood water damages houses

Flood not only damages household properties and crops but also sometimes becomes a life threatening phenomenon to the people of indigenous community. In this context, one of the elderly Chakma farmers demonstrated that in flood water his family was about to die in an incident. According to his words - *“One night, I was sleeping in my bed room and faced a severe experience likewise death. During my sleeping, suddenly I felt passing urine and woke up from the bed and found that flood water was about to inundate my cot. Instantly, I called my wife and children and tried to save some of our valuable and important materials from the water. Meanwhile, some sacks of rice and other valuables materials were inundated and damaged in water. I with my wife and children then left the house and stayed at neighbor’s house until the morning and when the rain stopped, we went back to home. In that night, if I could not wake up due to my feeling of urine in due time, we could be died by inundating in flood water.”*

About the severity of flood, an old farmer said – *“If I have money, then I will leave this place and buy land in other place where there is no disaster like flood. Every year, we face this disaster which damages everything in our life and makes us impoverished. So, we never become a solvent family in this locality and we need to buy everything after flood seeming that we start a new family”.*

In indigenous community, those who are solvent try to buy gas cylinder and rice cooker to use during distress time. Children and elderly/disabled peoples face problem mostly

during flood as they cannot move in flood water, even, for doing their daily activities. Educational activities such as going to school, reading etc. are also disrupted due to flood. Excessive rain, sometimes causes landslides in hill tracts area which contributes to collapse houses, especially muddy and wooden houses. Many a times, this collapse may cause huge damages to the houses near to hill, even, causes death/injuries to the family members. About this, one of the respondents highlighted-

“During rainy season, due to excessive rains houses were collapsed and my uncle and his son including wife died in landslides. Political leaders are cutting down hills illegally for their own benefit and poor people like us have to face the vulnerability owing to their ill activities. Local administration as well as government do not take any step to stop their illegal activities. After landslides, they visited the spot and gave some money to the affected peoples. They promised that they would take step against those ill activities but after some days later all became the same and they forget their promise”.

About the damage of house in heavy rain, one of the elder indigenous women reiterated- *“Rainwater damages house and also it enters into the room. We cannot sleep due to the anxiety thinking that if rain occurs more, the house may be more damaged. We cannot protect the damaging of house because it is not in our hand. It is the will of God and we have nothing to do. We can use tin in the roof to protect rain water but we cannot protect soil of the underground of the wall from collapsing”.*

Along with flood and landslides, indigenous people also experience cyclone in their locality. Due to climate change, the frequency and intensity of cyclones have been increased to a great extent in the recent decades which damage not only the housing structure but also crops and other properties in indigenous community. In the past, densely jungle and forest weakened the speed of cyclone and damage was less, but now, due to less jungle and forest, damage to the house and properties of indigenous people are higher. Cyclones swift away roof of the houses and cause massive damage to the indigenous community. It also breaks down the branches of trees and standing crops and vegetables. Those houses which are built with weak materials i.e., fence, woods, mud etc. face huge challenges in cyclone as many of those houses was damaged or roof of this houses were flown away due the strong wind of the cyclone recently. About the severity of cyclone, one of the affected respondents quote- *“In the last August of 2019, a cyclone hit our locality and damaged a lot to us and our neighbors. The roof top of our kitchen room was flown away and a lot to our properties and foods were spoilt.*

We planted some trees surrounding our houses and many of these trees were wiped out to this cyclone. Our neighbors' houses were also damaged as their houses were not very strong. They stayed in our house as their house were totally unsuitable for living.”

Many of the indigenous people are taking different steps to overcome the severe impacts of cyclone such like building their houses in the slope of hill so that the cyclone cannot directly hit the house. They also plant different trees i.e., jackfruit, mangoes, coconut, betel, and other wooden trees surrounding their houses so that these trees can weaken the flow of the wind and save their houses. Many indigenous people tighten their houses' roof with trees by ropes or cane so that the roof top won't be flown away in the cyclone.

About describing the devastating experiences of cyclone, one of the respondent quotes– *“One night, we experienced very terrible cyclone. The wind of cyclone flew away the roof top of our nearly neighbors' houses. The cyclone also hit severely to the wall (bamboo fence) and roof top of our houses and the roof was moved one foot from the wall. Finding no other ways, my husband and elder son hanged the bamboo of the roof and tried to protect it from flying. With the help of neighbors, I tightened the bamboos of the roof and bound it with a big tree as it cannot fly away. In this way, we could protect our houses from the cyclone but faced huge losses in the cyclone”.*

In indigenous community, people try to make their house strong in *Falgun-Cotro* (first half of February to second half of March) months. Those who have tin and wooden houses, tighten their roof top with trees by rope. People also repair bamboo made span roof/ couple-roof houses in this time, otherwise in cyclone, their houses may be getting damaged.



Picture 4.4: Cyclone damages houses in CHT

Apart from cyclone, indigenous people have recently experienced severe problems in thundering and lightning. In the past, people also observed thunders but those were not like now a day. In the past, people faced thunder storms only during raining and most of the time, this thunder might not harm them and only fall on big trees. The thunder in present time, fall on human beings and many a people has died in recent times by affecting thunder storms. Sometimes, thunder storm also falls on house buildings collapsing it partly.

About the severity of thunder storm, one of the Chakma respondents demonstrated – *“We feel very afraid when thunder storm occurs in the sky seeming that it may fall on my head. In the past, we never cared the lightning and storm as it apparently did not harm us. Moreover, it occurred during raining only. So, we would become careful about thunder, but now, it occurs any time even when there is no rain in the sky! So, we feel much afraid because of the present thunder storms as it can fall upon us any time as we may not stay in the house during thundering. In the past, during our work in farm land, if thundering occurred, we took shelter in a big tree, but in present time we cannot dare to take shelter under any trees due to its severity and destructive modes”*.

In the present time, indigenous people frequently hear that people are died in thunder storm. They also hear the news from the TV and radio that thunder storm kills many people in Bangladesh. Thunder storm not only harms human beings but also causes huge destruction to the properties. It is often heard that electronic appliances such as transmitter, WIFI router etc. do not work properly as thunder storm affects its functionalities. Trees also become dried if thunder storm fall on it.

4.5. Scarcity of Natural Resources and Vulnerabilities

In the past, the hills were covered with different resources ranging from fruits, wild vegetables, flowers, honey, different wild animals, trees etc. but, with the pace of time and gradual environmental degradations, these resources are decreasing to a great extent. The density of jungles in the present time is decreased with increasing the number of hunters and gatherers in indigenous community. Due to the wants of foods and security concerns along with climatic events, a number of wild animals such as deer, monkey, wild hens, different birds etc. were extinct from the forest, even, the fox which was available in the recent past. In the past, deer, wild hens and cocks were seen in the jungle, but different hunters such as Bengali, Mog, Chakma etc. people hunt them and it is being gradually disappeared. About the scarcity of natural resources, one of the elderly Chakma quotes –

“In the past, this village was very beautiful and only 12-15 families were living here. Now more than 200 families are living here. In the past, the hills of this village were full of dense jungles with the abundance of tigers, bear, wild deer, Dhanesh birds, different reptiles, wild cocks, etc. We have to visit the jungle frequently for hunting and collecting foods. Today, the jungle has become treeless and no animals are found. People are now cultivating different crops in these hills and jungles. Inside the hill and jungle, there was a canal/sora which was 6/7 feet deep, but now, it has become narrow and shallow and sufficient water cannot be found for whole years.”

In the past, indigenous people used to collect bamboos in the specific time of the years for making house and using in other tasks, but now, people collect bamboos any time of the years. Indigenous people followed some myths in the past that if bamboos were cut down other months rather than the specific time of the year, it might ruin all bamboos from the forest and bring bad luck to their family and community. People only cut big trees in the past respecting their myths, but now, they cut all types of trees for profit ignoring the benefit of environment.

In the previous time, different foods such as snail, oysters, fish, shrimp, etc. were found in the canal and surrounding the forest. Different types of vegetables such as *Dhekishak*, *Kochushak*, *Kachulati*, natural mushroom etc. were found also, all of these which were used as foods to the indigenous people. But, all of these foods are disappeared from the CHT now a days because of drying the canal from the forest and hill.

4.5.1. Privatization of lands limit the access of resources to poor indigenous people

Chittagong Hill Tracts is covered with different forest resources, and these forests are divided into 4 categories: 1) reserve forest which covers 1/10 of total CHT area, 2) protected forest which covers 1/10 of total CHT and most of the land is announced as reserved forests, 3) private lands which are mostly owned by indigenous farmer and some other non-local people or company, 4) non-classified forest which is surrounded at different part of CHT. In Chittagong Hill Tracts, though forests are divided into different categories, the resources in the forests are not abundant in the expected levels like previous time. Indigenous people in CHT leads a very miserable life because their access to natural resources is being limited in the last few decades. In the one hand, climate induced extremities limit the natural resources in the forest, on the other hand, privatization of hill lands restrict poor people to collect natural

resources from the forest. In 1980/82, hill lands were distributed to people and most of the lands were converted to private lands from the government land/khash land.

About the problems of collecting natural resources from the forests, one of the landless poor Chakma people quote- *“Like the past time, we cannot go to hill land/forest to collect resources because it is privatized. If we go to hill for the sake of collecting resources for our subsistence, the owner of the hills scolds us and use slang language for going there. They also address us as thief. Finding no other ways, I work as wage labor for other’s land such as cutting and cleaning jungles, cutting trees and soil, etc. on daily basis for managing our subsistence.”*

Along with this privatized land, there are some khash land/government lands where every people have access for collecting natural recourse except cutting trees and soil. The availability of resources in khash land are decreasing due to climate induced extremity and relentless pressure of human beings in this land. About the land use system in indigenous community, one of the headmen utter-

“All people do not have access to all lands for resources collection or land use. People only have access to the land of their own. However, some people may take lease of other lands and cultivate fruits or vegetables there. Moreover, some people/owner of land may offer poor people/landless people to cultivate vegetables in their lands in the condition to clean the ground of their sagwan trees. So, they/owner of the land may save some money required as weeding out cost. However, some owners of hill land provide their land for cultivation to the poor people without any demand, but this practice is very rare as the proportion of land is decreasing day by day in CHT.”

In the hill, some resources such as wild potatoes, tube, herbs, small branches of trees, honey, wild flowers, some vegetables etc. are atomically grown, and general people can collect it for their daily foods without getting permission from the owner of the hills.

Due to scarcity of land, indigenous people cannot cultivate livestock such as cow, goat, pork etc. in their community. This livestock needs land for grazing but indigenous people are not allowed to use other land for grazing. So, this cultivation has been reduced down to a great extent, but the headman and karbary along with rich man can cultivate this livestock because they have much lands to cultivate it. Rich people has also much money, so, during disaster they do not face any problem as they have multiple income sources to overcome the problem, but poor people who depend on land for livelihoods face problem in the hazard.

Indigenous people have an intimate relation with nature throughout the history. They depend on nature for their livelihood but never harm nature for collecting natural resources. They know if nature work well, they get resources from it, otherwise, they cannot get resources from the nature. In the past, they collected all their daily needs from the nature such as food, fuels, fiber, fish, meat, vegetables, housing materials, medicines, etc. and had a good understanding with the nature. But with the expansion of market/market-oriented economy, people are extracting resources excessively for profit and giving much burden on nature. Mainstream people usually take the nature as a source of capital accumulation and extract resources excessively for selling in the market along with trying to control the natural resources in their own hands. Seeing their trends, indigenous people has also started to pressure on nature for more resources and getting profits from the market-based economy. As a result, nature is losing its ecological balance gradually. However, to overcome this problem and make nature well, the decision-making power and conservation of nature should be given to the hand of indigenous people, otherwise, it would be difficult to regain the power of nature in the CHT. In the past, sora/canal was the source of life of indigenous peoples. Indigenous people never thought to buy fishes as they got it from the sora. Different types of delicious fishes were found in the canal such as *Gulsa*, *puti*, *ogol fish*, *bangaschi*, shrimp, etc. including 15/20 species of fishes. About catching fish, one of the interviewees quotes –

“In every evening in a bamboo made basket, we put some paddy husks and rice by making ball and kept the basket in the water of canal and in the morning before going to work, we picked up the basket. In this way, we got plenty of fishes and never thought of fish in our family throughout the year. If rain occurred heavily, the current of water of canal would become strong and the proportion of getting fishes was increased. One or two times in the years, there exhibited fishes in the canal, and we got much fishes at that time. One day from the hole of a tree in the canal, due to little water, got a flock of fishes about 35/40 kg. If we got much fishes, we could preserve it by heating in the oven and sunlight and it lasted many days for eating. In the present time, due to scarcity of water in the canal, fishes are not found sufficiently. If we think about the past, it seems a dream to us now.”

4.6. Changing the Traditional Housing Structures and Tradition of Slash and Burn Cultivation

In local language, the traditional house of indigenous people is called '*Machang*'. Most of the houses in indigenous community are made in the same design. The method of construction of the houses is simple and it looks like span roof or couple-roof types. Bamboos, wood, cane, and forest resources are the components required to make this house and Chakma people collect these materials from the nearest forest/jungles. They collect these resources to a definite time of a year from the forest to construct or repair their traditional houses. Two strong pillars are made in two sides of the house and the roof is kept on these pillars. Pillars are made with wood and bamboos which are used to construct the walls enclosing the room. Bamboo leaves, *Talpata*, *sonpata*, *kurup leaves*, and different branches of trees are used for covering the roof of the house. Indigenous people like to have clean yard in front of the house and the yard is fenced with bamboo and cane with a door for moving inside and outside.



Picture 4.5: Traditional houses (*Machang house*) of indigenous people

Throughout the history, indigenous people use their traditional houses in their community but this tradition is under great threat in the present days. Indigenous people generally build their house with woods and bamboos and it is above the soil (3 to 4) feet. They think, if they build their house in high place, it can protect them from wild animals as well as

flood. In the past, indigenous people had plenty of woods and bamboos, so, they did not find any difficulty to make their traditional houses in their locality. Even indigenous people could collect bamboos from other people's land and for this why they did not need to pay. In the present time, bamboos and wood are very expensive and it is not available everywhere in CHT. Due to natural hazards like flood and cyclone, this house cannot last long time (only two to three years), even, it is damaged within the making year. On the other hand, brick-built house lasts for long time and it is not damaged easily by the flood and cyclone. So, indigenous people are losing their interest to build traditional house in their locality.

Traditional house has also some maintenance cost and needs a hard work for keeping it well. For example, it needs to bind bamboos with wood by cane, otherwise, it may collapse anytime due to strong wind in hazards. In the modern time, like mainstream people indigenous people has also become modern and normally they do not like hard work for maintaining it well. The materials used for traditional houses are very often rotten by flood water and damaged/swept away in cyclone which are also other causes of not making traditional house in the local community.

About the change of living in traditional houses, one of the interviewees demonstrate- *“Traditional indigenous house is our identity and culture and we want to live on it but people are not interested to use it in present time. Due to scarcity of bamboos and wood and its short longevity in climatic events, we feel apathy to use it in our daily life. Moreover, tin made house is cheaper and long lasting against climatic events, and so, we are bound to make it. Moreover, in the recent decades, due to the increased cyclone, we feel insecure to stay in this house as it can collapse at any time on our head during hazards.”*

Jhum is intimately related to the social and economic factors of indigenous people in CHT. The meaning of 'Jhum' is 'Cultivation in Hill'. Hill (*pahar*) is a very important thing in CHT as without hill this locality cannot be imagined. If there is no hill, there is no rain and without rain, there is no cultivation of jhum and creation of river/lowland/canal in the locality. If there is no river/canal, there is no water and without water no life can survive.

Traditionally, indigenous people do slash and burn cultivation (Jhum) and it is being upheld generation after generation in CHT. Generally, 'Damra' is used to dig soil and sow seed and it is called 'Jahoma'. 'Jahoma' is the word that was gradually derived as the word 'Jhum' and now, this cultivation is called Jhum cultivation. If this cultivation takes place in hill (*pahar*), then it can be considered as jhum cultivation. Along with CHT, in other

countries such as Africa and some parts of India Jhum cultivation are also seen. In the southern region of Chittagong and Myanmar, it is called '*Taungya*'. Jhum cultivation is also familiar with the names Shifting cultivation or slash and Burn agriculture or swidden cultivation/Rotational agriculture.

Indigenous people depend on this cultivation from the very beginning of their ancestors and doing it for generation after generation. In *Choitro-Boishak* (first half of March and second half of April) month, they burn jungle in the hill slope for cleaning the land for cultivation when the land dried in sun. This burnt jungle makes huge ash which is used as fertilizer for the crops which is sowed in the hill lands. At the beginning of rainy season, when the soil become soft, they make small holes in the hill slopes and plant different crops i.e., paddy, turmeric, ginger, cotton, wheat, vegetables, fruits, banana etc. For jhum cultivation, farmers need to do hard work, otherwise, expected crops are not found. In jhum land, fertilizer and pesticides are not used as ash are used as natural fertilizer. Moreover, marigold flowers are planted in the jhum land whose flowers and roots are used as natural pesticides in the land. In jhum cultivation, irrigation facility, huge capital, or modern instruments for cultivation are not needed. Rain water is enough as irrigation for getting good harvest in jhum cultivation.



Picture 4.6: Preparing land for Jhum cultivation by burning jungles

In Jhum cultivation, after the usage of land, it is left for two to three years unused for next cultivation, and people shift to other new land for cultivation. So, indigenous people are like hunter and gatherer in the community. To cultivate jhum, they build temporary bamboo loft in the land for accommodation.

In the past, Jhum lands were sufficient but due to lack of deep forest and huge population, the land of Jhum cultivation is decreased a lot. For this why, indigenous people need to cultivate jhum same place frequently now and it reduces the amount of productivities. Consequently, a large proportion of jhum cultivators cannot get sufficient crops for the years. As jhum cultivators need to shift different hills for jhum cultivation, they cannot establish permanent house or cultivate livestock i.e., cow, goat, pig etc. permanently in their family. So, many often they cannot make a developed society in their community. However, many indigenous people return their residence after jhum cultivation staying few months in the hill.

About jhum cultivation one of the indigenous Chakma quote- *“In the recent time, people have become smart and digitalized. Like the people of past time, they do not like to do hard work for jhum cultivation. Moreover, for jhum cultivation, large amount of land is required for cultivation and after one time cultivation, the land to be unused for 2 to 3 years. So, people avoid to do jhum cultivation. Peoples make garden rather than doing jhum cultivation and plant different trees i.e., mango, jackfruit, lemon, orange, sagwan etc. which ease them from working the whole year and giving much benefit. They also cultivate ginger, turmeric, coriander leave, etc. in the land and get more benefit.”*

About the problem of Jhum cultivation, one of the Chakma farmers said that- *“In my childhood, I saw jhum cultivation in the hill of our locality, but now, I cannot observe jhum cultivation. Jhum cultivation needs favorable environment such as timely rain for irrigation, convenient weather etc., but due to climate change, it is difficult. Moreover, jhum cultivation needs large amount of land, but in our locality that is not found. For example, if a family has five brothers, the land of that family is fragmented into five pieces which is a great hindrance for jhum cultivation. In addition, after cultivating one portion of land, it is necessary to keep it unused for at least 2 to 3 years for making it fertile for next cultivation. But due to scarcity of sufficient lands, people are unable to keep land idle for this time period. Further, the yield of crops for jhum cultivation is reduced a lot. For example, in the past, my grandfather did jhum cultivation in one portion of land (one acres) got 150 Ari (one ari equal to 10 kg) paddy in one year, but now, we cannot get that amount of paddy in the hill.”*

In the recent decades, jhum cultivation cannot yield sufficient crops, so people are shifting away from this traditional cultivation systems. As huge amount of land was covered for jhum cultivation in the past, so peoples built temporary ‘*Machan Ghor*’ (bamboo loft room) in the jhum land but it is also disappeared in the present time.

The Department of forest and local government blame that jhum cultivation is pernicious for environment and many a time they forbade or hinder jhum cultivation in Chittagong Hill Tracts area. Indigenous people never acknowledge this blame because they are doing jhum cultivation years after years without endangering environment and disrupting ecological balance. Because in their ancestor’s period during jhum cultivation, there was no evidence of deforestation and environmental degradation in CHT. According to indigenous people, in jhum cultivation, they burnt jungles/bush but not big wooden trees and so, it is not responsible for deforestation and ecological disorder. Normally, every 4 to 6 years interval, a piece of land in hilly area is used for jhum cultivation, but due to scarcity of big plot of lands and reduction of jungle/bush areas, every 2 to 3 years interval they cultivate jhum in hill land. This unused jhum land for certain time period, different types of animals and insects can come together for the purpose of getting foods and water which safeguard jungles and bio-diversity of that particular area. In this time, the land again turns to a huge jungle or bushy land. This land is locally called *Ranya* (old jhum). Indigenous people blame wood businessman and political leader who are responsible for deforestation. Plantation of sagwan trees for the purpose of business is another cause of deforestation and ecological disorder in Chittagong Hill Tracts area.

4.7. Development Project, Destruction of Environment and Poor Communication Systems

During the conduction of our ethnographic field work, my plan was to interview the chairman and member of the union council of the study sites. For this why, I asked my students to manage phone number of the chairman of that particular union council. My student phoned several members of the union for getting the number, but they asked why I wanted to talk with chairman. My student informed them that we wanted to talk with him about the disaster management system and development projects of that locality, but he (my student) was refused to get the number. After trying hard, finally, he got the number with the help of his relatives of that area. After getting the number we phoned him (chairman) and got an appointment for interview. The chairman thought that we were the journalists and wanted to

detect the corruption of his union, so, he refused to give interview. But when we informed him that we were not journalist and we would not publish it in the newspaper and also would not disclose his identity anywhere, then he agreed to talk with us. During our talk, he also did not give all information about the union making different subterfuges.

4.7.1. Development project and destruction of environment

Local government and political leaders sometimes undertake different development project in the study area and many a time for this, they do not consult with local community. For this why, this development projects rather than improving the life of indigenous people, contribute to create different problems in every aspect of their lives. In this context, one of the interviewees quote this text indicating a bridge near to our conversation-

“You can see this bridge which is a burden to our community because here you will find no road to connect this bridge. This bridge does not bring any benefit for our village rather contributes to create a barrier to flow water to Karnofully river. When rain occurs heavily in rainy season, this bridge obstructs the flow of water and creates flood to this adjacent area which brings unprecedented suffering to the people of this locality. Local leaders construct this bridge to consume money from government. They claimed lump sum money from the government and spent only small amount to construct it and committed huge corruption in the community.”



Picture 4.7: Unplanned bridge that has no space underneath it to flow water during raining

Another respondent reiterates their sufferings in these ways- *“I have been living in this place since the last 16 years and hardly saw flood in this locality. The construction of electronic tower near the canal contributes to obstruct flow of water resulting flood in this locality. Moreover, landslides filled up the pond near the canal and this place was used as parking place. Before constructing the tower, no flood was happened in this locality”*.

The unplanned projects of government in the study area increase the suffering of indigenous people a lot. The corrupted officers in government implemented different projects without consulting the local people for devouring lump sum money. These projects include constructions of culvert, bridge, pavement road, dredging of canal, filled up canal etc. which either obstruct the water to flow in the river or disrupt the normal activities of the nature in the environment. If any bridge or culvert is needed over any canal or lowland, that is constructed in such an unplanned way that during the flood time water is obstructed by the pillars of the bridge or culvert as broken trees/wastage narrow down the hole of the bridge, consequently. Thus, water overflows the surrounding area and contributes to create flood and damages the crops of the fields and houses of that particular locality. For constructing the development projects, these officers did not feel to consult with the local peoples who live in this area and who have also dream about the locality. Local people are more knowledgeable about the nature and the locality where they live than the officers who implemented the project to that locality. So, officers should ask the local knowledgeable people before undertaking any project in that locality, but unfortunately, they (indigenous people) are neglected all the time. Local people also do not have representative who can influence government about their needs and problems. So, government is also unaware about the status of these people.

4.7.2. Poor communication and network system

The Chittagong Hill Tracts area is fully covered by different small and large hills along with some river and plain land. Due to the hilly land, many of the villages in this locality are unreachable to pavement road. Only walking on foot is the mean to go that village. Naraisory village where around 600/700 families are living have no pavement road for communication. Two to three canals/lowland are needed to cross and walking on foot is only way for reaching this village. For carrying goods, people use their shoulder and if they want to hire labor for carrying goods, they need to pay 1.18 USD for every turn. Sometimes, they use wooden or banana raft for carrying goods to the market as well as village through the lowland/canal by using the current of water. People face severe problem for bringing patients

to the hospital. In this case, they use two handles made chair where they can keep the patient sitting and pierce two bamboos underneath the two sides of the chair and four persons carry the chair at four sides of bamboos using their shoulders. In this way, they cross the hilly area of their village and reach main road and then take vehicle for reaching hospital. Children and elderly people also face great problem for movement in this village.

During the climatic extremity such as flood, the communication system in the study area become very bad. About the communication system during flood, one of the interviewees quotes-

“We asked the local leader to help us in flood time. The leader instructed us to go cyclone center/ or the building of nearest school. During the flood, there is not any road and all places are inundated under dirty water and wastages. It is very risky to move in this waste water and mud, because anyone can go inside the deep mud anytime and lost his/her life. Local leaders do not try to understand that we are not bird so that we can fly and go to the cyclone center when we wish”.

During the flood time, except the main road, many of the village local roads inside the community are inundated by flood water and looks like a big river due to plenty of water. In this time, local leader, even, NGO workers do not want to come inside the villages and help affected people providing relief and psychological support as well as evacuation. So, affected indigenous people are highly affected and suffering a lot during climate change extremities.

4.7.3. Hazards and migration of indigenous people

Climate induced hazards influence Chakma people to migrate to other city/village, but it is temporary. After the hazards, when flood water goes down, people used to return to their house and clean it for living. About the problem of flood water, one of the interviewees demonstrate- *“If we have money, then we will have left this village, migrated to other place and buy land for making house where there is no flood. Flood damages everything in our life, so, we do not want to stay here, but have no other option to leave the place permanently. During flood, we usually migrate to father’s house and come back after disaster”.*

Normally Chakma people do not want to leave their community due to the strong bondage among the members of their community. Moreover, rather than their traditional works they are not much skillful at other works, such as driving, digging soil, and industrial activities

etc. So, they cannot sustain in other city after migration. About the migration, one of the Chakma said-

“Due to flood, we do not migrate to other city because it is difficult to stay there long time for our pattern of works. We are not skillful at other works such as driving, working in industries etc. However, many peoples in our community were bound to migrate to the other place because disaster affected them severely and they lost everything. So, they migrated to other place for making their new life. Some people migrated but came back to their locality after hazards”.

4.8. Discussion

Over the last few decades, climate change is observed in CHT and indigenous people are most likely facing the effects of this change due to having limited resources. The perception of climate change is experienced and shaped by the knowledge of preexisting local environment and socio-economic conditions of that particular community (Petheram et al., 2010:682; Leonard et al., 2013: 630; Speranza et al., 2010: 302). In CHT, rainy season is not coming in due time because of which agricultural activities cannot be started in due time. Same scenarios are also found in case of winter and summer seasons vice-versa (Ahmed and Haq, 2019). As a result of late winter season, the nature could not scene its new looks and because of excessive hot weather in summer, the life of indigenous people has become intolerable even with the use of electronic fan in the community (Jacob, 2010:861). Elderly indigenous peoples claimed that in their childhood, they enjoyed the beauty of six seasons which were rarely found in the recent decades. In Autumn, they saw white clouds floating in the sky, and gentle wind gave them amazing feeling. In the night, they saw stars twinkling and the whole environments looked very interesting. But, all of these are just a dream now. Some indigenous people have blamed human beings for climate change, as they do evil tasks and exploit environment through cutting trees and hills, extracting stones from the soil, contaminating environment, etc. and that is why God is imposing cyclone, flood, excessive heat and cold as the curses. In the past, peoples did not exploit nature and did not cut down trees excessively, so, God was pleased and we hardly experienced natural disasters (Speranza et al., 2010: 302; Garai, 2017). However, these problems could be solved if peoples restrict themselves to exploit the environment and nurture the environment as their mother. Along with climate change, in the recent years, the frequency and intensity of natural hazards such as landslides, cyclone, tidal surges, thunder

storms, flash flood etc. have been increased drastically (Garai,2014:152; Petheram et al., 2010:683). In the recent years, the new dimension of climate change is thundering and lightening which may happen any time even though there is no cloud in the sky or it's not raining. This type of disaster causes massive damage to life and properties as peoples are ignorant of when this would be happened. Local understanding of climate change is important because it can be managed only through the experience and understanding of local context (Kodirekkala, 2018:300).

Over the last few decades, the peoples of indigenous community planted sagwan trees in their field/hills instead of planting other trees as this tree grows very fast without fertilizer and any other cares. However, the problem of this tree is that it is not environment friendly as it does not allow other trees to grow underneath of it. Moreover, sagwan tree cannot be able to preserve water under the soil. So, soil erosion, scarcity of water, landslides etc. are happened frequently in the environment. The inherent cause of planting this tree is capital accumulation which is introduced by the forest department in Bangladesh. Forest department rather than stopping to plant this tree, encourages peoples to cultivate this tree for more benefit for their family that contribute to create environmental disruption in indigenous community.

Due to the increasing demand of woods and fuels, peoples indiscriminately cut down trees in the forest, along with illegally cutting down hills for making residential houses in the study area. Moreover, some greedy businessmen collaborating with powerful political leaders illegally extract stones from the soil. Consequently, water level under the soil is being decreased, and people are facing acute scarcity of water in the locality (Ahmed and Haq, 2019). Moreover, the sora/canal that flows out from the top of hill is disappeared after few months of rainy season due to being filled up by landslides, wastages and sewage and its inability to reserve water for long time due to extraction of stones underneath of the soil (Jacob, 2010:868). Furthermore, excessive heat and irregular rainy season due to climate change also cause scarcity of water in indigenous community. This scarcity of water not only affects their daily life in terms of washing, cleaning, bathing, drinking, cooking, utilizing others purposes but also disrupts their livelihoods as this water is the main source of irrigation of their agricultural productivities. Excessive plantation of sagwan trees, cutting down of hills, and extraction of stones etc. also weaken the composition of soil that contribute to create soil erosion; consequently, frequent landslides are occurred, especially in rainy season in the community. This landslide causes massive damage to life and agricultural productivities because the soil of hilly lands covers the agricultural lands which is liable for less yielding crops due to infertile

soil. Local political leaders tend to accumulate more profit violating the environment and forests law. For the purpose of doing this, they usually offer bribe to the official persons of forest department and local administration, and build brick kiln in the residential area for getting sufficient fuels from the nearby forest in the brick field. Consequently, along with massive deforestation, environmental disruptions are occurred in the adjacent area of CHT. So, indigenous peoples are struggling due to both climatic and anthropogenic impacts in CHT (Ahmed and Haq, 2019; Miah et al. 2013).

Historically, indigenous people lead a life of hunter and gatherer along with cultivating in the hill, especially, slash and burn cultivation (*Jhum*). In the past due to having fertile land in their community, they could cultivate whatever they like and got bumper harvests including different vegetables such as potatoes, eggplants, turmeric, ginger, chilly, and fruits such as jackfruits, mangoes, pomelo, lemons etc. and for this, they did not need to use any fertilizers and pesticides in the land. They never had to think about foods for their family but the day has now been changed in their community. Recently, indigenous peoples cannot get expected crops from their land even using fertilizer and pesticides. Climatic events lead to decrease in the crop production and without using fertilizer and pesticides, expectation of bumper harvest has become a day dream to them now (Ahmed and Haq, 2019).

Being hunter and gatherer and leading nomadic life, indigenous peoples could hardly develop their mind for saving money and other properties for future. But, with the contact of mainstream peoples, they have made the concept of saving money and accumulating profit. They had never imagined to cultivate same land frequently to get much crops as they were satisfied with the crops if that could fulfill their demands for the whole years. Indigenous peoples only worked for few months in a year for managing their subsistence for the family and when they could think that these foods were sufficient for the whole year, they no longer worked for the rest of the months of the year and enjoyed their life by gossiping, playing, visiting relatives' houses, performing religious activities and so on. Capital accumulating tendency for more profit in this modern era has influenced them to work more for crop production and other activities. Being modern in recent years, indigenous people has used modern instruments such as power tiller and pump in agriculture land for more production rather than using their traditional cultivation methods. Different NGOs have provided them logistic supports along with training for modern cultivation whereas ADB has provided them five pumps and three power tillers for ploughing land and producing surplus crops. This tendency for capital accumulation in indigenous community has not only introduced pressure

on agricultural lands but also forest resources of that particular area. Local indigenous leaders with collaboration of corrupted forest officials cut down trees indiscriminately for logging business that certainly disrupts environment decreasing the water level underneath the soil. Excessive heat in summer and irregular rain in rainy season due to climate change are the reason for the failure to reserve sufficient water in the sora/canal which is flown inside forest from the top of hill. Consequently, agricultural activities have been disrupted threatening food supply and losing biodiversity in the hill tracts area (Ahmed and Haq, 2019; Ens et al., 2015:143).

Due to climatic events, indigenous peoples are facing different diseases (spots in crops and plants) in their agricultural activities (Ahmed and Haq, 2019). In the past, if they had seen any diseases/spots in the crops, they used to wipe out that seedling/crops, then other seedlings/crops remained spot free but this method is not working even using pesticides in the present time, as climatic events i.e., high temperature affects it severely. Along with this, flood is a great challenge for agricultural productivity in CHT, as it damages crops production massively (Kodirekkala, 2018: 308). Sometimes due to flood, peoples do not get back the money which they have invested for cultivation (Ahmed and Haq, 2019). Moreover, anthropogenic disasters such as construction of hydraulic dam in Kaptai lake had destructed both Jhum and plain agro-lands of indigenous peoples by inundating their residential houses which contributed to compel them to leave the places without getting compensation from government.

Climatic events have brought unprecedented miserable situation to the life of indigenous people threatening their existences in the community (Ahmed and Haq, 2019). In rainy season, excessive rain contributes to create flood which inundates the houses of indigenous people damaging and washing away all necessary belongings of their houses and properties (Garai, 2014). In the strong current of flood water, along with the standing crops, all the valuable materials in their family usually wash away including freeze, furniture, sacks of paddy, household utensils, livestock, together with submerging kitchen and toilet. Meanwhile, they have tried to make bamboo made loft inside their room to keep all valuable materials on it to protect them from the damage of flood water. During this time, they take shelter in schools/colleges, or neighbor's houses whose houses are in upper places and come back when flood water goes down. It takes several days to clean their house in post-flood period because wastes like sand, mud, water etc. dirties the floors and other area of the houses. Indigenous

people use blades, axes, knives, broom, whisk etc. to clean the floor and repair it with sand, brick, and cement etc. if necessary.

Due to frequent climatic events such as flood, indigenous people adjust their traditional housing structure to protect from the hazards. Rather than making their traditional houses, they construct their house with brick, cement and sands or wood and tin so that flood water cannot damage it. The foundation of their houses is made with brick, sand and cement for the purpose of making it strong to resist water to enter into the room and to protect from damage. Moreover, a temporary small wall is built in front of the door during or prior to flood as water cannot enter into the room piercing the underground of the door. Those who are not much solvent economically raise 3 to 4 feet long brick-built wall surrounding their house wall so that it can protect their room from entering water. However, those who have much money build brick-built house or shift their house in upper place such as to the pick of hill where flood water cannot enter. Apart from this, indigenous people make their kitchen in the upper place by making a bamboo loft (4 to 5 feet high) from the soil so that during flood they can prepare their food without any hassle. They also make a store room adjacent to the kitchen to store fuels for cooking during flood and rainy day. Due to the influence of modernization, solvent indigenous people use gas cylinder, rice cooker and other modern electronic appliances to reduce their suffering in climatic events.

The frequency and intensity of cyclone has increased to a great extent in recent decades due to climate change which damages not only the housing structure but also crops and other properties in indigenous community. Climatic events such as cyclone in the past had hardly damaged indigenous community having densely jungle and forest surrounding the community which weakened the speed of cyclone but now the reverse situation is found having limited jungle and forest in the community. Massive damages are occurred to the houses which are poorly made with fence, woods, mud, tin etc. along with the destructions of branches of trees, standing crops, vegetables, and other valuable belongings of the people of indigenous community. However, to protect their house and belongings from the strong winds of cyclone, they build their houses in the slope of hill as the cyclone could not directly hit the house. Apart from this, to weaken the flow of winds, they plant different trees i.e., jackfruit, mangoes, coconut, betel, and other wooden trees surrounding their houses so that these trees could save their houses. Moreover, many of them, tighten their house roof with trees using ropes or cane so that the roof top cannot fly away in the cyclone (Garai, 2017).

The forest and hills in CHT were abundant with fruits, wild vegetables, flowers, honey, different wild animals, trees etc. in the past but gradual environmental degradation together with climate change have decreased these resources to a great extent (Ahmed and Haq, 2019). Moreover, the density of jungles/forests in CHT are waning, on the other hand, the number of hunters and gatherers in the jungles are increasing. All of these things directly or indirectly affect the food supply and biodiversity in the forest (Mukhopadhyay,2009). Moreover, the scarcity of foods and security concerns together with climatic events compel to extinct the number of wild animals such as deer, monkey, wild hens, different birds and wild species etc. from the forest, even, the fox which was available in the recent past (Petheram et al., 2010:685; Jacob, 2010:871). Illegal hunting by mainstream and indigenous people have also triggered the disappearance of deer, wild hens and cocks which were seen in the jungle in the recent past.

Indigenous peoples follow some myth in their culture which are environment friendly. To illustrate the matter, they collect some forest resources such as bamboo in the specific time of the year assuming that if they collect it other months rather than the specific month, then it may ruin all bamboos from the forest and may bring bad luck to their family and community. Consequently, this resource may expand its growth in the forest and can easily serve the demand of people in the community, but now, it is hardly seen to respect the tradition/myth in the community as they cut down all types of trees massively for profit ignoring the benefit of environment.

Chittagong Hill Tracts is covered with different forest resources and these forests are categorized in several divisions including: a) reserve forest which consists of 1/10 of total CHT area; b) protected forest which covers 1/10 of total CHT, where most of the land is considered as reserved forests; c) private land forest which mostly belongs to indigenous farmers and some non-local peoples; and d) some non-classified forest which surrounds in different parts of CHT. In Chittagong Hill Tracts, though forests are divided into different categories but the resources in the forests are not abundant in the expected levels like the previous time (Roy, 2004 quoted in Chakma, 2020). Due to the privatization of land, indigenous people do not have access to all lands for collecting resources. However, they have access to some lands to collect these resources such as potatoes, tube, herbs, small branches of trees, honey, wild flowers, some vegetables etc. which are automatically grown in the forest. For collecting these wild foods, they do not need to take permission from the owners, but they cannot cut down trees or other resources in the forest.

Throughout the history, indigenous people have been maintained an intimate relation with nature. Though they were depended on nature for their subsistence, they never did harm to nature for collecting resources. In the past, from the nature, they had collected all necessary materials such as foods, fuels, fiber (3fs), fish, meat, vegetables, housing materials, traditional medicines, etc. and had a good understanding with the nature. But with the expansion of market/market-based economy, people have started to extract resources excessively for profit giving much pressure on nature. Mainstream people have taken the nature as a source of capital accumulation and extract resources excessively for selling in the market trying to control the natural resources in their own hands. This trend is also influencing indigenous people to extract more resources from the nature and sell in the market for capital besides fulfilling their demands in the family which they did not do in the past endangering the environment. All of these activities are affecting the ecological functionalities of environment. In this situation, to restore the power and beauty of nature, the decision-making power and managing responsibility of nature in CHT should be given to the hand of indigenous people, otherwise, environmental problems cannot be solved.

In local language, the traditional house for living of indigenous people is called '*Machang*'. It looks like span roof or couple-roof types made with Bamboos, wood, cane etc. which are collected from the nearest forest in the community. This wooden and bamboo made house are built above three to four feet of the soil. Indigenous people assumes that this height may protect them from the attack of wild animals as well as climatic events. Though indigenous people have been living to this traditional house throughout the history, but the continuation of using this house is under threat at the present time because of scarcity of housing material such as bamboo, woods, and cane in the forest and its cost-effectiveness. Moreover, this house is vulnerable to cyclone and flood as it is easily damaged in disaster and is lasted only 3 to 4 years after the construction. On the other hand, brick-built house is survived for long time and is not damaged easily from the flood and cyclone. So, indigenous peoples are losing their interest to build traditional house in their locality though it is related to their culture and it also express their unique identity in the community (Jacob, 2010:866).

Jhum is intimately related to the social and economic factors of indigenous people whose Bangla meaning is 'Pahar' (*Hill*). From their ancestor period, indigenous people have been doing slash and burn cultivation (*Jhum*) in CHT (Roy, 2017). 'Tokkal' or 'Damra' is used to dig soil and sowing seed and it is called '*Jahoma*' is gradually known as the word '*Jhum*' and this cultivation is called Jhum cultivation. Indigenous people are dependent on this

cultivation from the very beginning of their ancestors and doing it generation after generation. In *Choitro-Boishak* (Middle-March and Middle-April) month, jungle in the hill slope is burnt by fire for cleaning and are kept fallen for few days in the sun for drying (Dawan, 2018:158; Kanungo,2018:197; Roy, 2017). This burning jungle yields huge ashes which is used as fertilizer. In the early of rainy season, when the soil looks soft due to raining, small holes are dug in the hill slopes and different crops are planted i.e., paddy, turmeric, ginger, cotton, wheat, vegetables, fruits etc. (Ahmed and Haq, 2019). In Jhum cultivation, extensive hard work is needed for getting expected harvest. Jhum cultivation does not require the use of fertilizer and pesticides as ash is used as natural fertilizer. In Jhum land, marigold flowers are planted whose flowers and roots are used as natural pesticides in the land. Unlike modern agriculture, jhum cultivation does not require irrigation facility, huge capital, or modern instruments for cultivation.

Jhum cultivation does not support to cultivate same land continuously as it needs interval to regain its fertility for yielding bumper products which compels peoples to be hunter and gatherer to cultivate other land shifting from that place. For this purpose, they build temporary bamboo loft room (*'Machan Ghor'*) in the jhum land for accommodation. As jhum cultivators need to shift different hills for jhum cultivation, they cannot establish permanent house and most likely cannot cultivate cows, buffalos, goats, pigs etc. permanently in their family (Dawan, 2018:158). So, historically, indigenous people could not make a developed society in their community. In jhum cultivation, this unused land in unused time is locally called *'Rannya'* (old jhum) (Chakma, 2020;154). However, in the recent years due to the scarcity of jhum land, they have to cultivate same land frequently which contribute to yield less productions (Dawan, 2018; Kanungo, 2018, p197).

Forest department denounces jhum cultivation for deforestation and environmental disruption. However, indigenous people refuse this claiming that they have been doing this cultivation throughout the generation without disrupting environment. Indigenous people blame wood businessmen who are responsible for deforestation. Plantation of sagwan trees for the purpose of business is another cause of deforestation and ecological disorder in Chittagong hill tracts area.

Local government with the collaboration of political leaders have undertaken different development projects in indigenous community, but many often, these projects could not bring any positive change to the life of indigenous peoples rather bring about different

barriers in every aspect of their life. The corrupted officers in local administration implemented these projects without consulting the local people for devouring lump sum money from Govt. These projects may have included constructions of culvert, bridge, pavement road, dredging of canal, filled up canal etc. which either obstruct the water to flow in the river or disrupt the normal activities of the nature in the environment because many a time those have not been done in planned way. Local indigenous people are more knowledgeable about their locality. So, before implementing the projects, if this peoples' comments and involvement are ensured, then it can be fruitful but most often they are neglected in the development projects in their locality.

The communication system in hill tracts area is very poor as this area is covered with different small and large hills along with some river/canal and lands. This hilly land creates barrier for movement as in some community there is no pavement road for communication. People need to move only on foot crossing two to three canals/lowland and have to carry goods on shoulder as no vehicles are able to run over there. In rainy season, wooden or banana raft is the option for carrying goods and other communication but they face huge problems for bringing patients to the hospital in emergency situation. In this case, they use two handles made chair where they can keep the patient sitting and pierce two bamboos underneath the two sides of the chair and four persons can carry the chair of four sides of bamboos by their shoulders. School going children and elderly peoples also face great problems for movement in this village in their everyday life.

Chapter 5: Resilience and Cultural Adaptation of Indigenous People in Adverse Environment

Cultural and religious festivals are such some events from where you can get a comprehensive idea about a community as well as an ethnic group. As an ethnographic fieldworker, I never want to miss the opportunity to attend the function if I get any. During my fieldwork, I have very good plan that I will participate in different programs in the Chakma community that may be religious festival, marriage functions or other programs. Apart from some students, I have a colleague who belongs to Chakma community, so I have confidence that I can get an easy access to the function of this community with the help of these people. I had got an invitation for attending a marriage ceremony of Chakma community from my colleague and it was his own marriage ceremony. Luckily, I could attend that function because it was held before the outbreak of Covid-19. From that participation, I got a lot of idea about Chakma people and I enjoyed that program a lot. During my fieldwork, I had also planned to attend the largest religious festival of Chakma community that is 'Biju festival' but unfortunately due to the outbreak of Covid-19 in all over the world, including this community, I could not attend the festival. So, I could not see how they perform in this festival but during my interview of the people and the information getting from my students, I came to know that their ritualistic festival/religion is very much related to the nature, hills, forestry, river/sora and human beings. Their life, culture, religion, etc. are intimately related to the natural environment but that is severely affected either by climate induced natural hazards or anthropogenic destruction of environment.

5.1. The Change of Religious Practice and Local Response to Adverse Environment

Chakma people follow Buddhism as their religion along with worshipping nature. In the recent decades, the practices of their religious ritual are changing through the process of hearing, learning and seeing of other religious practices especially through the influence of mainstream culture. Every year, Chakma people celebrate 'Biju' ritual which is one of the largest festivals in their culture. The last day of Bengali year and the first two days of new Bengali year, Chakma people celebrate Biju in their community. The first day of Biju festival is called 'Full Biju' (Springtime festival), second day is 'Biju' (*Mul Biju*) and third day is called

'*NuyaBojor* or *Gojja-Pojja*' (*Gojja-Pojja Din*). On the '*Full Biju*' day, children, young and adult Chakma wake up very early in the morning and collect flowers from the garden and decorate their room and other places. They make temporary altar in the river for worship and float flowers in the river. On that day, everyone wears new and clean dresses and visits here and there with group. Young Chakma on this day greets/salutes elderly people and got bath them in the river. They also feed birds and animals' different foods on this day. In this ritual, they make different traditional cakes (*Pides*), sweets, vegetables etc. according to their capacity and offer these foods to people of their community. '*Pajon Ton*' (Ton means curry) is one of the foods which is cooked on this day. Mixed vegetables and dried fishes make this *Pajon Ton* foods. Chakma people believe that if they eat seven families/houses' *Pajon Ton*, then they suffer less diseases in their lives. This believe provides them mental strength to overcome any physical and mental health problems in their community. They also serve self-made wine to the guest on this day. On these days, they forget what class they belong to and irrespective of class, cast, rich, poor, young, old, male, female they meet one another and enjoy the days. If they can serve foods to other people, feel very happy and lucky on this day. In their religious festival, they also invite mainstream people and serve them traditional foods along with sharing their culture. This invitation brings them very close to mainstream people and exchange their culture with them. On the *Gojja-Pojja Din*, they bring delicious foods, drinks for religious leader (*Vanta*) in the temples and satisfy him. In the temple, they take '*Ponchosil*' and '*Ashtochil*' and hear sacred speech of their religion. For celebrating Biju festival, they take preparation for long time and clean and decorate their houses beautifully with great pleasure. Some indigenous people are seen to worship nature. They worship hill, river, sora, trees, and stone etc. The villagers normally belong to one ethnic group who selects a place collectively for doing worship. They have different Gods and Goddesses and each has a name. In the past, they had no temple and worshiped a large tree or a big stone. Keeping a big stone or a big wood piece, they worship it as a God. They worship this object in their own ways and sacrifice pig or cock to the God. They do worship with music and after that they eat together and drink wine.

With the influence of Bengali culture, Chakma people many a time have changed their food items and bought Bengali foods such as *Jilapi*, *rosogolla*, *cakes*, *singara*, *samucha* and other items from the market and offer it to their function. Due to climate change, the ritualistic activities of the people of Chakma community have increased to a great extent. People increase their religious practices in disaster for escaping the danger of disaster. Religious leader of Chakma community advises their people that practicing religion and prayer

protect them from the evil power of disasters. In this context, one of the interviewees said- *“I go to temple every day and pray to God for peaceful and happy life. I also pray to God for not bestowing hazards in our locality. I pray to God for the welfare of every creature in the planet.”*

During the time of the hazards, the belief of indigenous people toward religion increases a lot and people establish temples in every village for prayer. To remove the pressure of hazards and risk, they go to temple every day and pray to God for the betterment of their family and community. They follow the five principles of their religions and work accordingly, believing that if they follow the rules of religion and pray to God, then hazards may not harm them and the evil power of hazards will be disappeared from their community. The leader of Chakma religion raises awareness among the people to remove superstition from the mind of indigenous people.

Sometimes indigenous people face discrimination for practicing religious activities in their community being the people of different ethnic group in Bangladesh. Sometime, mainstream people raise questions about the practice system of Buddha religion and question why Chakma people worship deity for practicing religion. Sometime, some ill motivated peoples circulate rumor in the Facebook criticizing the activities of this people and damage temples of this community.

The religious practice in Chakma community is not decreased but changed due to the increase of natural disasters. In the recent decades, the frequency and intensity of disaster has increased and it also influences the suffering and death rate of human beings. So, the practice of ritualistic activities has intensified now a days. Peoples start to think that the increase of sin in the globe is the cause of profound hazards and death of human beings and practicing religion and satisfying God is the only way to overcome these problems.

In Chakma religion, slaughtering animals, or livestock is great sin, so they do not slaughter livestock for eating. They buy livestock in the market and get slaughtered it from other persons/butchers in the market and take to the house for eating. In the past, they reared livestock in the house and slaughtered it for eating but due to increase of hazards they stop rearing livestock. However, if they rear it but do not slaughter it for eating, they sell it to the market.

About the slaughtering of livestock in Chakma religion, one of the interviewees said- *“Slaughtering animals in our religions is forbidden but rearing livestock is not forbidden.*

In the past, we reared and slaughtered livestock for our foods. In the recent decades, due to the increase of hazards in our locality, we stop rearing and slaughtering livestock in our community. We buy slaughtered livestock from the market and consume it in our family. If the sellers give us dead chickens telling as fresh one, we have nothing to do for that and have to consume it.”

In Chakma culture, if any dog or goat climbs up to the roof top of a Chakma people’s house, it is considered as bad luck to that family. In this case, that family needs to remove this bad luck or evil power by offering puja to God with the help of religious leader and offering foods to some people of that community. In this way, this family can escape the evil power hovering over their family. About the prayer for not any hazard to happen, one of the interviewees uttered –

“We practice rituals following the books of our religion and influence other to follow this book. In the hazards, we pray to Buddha, that hazards do not occur and landslides do not happen. We also pray for not occurring much rain as it may create flood and landslides. During the hazards, we stay in house and remain very much careful about the outside situation to observe the disaster. For occurring disasters such as flood and landslides, we have nothing to do because it is the will of God Buddha. We can only pray to God for stopping the disaster and saving us from the danger”.

Indigenous people believe that if God bless them no disaster can harm them. During my interview, one of the Chakma people asked me to visit a hill which collapsed in 2017 landslides. This hill was very close to this peoples’ house. Keeping me near the hill, he asked me that a large part of this hill was collapsed but he with his family somehow saved themselves from the danger. He indicated a blank space and informed that here was his store room and some fruits trees but all were damaged in the landslides.

About the charisma of God about landslides, then he reiterated – *“This is the place which is 5 feet deep from the ground but due to landslides, it has become plain land with the hill soil. The part of the hill which collapsed had a very big tree which could not be moved by two powerful elephants fell down far distant from its root. It is the charisma of God. Our house was very close to this hill but due to the blessing of God, we save our life from the landslides. The hill was around 10 feet high but about the soil emerged from the collapse of this 10 feet high hill, nobody has any idea. It is needed to do research on these events. Due to landslides, big trees and human beings cannot save their lives but crab, shrimp, snails, and*

other species keep moving near underneath the water close to the landslides. They are not damaged. It is the charisma of Vogoban (God) who can save life whatever He wishes.”

For performing religious activities, Chakma community maintain an association where they donate approximately 2 USD every month and it is mandatory for both the poor and rich family. If any person of their community die, then approximately 176 USD from that fund is given for performing religious activities (funeral function) of that family as if the soul of the deceased person may get a place in the paradise. This function is performed by *Bhanta* (religious leader) and feast is offered to the villagers according to the economic capability of that family. Different foods and sacred objects are also offered to the soul of deceased person for the salvation of that person. This association also comes forward to help poor hazards affected people during and post hazards periods in order that they (affected indigenous family) overcome the stress and vulnerability of that hazards.

Chakma people believe that if any person does sin, then he/she can be born as a dog in the next birth. It depends on the activities of previous life. For example, if a dog is born in rich people's house, it can get a lot of foods but if born in poor people's house may not get sufficient foods. Chakma people pray to God, if any person again is born in any form, may they live in peace and happiness. In the Chakma religion, the birth of any being depends on the deeds of his/her previous birth. If he/she does good works in his/her previous birth, then he/she does not need to get rebirth and get nirvana in life. However, if he/she does sin in the previous birth, he/she has to be born 84 thousand times and suffers in the hell. One of the interviewees told me that I did good works in my previous birth, so I got the position of a teacher in this current birth at a university.

5.2. Indigenous Knowledge, Natural Symbols and Local Wisdom in Responding to Upcoming Hazards

Throughout the history, indigenous people gather some knowledge after seeing different symbols of nature. They observe different signs in the nature which indicate certain events in the environment. After analyzing these signs, indigenous people can perceive what is going to happen in the near future to their environment. On the basis of these signs, they make preparation to face the upcoming climatic events.

About the perception of upcoming natural hazards, one of the elderly Chakma said – *“During the starting time of raining, it is difficult to perceive how much rain will occur but after seeing the cloud in the sky, it can be understood how much rain will take place. If the*

cloud moves swiftly, it means that the cyclone may occur but it may not be strong. However, if the cloud moves slowly, the probability of occurring cyclone is much and the cyclone may be strong. If the cloud in the sky looks dense and it moves slowly, the probability of occurring heavy rain is much.”

Elderly Chakma people have extensive knowledge about the nature. So, if they find any abnormality in the nature, they can perceive something bad is going to happen to their community. To illustrate the matter, if they see that birds are moving here and there with chirrup and wild animals in the forest behave abnormally, they think that hazards may occur in their community. Moreover, if they see that wind is blowing from the east side of the sky and drizzling is lasting for several days, they perceive that cyclone or landslides may occur in their locality. According to elderly people, densely black clouds in the western corner of the sky symbolize the imminent nor' wester (typhoon) of their locality. These signs are very effective to them because on the basis of these signs they can prepare themselves to face/combat hazards and can minimize the losses that may be experienced their locality. Throughout the history, indigenous people follow their ancestor's techniques to predict about the recurring hazards taking consideration of existing ecological and meteorological situation in their locality. This technique helps them to combat hazards and develop resilience among the community people.

In the hazards, people try to remain conscious to avoid damage and risk of life. From the ward, or union council, signals/warnings are announced about the recurring hazards. People also listen to TV and radio to get the update of the upcoming hazards. In this time, though people feel stressed and afraid, but take preparation to overcome it and get shelter in safest place.

About the upcoming hazards, one of the interviewees demonstrates – *“Before the hazards in plain land, announcement is done with loud speaker, but in hill area it is not done. In the hill, it is very difficult to know when the hazard will occur and many people remain indifferent about this matter. It is also difficult to know the exact time of hazards like landslides in the locality but due to having long experiences, people can perceive about the occurrence of hazards and become aware about this”*.

In Chittagong hill tracts area with the help of local government, indigenous community form committee to monitor hazards, observe and take appropriate steps against the hazards. This committee gives timely update to the community about the recurring hazards and instruct them about the responsibilities.

5.3. Climate Change Events and Cultural Adaptation of Indigenous People

Over the pace of time and the gradual degradation of environment due to climate change and anthropogenic causes together with the influence of mainstreams culture, the traditional life of indigenous people has changed a lot in the present time.

5.3.1. Mainstream culture influences indigenous culture in Chakma community

Over the last 20 years, the culture of indigenous people has changed to a great extent. Due to the effect of climate induced extremities, along with the influence of mainstream culture, indigenous people need to change their tradition or adjust to the new change of their locality. Due to the expansion of education in hilly area for making different educational institutions in indigenous community with the support of government and NGOs, Chakma people are influenced by modern life that affects their traditional culture. Moreover, in the past, indigenous people never thought to go school for education. At their childhood, rather than going to school, they went to field for feeding/grazing cows and other livestock. In the past, they did not feel to be educated because they had no scarcity of foods. Only working for few months could give them sufficient foods for the whole years. After working few months and securing the foods of whole years, they enjoyed their life by gossiping, singing, dancing, travelling etc. and never thought about education. In this context, one of the respondents uttered-

“In our childhood, we never thought about education and other activities. Father sent us to field for feeding livestock rather than sending to school because we had no poverty/scarcity foods. We could manage food for whole year after working for few months, so we never thought life in complex way. But the situation now is changed and everyone wants to send their children to school for the hope of getting a good job and overcoming poverty”.

Due to climate change and environmental degradations, the crop production in our locality has decreased to a great extent. People are now no longer depending on natural resources for their livelihoods due to uncertainty of different disasters and diseases in the environment. So, they try to be modern and follow the culture of mainstream people in their life. They find difficulty to survive following their traditional life as well as to depend on natural resources as it is either affected by climate induced extremities or man-made destruction of environment. Presently every indigenous person sends their children to school to be educated and hoping to be a modern man and solving their economic hardship in future. The knowledge of education of young Chakma changes many things in the family of indigenous community.

For example, in the past, indigenous people did not know about washing hand after using toilet, and using soap in the bath and before taking meals but now they do it.

Indigenous people and Bengali people live side by side in hill tracts area and many of the cultural practices of mainstream people influence indigenous people and their culture. Indigenous people also subconsciously accept this culture. About the following of mainstream culture, one of the leaders of indigenous community uttered-

“We also advance our community with the advancement of Bangladesh. We are trying to be digital. In the past, we had three words in the union parishad but now have nine of which three are reserved for women. We are working with the motto of government and trying to overcome flood, cyclone etc. disasters with the guidelines of government. Along with the governmental supports, we the hilly people also support destitute people in indigenous community. During the disaster time, we cultivate our land with machines and social welfare organizations, Bangladesh Rural Development Board (BRDB) etc. helps us for the development of our community.”

Due to having relation with the Bengali people, the tradition of two cultures is more or less known between these two communities, but normally indigenous people very often follow the mainstream culture. In this milieu, the women member of union parishad demonstrated –

“We invite Bengali people to our function and they also invite us to their function. Due to this interaction, many of the traditions of their culture come to our culture but very few of us go to their culture. We want our culture to exist in our community forever and for this I discuss with the intellectual persons of our community but so far, no initiative has yet been taken to preserve our culture. For example, Biju function of our culture has changed a lot in the present time. Economic insolvency and hazardous environment may be the cause of this change. In the past, people decorated the Biju function in their own ways such as using their traditional cloths to decorate it but now they use professional decoration of the market of mainstream culture. Using banana leaf for taking foods also give place to one time plate culture in our community. In this case, scarcity of available banana leaf may be a cause of using plate in this function.”

Indigenous peoples are now much conscious compared to their previous generation. Many of the people in their community earn huge money and celebrate their religion luminously seeing the trends of mainstream people. Like Bengali people, they also build temples in every words/para in their community and pray for the welfare of their family and community. The recent frequency and intensity of disasters also encourage them to

increase their ritualistic activities in their community. In the religious functions, job holder people cannot attend due to not getting leave permission. The job holders as well as other family members of Chakma people urge me to request the government to grant leave permission to Chakma people in religious functions so that they can enjoy the festival. In this case, they refer to the leaves granted to the Muslim people who enjoy much more in religious festival. The interviewees thought that I have relation to the government and I can contact the governmental authority about extending holidays for Chakma people for celebrating their religious function. In this situation, I feel very much bewildered, because it cannot be done in that way. Moreover, I have no power and I have no connection to the government to give them leave permission to celebrate religious functions. I also felt myself very powerless that I could not help them about this.

5.3.2. Mainstream consumption and the change of local practices in daily life

Traditionally, indigenous people depend on natural resources for their subsistence and for this they do hunting and gathering in the hill and jungles/forests. Due to hazards, and gradual cut down of forest resources, the scope of collecting these resources becomes less and the availability of this wild foods decreases to a great extent. So indigenous people shift their food habits from traditional foods to market-based foods. In the past, they bought only salt and oil from the market, and all other things of their daily needs they could manage by themselves either by collecting from forest or made themselves in their community. The trend has now reversed and most of the daily needs of their family need to be collected from the market. So, their food habit is very much influenced by the foods of mainstream culture. About the food habit one of the respondents demonstrated –

“We eat different types of meats such as chicken, duck, mutton, snake, pork, beef, etc. We collect snakes in the jungles, even poisonous snakes, and hit the head of the snake. After that, we remove and burn the poisons and skin of the snake and keep it in the hole and take the meat for eating. In our religion, slaughtering animals is great sin, so normally we do not slaughter animals for food”.

Indigenous people make different traditional cakes in their house such as *Nappi*, *Sidol*, etc. during their traditional functions such as Biju. They make different cakes and delicious foods and community people enjoy such foods going to different houses. In these cases, indigenous people do not need to invite others, and people visit different people’s house spontaneously and enjoy the foods and festivals. Due to availability of different delicious Bengali foods in the market, Chakma people many often buy these foods avoiding their

traditional foods. So, these foods lessen their interest in their culture. Different local indigenous associations try to uphold their tradition from the extinction.

Indigenous Chakma people have distinct foods and cooking methods and they have unique condiment/spices. These condiments are very favorite to them that are *Sabarang*, *Fuzi*, and *Sidol*. If these spices are mixed to curry that becomes very tasty. They seldom use oil in the curry and use *Nappi/Sidol* for cooking curry. Apart from deep fried foods, they also eat some curry only by boiling and using own made spices to the boiled creeper/spinach which may contain full nutritious value due to cooking in light heat. Chakma has 14 types of cooking techniques that are: *Puja*, *Sikka*, *Khola*, *Gojja*, *Rannya*, *Pogonot-dya*, *Jhul*, *Kabang*, *Uchha*, *Gorang*, *Gudeiya*, *Taba-dya*, *Korbo*, *Gabi*, etc. All of these cooking techniques express their cultural enrichment and long tradition. Cooking in bamboo tubes/rolls and banana leaves are called *Gorang* and *Kabang* respectively. Many of the Chakma people claimed these two methods as the best cooking method in Chakma community. In the recent decades, Chakma foods get popularity in tourist spots of Chittagong, so different restaurants are built for the tourists in CHT. Indigenous people have different traditional cakes/flapjacks/pide that include *Sannapitha* (*Sannya Pide*), *Borapitha* (*Bora Pide*), *Binipitha* (*Bini Pide*), *Binikhoga*, *Bang Pitha*, *Kola Pitha* etc. *Bora* flapjacks is made with *Binni* rice by frying in oil. Other flapjacks are made with coconut, banana, and sugar cane molasses. These cakes are now sold in shops for business in different tourist spots in Rangamati and Chittagong. Though some mainstream people find interest in these flapjacks during their visit to hill tracts area, but young indigenous people lose their interest in these traditional cakes and get interested to mainstream foods/cakes in the market. Moreover, being cheap, delicious, and easily available, indigenous people like Bengali foods and lose interest in their traditional foods. The scarcity of resources due to hazards, and environmental degradation is also a cause of losing the appeal of making traditional flapjacks in CHT.

Chakma indigenous people have their distinct dress which bears their unique cultural identity in Chittagong Hill Tracts area. Chakma women normally weave fabric themselves and use it for their daily life. They knit *penon*, *khadi*, *salorkamij*, etc. for their daily personal use. About the dress wearing, one of the young girls demonstrated –

“My mother wears penon but I wear salorkamij at home. Sometimes, I also wear sari, khadi etc. when going outside. The choice of wearing dress has changed in the modern age but cannot make the dress disappear forever, because people wear whatever she likes according to time and space. For example, I feel better to wear penon today, then tomorrow may feel an

urge for salorkamij, so dress cannot go extinct. Personally, I like to wear penon more than any other dresses”.

The ancestor of Chakma community wears *Dhuti-panjabi* but now people wear *lungi gangi/shirt*. In the past, if any Chakma people wore pant, every people saw him in respected eye. Along with pant, if that person especially elderly person wore a watch (Seko-5), then Chakma people considered him very honorable person and respected him much. In the recent time, every people wear these types of dress, so nobody shows respect to this dress any more now. In the recent time, Chakma dress is not worn by any person in Chakma community especially by men and it is disappearing gradually. In this modern age, the young generation in our community do not take our dress in positive way and they do fun if anybody wears Chakma traditional dress in our community.

About the extinction of traditional dress in Chakma community, one of the elderly interviewees reiterated - *“Our traditional dress is disappearing day by day. Except some traditional functions, people do not wear traditional dress in our community. Only women are seen to wear traditional dress occasionally but men normally do not wear this dress. Bangladesh is becoming digital day by day and people try to adjust to the new changes. The people of Chakma community follow this trend to adjust to the changing world and try to be digital by wearing modern dress and being moderns. So, the traditional dress of our culture is gradually disappearing day by day”.*

About the wearing dress in Chakma community, one of the interviewees uttered- *“We the peoples in Chakma community wear different dress in our life i.e., Bengali dress, marma dress etc. along with wearing Chakma dress. Khadi, penon, dhobon, blouse, chador, etc. are dresses that we can make in our family especially for women and learned it from our ancestor. Due to climate induced hazards, our income in Chakma community has decreased a lot, so we make this dress for commercial purpose along with using it in our family. Bengali people like this dress very much, so many businessmen collect this dress from Chakma family and sell it to different parts of Bangladesh with high interest. The dress of our community is also changed due to the usage of different specific dresses in schools and colleges. The job holders in our community do not wear traditional dress, only the people who stay in houses wear these dresses. Due to the availability of Bangla dress in market at cheap rate and being more fashionable, our people are getting interested to use these dresses”.*

Dress and clothes of an ethnic group represent the culture of that groups. Indigenous people normally wear traditional dress in different religious festivals, cultural and state functions and enjoy their life. Different ethnic groups have their distinct dresses in

Bangladesh. Indigenous Chakma women play leading role in survival of their traditional dress by wearing and weaving in their family. Though indigenous dress loses its appeal in Chakma community, it has created a demand in the competitive market of mainstream society and that is very great news for them. In this context, some Bengali textile owners come forward and produce this dress in their industries and make this dress popular by selling at cheap rate to the young generation all over the countries. Being distinct in design and color, it easily attracts the attention of many mainstream people in Bangladesh. Businessman can trade through the products of 470-530 USD approximately (1 USD= 85) every month and earn a total of 176 USD by selling this indigenous dress every month.

Indigenous people have the capability to produce much and they have no apathy in production but they are not well planners for marketing. Most of them do not have any experience for marketing and they have no tendency to accumulate much profit through productions. They are not complicated to get more profit as they sell their products with less profit if they find any customers. So middle men buy it at less prices and sell it at high prices in the market and get much profit. Many a time it is seen that due to having no competitive attitude towards marketing, they do not want to sell their products in the market. They share excess products among their relatives and neighbors freely. But in the recent time, their old perception has changed a bit more and sell their commodity to the community and also disseminate it to other community to extend its demand for more profit. The culture of mainstream society influences them more to change their old perceptions.

The language of Chakma community is gradually being unused and going to disappear. The people of Chakma community in their language speak 50% Bangla and rest in Chakma. Children who are going to school rarely know meaning many of the words of Chakma language and are habituated to speak in Bangla language. The government of Bangladesh want that the people of Chakma community speak in Bangla and apparently no step has yet been taken to care for the survival of Chakma language. In some primary school, up to class 5 there is an opportunity to learn Chakma language but have scarcity of Chakma language teachers in that school. After class 5, no other program is offered in Chakma language in any educational institutions in CHT. In Chakma community, 95% people are educated especially at least up to primary school and can be able to write and speak Bangla language but many of them cannot write Chakma language but can speak. If any person wants to get job, Bangla language learning is important, otherwise, they may face problem in office. The indifferent attitude of government towards Chakma language may contribute to the extinction of this language in near future from Chakma community.

The Chakma people in their community prefer to play different games in their life, but these traditional games are not seen to be played now-a-days. Due to the complexities of life and being busy for education and managing livelihoods, people are rarely seen to play different games such as, *Danguli, Ha Du, Du, Bash Forn, Nila, Latim* etc. in their locality.

In the past after finishing work, indigenous people returned home at 10/11 am and completed their lunch at 11/12 and took shelter under the big trees. They gossiped with other people under the shade of trees. They also sang their traditional songs, reciting poems, playing traditional games, and passing their leisure enjoyably with other community members. Young people learn their tradition from the elder Chakma through interactions but all of these things are getting slighter day by day. In the community, it is now hardly found big trees for sitting and sharing the history, traditions, folk, songs, riddles, proverbs etc. with other people in the present time. Everything in the society has become institutionalized and nothing can pass from one generation to another through non-institutionalized process as the scope of interaction gradually becomes stopped. Hazardous environment along with climate change play a significant role to change the social structure in Chakma community as people need to keep busy themselves always to manage their subsistence rather than practicing to cultural activities.

5.4. Disaster Relief, Corruption, and Local Politics in Hill

During my ethnographic fieldwork, I used to start my work in the early morning. My student was always with me. The field sites being far away from the market and communication system being not well, we found difficulty to do our lunch. If we wanted to do our lunch from the restaurant, then it would be both time consuming and expensive because near to the field site there was no restaurant. My student and research assistant asked me that we could take our lunch in the participants' house and we could pay them for the foods. My student arranged this every time in the community but Chakma people did not take money for foods. So, I always kept some gifts in my rack sack and provided that to children if I found in their family. Chakma peoples may be economically insolvent but they possess rich mind and very cordial to the guests. One day after taking lunch in a Chakma family, we were taking preparation to resume our ethnographic fieldwork by interviewing. At that time, the householder of the house where we took our lunch came to us and asked us to leave the place as soon as possible. It is no longer safe for an outsider like me in CHT, some separatists might kidnap me anytime and ask a lump sum money to my family. If I refused to pay the money, they might harm even kill without any hesitation. At first, I did not give much heeds to these words, but when my student asked me seriously then I agreed to leave the place soon. My student is

very much familiar about this situation, so I asked him to know more during our return in the bus and got a lot of exciting information from him. The next day, from a newspaper, I came to know that two persons were killed in CHT in a shoot-out due to the political clash of two separatist groups. After that incident, I conducted my fieldwork very carefully. In this case, my student and colleague helped me a lot. Before conducting our fieldwork, they phoned some faithful friends in the site and if they confirmed that the locality was safe that day, then we visited the field for data collection. We also kept some phone numbers with us that we could take help if we faced any problems in the field sites.

5.4.1. Corruption and unequal relief distributions

Over the last few decades, the hill tracts area in indigenous community experiences different climate induced extremities and struggle to overcome these adversities. In this case, they use their saving and existing resources to overcome the vulnerabilities. Local leaders sometimes come forward to help destitute peoples but their support is not sufficient to overcome the vulnerabilities. The poor people whose houses are damaged in landslides/flood/cyclone, are offered 5/10 kg rice, 70 USD, 12 pieces of tins (one types of materials to make roof of house) but these supports are not sufficient for bounce back of poor people to normal life. In many of the cases, the real affected people cannot get the supports during the emergency periods. Reliefs are distributed among the friends and close kith and kin even though they are not affected in the disasters. Real affected people rarely get relief in disaster, however, if even they get, the amount is not sufficient for survive in disaster.

About the responsibility of political leader in disaster time, one of the affected interviewees demonstrated – *“Our chairman is not highly educated person in our community. He is not sincere about his duty and also not conscious about the rights of members of our community. Though he won in the election by our supports but never cared about the situation of us. In the eve of hazards, he does not visit us to see the situation and does not give us relief. NGOs also do not support us in hazards in our locality”*.

Political leaders do not visit the affected area to get the information and see the conditions of affected people. Sometimes after the disasters, they advise their assistance to visit the affected area to observe the situation. The assistants of the political leaders do not pay heed to the problems of the affected people because they are not elected by the vote of people. Sometimes, they give some relief to the people who have lost everything in the disasters but

many times do not provide any relief to the less affected people. The relief they provide to the affected people is also not sufficient for them to overcome the vulnerability.

About relief distribution in hazard period, women member in union parishad said - *“We cannot get sufficient fund from the government for relief distribution in hazard. The amount we receive from the government is distributed equally among the affected people. We do not know whether other people misuse it or not but we physically distribute it among the affected people. Two other members in our union are involved in other business and stay deep inside the union, so I need to work more to the welfare of our people”*.

The chairman of a union council reiterated that they cannot get sufficient fund from the government for distributing relief among the affected indigenous people during and post disaster periods. He said - *“The budget we submit to the government with certain expectation is not provided. We submit the budget to union council and union council gives us money according to their capacity. Fund is not sufficient for fulfilling the demand of affected people. We urge DC (District Commissioner) to raise fund then we can afford relief for all the affected people. Sub-district chairman distributes relief from which the union gets an amount of. We get less budget compared to other unions because our union is near to the sub-district and the population is also less compared to others’. If population number is higher, the budget is high in the union. If the house of any indigenous people is damaged in disaster, and the DC gets informed, he/she gets support (tin, money, rice, etc.) from DC for repairing house.”*

Local leaders especially political leaders have good relation with local government and utilizing these relations, they make money by different means. In this context, one of the respondents said - *“Some leader asked for money to the government for development in the local community and devour that money in the name of development. You can see this bridge which is useless as there is no pavement road connected to the bridge. Local leader engulfed lump sum money for constructing this bridge but it cannot bring any value in the community. Moreover, in rainy season, this bridge obstructs water and creates flood in the locality”*.

However, sometimes local leaders with the collaboration of local administration work for the development of local community. They keep good relation with the administration to preform activities in the indigenous community. Local political leader plans different projects and informs the administration for implementation. Different NGOs i.e., BRAC, UNICEF, PODHOKHAP, etc. and volunteers organizations, business associations, development firm, student associations work to combat hazards and enhance development in the locality with the collaboration of local administration. UNICEF makes some schools for

class (0-5) in indigenous community and provide 60 USD to each teacher for their teaching. BRAC works for the improvement of health and education of indigenous people in hill tracts area.

5.4.2. Local media, improper distributions of reliefs and corruptions

In hazards, if affected people inform headman (community leader) about their problems, headman tries to understand that and help them accordingly. Headman tries to inform local government about the problems of their locality and tries to get support from the government to help affected people in their locality. About getting relief in hazards, one of the affected people informed-

“If we inform headman about our problems during disaster, we get 4/5 kg rice but it is not sufficient for us for maintaining our family and recover the damages occurred in disaster. The government provides huge relief and money for helping affected people but chairman and members in our community devour this relief and do not give us any things”.

Being frustrated after getting no relief, one of the elder interviewees reiterated –*“After the severe landslides in 2017, a huge damage happened in our community. We went to the DC office for asking for relief to overcome our vulnerability. We made a list of affected people with names and father names, but could not get any help from the DC office. The UNDP had provided some fund for giving to affected people (176 USD) but the authority did not provide that to all peoples. They said the UNDP had given money for relief but still it went to you through us, so we would give you 60 USD as help. The chairman of sub-districts after meeting informed authority to provide money to the affected people but that money was not given to the listed peoples. The money came for the affected people with names on the list but they distributed it to other people. Please tell me how it can be accepted. Political leaders provide relief to their relatives, friends, clients and close people though they are not affected in hazards. We are not provided relief though we are very much affected. Nepotism, corruption, and other illegal activities of political leaders refrain affected people to get relief in hazards time”.*

Another respondent also blames local leaders for doing corruption for not providing reliefs. He said – *“Those who distribute relief in disasters belong to Chakma community but still they do corruption. The rich people who live surrounding us can help affected people by providing economic support, even by psychological supports but they do not do that in the disasters. Chairman, vice-chairman, women members come to the spots but do not give any support to the affected people in the disasters. Sometimes, they provide some relief to the affected people but that hardly fulfils the demand of that family”.*

During the disaster, along with improper distribution, the relief is not sufficient to provide to all affected people. If local leaders become cordial and honest, they can distribute it equally to the affected people, but though the relief is small in quantity, they devour some of it for their own purposes and the rest is distributed among the affected villagers. About the relief distribution, one of the chairmen demonstrated –

“There is scarcity of fund in ministry for relief distribution. Disaster and relief ministry provides fund for disaster but this is not sufficient for all. If possible, we provide 12 USD and 20/30 kg rice to the affected people. Affected people get these facilities two times in hazard periods. We provide 33 tons rice among 11,00 families in this locality (Kutukchari union). In Sapchari union, NGOs has provided 176 USD and 2 dozen tins to the affected people. Moreover, if any member of any family dies, they get 235 USD and the UNDP provides this support to the affected people.”

About getting widow allowance, one of the women highlighted – *“I have been taking widow allowance for last 6 years which is 35 USD in every 6 months. Some neighbors (3 families near to our residence) who are relatives of chairman also get this allowance for long time”*.

Local administration as well as leaders in CHT are very much cunning and corrupted according to the participants. Normally, leaders do not visit the affected area taking risk in disaster time. They choose the villages near to the city for providing relief where different media have access to cover the news. The relief they provide to the affected people hardly fulfils their demand but is highlighted in the media that they are working for poor peoples. Local leaders do not go to the remote villages to support affected people for two causes that are: Firstly, it is very challenging to visit this area during disaster periods due to poor communication system. Secondly, their relief distribution works may not be covered in the media at this time. However, indigenous people do not want relief to overcome their sufferings but urge to stop the root causes of disasters. In this context, one of the interviewees said –

“We do not want relief, we want that the government takes initiatives to dredge the canal of our locality, then the flood will automatically be reduced. We also urge the government to stop all unplanned development projects that are implemented in our locality, because these projects are liable for our sufferings rather than furthering the development of our life. So, the government should take that step that can help not to destruct our nature but conserve it to run smoothly.”

The relief and supports that are provided during disasters are not properly distributed to the affected people. The people who live in upazila (sub-district) and near to city

get the relief, medicine, rice etc. and Bengali people are more in number in city, so they get more support than the Chakma in disaster. Local admin also arranges accommodation for affected people during disasters but Chakma peoples do not go there for shelter during disaster as the place gets crowded. So, their names are not listed in the relief books and cannot get the relief. Different NGOs also run their supports in city during disaster, so village people cannot get support during disasters. Chakma leaders are busy for their own interest, so they do not pay heed to the sufferings of affected peoples. They do not provide relief to the affected people even do not inform the government about the problems of indigenous people. So, the suffering of these people also increases a lot during disasters.

5.5. Social Discrimination, Marginalization, and Resistance of Indigenous People in Adverse Environment

Indigenous people in CHT lead a very miserable life as they cannot feel freedom in their life. During my ethnographic interview, Chakma people did not want to share their sufferings with me though my student who belongs to Chakma community was with me. They thought, if they said anything against the administration, they might face problems even they refused to talk in the open place as anybody among them might report against them to the administration. Because, one of the indigenous people informed me that some Chakma people worked for the administration for the sake of getting benefits. So, they felt afraid to share their suffering in the open place with other people. During my fieldwork, I also got the information that Chakma people always live in a turmoil that anytime they can face problems in their locality.

5.5.1. Discrimination and marginalization of indigenous people in CHT

In Chittagong hill tracts area, indigenous people experience discrimination in different ways by the mainstreaming people. This discrimination may be caused in the form of ethnicity, race, class, caste, gender or religion. In CHT, there is so called class system that creates fraction in the community. One respondent said–

“He was discriminated by a Bengali in terms of religion. The mainstream people asked me disdainfully, why I worshiped deity, and why I did puja in our locality? Moreover, sometimes we face great danger with this people as they spread rumor against us through Facebook that we criticize their religion and their beliefs. It may be the cause of damage of our temples and residential houses and may create life threatening situation in the locality.”

The women of indigenous community face some fundamental discrimination than the women of mainstream society. Indigenous women experience two folds more discriminations than Bengali women. They become the main target of the eviction from land due to their marginality and vulnerable situation in the community. These women also experience sexual harassment and being destitute hardly get economic supports or loans to overcome their vulnerability in the community. Their produced products also face problems in marketing due to their weak position in the community. These women also are seen to be more destitute losing their land and separating from nature, hill and forest. Indigenous people have very close relation with nature, lands and hills and they recognize it as sacred things in their life. They never harm nature for their self-interest and for future generations. So being separated from land, indigenous women lead a very miserable life in CHT.

Chakma people sometimes face discrimination in the office due to their ethnic identity though it is not high in Rangamati city due to a small number of Bengali people in the office. In this context, one of the interviewees uttered – *“If we go to the land office for land registration, sometimes we face discrimination for being Chakma and are refused to get service in the name of different excuses, even they ask for bribe to provide the service. In fact, sometime, land officers ask for bribe to Bengali people also for the service”*.

Chakma people express mixed views about the exploitation they face in their life by the mainstream people. Some people said that Bengali people did not neglect/exploit them. If they exploit indigenous people, they cannot live in Bangladesh but other people express opposite views. They said some Bengali exploited them in their locality. In this context, one of the indigenous people demonstrated –

“Mainstream people do not do any exploitation to the Chakma people even though they do neglect us sometimes. Permanent Bengali people in our locality help us in our danger but settler Bengali people sometimes do some problems with us. Occasionally, they exploit us, even grab our agriculture land where we cultivate crops for generation after generation”.

Alike some mainstream people, the government of Bangladesh sometimes neglects the ethnic people living in Bangladesh. On 30 June, 2011 neglecting all human demands and hopes, promptly the 15th amendment in the constitution was passed. In the amendment, all people in Bangladesh are addressed as Bengali in which the other language, ethnic people lose their distinct identity and tradition and become Bengali in the constitution. Moreover, religious discriminatory policy prevails as usual by rejecting the four fundamental principles in the constitution such as Nationalism, Socialism, Democracy, and Secularism and continues to enact Islam as the state religion and “Bismillahirrahmanir Rahim” as the word for

the state by violating the fundamental principles of the constitution of 72' amendments. It is important to say that all citizens live in Bangladesh are Bangladeshi but not Bengali but the amendment of 15 does not recognize other ethnic groups such as Chakma, Marma, Khumi, Sautal, Rakhaine etc. and other distinct ethnic groups as they are also addressed as Bengali in the constitution.

5.5.2. Eviction from lands and exploitation by settlers

Indigenous people are very much rooted in the land where they live and this locality seems to them as own country/motherland. They do not think any other country in the world except the land where they live. They are fully dedicated to their land. They respect their own land and worship this land as God. According to them, this land is not sellable and exchangeable and they have personal and collective ownership of this land. In their community, they never practice to sell this land away to another person. They do not accept the claim of ownership of other people of their land and they also do not interfere in other people's lands. According to elderly Chakma people, having rights to land is important to indigenous community and this is not done by claiming any announcement. After living in a place for long time, they gain the right to the land and establish their ownership of the land. It is like community ownership. They do not need any document for ownership. The decision of village authority is effective to get the acknowledge of ownership.

If any person cultivates any land for several years, then this man gets the ownership of that land but this ownership is not permanent. However, if this land is given other person for use/cultivation, then he/she may be the owner of that land by using several years. This land is under the collective ownership of that villages. The traditional land management depends on oral management system. For land management or land distribution no document or proof is given. All activities are depended on oral based system. As most of the ingenious people in the past could not read and write, so giving documents of land was worthless system. However, mainstream settler people take this opportunity and grab the land of marginal indigenous people, but this marginal people cannot protect their land due to having no written document of their land. Law enforcement authority also cannot help this people due to having no written documents of their land.

Indigenous people are exploited by mainstream people in different places in hill tracts area but these people are settlers. They come from different part of Bangladesh and build their house in CHT. Sometimes, they grab land of their nearest indigenous people, even exploit them physically. Some other mainstream people, who stay there for long time and permanent

residence of that area are very helpful to indigenous people and make good relation with them. These people never exploit indigenous people but help them when indigenous people face any problems in their community. Some indigenous people join local political parties to raise their voice against the exploitation and getting their rights as a citizen of Bangladesh.

Sometimes military forces disturb indigenous people in different ways. They suspect indigenous people and search their house any time ignoring the privacy of that family. In this context, one of the indigenous people uttered – *“Military forces suspect us in many ways. If we have much money, they ask us where you get the money from? In 2018, 01 September, in the mid night, they entered our house for the purpose of searching and harassed us. They did not care our privacy and insulted us. We cannot move freely in our community as we have to face different questions of military force at any time in our locality.”*

About the exploitation of indigenous people in Chakma community, one of the interviewees uttered – *“Mainstream people in our locality are small in number, so people of this locality are not exploited by them but the area where they are in large herd, there they exploit Chakma people. We heard it but have not yet seen the situation”*.

In some locality, the land of indigenous people is grabbed by Bengali people and Chakma people in this case take the support from law to regain the land. Sometimes, indigenous girls are raped by naughty people of the mainstream society. Two years ago, an indigenous girl was raped by Bengali people. In this context, one of the respondents uttered – *“An indigenous girl who has no father one day went outside to look after their cow in the field before the evening. Three to four naughty Bengali boys kidnapped her and raped on the top of hill and killed her. This incident drove her mother almost to madness. We heard that law enforcement authority caught one culprit and tried to catch others. The mother of the girl gave a charge of women sexual harassment against the rapists and judgement is continuing still now.”*

5.5.3. Resistance and resilience of indigenous people in social discrimination and marginalization

Along with climate induced natural hazards, indigenous people also experience social discrimination and marginalization by the mainstream people which they take in two ways that are: they resist this or endure it finding no other ways being weak to resist this. After the independence of Bangladesh in 1971, when indigenous people face exploitation by the mainstream people, they formed peace keeping committee (*Santhee Bahinee*) and fought against the government as well as mainstream people to get their rights. They collected different deadly weapons and fought against the law enforcement authority against the

exploitation and finally in 1997 a treaty was signed between the government and the peace keeping committee for peace and the guerrilla warfare was halted. Indigenous people still face exploitation after the treaty, so they occasionally resist this with weapons. However, some permanent Bengali people help indigenous people to overcome their hardships, and make their life normal. If indigenous people face any exploitation, along with them, Bengali people raise voice against the exploitation and try to get the attention of government to solve the problem and get the judgement properly. Sometimes, indigenous people cannot get any support from the law enforcement authority and other people, so they have to endure the exploitation. However, many indigenous people migrate to India or other places to escape hardships and social discrimination. Some people migrate to plain lands and work in industries losing everything in their locality and start their life newly. Many of the indigenous people follow religious rules and practice rituals to relieve their pain and adapt to the adverse situation.

Historically, indigenous people have no documents of their land as their land is considered as community asset. It means that they cultivate a land year after years and they become the owner of that land. As this land has no document of ownership, so settler Bengali people grab this land and claim their ownership but indigenous peoples cannot protect it, even cannot get support of law due to not having documents of ownership. Law enforcement authority also cannot support indigenous people to recover the land. Nevertheless, some indigenous groups resist this exploitation and sometimes they succeed to get the land. They unitedly protect the exploitation and try to solve the problems with the help of administration.

5.6. Adaptation and Resilience of Indigenous People in Climate induced natural hazards

Indigenous people experience different types of problems in their life due to climate induced hazards. Due to the severe cyclone and flood, many a time the houses of indigenous people are completely or partially damaged. In this case, they need to repair their houses for accommodation but face problems of scarcity of money. Different NGOs and Banks come forward to give loans to this affected people to repair houses. In this context, one of the interviewees said –

“We took 825 USD as loan from CIBD to repair our house. For getting the loan, we need to show the proof of ownership of our land of house and have to pay 25 USD per month as instalment to return the loan within 3 years periods. It is approximately 940 USD to pay back within three years to the NGOs. Along with this, we also borrow money from relatives for repairing house and pay back the money in our convenient time.”

During and post-disaster period, what is most important for indigenous people is money along with contingency needs. At such time, indigenous people borrow money from relatives or take loan from NGOs to fulfil the emergency needs. This loan needs to be paid back within one year time periods with some interest.

In CHT area, different NGOs works for the development of poor indigenous people. Apart from different development project, one is to provide loan to indigenous people to uplift their life along with overcome the vulnerability of climate change extremity. Different NGOs such as *ASA, Podhokhap, IESA, CIBD, Brac* etc. work for giving loan to indigenous people to solve their economic problems. Indigenous people are offered 35 USD as loan preliminary and then provided 118 USD and 236 USD gradually depending on their capacity. For getting loan, they do not need to show any documents such as land documents or other properties but need to pay loan from time to time. Otherwise, NGOs workers provide some threat if not getting money. Bank also provides loans but all people have not access to this loan because proof of ownership of land or properties is mandatory to show during taking loan. For providing loan, banks offer 8% interest but NGOs interest rate is 11%. ‘Akti Bari Akti Khamer’ (one house and one farm land) project also provides loan to the poor people ranging from 1,18 to 1,176 USD and need to pay back within one year with 4% interest. Indigenous people during their distress get this loan from NGOs and bank and try to overcome their vulnerability and adapt to the adverse situation for making resilience in their life.

To overcome the economic vulnerability, and maintain the family both men and women work in the community. In this context, one of the women respondents demonstrated – *“My husband does wood business and also works as wage labor for earning and I work in house for knitting clothes and sell that in the market for profit. In the past, due to religious restriction, we did not rear livestock but to pay the loan, we rear livestock such as hens, pork, goat, cows in our house and sell that in the market in the present time. I try to cover the cost of family by doing this work and my husband tries to pay the instalment of loan from his income to overcome vulnerability.”*

To improve the economic condition of poor people and to overcome the susceptibility of climatic events, some philanthropists take different initiatives in the community. Notun para-association form an organization where a philanthropist provides 40 CNGs to the young people to overcome their economic vulnerability in the family. This young people do not need to pay any money in advance but after starting earning, they can pay the money to the associations and then the association helps other people with this money. This

association does not make any profit from the members but works for the betterment of the community. Community leader sometimes raises fund from the member of the community to help the affected poor family. To illustrate the matter, in the community, there are 200 families from where the community leader takes 02- 04 USD from each family and gives this money to the disaster affected poor vulnerable families for their development. Along with this, headman sometimes provide rice, potatoes, ginger, turmeric, oil, salt etc. to the affected people to overcome the vulnerabilities and building resilience in their life.

About the economic support to the affected people during disaster, one of the Karbary (village leader) said – *“It is difficult to get much supports from the government to help affected people. We collect money from the solvent peoples in the community and provide that to the affected people. Rich people also come spontaneously to help poor affected people. Some people give shelter to the affected people in disasters and support them in adverse time. Some people help affected people by giving labor, bamboos, woods etc. to repair their houses.”*

Every year indigenous people experience cyclone apart from other disasters which normally damage the houses of indigenous people, because the houses of this people are not strong enough to survive the strong wind of the cyclones. So, after severe cyclone and flood, repairing house of this people has become a common trend, but those who make brick-built house may not repair house all years as this house are not damaged easily. About the damage of house, one of the poor affected people uttered –

“The people of our community are very helpful. When my house was damaged in the cyclone, the headman, my brother, including neighbors came to my house and repaired it. Those who were economically strong gave us money to construct the houses. Some people provided us bamboos from their bamboo bushes and some people rendered labor to repair the house without getting any payment. This support from the neighbor helped me to overcome the vulnerability soon.”

Conventionally, indigenous people built (*Machang house*) traditional house in their community but due to the increase of climate induced hazards, this house cannot sustain long time as this bamboo-wooden made house damaged or swift away to the strong wind of cyclone. For this why to adapt to the adverse situation and for making resilience to their community they build brick-built or semi-brick-built house that can protect natural hazards strongly.

In climatic events, social integration among indigenous people increases to a great extent. Every person tries to come forward to help each other and overcome any kind of hardship in the disasters. If any people cannot plant paddy in his field, other people help this people to plant paddy in the field. People also share crops, fruits, vegetables with each other in their community for removing hardship. To illustrate the matter, if any indigenous person gets bumper paddy in his field, he gives some of the paddy to other people and that people also give other products in exchange that he cultivates in his field. During the flood time, the people whose house is inundated takes shelter in neighbors' houses whose house is situated in higher places. The affected people stay at neighbors' house until the flood situation becomes improved. In this time, affected people use their house, toilet, kitchen etc. for their daily needs and the owner of the house behaves very cordially with these people. At flood time, affected people know how high the water can raise and on the basis of this, they make bamboo loft and keep valuable material on this place to protect from damage. To illustrate the matter, they keep their refrigerator, rice cooker, gas cylinders, some valuable furniture, and other utensils on the upper place where water cannot enter and they take shelter in other house where there is no water. They also keep some of their valuable materials such as gold ornaments, money, documents etc. in the bamboo tubes or in the ceiling of their houses so that it is not stolen or damaged in the water. Indigenous people also are sincere for the welfare of their community. They clean floors of schools, college, temples etc. after the flood collectively as the people of their community can find a good environment for getting education and other facilities.

About the adaptation in flood time, one of the interviewees said – *“During the flood, we take shelter in neighbor’s house where water cannot enter. We stay 2 to 3 days until the water of our house goes down. In this time, we bring our rice, vegetables, oil, salt etc. and daily utensils to their house and use their kitchen for cooking. Some other affected people also take shelter in this house and neighbors are very helpful to us during disaster periods. After improving the situation, we return to our houses and clean the room for living”*.

During the flood, some indigenous people migrate to other place such as in Rangamati and after the situation improved return to their previous place. Some people have relatives in city or other places where there happens no disaster. During the flood time, this people leave the affected place and take shelter in relatives house in other city or villages and return to their house after the improvement of flood situation.

About the adaptation in the distress of flood, one of the affected interviewees said – *“In the flood, our house got damaged and inundated in water. We took shelter in college building for 2/3 days. We made a bamboo-wooden loft inside the room and kept all valuables things on it including rice, electronic objects, money, ornaments, foods, etc. whichever could be damaged in water. We got free domestic animals from the sheds at this time as it could go to safe place to protect their lives. We kept goats and cows in the top of hill or upper place in the road as it could not inundated in water. Elderly people and children were given especial care so that they did not get inundated in flood water. We kept them in neighbor’s house where there was no risk of entering water and returned them back when water was going down.”*

Indigenous people during flood free their livestock from the sheds as it can take shelter in safest place to survive. They also keep their cows, goat in the top of the hill as these animals do not get inundated in the water. Along with this, they keep some of their materials such as furniture, clothes, daily material etc. on the top of hill to protect from flood water. Indigenous people preserve some dry foods for flood time such as puff rice, molasse, fried rice, biscuits, fruits, pure drinking water etc. as they can use it as contingency foods.

About the prevention of flood from entering house premises, one of the residents expressed his views in this way – *“Every year flood water enters our house including some of our neighbor houses. We plan to make an embankment near to our house to prevent the flood. We discuss with other neighbors and plan to raise fund for making embankment. I am the main planner of making the embankment and I also give more money to make the embankment. This embank can help us protect our house from inundation by flood water and sustain our house for long time”*.

In the past, most of the indigenous people do not have modern utensils such as gas cylinders, stove, water filter, rice cookers etc. and they depend on moveable oven for cooking in flood time. They kept this oven in upper place or up to a bamboo loft and cooked/prepared foods for family. They also preserved fuels such as dried branches of trees in store room as it could not become wet in flood/rain water. They used these fuels for preparing food during flood or heavy rain.

Table 5.1: Shows different climatic events/hazards and its impacts and coping strategies of indigenous people in the present and past

Climatic events/Hazards	Impacts and vulnerabilities	Adaptation and coping strategies in the present time	Adaptation and coping strategies in the past
Floods	Damage houses & crops; Flew away household utensils; Inundation of well and tube wells; Losses of livestock; Barrier to movement; Losses of business;	Adjust to alternative housing structure; Build small wall in front of door to protect flood; Use water resist materials to wall to protect flood; Use bamboo made higher loft to keep valuable assets; Make brick-built floor and 3/4 feet brick-built walls surrounding the house to protect flood; Make house upper place of hill to avoid flood; Take shelter to neighbors' house/school/colleges etc.; Make kitchen on bamboo and wooden loft above soil; Keep valuable assets in bamboo tubes or in ceiling; Keep household assets to the pick of hills; Shift children/elderly/disabled peoples in safe places; Take loan/relief to overcome vulnerability; Use raft of banana trees to evacuate from flood; Excavate canal to stop flood;	Take shelter in the store room in the apex of hill Keep household assets to the pick of hills; Use movable cooker for cooking Keep fuel in safe place for dry for cooking Eat less or 2/1 meals in a day for saving foods Cultivate crops/paddy only one time (winter) in a year to escape from damage Keep crops in upper place to avoid damage Build house where flood water cannot enter
Cyclones	Damage houses & crops; Injures human being; Losses of livestock; Swift away household utensils; Damages of trees;	Make houses to the slope of hill to protect wind; Plant trees surrounding house to protect from wind; Tighten roof with trees by rope to protect flown away; Adjust to alternative housing structure; Hang with bamboo of roof to defend flown away; Make house strong/brick build to protect cyclone; Take shelter to other house/school/ brick-built houses Keep attention on tv, radio, for weather forecast; Apply indigenous knowledge to perceive hazards; Pray to God to escape damage;	The height of the housing structure was low to escape from the strong flow of wind Depend on natural symbol (i.e., behaviors of animals, birds) to understand of recurrent cyclone as there was no available media at that time. Tighten the house with rope to big tree from swift away Stay in one corner of house to save themselves from the hurt of cyclone Villagers help to repair house if damaged in cyclone/typhon Cannot get governmental support/relief
Landslides	Broken down houses; Damage crop lands; Filled up sora/canal; Died/Injured human beings; Losses of livestock;	Keep axes, blades, knife in the house for evacuation; Shift safe place during excessive rain if house is near to hills; Stop cutting hills and extract stones underneath of soil; Inform the location to neighbors to evacuate during landslides over phone; Pray to God and keep aware during excessive raining;	Rarely happened landslides as people lives normally small hills/plain land During excessive rain people left hill and take shelter to neighbor's houses People seldom cut down hill indiscriminately for making house or other purposes

Thunder storms	Collapse houses; Damage trees; Died/injured human beings; Damage electronic appliances & others;	Take shelter in houses' During work in field, take shelter in bushy jungles or under big trees; Try to keep aware;	Thunderstorm was not so severe enough to kill human beings abruptly Only during raining it is happened and people can avoid it by taking shelter in house/safe place Unlike present, it is not happened in all seasons
Drought	Irrigation problems; Scarcity of water in canal/lowlands ; Problems in household activities;	Depend on modern technology i.e., power tiller, pump etc.; Dig deep tube well; Excavate canal to restore water; Use water economically; Search new wells/water source in hills/canals; Dig soil to search water in the hills;	Depend on rain for irrigation Though there is no rain and excessive hot weather in summer but there was water in the canal/sora due to high reservation quality of soil

Source: field work

In hilly area, landslide is such an event which does not give any time to overcome the danger, because it happens within a single twinkle of eyes that nothing can be done within this time. However, indigenous people whose house is near to hill take especial preparation to escape the danger of landslides especially in rainy season. They plant different types of wooden trees surrounding their house as it can protect soil of their house. In recent time, they plant Shibu trees circling their house as this tree protects their house from landslides. Indigenous people keep blades, axes, knives etc. inside the room all the time in order that they can instantly cut the wall/fence of their house and leave the room. They also inform their nearest neighbors about their location that they can come timely to evacuate them from the landslides. In this context, one of the elderly people said –

“My son asked me to keep ready blades, axes, knives etc. inside the room in the night as if during the landslides, we can escape cutting down fence/wall of the room. We pray all night during the heavy rain and cyclone to Buddha that every creature remains safe and secured in these disasters”.

In the past, indigenous people rarely experienced landslides as they live plain land or small hills in the hill tracts area. Moreover, people in the past did not cut down hills indiscriminately, and also did not extract stones underneath the soil illegally, so landslides happened very seldom. However, during excessive rain, if the people who live top of the hills seemed that it may be collapsed, took shelter in neighbor’s house to avoid the risk of landslides.

In CHT, it is very difficult to understand, when climatic extremities will occur or even it is difficult to perceive whether landslides will be occurred or not but people always try to remain aware about the disasters. People whose houses are close to hill are advised to take

shelter in brick-built houses if there occurs heavy rain for long time. They are also advised to take preparation to combat the events. In the heavy rain, the locality is covered with deep water and it is very difficult to move at this time as all roads go under water. In this time, those whose house are inside the community, find much difficulty to come to safer place. In this case, people phone them to take shelter in upper place and at suitable time they will be evacuated. About the evacuation from flood water, one of the respondents said –

“In flood water, we cannot move due to inundation of pavement road under water. In this time, we communicate with the affected people over phone and try to find solution to evacuate them. We observe the locality and try to find suitable place to evacuate them to. If there is current in the water, we manage banana trees or a sack full of bottles and asked victim to grab this in one hand and a rope with other hand and come to the safe place. We provide a rope to them to grab one side and keep other side in our hand. In this way, with the help of rope and banana tree, victim can be evacuated from the flood water. Sometimes we provide a very large bamboo to them and asked to come by grabbing this bamboo to the safest places. This bamboo can protect them from getting away with the strong current of the flood water.”

Indigenous people always try to overcome natural disaster in their own ways. They develop new idea to adapt to the adverse situation of the climate change extremities. To protect their house from flood water, they avoid to make their traditional houses and try to build house with brick and cement. If indigenous people do not have much money, they only make their ground of the house with brick, sand and cement. They also build the wall surrounding their house measuring two to three feet and make fence wall or tin wall above the brick-built wall. If they make fence wall from the ground, the flood can damage the wall within few years, and they may need to repair it again. They also make a small brick-built wall in front of the door as flood water cannot enter the room through the door. During the flood time, they close the door and put some mud below the door to stop the leakage as water cannot enter through the lower side of door. This method is very effective to prevent flood water to enter the room. One of the Chakma women said about this method –

“During flood time, water with mud and other wastage enter our room. To stop this wastage to enter our room, we close the door of our room during flood and cover the leakage underneath of the door with mud, so that flood water cannot enter the room. Indigenous people whose houses are at lower place and prone to the effect of flood follow this method to escape the suffering of flood water”.



Picture 5.1: Make temporary wall with this door to prevent flood water to enter room during flood



Picture 5.2: Make small wall to this door to protect flood water to enter room during flood

Indigenous people face acute scarcity of drinking water in the flood time as the soras/wells are gone under water and not suitable for collecting water. Tube well also is inundated in the flood water. They collect rain water by the help of banana leaves or tin and reserve it for drinking during the flood time.

Indigenous people take different training from the NGOs and governmental organizations. These training includes crops productions training, fish cultivation training, disaster management training, tree plantation, paddy and vegetable plantation training etc. which helps indigenous people especially women to be self-sufficient in the society and makes

aware to combat disaster in the community. Different development organizations provide this training to the indigenous women without taking any money. Moreover, agriculture officers sometimes instruct indigenous farmers to cultivate different crops more effectively to get bumper harvest.

Every words/mouza in indigenous community has a headman and karbary who are selected by the DC office and the following headman and karbary are selected by lineages. If anyone refuses to take the post of his/her father or brother then election may be held to select the new leaders. Three members work under the instruction of headman such as karbery, village police, members etc. Headman and karbary are given training on different issues in the DC office and instructed to solve different problems in their community. Headman and karbery help indigenous people by giving suggestions, even by money/relief to overcome different problems including disasters in their community. Along with this, headman collect tax from the community and send that to the DC office. Headman collects 5 BDT per acre land in CHT and gives it to the king. For this duty, he gets 1 BDT per acre lands that means if he collects tax of 500 acres land gets 500 BDT as commission. Headman also takes the role of judgement in the community if there occurs any conflict among community members. Headman hears the problems of two side and on the basis of information gives punishment and solves the problems in the community.

Along with this, headman as a community leader gives psychological supports to the disaster affected vulnerable people as they can overcome the vulnerability and make resilience soon.

5.6.1. Institutional response and recovery to disasters/hazards in CHT

In Bangladesh, the Disaster Management Act 2012, provides an outline about the function and plan about disaster management in local as well as national level. According to the Act, there are two administrative committee who monitor and co-ordinate activities and implement decision to disaster mitigation and adaptation from national and district/local level to the country. Apart from this, there is an inter-ministerial disaster management committee which is run by the experts and advisory committee nominated by honorable prime minister in the country. In Bangladesh, there is a ministry of disaster management and relief distribution which executes planning and decision during emergency periods along with monitoring the activities in disasters. The advisory committee of the ministry also formulate and implement plan and policy to protect disaster and mitigating losses in the disaster-prone area. District level disaster management committee work in both district and sub-district as well as root level with

the instruction and planning of national disaster management committee. The disaster management committee has gained much popularity for its effective planning, functions and monitoring for disaster management, disaster risk reduction and relief distribution throughout the country.

Deputy Commissioner (DC) is the head of a district, run district administration with the support of several representatives of sub-districts (thana/Upazila). Moreover, several unions form a thana (sub-district) and several villages form a union in the local administration. The district disaster management committee consists of several sectors such as Ansar and village defense party (VDP), local government engineering department, fire service and civil defense and so on apart from some NGOs and volunteers from the locality.

The chairman and members of upazila parisad (sub-district) and union parisad consult deputy commissioner (head of the district) about the hazards and possible damages in local level and bring fund for development and recover losses of the affected peoples. The general indigenous people do not have direct connection to the disaster management committee but they inform their distress to the local leaders to solve the problem. Local leaders support affected indigenous people to overcome their distress but the support which they get rarely fulfill their demands. Apart from this, local administration/disaster management committee provide relief and monetary support to the affected people but it seldom reaches to the remote area where communication system is bad. However, different local volunteer welfare organizations render support to affected people in terms of providing relief, foods, money, medicines, housing materials and so on. They search affected people even in remote area and help them to overcome adversity. These welfare organizations collect donations from rich and established indigenous people to run these organizations. Apart from this, some non-state organizations i.e., NGOs and international development organizations work for the welfare of indigenous people and support them in adversity for developing resilience in their community.

5.7. Discussion

Throughout the history, indigenous people have been following Buddhism as religion and worshiping nature and practicing holistic and spiritual knowledge generation after generation (Ahmed and Haq, 2019: 679). The Chakma people celebrate their largest religious festival “*Biju*” in the last day of Bengali year and the first two days of new Bengali year. The first day of Biju festival is called ‘*Full Biju*’ (Springtime festival), second day is Biju and third

day is called *Nuya Bojor* or *Gojja-Pojja* (Dawan, 2018:158; Kanungo, 2018: 191). In the '*Full Biju*' day, peoples of different ages wake up very early in the morning and collecting flowers from the garden, they decorate their room and other places. Fleeting altar is made in the river for worship and flowers are floated there. Peoples are seen to wear new dresses and moved into different places with joy. Young Chakma peoples in this day greet/salute elderly peoples and feed animals' different foods. Different traditional cakes, sweets, vegetables etc. (delicious foods) are prepared in every Chakma family and they offer this food to the community members according to their capability. '*Pajon Ton*' is one of the foods which is cooked with mixed vegetables and *sutki* fishes in these days. Chakma people believe that if they can feed seven families/houses' '*Pajon Ton*' then they may suffer less diseases in their lives (Dawan, 2018: 158; Kanungo, 2018: 191). Guests are also served family made wine such as *jogra*, *kanje* etc. in this day. Serving foods to other people are considered as a matter of luck to them in this day. People try to forget what classes they belong to irrespective of class, cast, rich, poor, young, old, gender etc. and meet one another to enjoy the days. In the *Gojja-Pojja Din*, devotees offer delicious foods, drinks etc. to religious leader in the temples to satisfy him. Devotees also take '*Ponchosil*' and '*Ashtochil*' along with hearing sacred speeches in the temple (Dawan, 2018: 158).

Indigenous people also worship nature including hill, river, sora, trees, and stones etc. In the community, collectively they have chosen a place or big trees or big stone and worship it as a God. They do worship different Gods and Goddess who have different names. Along with adoration to God and Goddess, they also consecrate pig or cock for the satisfaction of God. They do worship with music and after that they eat together and drink wine.

Chakma people are very much influenced by mainstream culture (Bengali culture) and very often buy mainstream foods such as *Jilapi*, *rosogolla*, *cakes*, *singara*, *samucha* and other items from the market and offer those during their religious function. Climate induced hazard has influenced indigenous people to practice more ritualistic activities compared to the previous time. People also increase their religious practices in disaster for escaping from the danger of disaster and religious leaders also encourage them for praying to escape from the evil power of disasters by satisfying God through prayer (Speranza et al., 2010:302). They follow the five principles of their religion and work accordingly, believing that if they can follow the rules of religion and pray to God, then disaster may not harm them and the evil power of disasters will be disappeared from their community. These religious

prayer/activities will remove their pressure and risk of disaster and bring betterment for their family and community (Leonard et al., 2013).

They believe that due to the increase of evil works in the globe, disasters are increased and only doing ritualistic activities and satisfying God, this problem can be solved. In their religion, slaughtering animal is considered as great sin, so, they avoid slaughtering animals and do not buy slaughtered animal from the market. Chakma people believe that if God blesses them, then disasters could not harm them. During our interview, they showed some evidences that due to having bless by God, they escaped from the harm of disasters in their locality. In order to perform religious activities properly, every family in indigenous community donates 2 USD in every month and if any person died in their community, 176 USD are provided to the deceased persons' family to perform ritualistic/funeral activities properly and also offer sacred object to the soul of demised person for the beatitude of that person. This money is also provided to the disaster affected family to overcome the vulnerability in the disasters.

For ecological understanding and management at local level, indigenous knowledge is very important as that knowledge has been tested, adapted, and accumulated through several generation of a particular local community (Ens et al., 2015; Raymond et al., 2010). So, certification of traditional knowledge is essential for the traditional knowledge holders to utilize, promote and implement the knowledge effectively in right situation (Ens et al., 2015; Langton and Ma Rhea 2005). In CHT, indigenous people have knowledge to perceive about the recurring hazards after seeing the signs and symbols of the nature. This local indigenous knowledge can be helpful to strengthen the local adaptive capacity of vulnerable indigenous people in vulnerable regions during natural hazards (Ahmed and Haq, 2019: 679; Garai, 2017). Indigenous people, especially, elderly people can understand what can be happened after seeing the behaviors of animals and other natural species (Petheram et al., 2010:686). According to the elderly indigenous people, if the cloud in the sky moves swiftly, there may be the possibility of occurring cyclone, but if the cloud moves slowly, then the possibility of occurring cyclone is more and it may be strong (Speranza et al., 2010: 298; Luseno et al., 2003). However, if the cloud looks black, dense and it moves slowly, there is the possibility of heavy rain. Indigenous people also believe that if birds/insects are seen moving here and there with chirrup/certain noises and wild animals in the forest behave abnormally (Speranza et al., 2010: 305) it may symbolize that hazard may be occurred in their community. The certain noises made by millipedes and crickets at night also indicate disasters like drought in the locality. Some domestic animals' behaviors such as poultry and cattle are looking hungry

all the time and fighting for foods also symbolize the recurring drought in the community. Moreover, finding too much honey in the beehives demonstrates that raining will be less in the following season in that locality (Speranza et al., 2010).

Moreover, if they see that wind is blowing from the east side of the sky and drizzling is lasting for several days, they perceive that cyclone or landslides may be occurred in their locality. Densely black cloud in the western corners of the sky symbolizes the imminent nor' wester (typhoon) in their locality (Garai, 2017). This knowledge and perception are very important for their community as they can make themselves prepared to combat these hazards and minimize the losses of their life and properties. This profound knowledge can facilitate effective adaptation in indigenous community but the lack of attention and negligence of government to nurture this knowledge may disappear this knowledge in near future that might be a great loss in management of disaster science and policy (Kodirekkala, 2018: 301; Speranza et al., 2010: 297).

Due to the impacts of climate induced extremities, along with the influence of mainstream culture, indigenous people are changing their tradition or adjusting to their biocultural knowledge of their locality (Ens et al., 2015:135). In the present time, the expansion of education has influenced Chakma people to send their children to school but their previous generation never thought to send their children to school because they had no scarcity of food in their house (Ahmed and Haq, 2019: 679). In their childhood, they used to graze in the field for feeding livestock and after working 4 to 5 months, they could manage foods for whole years and the rest of the months in the year, they could pass life singing, gossiping, visiting relatives, dancing, playing etc. But, due to climatic events, they cannot manage foods for whole years now (Ahmed and Haq, 2019: 679). So, they have to find out alternative ways to earn money. They send their children to school so that they can get good job to solve their financial problems. Traditionally, indigenous people depend on natural resources for their livelihoods but climatic events have (Jacob, 2010:63) reduced this to a great extent. So, indigenous people try to search alternative subsistence and try to adjust with mainstream culture for survival (Ahmed and Haq, 2019). Moreover, due to living side by side with the mainstream people, indigenous people have to follow mainstream culture which influences their traditional life and ritualistic activities i.e., indigenous people celebrate their ritual more luminously than previous time and establishes more temples for prayer in their locality alike the mainstream people.

Dependency on natural resources for subsistence and hunting and gathering in the hill/jungles are the main tradition to indigenous people, but all of these are in the verge of extinction now (Jacob, 2010:871). Climate induced natural hazards, together with

anthropogenic impacts are the main causes for the shortages of natural resources and supply of traditional foods in the forest/hills (Ahmed and Haq, 2019; Jacob, 2010:871). So indigenous people are compelled to adjust their food habits from traditional forest based-foods to market-based mainstream foods (Ahmed and Haq, 2019; Rahman and Alam, 2016). In the past, indigenous community were like self-sufficient village community as they could manage/produce all necessary commodities in their community or collect from forest except salt and oil (Petheram et al., 2010:686). In the recent years, the trends have been reversed and most of the daily needs of their family are collected from market which contributes to the change in their foods habit.

Indigenous people make different traditional and delicious cakes such as *Nappi*, *Sidol*, etc. in their house during *Biju* functions and community members enjoy these foods visiting different houses. They have distinct foods cooking methods and unique condiment/spices such as *Sabarang*, *Fuzi*, and *Nappi* which are very favorite to them. Moreover, they have 14 types of cooking methods including *puja*, *sikka*, *kabang*, *uchha*, *gorang*, *gudaia*, *tabadda*, *khola*, *gojja*, *ranna*, *pogontodda*, *jhul*, *korbo*, *gabi* etc. These cooking methods reveal their cultural enrichment (Dawan, 2018). However, due to availability of different delicious Bengali foods in the market, Chakma people many often buy these foods avoiding to make their traditional foods. So, these foods are losing the interest in their culture. Climatic and environmental factors also influence this change in their life (Kodirekkala, 2018:301; Adger et al., 2013). However, different local indigenous associations are trying to uphold their tradition from the extinction.

Indigenous knowledge/tradition are not static and are continuously adjusted by the influence of other culture, social, economic, political, and environmental factors (Ens et al., 2015:136). Indigenous people have distinct dress, traditional games, and language which represent their culture, but all of these are now gradually disappeared due to the influence of mainstream culture and the adverse situation in their community. Though indigenous dress has lost its appeal in indigenous community but it attracts the tourists who pay visit in indigenous community. So, indigenous people get an opportunity for marketing their traditional dress in mainstream society.

Indigenous people are hard worker and can produce mass production, but they are not well planner for marketing. Chakma people has no tendency to accumulate much profit and they do not apply any trick to get more profit as they sell their products in less profit if they find any customers (Dawan, 2018:117). Middleman takes this opportunity by buying products from Chakma in cheap rates and selling that in high prices in the market to accumulate much

profit. They have idleness to sell their products in the market with profitable prices, even, they are seen to share their excessive products among their relatives and neighbors freely. However, recently, their old perception has been changed a bit more and they are selling their commodity to the community and also disseminate it to other community to extend its demand for more profit (Dawan, 2018:117). The culture of mainstream society has influenced them highly to change their old perceptions.

Over the last few decades, indigenous people have been struggling to overcome the climate induced events, especially, having least resources and facing socio-economic and environmental impacts (Leonard et al., 2013; Ens et al., 2015:143). They try to utilize their savings if they have, otherwise, they have to depend on relief from government or other organizations. The local political leaders as well as administration are not supportive to help these affected people. However, if affected people get relief that are not sufficient to overcome the economic vulnerability from the extremities. Sometimes due the corruptions, real affected people are deprived from getting relief but the relatives and friends of local leader get the relief, even though they are not affected in the events. It is true that the budget that local leader get for distribution is not sufficient comparing the total affected people of a locality, but that are rarely distributed equally to the affected people. However, some NGOs such as BRAC, UNICEF, Podhokhap, etc. and some volunteer organizations, business associations, development firm, student associations work to combat disaster and development in the locality. Headman and karbary are sometimes cordial to support the affected people as they inform local administration to provide support to the affected people in their locality.

Local administration as well as leaders in CHT are very much cunning and corrupted as they do not provide relief to the affected people visiting the spots due to risk and poor communication system. They provide relief to the affected people near to the city and try to cover that through media to highlight their activities to the government, but in reality, their support hardly fulfils the demand of the affected people in hazards. However, indigenous people do not want relief in climatic events but urge to stop the root causes of extremities in their locality.

Multidimensional discriminations have been experienced by indigenous people in CHT which may be caused in the form of ethnicity, race, class, caste, gender or religious basis (Petheram et al., 2010:684). In CHT, there is so called class system which creates fraction in the community. Indigenous women face two folds more discrimination than mainstream women for being more destitute and vulnerable. They have become the main target to the eviction from land due to their marginality and vulnerable situation in the community

(Petheram et al., 2010:684; Kodirekkala, 2018:300; Ramos-Castillo et al., 2017). Indigenous women also experience sexual harassment and hardly get economic supports or loans to overcome their vulnerability, even, face problems for marketing their produced products/crops due to their weak position in the community. These women are also seen to be more destitute being lost their land and separating from nature, hill and forest as land is considered the main source of their life.

Indigenous people consider land as sacred object and they worship it with great care (Jacob, 2010:866). Indigenous custom does not support to exchange or sell land and they have personal and collective ownership to the lands. After long time living and cultivating a piece of land for several years, they can gain the right to the land and establish their ownership over the land. They do not need any document for ownership. The traditional land management depends on oral management system. The decision of village authority is effective to get the acknowledgement of ownership. As most of the indigenous people in the past could not read and write, documentation of lands was considered as worthless system to them. Indigenous people are exploited by the mainstream settler people who come in CHT from different parts of Bangladesh and sometimes forcefully grab land from the destitute indigenous people. Lacking documentation of ownership, indigenous people many often face problem for claiming their ownership of grabbed land.

Indigenous people take the exploitation and social discrimination in two ways; either they resist against this or endure it being weak in position. The past history of indigenous people indicated that they formed armed force to resist the exploitation and conducted guerrilla warfare. However, that was stopped after doing negotiation and signing treaty with government. During the exploitation in CHT, permanent Bengali people helped them to get justice by getting attention of government. However sometimes, indigenous people cannot get any support from the law enforcement authority and many of them are migrating to India or other places to escape from the hardships and social discrimination. Some people migrate to plain lands and work in industries losing everything in their locality to start their life newly (Petheram et al., 2010:687). Many of the indigenous people follow religious rules and practice rituals to relieve their pain and adapt to the adverse situation.

During and after the climate induced extremity, indigenous people face different types of problems in term of destruction of houses/infrastructures, scarcity of foods, emergency needs and so on. The most vulnerable forest dependent indigenous people need to adapt making resilience to multiple stresses in adverse situation. Indigenous knowledge is

unique to a culture or society which is acquired through the experience of local peoples' accumulation from generation to generation (Petheram et al., 2010:682; SCRGSP 2009). During and post climatic events, the most important needs to this people is money to repair house and to buy other important materials for their household which can be collected from their saving, or taking loan from NGOs, relief or borrowing money from relatives and try to overcome their vulnerability. (Garai,2014:161). Some philanthropists sometimes give loan or CNG to young indigenous people to solve their economic deficiency in the family after the climatic events. Moreover, to overcome the economic vulnerability, both men and women work in the community. Men may work as wage labor or wood businessmen to maintain their family and women work knitting traditional fabrics to sell in the market and to pay the instalment of loan or costing other development work in the family.

Indigenous people have strong communal feelings to the member of their community. So, after disaster, all people come forward to help the affected peoples (Petheram et al., 2010). For examples, if any peoples' house is damaged in cyclone, solvent people provide money to repair the house. Some people provide wood, bamboo, even, those who have nothing provide labor to repair the house of the affected people. Moreover, during the disaster (flood & cyclone), those whose houses are weak can take shelter in neighbor's house and stay there and use their resources until the situation become normal (Petheram et al., 2010). Indigenous people also help each other in cultivating in the field (Leonard et al., 2013: 629) in distress along with sharing/exchanging foods or bartering different items among the family to overcome vulnerability and get resilience (Leonard et al., 2013:687; Petheram et al., 2010).

During flood, indigenous people usually free their livestock from the sheds to give them scope to take shelter in safest place. They also keep their cows, goats, buffalos, pork etc. on the road sides or the apex of the hill where water cannot clog up and affect them. Moreover, they keep some of their belongings such as furniture, clothes, daily material etc. on the top of the hill to protect from flood water. Indigenous people conserve some dry foods such as puff rice, molasse, fried rice, biscuits, fruits, pure drinking water etc. as contingency foods for using in climatic events. Sometimes, they make bamboo-wooden loft inside the room and keep all valuables household materials there to protect damage of flood water. Some indigenous peoples keep their valuable material i.e., gold ornament, money, documents in bamboo tubes and keep inside the ceiling for more security (Garai, 2017).

Indigenous peoples always apply their traditional knowledge to overcome the effects of climatic events. Throughout the history, they have developed new idea to adapt the adverse situation to enhance resilience in their community. They have adjusted their traditional

housing structure in order to escape from the flood water and are trying to make brick-built house in the community. If they are not economically solvent, they only make the ground of their house with brick, sand and cement. A small wall (3 to 4 feet high) is constructed surrounding their house and above the wall, bamboo made fence or tin/wood made wall are constructed which may last for long time as flood water cannot damage it easily. Moreover, the small brick-built wall below the bamboo/wooden/tin made wall can protect flood water to enter their room. They also make a small brick-built wall in front of the door as flood water cannot enter the room through the underground of door. During the flood time, they close the door and put some mud below the door to stop the leakage so that water cannot enter through the lower side of door. This method is very effective to protect flood water to enter the room. However, economically solvent people can build fully brick-built house to avoid the suffering of flood and cyclone (Petheram et al., 2010).

Landslides is such a disaster which is unpredictable to think when it would be happened, however, the peoples who stay near the hills usually take special preparation to combat landslides in rainy season. They plant wooden trees surrounding their house so that soil composition become strong enough to protect landslides. Recently, indigenous people plant Shibu trees surrounding their house to protect from landslide. Indigenous people keep blades, axes, knives etc. inside the room all the time so that they may instantly cut the wall/fence of their house and escape from the room. They also keep mobile phone to inform other about their position for evacuation from the landslides in emergency situation. Moreover, during the long-time heavy rain, these people take shelter to neighbors' house to avoid the risk of landslides.

Apart from this, indigenous people, especially, women take different training to combat climatic events including training for crops productions, fish cultivation, disaster management, tree plantation, paddy and vegetable plantation etc. from different NGOs, volunteer organizations, and so on (Garai 2014: 162).

Chapter 6: The Impact of Covid-19 Pandemic and Local Responses from Indigenous People

Conducting ethnographic field work is always challenging and this challenge may increase manifold during pandemic situation. Being an ethnographer of mainstream society and conducting field work in indigenous community where peoples would like to assume the mainstream society as dominators make this study more complex. Moreover, collecting data from different/unknown settings regarding environment, foods, religion, culture, peoples and especially language, aggravates the challenge. Anyway, these challenges very often provide ethnographer exciting information to write his/her chapters. In the point of view of validity and reliability, conducting ethnographic field work may seem unsuitable in pandemic situation, because ethnographic study requires interviewing the participants and the respondents as well as their families more closely to know that society and peoples comprehensively, but pandemic situation especially Covid-19 does not allow such practice at present. In my case, I designed my research project before September 2020, and it was about the adaptation and resilience of indigenous peoples to climate change but during my field work the outbreak of Covid-19 compelled me to redesign my research topics. In this case, I am greatly indebted to my chief supervisor Dr. Ku Hok-Bun, Ben, who encouraged and supervised me to conduct the study on Covid-19 in the pandemic situation. Being encouraged by my chief supervisor, I write this chapter and in this case my student Amlan Chakma (belonging to indigenous community) helped me a lot providing information about the indigenous community. During the middle of my ethnographic field work, due to the outbreak of Covid-19 and the widescale lockdown afterwards, I faced huge problems to conduct fieldwork. Indigenous people also adopted lockdown and did not even allow their community people to enter living in the city let alone the outsiders. Being an outsider, I could not get access to the community but at that time I collected information with the help of my student through online/mobile phone. Afterwards, when the lockdown was relaxed due to the waning of infection rates of Covid-19 across the country, I got access to the community and resumed my ethnographic field work maintaining safety measures.

6.1. Perceptions of Indigenous People Toward Covid-19

First the news of Covid-19 spread out to the indigenous community by mass media such as television, radio, newspapers and other news portals. Some indigenous people also gossiped about the virus in the community. At first, indigenous peoples did not give much heed to this virus because it was then only found out in China and not in Bangladesh and elsewhere. Moreover, they had come to know that it spreads out in winter season in cold weather. Therefore, in Bangladesh, it could not become more severe as winter comes here only for two months. Moreover, the virus first appeared in Bangladesh at the early days of Summer. So indigenous people could not find anything worrying in the initial stage. In this context, one of the indigenous interviewees said –

“When the corona virus was detected at Wuhan in China first, we got the news from television and thought that it might not come in Bangladesh due to the prevalence of hot weather. We felt much sympathy for the inhabitants of China who were infected by the virus. From the media, we had also come to know that wearing mask could protect the spread of this virus from human beings to human beings. Unfortunately, when the virus was first detected in Bangladesh in March, it also spread out speedily and make devastating situation in Bangladesh. At first, we felt worried about the virus because we did not know anything about the nature of the virus but after getting the news from the government, we tried to follow that to protect ourselves from the virus.”

About the spread of Novel coronavirus, an indigenous Chakma young lady said –
“I came to know about the virus through Face book and TV. My father regularly hears news on TV tuning loud sound and it can be heard from my room. To be honest, I did not pay heed about the virus at the first stage seeming that it is like a malaria disease. Moreover, this disease might come to Bangladesh, could not even be imagined, although I sympathized with the people of China who got affected by this disease. My father is very sincere and when he heard that this virus is spreading out all over the world crossing the borders and for protection from the virus wearing mask and washing hands with soaps several times are necessary, he asked me to do so. But I never tried to do that taking it as a simple issue. Anyway, when it was detected in Bangladesh and started spreading out speedily, and my father scolded me frequently, I was bound to wear mask and follow other rules to protect myself from the virus. Finally, I understood the severe façade of the virus and tried to keep myself protected.”

In CHT, when the indigenous people first heard about the virus mixed reactions were found among the people. Some people did not pay heed to the virus thinking that it might

not appear in Bangladesh, but some people took it seriously from the initial stage when they saw that this virus gradually was spreading out all over the world. On March 8, 2020 when the first infected patient of corona virus was detected in Bangladesh and the detection rate was gradually increasing, both the mainstream and indigenous community got terrified.

From the interpretation of transcript about the perception of Covid-19, one of the elderlies among the indigenous peoples has been found saying – *“Covid-19 is the curse of God. Peoples all over the world do a lot of sins and they do not obey God, so God send this disease to the universe. Nature is the sacred object where God exists, but people exploit the nature excessively and destruct the environment, so nature takes revenge by giving this disease to the human beings”* He further uttered – *“If we want to live peacefully in the universe, we need to satisfy God by prayer and also need to stop exploitation of nature, then we can escape from the curse and revenge of God and nature, otherwise we can be vanished from the universe.”*

Indigenous peoples believe that Novel Corona virus is nothing but the curse of God and being angry to humankind, God sends this virus to the universe due to increasing the unsocial and evil activities in the earth. Moreover, nature is the creation of God which is now in distress position due to the frequent extraction of excessive natural resources and indiscriminately contaminated the environment. So, nature also takes the revenge by offering this deadly disease/virus to the human beings that compel them (human beings) to confine in houses and restrict them to exploit the motherly universe. Indigenous religious leader as well as elderly people believe that the universe could be return to the normal ways and the virus might be disappeared if people satisfy God by following ritualistic activities and prayer, along with discontinuing all evil tasks from now. They also believe that people’s mentality especially the people of developed countries who exploit nature excessively for more capital accumulation should be changed and might be considered the earth as mother. Thus, the situation become normal again and people can resume their life soundly.

6.2. Impacts and Vulnerabilities of Covid-19 on Indigenous People

During the middle of my ethnographic fieldwork when the Novel corona virus outbreaked in Bangladesh, alike the mainstream people, indigenous people had no comprehensive knowledge about the virus because it was the first time for the people of Bangladesh as well as to the world. So, when the first patient of Covid-19 was detected in Bangladesh, people became worried across the country about what should they do for protection. Having no knowledge about the nature of the virus, people kept keen eyes on the

government information and guideline but sometimes the contradictory guidelines of government made people confused about their dos and don'ts regarding the protection from the virus. When the first patient of Covid-19 was detected in Bangladesh, I still continued my ethnographic field work wearing mask and following other safety measures. However, when the government announced lockdown across the country, I had to pause my field work for few days due to the restriction of movement and access to indigenous community. During this time, indigenous people got panicked and took different steps following their indigenous knowledge and wisdom and many of them went to temple for prayer to escape the adversity.

6.2.1. Disruption of livelihoods and income generating activities in CHT

Indigenous people are not only affected by climate induced hazards but also the outbreak of Covid-19. Most of the people in CHT depend on natural resources and agricultural activities for their subsistence but the imposition of lockdown and restriction of movement make their subsistence difficult to manage. From the interpretation of transcript, it is found that indigenous people depend on natural resources which are depleting day by day due to climate change and anthropogenic causes. Livelihood of these people is already under threat, on top of that the lockdown to curb the spread of Covid-19 has worsened this situation because many of them live on hand to mouth for their subsistence. During the lockdown time, this people cannot go out for working and face a great problem in their life. In this context, one of the indigenous people demonstrates – *“Due to lockdown, they are confined to house and cannot do any income generated activities for family. They also cannot sell their own produced vegetables, crops and also cannot buy their daily commodity due to lockdown and lead a very miserable life in the community. Sometimes, they can sell some agro-products but the price is very cheap but the products which they buy are expensive”*.

Moreover, due to the shutdown of shops, they cannot buy their necessary materials from the market. Those who produce vegetables and fruits cannot sell that in the market and it becomes rotten in the fields and also cannot buy their necessary agricultural inputs such as fertilizers and pesticides to use in their fields. Sometimes, indigenous people can sell their vegetables to the local people but the price is very low because they cannot bring it to the city for the real price. However, when they buy any daily commodity, they need to pay more money compared to the real price. In this context, one of the indigenous farmers said – *“Due to the imposition of lockdown, we cannot sell our vegetables, crops, and fruits in the market, so we need to sell it 4 to 5 times cheaper to the local people. Now, I think if I cannot sell these products, I have to throw them away as the communication is totally restricted in the*

locality. I am also worried that little amount of foods are reserved in our house, if this lockdown continues for long time, we have to starve without any food.”

About the Covid-19 outbreak and lockdown, one of the Chakma workers in foot wear factory said – *“I have two children and wife who live in Chittagong city for 8 years. Due to frequent hazards, we migrated to the city and led a very good life but because of the outbreak of Covid-19 the owner of the factory closed the factory and I lost the job. It is very difficult for us to sustain in city without job because we have to bear the rent of house and also the tuition fees of my son. So, we decided to return to village but faced a lot of problems in the road from law enforcement authority. So, we started to walk for village through the jungle and it took two days to return to the village. After coming to village, we had to undergo 14 days quarantine and after that we became able to go back to our house. We feel very worried about our future because we have already spent our saving for living but have nothing to maintain the cost of family. We do not know when this virus will be vanished and how long will be able to survive without any job in the village. People do not even offer me any laborious work as I have returned from city, so lead a very miserable life in the community”.*

Rangamati is one of the most attractive tourist places in Bangladesh and many indigenous people in this locality directly or indirectly get some earning from this industry. To illustrate the matter, we can take the sample of the women in Chakma community who weave some traditional fabrics such as *khadi*, *penon*, etc. and sell that in local markets. The tourists who come from different parts of Bangladesh buy these products with great attraction but due to the outbreak of this disease people are not allowed to come in Rangamati and women also cannot sell their products to the market. In this context, one of the Chakma women demonstrates –

“We knit different traditional dresses in our community and also get some orders from the businessman, but due to lockdown and the outbreak of Covid-19, we cannot get any order from the businessmen. Due to hazards, over the last few decades we need to struggle to maintain our family cost, so knitting traditional fabrics give us a very good income sources to maintain our family but now this is also stopped along with the stoppage of other income sources in our community. Though income sources are waning but the cost has increased as we need to buy all things with two to three times more prices compared to the real prices.”

A large number of indigenous women work in garment factories in Chittagong and Dhaka for their subsistence. When the government and owner of factory got bound to close down those factories, these workers saw no other option than returning to village though there were high chances of getting infections. Because without jobs, it is not possible for them to

stay in city and eventually they become vulnerable both psychologically and physically in their community. These migrant workers also face harassment and exploitation from the political leaders in their community as they may be the causes of risks of infection in their community. So, these indigenous women not only lost their jobs but also faced excruciating situation in their community, along with the possibility of getting infections.

In the past, indigenous people have plenty of foods in the houses, and they never worried about the foods but the hazards that frequently happened over the last few decades made them worry about the foods. Moreover, this pandemic makes their life more vulnerable as they lose their subsistence. Living in remote area and facing the restriction of movement, they cannot get sufficient prices of their products and consequently they hardly manage their basic foods in every day. So, they have to cut down their daily meals from three to two even one on some days in lockdown situation. They also try to change their food habits, as they lose the capability to buy rice and vegetables from the market due to restricted income and ultimately depend on wild potatoes, herbs, different branches of trees, leaves, lettuce and other wild foods from the hills and forests for daily meals. Though at the initial stage, they were very much worried about the corona virus but they are now much worried about their foods rather than corona virus. In this context, one of the Chakma people states –

“We are much worried about our starvation rather than corona virus as we have no foods in our house. If this lockdown continues for more days, then we have to die without getting foods. We cannot find any ways about how to get foods because due to imposition of lockdown, we cannot go out for income. However, if we go out law enforcement authority scold us even beat for coming out from the house but they do not want to know that we have no food and no money for subsistence in the community”.

Traditionally, indigenous people live in collective way that means they always work collectively and after the work they also gossip in group because the bondage and integration is very high among the community members. Moreover, their way of life such as religious festivals, marriage ceremony, burial functions, harvesting activities etc. are done in collective ways, that are now restricted due to pandemic situation and it severely affects their psychological and physical health.

6.2.2. Deprivation of getting modern health services among indigenous people in CHT

Indigenous people in CHT are very much vulnerable to Covid-19 due to their structural inequality and having less facilities. Living in very remote area and having poor communication system, they cannot get sufficient information about the Novel Corona virus.

Moreover, the constraints of communication limit them to access to expert doctors for getting treatment. During the outbreak of Covid-19 of the first three to four months, indigenous people had not sufficient access to hygienic materials such as mask, hand sanitizer, PPEs (Personal Protective Equipment), gloves and other health related materials as the prices of these products increased 10 folds higher than the real prices and also were unavailable in the local market of their community. Indigenous people used mask by making their own knowledge and used soap instead of hand sanitizer in their community due to high prices and unavailability in the market. About the crucial sanitation system one of the respondents said – *“Due to the outbreak of virus, I wanted to buy masks and hand sanitizers from the pharmacy but could not buy that due to unavailability in the shops. I found it after searching several shops but the prices were 10 folds more than the real prices which were beyond the capability of mine to buy.”*

Many of the Indigenous people in CHT live in remote area where people are not much aware about the health and Covid-19. If any indigenous people feel sick, due to poor communication system they cannot become able to consult expert doctors. Moreover, in their locality there is no medical health center for getting treatment. Many a time, it is seen that indigenous people consult traditional healers such as *Kabiraj/bodhya* for getting treatment depending on traditional medicines. During this pandemic situation, there is hardly found any facility to test Covid-19 and provide good treatment. If any people get affected, it takes several days to do test and get the report, even sometimes not possible to do test. In addition, there is much shortage of hygienic materials such as hand sanitizers, masks, gloves, clean water and other dis-infectious materials which are liable to spread out corona virus quickly in the community. There are some villages in the indigenous community where there are no pavement roads for communication. Two to three canals or sora need to be crossed along with hills to reach the main road to take vehicle for reaching hospital. So, it is very difficult to get basic treatment let alone the standard treatments of indigenous people in the locality. Moreover, being poor and uneducated, indigenous people are not much aware about their health and most of the time they get treatment from traditional healers in their community. They also depend on traditional medicines for treatment and only when they feel severity of any disease, they go to city to consult expert doctors. About the medical treatment system, one of the indigenous interviewees demonstrated - *“The hospital is far away from our community and it is expensive for us to get treatment. We go to traditional healers for getting treatment and depend on traditional medicines for treatment.”*

During the Covid-19 pandemic and lockdown period, no indigenous people are permitted to go out from the community even to the hospital for getting treatment. If any people

go outside of the community even to the hospital, then she/he needs to undergo quarantine for 14 days before entering the community. During the lockdown, if any person feels sick, they need to consult faith healers inside the community but are not allowed to consult outside doctors as there is the chance of getting in touch of the corona virus in the community. About this one of the Chakma women demonstrated – *“During the lockdown, my son felt pain in the stomach and we planned to bring him hospital but the village leader impeded us to go to hospital saying that in the hospital there might be the risk of infection of Covid-19, so got bound to consult a faith healer in the community. Moreover, as my son was sick so other villagers did not come to our house and kept us in quarantine for few days during the lockdown thinking that my son was affected by corona virus. Anyway, after getting treatment from the traditional healer, my son became well”*.

6.2.3. Impacts of price hikes on indigenous people during lockdown and pandemic situation

Due to the outbreak of virus and lockdown situation, the price of every product increased a lot in CHT. Shopkeepers claim that due to limited access of products in the market, prices are higher of the products. Though the local administration tries to strictly implement the law, the situation of price hiking is still out of control of the general people. About the price hikes, one of the Chakma people uttered – *“The price of 5 BDT for a mask reached 40-50 BDT, 90 BDT hand wash became 300-350 BDT which are essential to buy at that time but it is out of control to general people. The price of foods and other products have also increased a lot. We have different vegetables and fruits but we cannot bring that to the market due to no movement of vehicles. It is not possible to take that in the market for selling as it is restricted by government. However, local small-scale businessmen buy papaya at 8 BDT which original price is 18-20 BDT. The khadi of banana is sold 10-12 BDT but the original price is 50-60 BDT. So could you please inform me how general peoples buy and sell this to maintain their family?”*

Another respondent demonstrated – *“Normally, in every pharmacy we can get surgical mask by 3 BDT but during the outbreak of Covid-19, we cannot find any masks in the shop. Shop keepers said that all were sold out along with other products such as hand sanitizer, gloves, goggles etc. Few days later, we got mask in the shop but the price was 40-50 BDT which was beyond the capacity of purchase. On the other hand, if BGB (Bangladesh Border Guard) and military found us without mask, they scolded us and even punished physically. We also cannot sell our products in market due to the lockdown, so it is difficult to buy other necessary products due to scarcity of money and many of our products become rotten in the*

field. On the one hand, price is rapidly hiked, on the other hand, our income sources are stopped that affect our daily needs and living activities. Moreover, along with the threat of this virus, price hikes and the activities of law enforcement authority make our lives more vulnerable during the outbreak of corona virus.”

Sudden lockdown and sudden spread out of this unknown virus create panic among the mind of indigenous people. Many of the Chakma people in this time cannot find out what they should do to overcome the vulnerability. Many indigenous people have crops and fruits but cannot sell that and also cannot buy necessary commodities due to the close down of market and vehicles. Community people even are prohibited to visit other villages near to them. So indigenous farmers face great problems to sell their products. In this context, one of the farmers said – *“Imposition of lockdown brings unprecedented losses to our family in the community. I have a garden of banana trees where there are many bananas khadi enough to sell in the market. Prior to lockdown, I sold every banana khadi at 70-80 BDT but due to lockdown, I have to sell that at 15-20 BDT. Considering the situation, I am happy to sell the banana, otherwise, I could not get any money from the cultivation and all banana would become rotten. Those who have pineapple cultivation, get a much profit as when the lockdown is relaxed, they sell per piece at 8-10 BDT and get a much profit at that time.”*

6.2.4. Deprivation of education in pandemic situations

Due to the lockdown and closure of educational institutions, children and young people are deprived of getting formal education. Living in remote area and not being aware about the education, a large proportion of indigenous people are deprived of getting education in CHT. During the pandemic, government introduces educational program on television and internet but because of poor network and unavailability of televisions among many families in indigenous community, children and young people get deprived of getting education. At the higher education levels, classes are offered online and those who have computer/smart phones and internet facility can participate in the class. In this context, indigenous students are also deprived because being hard core poor people, most of the Chakma indigenous students do not have smart phones and internet facility. Smartphone is considered to them as luxury product. However, those who have smart phones cannot get access to the internet connection due to poor network system in the hilly area of the community. During our interview, this is found that some students climb to roof top of buildings or the high trees to get good internet connection to access the class. Many of these indigenous students stayed in university

residential halls for their education during the running of university at cheap cost, but they had to return to their village when university was closed down to curb the spread of corona virus.

About the access of education during Covid-19, one of the indigenous students claimed – *“We find difficulty to manage money to buy foods for our family. Having a smart phone/computer to get access to classes along with internet connection is a day dream to us. Before the Covid-19, we had to struggle to buy educational instruments such as exercise books (khata), pen, pencil, etc. and paying tuition fees, so accessing online class through electronic devices are very difficult for us.”*

Tables 6.1: Impacts and vulnerabilities of indigenous people to Covid-19

Types of vulnerabilities	Impacts and vulnerabilities of indigenous people to Covid-19
Economic & subsistence	Threat of traditional livelihoods; Loss of income generating activities; Cannot sell and buy products in the market; Crops/vegetables are rotten and damaged in the fields; Price hiked and unable to buy necessary products; Loss of jobs; Impede to wave/knit and sell traditional dresses;
Deprivation of health-related services	Limited access to expert doctors; Limited access to hygienic material, i.e., masks, sanitizer, PPE etc.; No medical health center in the locality; Have to depend on traditional healers/having amulet; No facilities to Covid-19 test and tracing system; Have no awareness about health;
Deprivation of education	Deprivation from getting formal education; Have limited access of online education through TV/internet; Having less aware about getting education; Poor network system to get access of internet/mobile; Limited access to smart phone/computer/TV; Less capability to meet educational expenditures;
Disruption of culture & tradition	Disruption of cultural gathering such as harvesting crops, marriage ceremony, celebrating religious function, gossiping etc.; Elderly people are the savior of traditional knowledge, wisdom and expertise but they are under the great risk of Covid-19; Chakma language is under great threat as elderly people are the main users;
Land grabbing and violations	Land is grabbed by settler people; Due to lockdown, cannot get media coverage and support from law enforcement authority; Widow and destitute women loss their lands/belongings;
Misinformation/rumor	Misguided and cheated by faith healers/ <i>Kabiraj</i> with fake medicines; Usage of amulet to protect virus; Buying traditional medicines with high prices; Taking excessive wine as corona medicine and become sick;
Relief/supports	Getting limited support from govt/NGOs in lockdown periods; Deprived from getting relief/ loan; Unequal distribution of relief;

Social sufferings	Stigmatized for the infection of Covid-19; Getting negligence to return from city in the community; Inhuman sufferings in quarantine process; No scope to go temple for prayer;
Political sufferings	No scope to go outside during lockdown; No freedom to take decision; Political leaders pay no heed to our sufferings;

Source: field work

6.2.5. Disruption of cultural tradition in indigenous community

Covid-19 has far reaching impacts on inter-generational activities of indigenous people because throughout the history, they are living collectively arranging different traditional gathering, harvesting crops, doing jhum cultivating, celebrating religious function, arranging marriage ceremonies, playing traditional games, even combating natural and man-made hazards but the pandemic situation made them separate which disrupt their cultural norm and traditions. It not only affects their culture but also affects individual psychological condition as well as physical health of Chakma community.

Affliction of elderly indigenous people during this pandemic situation is a great loss to indigenous community because they play the vital leadership role in the community and they are the reservoir of traditional knowledge, wisdom, history, mythology and language of that community. The passing away of elderly indigenous people due to infection of this virus is thus a great loss to their existing culture as way of livings, stock of knowledge, conservation of biodiversity and ancestral expertise, even the knowledge of traditional medicines are practiced by elderly indigenous people. In Chakma community, many of the young Chakma cannot know Chakma language. Though some of them can read and write, a large portion of them cannot write and only can speak. Elderly people are the saviors of this language, so the sudden demise of these people, may disrupt or extinct the long traditions of indigenous community within few days.

6.2.6. Land grabbing and other violations in indigenous community

Indigenous people have close relation with land and nature. They recognize land as sacred object and worship it. During the pandemic situation, some mainstream settlers try to grab lands of indigenous people thinking that because of lockdown nobody can come to help indigenous people. Moreover, media may also not come to cover the news. From the transcript, it is also found that sometimes law enforcement authority remains indifferent, even facilitate the environment to exploit the indigenous people. Widow and destitute women in this case face

the severe vulnerabilities as their lands are frequently grabbed by settlers. In the lockdown periods, several of hard-core peoples' lands are grabbed and they become more vulnerable losing their last and only resources. Due to the lockdown and pandemic situation, this vulnerable people cannot get any support to protect their lands and lead a very miserable life in the locality.

After losing jobs due to lockdown, hundreds of thousands of indigenous garment workers return to their village but on the street, they are seized by the law enforcement authority and face bitter experiences. Many of the women garment workers are also physically and mentally harassed by the law enforcement authority. After waiting for a long time, these workers get release negotiating with the sub-district and union council chairman and go under quarantine in their locality but cannot get any relief, even food and water from the administration. During their quarantine, these workers have to manage their foods and other supports from their family.

6.3. Responses and Resilience of Indigenous People to Covid-19

After the relaxation of lockdown and the post-first wave of Covid-19 in Bangladesh as well as in CHT, when I resumed my ethnographic field work, I got exciting information from the indigenous people. Very few indigenous people are affected by the Covid-19 and the mortality rate is very low among these people in indigenous community. From my empirical data and evidence-based perception, it is clear that due to living very close to nature in remote area and doing hard works in the hills and lands, the resiliency and recovery powers of indigenous people are more than the people of mainstream society and thus mortality rate is very low to the people of this community.

Indigenous people in CHT possess a strong communal bondage among them. They enjoy their life collectively and also fight against adversity collectively and cooperatively. When indigenous people hear comprehensively about the virus from the media and the guidelines of government, they form village committee and strictly monitor the movement of people to enter and exit the community. Normally, they do not allow any outsider to enter their community and they also do not go outside. If anybody enters their community from outside, they must undergo 14 days quarantines. Different welfare organizations of

indigenous community also play strong roles to protect their community from the infections. In this case, the name of 'Unnatesh'- a welfare organization can be referred. Some members of this organization every day visit the main points of entering the city and disinfect the location using spray. The organization-members also visit the spots of the village and spray the locality to disinfect the place. They also provide hand sanitizer, masks, and other hygienic products to the indigenous people and make aware about the virus and also instruct people how to overcome from the diseases and save their community from the danger. The local government administration such as union council and upazila council along with other community organizations try their best to take steps and raise awareness among indigenous people. Different organizations instruct indigenous people to clean hand with soaps or hand sanitizer, wear mask when go outside, stay at home, maintain distance with other members in the community, follow 14 days quarantine if coming from the outside of the community, maintain self-imposed isolation if feeling unwell, etc. in their community and indigenous people also try to follow these for the welfare of their family as well community.

6.3.1. Precautionary measures and community resilience

Traditionally, indigenous people take different traditional medicines to protect from diseases. To avoid the infections of Corona virus, indigenous people take some precautionary steps. They drink hot water and take lemon tea several times in a day as virus can be crushed if it enters their throat and lunch. They also use ginger, cardamom, black cumin, honey etc. in their everyday life so that the virus cannot affect them. Those who are suffering from cold and cough, take honey and basil leaves (*Tuloshi leaves*) mixture as medicine to recover from the diseases. Some people use neem leaves with slight hot water for bathing as this virus may be perished during their baths. Some indigenous people take water stream as vapor into their nose so that virus becomes ineffective in their throat and nose. The Chakma people who are economically sufficient try to eat vitamin C containing fruits such as oranges, malta, lemon, grapes, guava etc. to boost their immune system. Some of the indigenous people go to faith healers to take amulet (*tabij*) or traditional medicines to ensure that corona virus cannot infect them in their life. Many indigenous people plant traditional medicinal seedlings in their home yards and use this medicine to boost their immune systems. Traditionally, throughout the generation they depend on different indigenous medicines to recover from diseases. Moreover, many indigenous people go to temple for prayer to Buddha that they can remain safe and secured from the evil diseases of the corona virus.

Throughout the history, indigenous people use their traditional knowledge and practices to overcome any difficulty happening to their life as well as community. Solidarity and mutual co-operation as well as strong communal bondages is the most important mechanism to indigenous people for resilience to any disaster. For example, during natural hazards, i.e., flood and cyclones, those whose houses are damaged take shelter to neighbors' houses until they repair their houses. For building community resilience and adaptation to adverse situation, indigenous people help each other in exchanging foods and support to overcome vulnerability. Due to strong communal bondages, indigenous people help their neighbors in case any family faces shortage of foods. Moreover, sometimes they exchange their crops/foods to fulfill their family needs in the community. For example, if one indigenous person has plenty of vegetables but has no rice in the house, then other indigenous people who have more rice exchange that with vegetables during pandemic for adaptation. During the outbreak of Covid-19, indigenous people work in the field/hills maintaining distance and following health precautionary measure to fulfill their deficiency of foods and overcome the adversity. Indigenous people also strengthen their effort to protect their livelihoods and traditional way of livings by implementing their traditional knowledge and wisdoms.

In CHT, most of the goods such as daily commodity, vegetables etc. are tried to be produced/managed inside the community to remove the risks of infections alike their ancestor periods. From the interview of an elderly Chakma, it is found that in the past only for oil, iron, and salt indigenous people had to go to market and other materials they produced in their community, but with the pace of time and climate induced hazards many of the resources are not found today in the indigenous community. Modern life also influences the community people to depend on market for livelihoods. Due to the pandemic, indigenous people try to return to their previous life to avoid to depend on market and manage all products from the community. In this context, one of the elderly Chakma people said – *“In the past, there was no market near to our community as we did not need to go market normally, because we produced all goods of our family in the community. Only oil and salt were bought from the market but that was not done regularly. Due to the outbreak of Coronavirus, we are trying to back to our ancestors' traditional life then we can save ourselves and our community from the infection of Covid-19”*.

6.3.2. Announcement of lockdown, quarantine procedures, and resilience

The experience of lockdown is not for the first time to the life of indigenous people in CHT. Elderly people in indigenous community indicate that from the ancestor periods indigenous people followed lockdown practice. The knowledge of indigenous people is formed through observations and experiences of hundreds and thousands of years. Throughout the passing of adversity, pandemic and outbreak of different diseases, indigenous people gather this knowledge and wisdom and apply that when they think necessary in their community.

In the past, if any respiratory disease spread out in the community, village leader (headman) imposed lockdown and made demarcation to prohibit to enter other people in the community. In this context, the ‘cholera’ disease can be referred which affected a large part of a locality in the past. At that time also lockdown and quarantine or self-imposed isolation practices were prevalent in the indigenous community. It may also create a controlled zone and people are not allowed to enter and leave this place. The spiritual leader of indigenous community performs spiritual rituals to control the diseases. This leader spiritually lockdown a specific territory assuming that the diseases/evil power cannot enter that territory and cannot harm them. The traditional faith healers with traditional medicines treat most of the disease of this locality and many of the times people get recovered. Generation after generation, indigenous people keep their faith in this traditional medicines and practices for getting treatment.

To curb the spread out of Novel coronavirus in Bangladesh, the government announced lockdown across the whole country including the indigenous territory. At the same time, all factories and offices are also closed down. Like many other people, indigenous people who work in city plan to return to their community but due to the restriction of movement, they face different barriers in their life. In this context, one of the indigenous people who loses his job in the city demonstrated about returning village in this way – *“After losing job, I with my wife planned to return to village but faced a lot of problems in the street. From other people, we came to know that those who return to Rangamati from city are seized by BGB (Bangladesh Border Guard) on street and are kept in a big room for quarantine with a lot of people. Hearing this, we got afraid that if BGB seized and kept us with many people in a room, and if anyone of them was infected then all people would be affected by this virus. So, we planned to return to village through the jungle and started to walk through the jungle. It took two days for walking and during walking, we saw some people who also return to village like us to avoid BGB. In*

the street, we saw some tents in the jungle where we took sleep at night and also got foods from local villagers for free. Local villagers helped us to the return as they also belong to indigenous community and come forward to our adversity. When we reached the village after walking two days and crossing the local largest hill FUROMON, far away the community a temporary tent (Jhum house) was built by our family for maintaining quarantine. We stayed there 14 days. Different types of foods, vegetables, dry foods etc. were kept before we entered the tent and we cooked it for eating. During the quarantine nobody was allowed to meet us, if anybody wanted to meet us, they also needed to undergo 14 days quarantine. During quarantine, no money needed to be paid as it might also spread-out virus. We paid the cost of foods after completing the quarantine. As people had no good idea, so after quarantine we only stayed at home and were not allowed to meet other people. This practice only was applicable for those who came from city during lockdown periods.”



Picture 6.1: Doing quarantine in Jhum house (temporary tent) in the forest far away from community

During the lockdown periods for maintaining quarantine, some places in the forest are selected which are far away from the community and temporary tent (Jhum house) are established there for maintaining quarantine. Different types of foods, i.e., fried rice, biscuits, rice, vegetable, oil, salt and other commodity are provided to them and they (isolated people) need to cook that for eating. During the quarantine time, no money is taken from the isolated person as virus may spread through the money of that parson. After the completion of quarantine, they can pay the money to the member who provides them with foods. Sometimes,

the family members or relatives provide the food to the isolated people but that must be maintained keeping far distance and cannot be talked to them directly. If any member violates the guidelines of the procedure, he/she also needs to undergo 14 days quarantine in the remote forestry.



Picture 6.2: A temporary Jhum house for undergoing quarantine in the forest premise

Though quarantine may curb the outbreak of Novel coronavirus, the sufferings for undergoing this process is very severe. About the quarantine another Chakma people said- *“My father in-law made a temporary tent (Jhum house) in the forest for us to undergo quarantine far away from the locality. Before starting the quarantine, our family member provided us all necessary materials including foods. We only cooked and took our meals but the problem was we suffered from running pure drinking water. As the sora/canal near to the forest dried up, we also faced problems for bathing and doing other activities. Meanwhile, due to a small-scale cyclone, our house (Jhum house) roof was damaged and my father- in- law wanted to repair it but due to the protest of villagers he could not do that. Because if he would come to us for the repairment of the jhum house, then he had to undergo 14 days quarantine with us. We tried to repair the house and passed the 14 days staying there. Sometimes rain occurred in the forest that affected our staying place but we tried to catch this water for drinking and using in the cooking. During our quarantine, because of insufficient food, we searched wild foods such potatoes, soft bamboo tubes, vegetables, lettuce, forest creepers etc. and took as our foods.”*

Community people normally discourage members to return to their community who stay for long time outside of the community to curb the spreads of corona virus. However, if they return to the village from the city, it is not taken positively by other members of the community. So many often these people are neglected or avoided by other members though they maintain 14 days quarantine. The people who lose job in the city and return to the community face big problems in life, because they not only are worried about losing the job but also are stigmatized for returning to home risking the lives of community member. However, the affected people in the community experience both negatively and positively. If any person shows the symptom of virus, the nurse and local government health workers take the sample and send that to the city - Chittagong for test. It takes around one week to get the report. During this time, suspected persons remain isolated and take medicines from the faith healers. Suspected people can also take medicine by dialing some specific numbers through phone for telemedicine. This service is free for all people in Bangladesh including indigenous territory. During the affected periods, patients take medicine along with drinking hot water, vitamin C related medicine, fruits, drinking tea with lemon, ginger, cardamom etc. to improve the immune system of their body.

During the outbreak of Covid-19 and lockdown, indigenous people are very much cautious to protect themselves from the infection of Novel coronavirus. This is why, in spite of maintaining social distance, wearing mask during going out, frequently washing hand with soap and water or sanitizer, some of the people become infected with the Covid-19. In this context, one of the indigenous small-scale businessmen said –

“From the initial stage of the outbreak of Covid-19, I strictly maintained health policy to avoid infection. I used to drink hot water, and tea mixing ginger, lemon, cardamom, and maintained other guidelines but unfortunately, I was affected by Covid-19. At first, I felt fever and dry cough and did Covid-19 test and found positive result. For this why, our building was locked down, and I was completely in the room. Two nurses came to my room wearing PPE and mask and contacted me with a doctor over phone. According the prescription of doctor, I took medicine along with taking fruit, drinking hot water and tea, and taking warm water vapor. At this time, the owner of the building provided me foods and other materials by the help of care taker. Gradually, I became well and 27 days later I was tested negative but the community people avoided me as I was affected once. Now the situation becomes normal and I have applied for the corona virus vaccine.”

On the eve of lockdown, another respondent demonstrated about the infection of Covid-19 in this way- *“In the night, I felt heavy fever (104 degree) and became very worried. Hearing this, local govt. and villagers isolated/locked down our house. According to doctors’ advice, I took medicine but become worried as doctor refused me to admit in the hospital. Anyway, I was separated in a room and kept a heater in the room to heat water for drinking along with drinking tea with lemon, ginger, cardamom, and fruits and nutritious foods. After giving nasal and throat samples, it took 12 days to get the result and it was positive but this time I was isolated. During my isolated time to increase my mental strength, I talked to my friends and recited holy religious books. After 48 days, I became well and on 49th day my sample was given for test and it became negative. After the negative result, I went outside but people did not talk to me and avoided me for few days and gradually it became normal.”*

About the resilience from the infection of Covid-19, one of the educated Chakma interviewees demonstrated – *“During the pandemic situation in our community, suddenly one day I felt fever and caught cough. At that time, I undertook self-imposed isolation as a precautionary measure because in our family my grandfather and mother who were old were living with us. I had confidence that I could recover from the disease but these elder members might not fall an unexpected situation for my deeds. At that time, I drank hot water and lemon tea with ginger, cardamom, and also took hot water vapor along with taking nutritious foods and fruit. I only took paracetamol and histamine tablets and within 4 days became well.”*

6.3.3. Formulation of policy, village committee and volunteer work in CHT

During the lockdown across the country, village committee is formed including the headman and *Karbary* (village member) of each village, along with formulating some policies to monitor the villages. This committee strictly controls and monitors the movement of community people in the locality. Every entry point (gate) of villages, there is made a fence wall and some assigned indigenous people always stay there to monitor the movement of people’s insides and outsides of the village. Before implementing the policy strictly during lockdown in the community, those who are community members but stay outside are given a chance to return to village within a definite timeframe. If they fail to return within that time frame and come later, then they also need to undergo 14 days quarantine in the locality. After the implementation of policy of lockdown, no people can enter the community without undergoing 14 days quarantine and any people of the village has to undergo 14 days quarantine

if they go to city and return back after that. Social distancing and self-imposed isolation are also implemented in the community and it is mandatory to wear mask if any person goes outside the house and social gathering is restricted such as marriage ceremony, funeral, social festival etc. If any person enters the community from city for emergency purpose, he/she cannot stay at night without undergoing quarantine. Tea stall is closed down as people may be affected from the stall. Because in the tea stall many peoples sit together and gossip without maintaining distance. Moreover, same cup is used for drinking tea for many people. If any person is affected and drinks tea from the same cup and then other people also use it, the possibility of infection among many people will be increased. According to the village committee, only nurses and shopkeepers can be allowed to go to city for buying products and other activities but they strictly maintain safety measures and distance from the community people. If they fail to maintain safety measures, their shops will be closed down by the village committee. When government announced to test corona virus of every medical staff for safety purpose, then one of the nurses in our village became corona positive. After hearing that village committee locked down their house and arranged foods and other necessary measures for that family. In this context, one of the interviewees near to the house of the affected staff said –

“We helped the affected family by providing cooked food, fruits, medicines and other supports. Village committee and other neighbors also supported the affected people. Though I not physically met with her but contacted her over phone and gave mental support. After talking to her, I came to know that she had no symptom such as fever, cough, nose running, etc. and she was thinking that her result may be error because she could not find any difficulty at that time. Finally, I could not say how she got treatment but now she is well”.

Due to the outbreak of Covid-19, some young Chakma form a volunteer organization in the community and work to curb the spread of Covid-19 and help affected people in CHT. This young Chakma group raise a fund named “Corona crisis fund” and use the money for different purposes. To illustrate the matter, they spray different busy points for disinfection to enter the village and city and supply mask, sanitizer, and relief to the destitute and poor people. For disinfecting different spots by spray, they face water problem. Many young men near to the spot area come forward by providing water but sometimes they also need to buy water (one tank 1.18 USD) to spray the locality. Some people also come spontaneously to the organization and take hand wash, mask, spray instruments and distribute that in their locality. This organization gets support from well-known and economically solvent indigenous people to conduct their volunteer works. Some foreign indigenous people also

donate them to continue their works. They also post their activities to the face book, so many young people from different parts of their community join their program and work spontaneously. This young group also makes some small sub-groups on the basis of community to monitor the movement of community member in their locality and instruct to follow the rules to curb the spread of virus. Being aware, villagers take the spontaneous roles to keep their area locked down by themselves. When the situation of corona virus becomes worst, the volunteer workers are given Personal Protective Equipment (PPE), hand gloves, goggle, etc. to work more smoothly. They physically distribute relief and other materials to the affected people but send money to the poor affected people by *Bikash* (transferring money through mobile network) where it is not possible to go by themselves due to poor communication. They serve the emergency of people on priority basis. About the experience of volunteer work in pandemic situation, one of the young Chakma stated –

“One night, we were some volunteers sleeping in the night after doing hard work in the day, and around 1.30 am my phone was ringing. I woke up by the sound of ring tone and received the phone call and what I heard was very pathetic and disheartening. A 2nd year Chakma student who studied in Rangamati collage stayed in a rented house in Rangamati. He was suffering from scarcity of blood and short breathing. Hearing this, the owner of house threw him out in the mid night with his belonging suspecting him as corona virus infected. This student was very weak and became very sick and even he could not talk. Hearing this, we four volunteers wore PPE and come out to him in the midnight of winter and brought him to the hospital but doctor refused to treat him being scared of him as a corona patient. After requesting a lot, a doctor agreed to treat him and after investigation asked us to arrange blood because his situation was very bad. The blood group of the student was not matching with us, so we called another volunteer whose blood group was similar to him and asked to come to the hospital at that night. The next day, this student was returned to his house and was kept in quarantine including all people visiting the hospital at the time due to the risk of spreading coronavirus.”

Tables 6.2: Responses and resilience of indigenous people to Covid-19

Responses and resilience of indigenous people to Covid-19	
Precautionary measures and community resilience	Drink hot water, lemon tea with ginger, cardamom etc. to vanish Novel corona virus; Take Basil (<i>Tulashi</i>) leaves and honey mixture to remove cold; Use neem leaves with mild hot water for bath; Wear mask maintaining distance, frequently wash hand with soap to curb the spread of virus;

	<p>Take water stream as vapor into nose & throat to remove virus; Eat vitamin C related foods to boost immune system; Go to faith healers for getting amulet and traditional medicines; Solidarity and mutual co-operation for community resilience; Exchange of foods and supports to overcome vulnerability; Exchange rice in lieu of vegetables with neighbors to fulfill demand; Try to produce all commodities inside the community except iron, oil and salt; Try to maintain traditional livelihoods following indigenous knowledge and wisdom; Avoid to depend on market to minimize risks of infection;</p>
Announcement of lockdown, quarantine procedure and resilience	<p>From their ancestors, follow lock down process; Self-imposed isolation or quarantine is practiced; Religious leaders imposed spiritual lockdown to specific locality; Mandatory for outsiders to quarantine 14 days to enter community; Make jhum house in forest (far distance from community) for arranging quarantine; Search wild foods such as potatoes, vegetables, forest, creepers as foods in quarantine periods along with other foods; Suspected people are kept isolated and sent sample to test;</p>
Formulation of policy, village committee, and volunteer works	<p>Village committee monitor the movement of villagers/people to inside and outside; Fence wall is made surrounding the enter point (gate) to monitor and social gathering is restricted such as marriage ceremony, religious festivals, funeral etc.; Only shop keepers and selected people are allowed to go market and bring goods for all villagers maintaining rules; Raise fund by volunteer to help vulnerable people; Spray different busy points for disinfection; Post in Facebook timeline for volunteer works to encourage young people to join the organization; Form sub-groups to work in own area in community level;</p>
Relief/getting loan for resilience	<p>Get relief from government/NGOs that is not sufficient; Lend/borrow money from relatives/friends to overcome vulnerability; Mutual co-operation from the neighbors and relatives; Cut of meals three to two even one in distress/lockdown; Use savings to buy foods and other emergency needs;</p>
Strengthening traditional livelihoods centering lands and natural resources	<p>Develop resilience centering natural resources and land by collecting and producing crops/vegetables in CHT; Follow ancestral and traditional food production systems; Avoid monetary and market based live as much as possible; Plant timely demandable plants such as orange, lemon, pine apples, guava etc.; Plant traditional medicinal seedlings in home yards; Small scale entrepreneurships such as grocery shops etc.;</p>
Traditional faith healer and traditional medicines	<p>Depend on faith healer and traditional medicines; Take amulet to protect <i>AVA PIRA</i> virus (respiratory diseases); Faith healers made medicines with traditional plants collecting from forest such as leaves, roots, bark/cortex etc.; Take amulet /<i>tabij</i> and black magic to protect virus; Sacrifice animals in the names of Ganga and Bon Badsha to recover from corona virus;</p>
	<p>Stop evil tasks (sin) to curb infection of Covid-19; Stop exploitation to nature to stop Covid-19;</p>

Ritualistic activities to overcome Covid-19	Prayer to God to stop spread of Covid-19; Offer puja and oblations to God and religious leaders; Sacred and humanistic works and ritual bestow mental strength to overcome adversity;
Response of indigenous women in Covid-19	Knit traditional fabrics and sell communal market after relaxation of lockdown; Enjoy more freedom than mainstream women to decision making in pandemic situation; Utilize unused lands for horticulture and plant different seedling to fulfil family needs;
Restoration of natural environment in lockdown periods	Intimate relation with nature makes indigenous people stronger to develop resilience; Maintain traditional life in remote area to cut off infection; Closing down market and vehicles in Lock down, restore the beauty of nature due to less destruction;

Sources: field work

6.3.4. Unequal relief distributions, hardships and resilience

In CHT, indigenous people get very little amount of relief from government as well as other organizations that is not sufficient for them. The distribution of relief is also not fare as the political leaders and other corrupted persons devour it and distribute less. In this context, one of the Chakma man said –

“We get very small amount of relief from the government and it is 20 kg rice, 2 liters soybean oil, 500 gm pea (dal), and 500 gm salt over the last 4 months. It can only fulfill two weeks demand in our family. So, we have to cut our meal and take two times instead of three in a day to survive in the community”.

Another respondent claimed about relief distribution- *“We get 10 kg rice, 500 gm soybean oil, 1000 gm salt, 500 gm pea (dal), 500 gm sugar, etc. and this is budgeted for each poor family in the CHT but it is very small for a family to run one month in the community.”* Apart from this relief, the prime minister of Bangladesh announced a fund for poor people. To reduce the corruption and ensure the getting of fund of each vulnerable family a list is made across the country and 30 USD is sent through their mobile number via *Bikash* (transferring money through mobile) account. It is a matter of sorrow that corruption is still not stopped as many rich family names are in the lists and same numbers are given several times to get more money. Prime minister wants to ensure the transparency but some corrupted officers and leaders make it as a source to devour money during the pandemic situation. About the corruption of relief distribution, one of the Chakma volunteers said -

“Some government officers adopted corruption in distributing government relief to the poor people. So, we asked our volunteers not to distribute relief during the distribution of relief of government officials, because we came to know that they also distribute relief when we

distribute and capture pictures of our relief distributions and claim that they have distributed this. Actually, this is happening and by not giving relief, they (local govt. officials) upload our distributing images to their website claiming those as their relief works. Seeing this when we asked them about the images, they did not acknowledge first but when we gave them proof of screenshots and other documents, they apologized to us for their misdeeds.”

During lockdown, indigenous people having no work and no income face huge problem in their life. Those who have some savings try to utilize that along with finding other sources of getting relief or earning. In this context, one of the women said- *“We have some saving but if we utilize that we can bear two months of our family cost but after that how we can maintain family. My husband said that within these two months we can find other solution for our alternative income.”*

Another respondent said- *“Finding no other ways, I took loan from an NGO to bear the expenditure in my family. If the lockdown is over and the environment becomes well, then by doing hard work, I can pay the installment and overcome the vulnerability. I am waiting for the good days when we can do work and meet with other people freely without the fear of corona virus. During the pandemic situation, it is not easy to get loan like normal periods. Due to lockdown, NGO workers cannot come to the village for giving loan. Moreover, due to uncertain situation, nobody wants to give loan/or lend money to others as what is happening to the near future nobody can know.”*

The indigenous volunteer organizations support poor indigenous people in many ways, among which giving relief and money is remarkable. They provide 18 USD to the poor people along with giving 15 kg rice, two pieces soaps, one liter soybean oil, one kg *nappi*, two kg potatoes, one kg onion, and one kg salt to overcome the economic vulnerability during pandemic situation. This organization also supports the villagers by sending goods to the remote area. To illustrate the matter, due to lockdown and poor communication system in some remote areas indigenous people face scarcity of food. This community may have money but there is no rice in their locality. In this case, this organization sends some sacks of rice to that village to remove the scarcity of rice of that particular community.

6.3.5. Strengthening the possession of traditional livelihoods centering lands and hills

Indigenous people recognize land and nature as sacred objects and worship those in their life. Throughout the history, they develop resilience to any adversity centering the lands, hills, and nature. Historically, most of the indigenous people in Chakma community depend on indigenous land and cultivation system to generate food and because of the Covid-

19, they strongly follow their ancestral and traditional food production system and try to feed themselves by avoiding to depend on external foods and market-based livelihoods system. Rather than following the mainstream system, Chakma people follow their traditional communal works, express solidarity, and reciprocity and limitedly depend on monetary exchange for maintaining their livelihoods. So, when the lockdown is gradually relaxed, indigenous people start to get involved in their agricultural activities more intensively and depend on natural resources as the market-based foods become very expensive and also not available sufficiently in the community. In this case, indigenous people utmost demand is to stop encroachment of traditional lands and illegal logging of trees for brick field and other purposes. Because it also destructs the environment and intensifies the scarcity of forest resources in the hills.

Indigenous people have very small amount of saving in their lives and due to their dependency on nature for livelihoods and having limited tendency to accumulate profit are destroying environment. During pandemic, when indigenous people see that their small saving and rice/foods are gradually consumed, they no longer remain confined in the house. They are scared not only of corona virus but also of starvation, as they may run out of foods. As the density of population in remote hilly areas is low and most of the peoples work in hills and forest, they start to work maintaining distance and following health rules. Along with cultivating paddy and vegetables to fulfill their basic needs of foods, they try to plant timely demandable products in their fields/hills for market such as oranges, malta, pomelos, lemon, pineapples, guava etc. which become money earning products in the periods of Covid-19. Some indigenous people also plant traditional medicines in their field. Many of the indigenous people who lost jobs due to corona virus in the city start to work in the field to help their family in the community. Some migrated Chakma people do small scale entrepreneurships in their community or make small grocery shops who have some savings of money during their jobs and try to recover their economic hardships in the locality.

For getting resilience, indigenous people apply multiple strategies in adverse situation. For example, those who have rice in the house try to depend on wild forest resources such as forest creepers, roots, tubes, potatoes, vegetables, mushroom etc. for curry and search fishes in the canal/sora and make their survival without depending on market. Only for oil, salt and other emergency needs, they go to market. Other people search relief from government or other organizations for living during the pandemic situation. Some people also exchange/mutual exchange of crops and try to survive in the adversity.

6.3.6. Spreading of rumor and its impacts in indigenous community

In CHT, many of the indigenous people fall in the trap of religious leaders by misinformation. One of the religious leaders announced that one child after birth can start to talk and advice people that after 12 am if people pick up water from the well/sora and drink in one breath then corona virus will not affect them anymore. Hearing this news, hundreds of indigenous people started to do that to get relieve the infection of corona virus by drinking water from the well/sora. Another misinformation was spread that God offers medicine from the sky which can protect corona virus. In this context, one of the elderly Chakma women quote – *“In one night, after finishing dinner, we went to sleep but, on the midnight, I was awakened with the sound of a crowd and torchlight. I also awakened my husband and went outside and saw that a crowd of people searching something under some trees. I asked them and came to know that God bestowed some medicines to this tree from the sky which can protect from corona virus. Hearing this, we also searched that medicine. It was actually some seeds of a specific trees and we collected 9 seeds and took two of each. Later, we came to hear that it was rumor and many people became sick and got admitted to hospital as they ate many seeds.”*

Another respondent quote – *“Due to wetting in rain, my daughter caught cold and fever and I bought some medicines for her from the pharmacy but she was not cured. So, I brought her in the hospital and on the way law enforcement authority seized us and asked to do corona test of my daughter. We informed them of going hospital and after reaching hospital found no doctor due to the panic of corona virus. Luckily, one doctor agreed to provide treatment but demanded huge money. Finding no other way, consulted a homeopathy (herbal) doctor and returned to community. Meanwhile, there broke out a rumor in the community that my daughter was infected to corona virus and lockdown was imposed to our house and nobody was talked with us after that. The CNG driver’s house was also locked down. However, by the bless of God, after few days, my daughter is recovered from the fever and now fully well.”*

Though this rumor had given some mental stress and suffering to the people being suspected to Covid-19 infection but it raised awareness among the members to become careful to curb the spread of the virus in the community. So, this rumor worked as local response to stop the outbreak of corona virus, because village people forced their suspected member to remain confined in house to avoid unexpected risks of spreading Covid-19 infection and in this case, whether that person was infected or not that was not the matter.

In CHT, one of the Buddhist leaders (*Vikkhu/vanta*) who is very well-known provides traditional medicines to indigenous people. From the community members, it is heard that this medicine is very effective to recover seven types of diseases including removing

stomach pain. During the outbreak of corona virus, it is heard that this medicine is effective to protect the infection of Novel corona virus. So, the demand of this medicine is increased in the locality and people start to buy this medicine with high price 12-24 USD which real price is 3-5 USD. Meanwhile, when educated person in the community raise questions about the effectiveness of this medicine, vikkhu claim that he does not know anything about this. He (*vikkhu*) makes this medicine with the help of an assistant that means he tells the formula to the assistant and he makes the medicine. During the lockdown, he was in India and his assistant propagated the rumor and sold this medicine among the indigenous people in CHT and earned a lot of money by misleading general indigenous people.

Some indigenous people in the Face book timeline posted that wine is effective to protect coronavirus. So many people started to drink wine even more amount to protect themselves from the diseases of corona virus. Many of the parents who forbade their son and daughter to drink wine gave them wine for drinking. This trend made many people to become sick and admitted to hospital. In this ways, indigenous people deceived from the misinformation that contribute to create them vulnerable physically, psychologically and economically.

Though these types of information have no scientific value and have no direct relation to protect the infection of Covid-19 but it has some positive effects as well. During the outbreak of Covid-19, people were very excited and tensed as they have no knowledge about the nature of virus. So, they were suffering from mental disorder and this news/information about the protection of Novel Corona virus gave them mental strength and some sort of relaxation that are very important for the removal of mental disorder and bring some happiness in the mind, because people believe that these information/medicines can protect corona virus though it has no scientific values at all.

6.3.7. Traditional faith healers, traditional medicines and resilience from Covid-19

During the lockdown time, movement is strictly maintained and even any sick people cannot consult doctors physically in the hospital. The village committee thinks that if community member consults any doctors, they need to undergo mandatory quarantine as from the hospital, he/she can be infected and may be the risk to spread it out in the community. However, to avoid the risk of infection and having the faith of faith healer, community members consult faith healer for getting healing. In this context, one of the participants said that –

“My elder son was suffering from pain in the stomach, so I wanted to consult a doctor in the hospital. The headman of the village asked me if you go to city for consulting doctors, you need to undergo 14 days quarantine. So, I consulted a faith healer for my son and after getting traditional medicine, he recovered.”

In indigenous community, the influence of *Bodhya* (faith healer) is enormous. During the lockdown, indigenous peoples are not allowed to get treatment outside the community as well as in the hospital to curb the spread of infection. At this time, only *Bodhya* (traditional healer) gets the responsibility to treat people in the community. Not only in pandemic time, but also the year round they treat indigenous people professionally. Though these traditional healers have no modern instruments to detect diseases but hearing the symptoms of patient, their capacity to identify disease is outstanding. However, if they fail to identify the disease, they get help from doctor and able to provide treatment to the patients. Faith healers make medicines by their own hand. They collect different branches, roots, bark/cortex, and leaves of trees and plants, from the forest and jungles and grind it with the help of stones and make medicines. Every faith healer plants different traditional medicines in their home yards so that they do not need to visit jungle to collect medicine for doing treatment. Though the traditional medicine is accepted by all people in indigenous community but some treatments such as giving amulet (*Tabij*) and black magic/ pishogue (*Tontro-Montro*) are not accepted by all people. But many faith healers claim that this treatment is also effective to recover diseases. They also sacrifice different animals which is called (*Dali*) in Chakma language. If anybody becomes ill suddenly then they arrange *Dali* ritual in the name of ‘*GANGA*’ in the river and in the name of ‘*BON BADSHA*’ in forest/land and sacrifice animals. Moreover, many people do vow (*Manat*) for arranging *Dali* ritual to recover from diseases. In Chakma language, contagious disease is called ‘*AVA PIRA*’. *Ava Pira* means diseases that spread through winds. Faith healers claim that they have one types of amulets (*Tabij*) which can protect people from being affected by contagious diseases. The usages and practices of this amulet has increased a lot in pandemic situation. The price of this amulet is 4 USD. About the usage of this amulet, one of the educated women said –

“During the pandemic situation, many people use this amulet to protect themselves from getting infected. Though I was confused about the effectiveness of this periapt to fight corona virus but bound to use it because my father enforced me to use the periapt. I asked my father, if the faith healer would go to USA and embrace a corona infected person wearing this periapt and return to Bangladesh without infection, I can use the periapt. For my words, father became angry. Anyway, to make my father satisfied, I used that periapt.”

6.3.8. Ritualistic activities as an instrument to overcome Covid-19

According to the religious leader, Covid-19 is the curse of God. Due to the increase of evil tasks (sins) and exploitation of mother earth this disease has appeared in the planet. If people continue to do such evil tasks and destruct the environment indiscriminately, nature will continue to take revenge by rendering different diseases to the world. The religious leaders urge human beings to stop exploiting the environment and stop doing unsocial activities. They suggest praying to God every day and offering flowers and worship to God in the temple to satisfy Him to overcome the curse. Religious leaders (*Vanta*) were offered rice, water, etc. regularly in temple before the outbreak of Covid-19. So, for securing and caring them during pandemic and accelerating the prayer more, two people are recruited in the temple. These two people will serve to *vanta* until the waning of the infection of the Covid-19 situation in the CHT. Meanwhile, by turn every devotee will offer their puja and other supplies to them accordingly. About the spiritual power of religion one of the educated Chakma said –

“We pray to God to satisfy Him and also do sacred work for our mental satisfaction. We do not know coronavirus is the curse of God or not and has it occurred due to the anger of God or not but it has happened due to the exploitation of environment and hunting the wild animals in the forest. Our sacred work and prayer give us mental strength and happiness which give us confidence to fight against coronavirus.”

During the serious situation of USA and Europe due to the surge of coronavirus, along with mainstream people, indigenous people were very much worried about the pandemic in Bangladesh. In this time, religious leaders play both positive and negative roles and still playing. In this context, one of the indigenous people demonstrated –

“Religious leaders (Vanta) encourage people to do sacred tasks to satisfy God and to pray so that the curse of God will be disappeared. Following this advice, indigenous people do sacred and humanistic works which give them mental strength and help to keep their health sound. However, many Vanta sell different traditional medicines as corona protective medicine and earn a lot of money. To follow the instruction of vanta, many indigenous people need to offer resources such as fruits, rice, money etc. to vanta in the temple and many peoples face economic vulnerability as they have no income at that time. However, some vantas help poor people by giving their money or the money they get from the devotees in temple (Bihar).

6.3.9. Responses of indigenous women in pandemic situation

Indigenous women in Chakma community play an indisputable role in economy as well as the family. They are the caregivers and earners in small scale productions in their community. Indigenous women weave different traditional fabrics and sell that in the communal market for income earnings. Though their income has stopped due to the lockdown in their community but after the relaxation of lockdown, they again start to do their business. They knit these dresses not only to fulfill their family needs but also meet the orders of the businessmen in the communal market. Due to the outbreak of Covid-19, indigenous women who work in garments in Chittagong and Dhaka face the experiences of losing jobs. During the lockdown periods, because of the close down of factory, or running the factory with half of the workers, many of the indigenous women lose their jobs and return to their community. Many of these women are the only earning members in their family and losing the jobs create huge vulnerability in the family. In this context, one of the Chakma garment workers said –

“I am the only earning member in my family but losing the job I cannot understand how I can maintain our family. I return to my village taking the risk of infection but feeding our family is now at more risks as I have no alternative income sources in the family”.

During the pandemic situation, violence against indigenous women, physical harassment, grabbing destitute women’s land etc. increase a lot in the CHT. Domestic violence, is also seen in some indigenous family which was hardly found before the outbreak of Covid-19 in Chakma community. Losing jobs and doing some additional traditional works in the family, women also suffer from mental stress in the community. Destitute women especially elderly women who are the head in the family often feel insecurity to possess their land feeling that it may be grabbed by settlers or ill-motivated people in the community in the pandemic situation.

Chakma women enjoy more freedom than mainstream women in CHT, so they have much influence in family decisions in Chakma community. Chakma women help their male counterparts in agriculture field for crop cultivation and also work as wage labor in the community. Though indigenous women play a significant role in economy of Chakma community ranging from caregiving, cooking, collecting water, caring elders and disabled people, and performing different household chores, but still, they face discrimination in terms of wages in the local community. Indigenous women for selling labor get 4 USD but doing the same task a man gets 5 USD in their community. This wage discrimination disappoints women to fully participate in the formal economy but to overcome the economic vulnerability, women take part outdoor works along with doing their household chores. During lockdown, nobody

goes outside of their house in the fear of getting infection but those who are economically solvent employ labor in the agriculture field for cultivation. For this purpose, they provide 7 USD for men and 5 USD for women. Due to the lockdown situation for long time, for the recovery of economic deficiency, indigenous women utilize their unused lands for horticulture and planting different seedlings including fruits such as mangoes, jackfruits, pomelos, lemon, guava, and different vegetables in their home yards and other places. This not only fulfill the demands of foods of their family but also ensure the basic foods of neighbors as they exchange this with the neighbors in the community. In this context, one of the indigenous women said –

“We have experience about how to move forward to overcome adversity as we face this during natural hazard in our locality. Though at the beginning of outbreak of coronavirus, we feel anxious due to having no knowledge about the diseases but now we understand that first of all we ensure our basic food and then need to isolate us from the outsider. We are giving more efforts during the pandemic and try to utilize all unused lands to produce more crops as we can ensure foods for all members in the community.”

6.3.10. Covid-19, indigenous people and natural environment

Though Covid-19 makes devastating situation across the world, it has some indirect positive impacts on natural environment especially due to the imposition of lockdown in CHT. In lockdown situation, people cannot move because of the restriction on vehicles and movement. So, the stress on nature by human beings decreases a lot and nature restores its losing beauty and power. To illustrate the matter, before the lockdown human beings illegally cut down trees, extract stones from the underneath of soil, cut down hills and destruct the environment indiscriminately. Destruction of environment is generally caused by mainstream peoples but due to the lockdown, they cannot reach to the forest because of having no vehicles and unfavorable environment. Moreover, due to the close down of market, they could not sell these resources in the market. On the other hand, most of the indigenous people live in remote area being very close to nature, they can nurture the nature and make their intimate relation like the previous time of their ancestor. They only extract resources for their own need and not for capital accumulation, so nature is not affected by the deeds of indigenous community. Moreover, due to close of market, indigenous people get back to their traditional life and avoid to depend on market-based economy. It not only curbs the infection of corona virus but also makes a good opportunity for indigenous people to come closer to nature. In this situation, it can be said that the relation of indigenous people with nature gives them more strength to get resilience to overcome the vulnerability of corona virus. From the interview transcripts, it is found that the infection rate of Covid-19 is very low in indigenous community during

lockdown, but when the lockdown is relaxed, the number of infections increases due to having no proper tracing and testing facility in the community. The government cannot provide sufficient facility to detect the virus in the community. Though a good proportion of indigenous people is found infected but mortality rate is very low in indigenous community due to living very close to nature and maintaining traditional life. Because the people who live in city, no matter indigenous or mainstream people, if affected, a good proportion of them die but in the case of indigenous community in remote area, mortality is very low even hardly found.

6.4. Discussion

In CHT, Indigenous people live in remote area but due to the influence of mainstream society and modernization, they are also very much aware about the world. So, when Covid-19 first spread in China, indigenous people came to know about the virus from the media but they did not give much heed to the virus (Chakma,2020;8). But they started to think seriously of the virus, when it was first detected in Bangladesh and lockdown was imposed across the country by the government of Bangladesh.

Due to the outbreak of Covid-19, when lockdown is imposed, indigenous people especially poor and destitute people face huge problems for managing their subsistence along with facing other crises in their life (Carmen,2020; Chakma,2020). Most of the indigenous people live on hand to mouth collecting natural resources in the forest, but over the last few decades, because of climate induced hazards, they cannot get sufficient foods in the forest. Moreover, the imposition of lockdown shrinks their traditional livelihood and resources in the forest and land in the CHT (FAO,2020; Carmen,2020; Hennin, 2020). Furthermore, lockdown brings them unprecedented sufferings because they cannot go to market to sell their crops or resources and also cannot buy any necessary commodity from the market. So many of their produced resources get rotten and damaged in the field. Nevertheless, they can sell their products to the local people with much less prices due to the close down of market (Chakma,2020;13). Many of the indigenous people directly or indirectly depend on tourist for their subsistence. Indigenous women knit traditional dresses such as *Khadi*, *penon*, and other traditional fabrics which are very much attractive to the mainstream people (Chakma,2020:14). Tourists very often buy these dresses when they visit the locality and many local businessmen sell these products all over the country and get a good amount of money but all of these activities have stopped due to the imposition of lockdown in the indigenous community as well as in Bangladesh and created unsecured livelihood to these indigenous women (FAO,2020:3, Hennin,2020). Many indigenous women work in garments both in Chittagong and Dhaka but

they are bound to return to their community losing job during lockdown periods though having the possibility of getting infection as all of these industries are closed down at that time (Chakma,2020:14; Hennin,2020:34). Long term lockdown, in indigenous community encourages them to depend on forest resources such as forest creeper, roots, bamboo tubes, mushroom, leaves etc. avoiding to depend on market.

Living in remote area, indigenous people are deprived of getting modern health services as there is no medical health center in the community (Chakma,2020:14, Hennin, 2020:36). Moreover, due to poor communication system, very often peoples cannot go to hospital timely to get treatment (FAO,2020:3). Finding no other ways, many of the indigenous people depend on faith healers for getting health services in the locality (Chakma,2020:17). This unequal medical health services compared with mainstream people make indigenous people more susceptible to the impacts of Covid-19 in pandemic situation. Moreover, to curb the spread of Novel corona virus, it is very urgent to make sure the availability of hygienic material (public sanitizers) such as mask, hand sanitizer, gloves, PPEs, googles, medicines etc. but that are not available in the locality, even if found prices are very high compared to the real price which are beyond the capacity of poor indigenous people (Kaplan et al.,2020:1728; Reinders et al.,2020). The people of indigenous community are deprived of getting education as government introduces formal education through TV and online due to close down of educational institutions for long times (Chakma,2020:18). Poor indigenous people have no capability to buy smart phone/computer or TV to access the class. Moreover, this hilly remote area is not always under the good coverage of network system that affects the offering of education to the young people of Chakma community (Hennin,2020:35).

In pandemic situation, indigenous people experience multiple challenges in physical and cultural aspects (Hennin,2020:33). It also affects transmitting inter-generational activities of indigenous people because throughout the history, they are living collectively through performing different cultural gathering, harvesting crops, doing slash and burns, celebrating rituals, arranging marriage ceremonies, playing traditional games, even combating natural and man-made hazards but the Covid-19 situation makes them fragmented which disrupts their cultural norms and traditions (Hennin,2020:39). It not only affects their traditional practices and bondages systems but also affects individual mental health as well as physical health in indigenous community.

Elderly indigenous people are the reservoir of traditional knowledge, wisdom, history, mythology and language of a community, so any risk of these people especially demise due to Covid-19 is a great loss to the community. Their stock of knowledge through life long

observation and adaptation supports indigenous community to combat seasonal and weather change related diseases, scarcity of resources, and epidemic (FAO,2020:1). The passing away of elderly indigenous people due to Covid-19 is thus a great loss to their existing cultural practices, way of livings, stock of knowledge, conservation of biodiversity and ancestral expertise, even the loss of knowledge of traditional medicines which are practiced mostly by elderly indigenous people (Hennin,2020). Elderly Chakma are the savior, nurturer and transmitter of their native language and many young Chakma still cannot read and write this language and only can speak. So, the sudden demise of these people, may disrupt or extinct the long traditions of indigenous language from the community within few days.

Indigenous people recognize land as a sacred object and they worship it and lead their life centering the land and natural resources (Hennin,2020:43). Indigenous people many times cannot save their land as settler Bengali people grab it or enforce them to evict from the land. Along with the impact of pandemic, this eviction from land makes indigenous people more frustrating and vulnerable because it is the only means for their survival (Chakma, 2020:18; Hennin,2020:43). During the pandemic, this practice increases a lot as media and local administration play indifferent roles due to the outbreak of Covid-19 (FAO,2020:2). Destitute widows are the most vulnerable in this case, because they have very limited power to protect their lands. Indigenous young women also face sexual harassment and physical torture in the pandemic situation (Chakma, 2020:19).

Misinformation as well as rumor greatly affects the people of indigenous community, as they are not much educated and believe more in mythology. Hearing any rumor, they try to do that to protect themselves from corona virus without thinking its reality and validity. So many often, they become sick by taking different substances as medicine. To illustrate the matter, after hearing that wine is effective to fight corona virus, many indigenous people drink it excessively and become sick. Nevertheless, this rumor gives mental strength to some indigenous people that help them for developing resilience and cope with the adversity.

Like mainstream people, indigenous people are very much cautious about the Novel corona virus. They take different precautionary measure to protest the virus. Among them, drinking hot water and tea with ginger, cardamom, black cumin, wearing masks, washing hands with soap or sanitizer, bathing with neem leaves pest, eating basil leaves with honey, taking nutritious foods, vitamin C related fruits etc. are remarkable (Reinders, et al. 2020). Throughout the history, to overcome vulnerability and adversity in indigenous community, Chakma people apply their traditional knowledge and practices. Solidarity and mutual co-

operation as well as strong communal bondages are the most important mechanisms for indigenous peoples for resilience to any hazards or epidemics.

Traditionally, indigenous people possess strong communal bondages in their community that contribute to create resilience and adaptation in adverse situations. In the periods of lockdown, if there is any shortage of food in any family, neighboring families come forward to support them. Throughout history, indigenous people are self-sufficient and capable to produce almost everything in their community. So, if any family faces scarcity of rice/foods, then neighboring families provide that and in lieu of that that family exchanges other products such as vegetables, fruits etc. if it has. In this way, at the community level, they fulfill their demand avoiding to depend on the market. Being hard workers, indigenous people try to fulfill their shortage of food by cultivation in the field maintaining social distance and other precautionary measures. Indigenous people also strengthen their efforts to protect their livelihoods and traditional ways of living by implementing their traditional knowledge and wisdoms, though modern life influences them to depend on the market for livelihoods. To control the spread of Covid-19, indigenous people try to return to their previous life for traditional livelihoods, avoiding to depend on market-based economic activities.

Lockdown is not new to the peoples of indigenous communities as from the ancestor period, their ancestors used it in their communities. In ancient times, the Chakmas had their traditional practice "*Adam-Bon*" or lockdown to control epidemics. In Chakma language, "*Adam*" refers to village and "*Bon*" means lockdown. During *Adam-Bon*, Chakma peoples fence the locality with bamboo fences and control the movement between villages as well as the community (Chakma, 2020:9, Hennin, 2020:40). When any respiratory diseases break out in their locality, religious leaders and headmen implement it to curb the spread of the diseases. Spiritual leaders can lock down any locality spiritually to hold the evil power or diseases from entering that locality. During the lockdown, the peoples who work in cities return to their villages losing jobs. During their return, they face huge problems on the roads and law enforcement authorities force them to undergo quarantine with many peoples in one room. So, violating government rules, and for escaping from the law enforcement authority, these indigenous peoples return to their villages through jungles and maintain quarantine in the forest (Jhum house), far distant from the community. The village leader with the help of family members arranges this quarantine process to curb the spread of coronavirus in indigenous communities. For the quarantine, family members supply foods and other materials to the quarantined people what he/she prepares for feeding maintaining separation.

To curb the infection of Covid-19, village committee always discourage the members not to return to the community who stay long time outside of the community. Nevertheless, if they return to the village, community people do not take them positively. Consequently, they experience negligence and stigma by political leaders though they maintain 14 days quarantine. Indigenous migrant workers losing job face big problems in life, because they are not only worried about getting new the job but also stigmatized for returning home risking the lives of community member.

To curb the spread of Covid-19, indigenous community form a self-governed village committee to monitor the mobility of entering and outing of the community (Reinders et al.,2020: 4). Every people strictly maintain the policy and if any person comes from outside, he/she needs to undertake 14 days quarantine (Ayuningtyas et. al.,2020:69; Kaplan et al, 2020:1729, Reinders et al., 2020:6). Only shopkeepers and some selected people can go to market to buy necessary commodity for villagers only one day in a week and they also maintain strictly the health policy. Village committee also suggests to close tea stalls in the village as many people sit in a stall and drink tea together that may contribute to spread of Covid-19 in the community.

In CHT, during the outbreak of Covid-19, a group of young indigenous people form a volunteer organization to curb the spread of Covid-19 and help destitute people in the community. For this why, they raise fund named “Corona Crisis Fund” from the donors of solvent indigenous people. Volunteer Chakma people spray different important points for disinfection and help poor destitute people with foods, mask, sanitizer, and others to help to overcome the vulnerability (Ayuningtyas, et al., 2020:69; Reinders, et al., 2020:5). They also help affected people by sending foods in remote area where communication system is not good. This volunteer organization gets support financially from the donor of solvent indigenous people, educated person, teachers, businessman, well-wishers etc. to run the organization.

During the lockdown, less fortunate indigenous people cannot get much support to run their family, from the government as well as from NGOs (Ayuningtyas, et al., 2020:69; Reinders et al., 2020:7; Chakma,2020:11). So, they apply their own strategy to survive in the community utilizing their culture and natural resources (Hennin,2020:37). They use their small saving to bear the cost of family and search alternative income to help their family. Sometimes, they cut their meals off three to two even to one to survive the situation and collect wild forest resources for foods. Unlike the mainstream people, indigenous people have no tendency to accumulate capital for future destroying environment and hardly have saving for future consumption, because they collect resources from the forest and survive. During pandemic,

finding scarcity of food in the house, they start to work in the field rather than confining themselves in the house because starvation may destroy them if they have no food in the house. Due to remoteness and less density in forest and hill, indigenous peoples cannot find difficulty to work there during pandemic following health rules. Apart from basic foods such as paddy and vegetables, they cultivate timely demandable products in their fields/hills for market such as oranges, malta, pomelos, lemon, pineapples, guava etc. which become money earning products in the periods of Covid-19. Indigenous people encourage younger people to involve their traditional food production to overcome the adversity. They also involve community garden, expand traditional seed banks, seedlings and other agricultural inputs to the community so that they do not find scarcity to continue their agricultural activities in pandemic. Some indigenous people plant traditional plant in the home yard and other do small scale entrepreneurs in the community to overcome economic hardships in the pandemic situation (Carmen,2020:4).

The influences of faith healers (*Bodhya*) in the life of indigenous people are enormous as they are the key health service provider in the community due to the limited access to modern health service in the locality (FILAC,2020:12). Moreover, during the lockdown periods, indigenous people are not permitted to go outside/to hospital for treatment to curb possibility of infection of Covid-19. Throughout the history, faith healer serves indigenous people professionally with traditional medicines and it is much effective in indigenous community (Carmen,2020:4; FILAC,2020:12). However, if *Bodhya* cannot detect the diseases investigating the symptoms of a patients, they take help from doctor and after identification of the diseases, they can treat the patients effectively. Faith healers depend on traditional medicines, found in the hill and forest and apply that to the patients. These medicines include different branches, roots, bark/cortex, and leaves of trees and plants, from the forest and jungles and it is grinded with the help of stones to make medicines. Some faith healers (*Kabiraj*) provide amulet (*Tabij*) and apply black magic/pishogue (*Tontro-Montro*) for treatment to the patients but there is debate among some indigenous peoples about its effectiveness. Indigenous peoples sacrifice animals to remove evil power in their community which is called (*Dali*) in Chakma language. If anybody becomes ill suddenly then they arrange *Dali ritual* in the name of 'GANGA' in the river and in the name of 'BON BADSHA' in forest/land and sacrifice animals. Moreover, many peoples do vow (*Manat*) for arranging *Dali ritual* to recover from diseases. In Chakma language, contagious diseases are called "Ava Pira" which spread through winds. Faith healers claim that they can protect it by using/taking amulet

(*Tabij*). They also claim that their *tabij*/amulet can fight corona virus, so the price of the amulet in the community increases a lot in the pandemic situation.

Religious leaders (*vanta*) believe that Novel Corona virus is nothing but the curse of God and it is happening due to the increase of evil tasks (sins) and exploitation of motherly earth for resource extractions. The virus will not be disappeared and may be more dangerous in near future if people continue to do these evil tasks and destruct the environment continuously. *Vanta* urges indigenous people as well as world community to stop these evil tasks and pray to God to bring peace and happy to the motherly earth. Praying together, offering flowers and worshipping God in the temple can be an effective instrument to remove the Novel Corona virus from the universe. In this pandemic situation, religious leaders continuously pray to God offering flowers for making Him satisfied and for serving the *vanta* two people are recruited who take care of the *vanta* in the temple. General indigenous people can perform their prayer and ritual going to the temple following hygienic measures.

Though it seems surprising to discuss that Covid-19 has some positive sides along with negative ones. Due to the prolonged lockdown in CHT, people cannot move freely as any kind of mobility inside the community from the outside is restricted along with close down of market and vehicles. Consequently, settler people especially mainstream cannot visit the remote areas for cutting down trees and hills, extracting stones from the underneath of soil, hauntings wild animals, and destructing environment indiscriminately. Moreover, market being closed, their possibility of selling these resources become difficult. So, the stress on nature by human beings decreases a lot and nature restores its losing beauty and power. On the other hand, living in remote area, indigenous people can resume their intimate relation with nature and nurture the nature. They only extract resources for their own need making no harm to the nature alike their ancestor as historically they are indifferent to accumulate capital/profit. The nature based traditional livelihoods though create scarcity of cash money in the community due to non-reliability on market-based economy, but it provides self-sufficient village community like their ancestral periods, along with diminishing the chain of infection of Covid-19 in indigenous community. Cash money may not affect much on indigenous peoples' life as they collect most of the commodities from the forest and land, however, those who are involved in small scale business may face some problems in the community. Indigenous people living very close to nature and leading traditional life develop resilience in their life and if they get infected with corona virus, their recovery rate is very high as well as death is rarely found.

Chapter 7: Conclusion

Conducting ethnographic fieldwork is always challenging. However, if the fieldwork is conducted in pandemic situation, that challenge will be increased manifolds in terms of maintaining health measures and social distancing, getting access to the field sites, having foods, language and communication problems, as well as getting respondents for taking interviews spontaneously. In my case, I had handled everything skillfully and my student Amlan Chakma helped me a lot as a gatekeeper. I knew that the findings and originality of my research project would largely be dependent on the authenticity of data and how I could implement my plan in the field, so in this case, I did not make any compromise though I had faced huge challenges to handle the issue. During the last day of my field work, some respected interviewees whom I met many times due to staying long time in the field sites asked me to do something betterment for their life. They asked me to inform government to take necessary steps to minimize their sufferings and struggles assuming me a person of Government. Indigenous people assumed me a powerful person as I was a teacher and government job holder but I could not say anything to them. After returning to home from field sites, when I was sleeping at night, I was feeling very upset and guilty as I could not do anything to change the position of these vulnerable people as I was not a person from government and had no influence to policy making to change the position of these affected people. In the night, all these vulnerable faces were floating to my eyes and this made me depressed as I was unable to help them due to my limitation. However, I felt relaxed thinking that my research works might get attention to world community as well as the government of Bangladesh when it would be published from The Hong Kong Polytechnic University, then, perhaps government might come forward with new policy to improve the condition of these unfortunate people.

Though indigenous people constitute only one percent of the total population in Bangladesh but their contribution to cultural diversification and economy cannot be neglected. Indigenous people mostly live in hilly area of Bangladesh and they occupy a large portions of country's remote area. So, in the context of nation's environmental and economic impacts, their adaptation strategies have already become a significant issue (Petheram et al 2010). Bangladesh is one of the most vulnerable countries and indigenous people are among the first who face the direct or indirect consequences of natural hazards being highly dependent on environment for their subsistence (Ahmed and Haq, 2017). This study is an attempt to find out the impacts and

vulnerabilities of natural hazards and environmental degradation on cultural and traditional life of indigenous people. The study indicates that over the last few decades, climatic events are observed in CHT and indigenous people are most likely confronted the severe effects of these events having least resources and being dependent on forest resources for their livelihoods. Because of climate change, rainy season is delayed to start which affects the agricultural activities of indigenous people. Winter and summer seasons are also not started in due time vice versa (Ahmed and Haq, 2019; Jacob, 2010:861) that affects the ecological activities of the environment and has severe impacts on indigenous peoples' subsistence. Climate change has brought new dimensional hazards like lightening and thundering in recent years which have occurred any time, even, having no cloud in the sky. Consequently, people may face unprecedented sufferings and loss of lives as they may not escape from this in right time.

The study findings also indicate that over the last few decades, the people of indigenous community plant sagwan trees in the hills for more profits because the growth rate of this tree is very high, so, they can easily sell it after three to four years of plantation to get much money. However, this tree is not environment friendly as it does not allow other trees/crops to grow underneath of it and cannot reserve water under the soil which contributes to destruct environment. Excessively cutting down hills and extracting stones under the soil are also liable for decreasing water level which create scarcity of water in summer season. Apart from creating irrigation problems in agro-lands, this scarcity of water affects their daily life in terms of washing, cleaning, bathing, drinking, cooking, utilizing others purposes. Throughout the generation, indigenous people had been followed nomadic life and worked as hunter and gatherer. They did not have the tendency to accumulate profit exploiting environment and they were satisfied with the resources if that could fulfil their whole years demand. So, after working four to five months in the field of a year, they enjoyed rest of their time by gossiping, playing, visiting relatives' houses, performing religious activities and so on. But, with the contact of mainstream people, they have changed their mindset and involved to accumulate profit from the nature. They are applying modern technology such as power tiller and pump in the land and cultivating same lands frequently for more profits alike the mainstream people which contributes to less production and decrease in the fertility of the soil. Moreover, climatic events cause different diseases to their crops and plants which are sometimes not cured even by using pesticides (Ahmed and Haq, 2019).

Climatic events also cause flood that wash away all household belongings along with damaging houses. So, indigenous people are trying to adjust their housing structure and build brick-built house instead of making traditional houses. Economically insolvent family

only makes the ground of the house with brick, sand and cement and constructs upper wall with bamboo fence/wood for making it long lasting/strong and protecting from climatic extremities. In the recent past, indigenous people made their traditional house which was called *Machang*. This house was built three to four feet above the soil to protect from the attack of wild animals and natural hazards but due to shortage of bamboo, wood and cane in the forest and being expensive, people lose interest to make this type of house. Moreover, this house cannot protect them from flood and cyclone and these are easily damaged during disasters. So, people are not making traditional houses in the present time.

Throughout the history, indigenous people have maintained an intimate relation with nature where they would collect all their daily commodities such foods, fuels, fiber (3fs), fish, meat, vegetables, housing materials, traditional medicines, etc. from the forest without endangering the environment. But, with the expansion of market/market-based economy people have started to extract resources excessively for profit putting huge pressure on nature. In this context, they are very much influenced by the mainstream people. Moreover, climatic events also decrease the resources in the forest which ultimately increase the pressure on the natural resources in the forest.

Traditionally, indigenous people do slash and burn cultivation (*jhum*) cultivation (Roy, 2017). In *Choitro-Boishak* (Middle-March and Middle-April) month, jungle in the hill slopes is burnt by fire for cleaning and at the starting of rainy season, they plant different crops such as paddy, turmeric, ginger, cotton, wheat, vegetables, fruits etc. (Ahmed and Haq, 2019; Dawan, 2018:158; Kanungo,2018:197; Roy, 2017). *Jhum* cultivation requires large piece of land. But, due to the pressure on the lands and climatic events, this cultivation has gradually been disappeared from the tradition of indigenous culture.

This project also tried to find out the coping strategies of indigenous people during climate change extremities/hazards through adaptation and resilience. The study findings reveal that Buddhism in belief and worshiping nature as God, Chakma people celebrate '*Biju*' which is one of the largest festivals in their culture. The first day of *Biju* festival is called '*Full Biju*' (Springtime festival), second day is *Biju* and third day is called *Nuya Bojor* or *Gojja-Pojja* (Dawan, 2018:158; Kanungo, 2018: 191). This religious function brings about strong communal feelings among the indigenous people as they enjoy the day collectively. Young Chakma people in this day greet/salute elderly people and feed animals' different foods and also try to forget what classes they belong to irrespective of class, cast, rich, poor, young, old, gender etc. meeting one another to enjoy the days. They eat '*pajontone*', one kinds of

mixed foods in this day with the believe that if they can feed seven families' *pajontones*, then they may suffer less diseases in their life (Dawan, 2018: 158; Kanungo, 2018: 191). Indigenous people have strong bondage that help them to get collective decision to any issue. Along with believing Buddhism, they also worship nature and for this, they collectively choose a place or big trees or big stone for worshipping it as a God. After the rituals, they usually drink wine and dance/sing collectively which increase solidarity in the society.

The study findings reveal that due to climate induced hazards, the ritualistic activities of indigenous people have been increased to a great extent. People believe that because of the upsurge of evil works in the universe, hazards are increased and only by doing ritualistic activities and satisfying God this problem can be solved (Leonard et al., 2013). People have also enhanced their prayers and religious activities in the recent years believing that religious prayer/activities would remove their pressure due to hazards and risks and bring betterment for their family and community (Leonard et al., 2013).

Indigenous people have the capacity to perceive the recurring hazards by seeing the symbols and signs of the nature, especially, elderly people can understand what can be happened after seeing the behaviors of animals and other natural species (Petheram et al., 2010:686). Indigenous people can understand about the recurring hazards by seeing the nature of clouds and winds and hence, they can take preparation to face the hazards accordingly. If the cloud moves swiftly in the sky, there may be the possibility of occurring cyclone but if it moves slowly in the sky, then it may be occurred strongly (Speranza et al., 2010: 298; Luseno et al., 2003). However, if the cloud looks black, dense and slowly moved, there is the possibility of occurring heavy rain. Abnormal behaviors of natural species and chirrup/certain noises of birds/wild animals in the forest also symbolize that natural hazard may occur in the locality and indigenous people try to take preparation to tackle this (Speranza et al., 2010: 305).

Due to climate change extremities, the resources in the forest have been decreased a lot. Consequently, indigenous people are compelled to search alternative job to manage their subsistence. In the past, due to abundance of foods in the forest/hills, they worked for a limited time and enjoyed rest of their time but now, they cannot do that due to scarcity of foods/ resources (Ahmed and Haq, 2019: 679; Jacob, 2010:871). So, in recent years indigenous people are sending their children to school assuming that after getting educated, they may get good job and solve their economic problems. Indigenous people are compelled to change their food habit also as their traditional foods are not available in the hill/forest. Moreover, young people's fascination to mainstream foods have also been increased to the community in recent

years. So, they need to depend on market based mainstream foods that contribute to create disappearance of their traditional foods gradually from their culture.

Indigenous people, especially, vulnerable people do not get sufficient supports from the governments even from NGOs to overcome their vulnerability. Local leaders devour money from the budget of relief and distribute relief unequally. So, real affected people do not get sufficient relief to overcome their vulnerability. Multidimensional exclusions have been encountered by indigenous people in CHT that may be caused in the form of ethnicity, race, class, caste, gender or religious basis (Petheram et al., 2010:684). Indigenous women also confront social discrimination and sexual harassment in their life, along with being expelled from their lands in the community. Moreover, by the reason of having communal ownership of lands and having no documentation of ownership, indigenous people also face challenges to keep their occupied lands from the exploitation by settler people. Nevertheless, indigenous people resist this exploitation collectively and try to gain their rights in the community.

During and post-climatic extremities, indigenous people encounter different types of problems in term of destruction of houses/infrastructures, scarcity of foods, emergency needs and so on. Indigenous people at this time utilize their small savings to repair their houses and buy emergency needs, otherwise, they have to search for relief or borrowing money from relatives/friends to overcome the hardships. Indigenous people have strong communal bondages so, if any family faces problems in hazards, community members come forward to help that family spontaneously. If any peoples' house is damaged in cyclone, neighboring people help him by giving money, housing materials, labors, shelter and supports, etc. to overcome the adversity (Petheram et al., 2010). Sometimes, they also share foods and exchanging/bartering necessary commodity to the community to overcome vulnerability (Leonard et al., 2013:687; Petheram et al., 2010).

The study findings also indicate that to protect flood and cyclone, they make brick-built house by adjusting their traditional house. They make bamboo loft inside the house to protect their valuable products from the damage of flood water. Indigenous people preserve some dry foods such as puffed rice, molasses, fried rice, biscuits, fruits, pure drinking water etc. for using these during climate induced hazards. Sometimes, indigenous people keep their valuable material i.e., gold ornament, money, valuable documents in bamboo tubes and keep inside the ceiling for safety (Garai, 2017). Chakma people are very much careful about the landslides, especially, those who live close to hills during heavy rain occurring for long time. Moreover, they keep blades, axes, knives etc. inside the room all the time so that they can instantly cut the wall/fence of their house and escape from the room during landslides. During

the emergency situation, their position is also informed to the neighbors over phone for evacuation. Some people stay at neighbor's house during that time to avoid the risk of landslides. Apart from this, they plant Shibu trees and other wooden trees surrounding their houses as it can protect landslides. They also take different disaster management training to combat climate change extremities in their locality.

This project also tried to find out the impacts of Covid-19 on indigenous people and the ways how they response to the pandemic in the adverse situation. The study findings indicate that indigenous people are well aware about the impacts of Covid-19 and they are facing severe problems due to the prolonged lockdown in the community because most of them live on hand to mouth for their subsistence (Carmen, 2020; Chakma, 2020). Lockdown has brought unprecedented sufferings to the life of indigenous people due to prolonged close down of market as they cannot market their products/commodities and many of their produced resources get rotten and damaged in the field. Nevertheless, they are coerced to sell their products to the local people at cheap rate to minimize their big loss (Chakma,2020;13). Indigenous people usually earned a handsome money from tourism and garments factory, but, the outbreak of Covid-19 have stopped that and brought miserable situation to their life.

Due to poor communication system and being living in remote hilly area, indigenous people are deprived from getting modern health services as there is no modern medical health center in the community (Chakma, 2020:14, Hennin, 2020:36; FAO, 2020:3). For this why, indigenous people are bound to consult with faith healer/*Kabiraj* for medical consultancy in their locality (Chakma,2020:17). Moreover, to curb the spread of Novel corona virus, indigenous people cannot have sufficient access to the hygienic material (public sanitizers) such as mask, hand sanitizer, gloves, PPEs, googles, medicines etc. in their locality even if they find, prices are very high compare to the real prices which are beyond the capacity of poor indigenous people (Kaplan et al.,2020:1728; Reinders et al.,2020). The people of indigenous community are deprived from getting education as government has introduced formal education through TV and online due to close down of educational institutions for long times (Chakma,2020:18) but Chakma people can hardly access to these facilities to participate in the program.

Traditionally, indigenous people are habituated to live in collective way being a collective entity but Covid-19 shakes that severely. It also distresses transmitting inter-generational activities because throughout the history, indigenous people are living mutually through performing different cultural gathering, harvesting crops, cultivating slash and burns, celebrating different festivals, arranging marriage ceremonies, playing traditional games, even

combating climate induced hazards but the Covid-19 pandemic has made them fragmented which also disrupted their cultural norms and traditions (Hennin,2020:39). Elderly indigenous people are considered as the saviors of tradition, wisdom, history, mythology and language of a community, so, any danger of this peoples especially, decease due to Covid-19 is a great loss to their prevailing culture, way of livings, stock of knowledge, conservation of biodiversity and ancestral expertise, even, the loss of knowledge of traditional medicines in the community.

People in indigenous community are very much cautious about the virus of Covid-19 and they have undertaken different precautionary measures to escape from the virus. This includes drinking hot water and tea with ginger, cardamom, black cumin, wearing masks, washing hands with soap or sanitizer, bathing with neem leaves pest, eating basil leaves with honey, taking nutritious foods, vitamin C related fruits and so on (Reinders, et al. 2020).

Traditionally, indigenous people possess strong communal bondage in their community that contributes to create resilience and adaptation in adverse situation. In the periods of lockdown, if there was any shortage of food in any family, neighboring family would come forward to support them. People also exchanged commodity or followed barter system in the community avoiding to go to market for buying products for their family. Moreover, to fulfill their family demand, they had to work hard in the field maintaining hygienic measure for getting crops/vegetable and tried to avoid dependency on market for their daily life.

The concept 'lockdown' is not new to the members of Chakma community because they have been familiar to this concept since their ancestor periods. In the ancient periods, the Chakma had their traditional practice "*Adam-Bon*" or 'lockdown' to control epidemic. In Chakma language, "*Adam*" refers to village and "*Bon*" means lockdown. During *Adam-Bon*, peoples' movement were restricted by circling bamboo fence/walls between the villages (Chakma,2020:9, Hennin,2020:40). During the implementation of lockdown in Bangladesh, indigenous people formed village committee to monitor the movement of people to enter and outing (Reinders et al.,2020: 4). They implemented 14 days quarantine policy if any person would come from outside of the community. Only shopkeepers and some selected people could go to market/outside of the community to buy necessary commodities for villagers only for one day in a week and they also had to maintain the health policy strictly.

In CHT, during the outbreak of Covid-19, a group of young indigenous people formed a volunteer organization to curb the spread of Covid-19 and help destitute people in the community. For this why, they raised fund named "Corona Crisis Fund" from the donors of solvent indigenous people. They disinfected different points of the community to curb the

spread of virus, along with supporting destitute people in terms of giving relief, food, medical support, mental support and so on.

For the survival from the impacts of Covid-19, Chakma people applied their traditional strategies following their culture and natural resources (Hennin,2020:37). They used their small saving to bear the cost of family and searched alternative income to help their family. Sometimes, they cut their meals off three to two even one to survive the situation and hoard wild foods from the forest for consumption. They avoided to depend on market based economic activities that reduced their usage of money and give much concentration on forest resources and ploughing land to fulfil their family demand. So, the outer world could not affect them much in pandemic situation.

In indigenous community, due to limited access to modern health services, faith healer (*Bodhya*) has played a conspicuous role throughout the history (FILAC,2020:12). Moreover, in lockdown periods this role has increased a lot as community people are not allowed to go to hospital for treatment due to having the risk of infection. Faith healer has been giving treatment to the indigenous people successfully throughout the history and in this case, they used their traditional medicines which they collected from forest (Carmen,2020:4; FILAC,2020:12). Indigenous people believe on spiritual power to recover from diseases. They sacrifice animals to remove evil power from their community which is called (*Dali*) in Chakma language. For the recovery from certain diseases, they arrange *Dali ritual* for the name of 'GANGA' in the river and for the name of 'BON BADSHA' in forest/land and sacrifice animals.

Apart from religious leaders (*vanta*), most of the people in indigenous community believe that Corona virus is the curse of God and it is happening due to the increasing of evil tasks among the human beings and the exploitation of motherly universe for excessive resource extractions. The destructive activities of Novel corona virus cannot be stopped until people halt their evil task and terminate to destruct environment for extracting resources. Religious leader (*vanta*) believes that along with stopping evil task, and only by praying together, offering flowers and worshipping God in the temple, peoples can be relieved from the curse of this deadly Novel Corona virus from the universe.

The study findings also demonstrate that due to prolong lockdown and close down of market, mainstream people did not get scope to exploit environment i.e., could not involve in cutting down trees and hills, extracting stones from the underneath of soil, hauntings wild animals, and destructing environment indiscriminately. On the other hand, indigenous people returned to their traditional life avoiding to depend on market making intimate relation with nature to collect resources by not harming environment. Consequently, nature is getting

enough scope to restore its lost beauty and power and becoming very much natural. Moreover, living very close to nature and leading traditional life, indigenous people enhance resilience to their life because the recovery rate of infected Covid-19 indigenous patient is very high and hardly found the people who has died due to the infection of Covid-19 in indigenous community.

Finally, it can be said that climate induced hazards and destruction of environment are happened in CHT which affect the traditional life of indigenous people but they fight against this adversity in their own ways. Their life long struggles, indigenous knowledge, and cultural practices provide them effective strategies to fight against the adversity. Moreover, their integration, mutual co-operation, and collective efforts help them to overcome their vulnerability and develop resilience adapting them in adverse situation.

This project mainly focuses the ways of living of indigenous people, their vulnerability and coping mechanisms in climate induced hazards and Covid-19 pandemic situation, especially, for those who are living in remote hilly area in Chittagong Hill Tracts of Bangladesh. Apart from this, a large portion of indigenous people in Bangladesh are living in plain lands and coastal belt area and their culture and coping strategies are different from the culture of hilly indigenous people. These people are also facing huge challenges from the exposure of coastal belt related hazards due to climate change and man-made hazards but their ways of livings, vulnerabilities and responses are not focused in this project. Thus, in the near future, some projects can be undertaken on these vulnerable indigenous people to know about their ways of livings, nature of vulnerabilities, and coping strategies, then a comprehensive idea can be gained and a comparative picture can be found of overall indigenous people in Bangladesh which will help policy makers to formulate policy to implement disaster management strategies in that particular area. Moreover, the incorporation of modern technology and institutional responses together with the local indigenous strategies can formulate an effective strategy that can help fruitfully to combat any hazards in Bangladesh as well as similar settings in other parts of the world.

7.1. Implication of this study to the development of mainstream people in Bangladesh

Bangladesh is considered a multicultural diversified country as different ethnic groups live here with different culture, language, religions, foods and so on. More than 47 ethnic groups live in different parts of Bangladesh with diversified culture and the indigenous people who live in CHT are fully different from mainstream people in terms of culture i.e., language, foods, dress, religion, tradition, even cultivation procedure etc. As the Chakma

people along with other indigenous people live in Chittagong Hill Tracts area which is far distance from the majority of mainstream people, there develop a gap between the indigenous and mainstream people. Though indigenous people are deprived from getting fundamental rights due to poor policy of Bangladesh along with the exclusion of mainstream people throughout the history, but many people in mainstream society assume that indigenous people lead a good life due to the highly attractive natural environment and tourist place in CHT. They also seem that indigenous people enjoy more freedom and especial facility living in a distinct territory of Bangladesh. Mainstream people also possess a negative view to the indigenous people due to their taking possession to Pakistan during the liberation war in 1971 and subsequently resisting against the exploitation of mainstream people as well as poor policy of government after the independence of Bangladesh. This resisting trend has brought a negative attitude towards indigenous people by mainstream people and many often they do not possess any sympathy to this indigenous people. After talking many mainstream people, I got this information but many indigenous people are very much sympathetic to this ethnic groups. This knowledge gap between these two groups sometime turns into an antagonistic situation in our country but I think when this knowledge gap would be narrowed/misunderstanding would be disappeared, mainstream people will come forward to help indigenous people.

Apart from this getting not much opportunity, indigenous people cannot become higher educated and also cannot develop leadership skills being confined in remote area. So very often it is seen that none was found active to represent indigenous community, their culture, religion, philosophy among the mainstream society. Moreover, mainstream people often neglect them assuming backward community in terms of being less educated, unskilled, and unproductive people. This trend actually creates a misunderstanding between the people of mainstream and indigenous community. In this context, the leadership of indigenous people could make understand that they (indigenous people) are not incompetent to other people. However, being situated in remote area and having poor communication system, very often mainstream people express apathy to stay in CHT, so their misconception about indigenous people is not removed easily and they possess this thinking generation after generation. Moreover, the young people who has never visited in CHT think differently about indigenous people as their culture, food, religious, language etc. being different. This trend may be changed if media and other means of Bangladesh do not present indigenous people in different ways.

The government of Bangladesh always see indigenous people in suspicious eye due to their past history i.e., revolution for separate state and taking their position in favor of Pakistan during liberation war. The government of Bangladesh has set up several military camps in every point and keep very watchful eye to the activities of indigenous people. If this military force finds any suspicious activities among people, they take action against this, even they charge against this people on the basis of suspicious thinking, consequently, a gap has been developed between the people of these two communities. Indigenous people though live in independent country but they sometime have to think that they are not liberated.

In the decades of 1980s, many Bengali people especially landless poor Bengali people were migrated to CHT with the patronage of government and settled with house and land by the government. Apart from this, many Bengali people were migrated to CHT and made their houses for living permanently. Many of these people had exploited indigenous people and grabbed their agriculture land and even land in residential area. Sometimes clash was happened among these groups and administration was seen remained silent very often. However, many permanent Bengali people helped indigenous people to their distress and maintained intimate relation with this community. In 1980, when the kornafully hydraulic dam was constructed, a huge number of indigenous people had lost their house and agriculture land and forced to migrate in neighboring countries such as India and Myanmar. Some settler Bengali people seized this land and used for their own interest. Government should take action to return this migrated people and rehabilitate them in their lost land, then the gap between indigenous and mainstream people could be removed and a mutual understanding can be developed among the people. It is heard that settler Bengali people socialize their children from childhood saying that indigenous people are uncivilized, separatist, unproductive and a negligible attitude always works in their mind. For this why, indigenous people often get misbehavior from the mainstream people. This process would be changed by changing attitude toward indigenous people and cordial and respectful behaviors is expected from the both parties to develop a good environment in CHT.

I think this research project would be a good piece of work for mainstream people those who think that indigenous people are living very soundly in CHT having very attractive natural environment and tourist spot. Mainstream people also able to understand that indigenous people are struggling throughout the history to adapt to the unfavorable environment by implementing their local strategies and try to adapt to the adverse situation. Mainstream people also could understand that government policy to CHT is not fruitful to the ultimate development of this vulnerable groups as some corrupted officers of local

administration misguided the development project in the territory and this development project turn into burden to the life of indigenous people. Local government or development officers should consult with local indigenous people before implementing any project in the locality, because local people know better about the environment than the development officers. This project also informs mainstream dominant society that due to illegal wooden business and illegal stone extraction by the mainstream people disrupt the environment of that locality and indigenous people have to pay for this by struggling to experience different natural hazards throughout the years. As a researcher and teacher of sociology, I was well informed about the vulnerability and exclusion of indigenous people in CHT as some of my friends, colleagues and students belong to indigenous community who share their suffering to me and during my visit in CHT I also witness that in my eyes. But when I share my experience with some of my friends and colleagues of mainstream society, they could not believe my words as they possess a bad attitude historically to this indigenous people (many mainstream people have sympathy and positive attitude to indigenous people also). I think this empirical work remove their misconception towards the indigenous people and become positive to them. I think mainstream people come forward to the welfare of this people and also make aware other people about the vulnerable situation of indigenous people. I also gather many thrilling and authentic information and get well informed many issues about this backward indigenous people that might influence me to do more study to this unfortunate people. I think the settler people who exclude indigenous people also rethink about them before doing further exclusion of indigenous people in CHT after publishing this project, because they could understand their mistake and also be aware about the suffering of their counterpart in CHT that influence them to live mutually and co-operatively in near future rather than doing exploitation any more. Government also rethink and reshape their policy and implement it on the basis of empirical finding of that particular locality that would be more effective to change the wheel of luck of indigenous people.

Finally, it can be said that there is huge communication gap between mainstream and indigenous people which make separation and distrustfulness between these two groups. In this context mutual cooperation and respect is important to built good relation among the community and government should come forward changing their attitude towards indigenous community, then a good environment will be developed in Hill Tracts area in Bangladesh.

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Appendix 1:

PARTICIPANT CONSENT AND INFORMATION SHEET

This information sheet expects to get your participation in a research project conducted by Joydeb Garai, a PhD candidate at the Department of Applied Social Sciences in The Hong Kong Polytechnic University under the supervision of Dr KU Hok-Bun, Ben (chief supervisor) and Dr Zhan Yang (co-supervisor). Your participation and provided information may contribute to create my doctoral thesis an important document for climate change adaptation of indigenous community. You are selected as a potential respondent because of your expertise and good commands as well as your experiences in climate change impacts and adaptation that will be valuable to the research project.

1. TITLE OF THE STUDY

Hazards, Vulnerabilities and Responses of Chakma Indigenous People: A Case Study from Rangamati Districts in Bangladesh in the Period of Covid-19 Pandemic

2. PURPOSE OF THE STUDY

The purpose of this study is to find out the impacts and vulnerabilities of climate change on indigenous people. This study also tries to explore the coping strategies and climate change adaptation procedures that indigenous people adopt during and after natural hazards. It also explores the impacts and response of Covid-19 on indigenous people in CHT.

3. PROCEDURES

Two hetero sessions will be required for your involvement, if you provide your consent to participate in the research project. Firstly, you need to participate in an interview process on the basis of research objectives and subject matters. Secondly, you will be a member of checking obtained data where you will validate your opinion whether it is captured accurately or not. Both of these meeting will be voice recorded, transcribed, and analyzed and lasted minimum 60-90 minutes. The place of this interview will be selected after consulting with you and your preferred place will be given most emphasize.

4. POTENTIAL RISKS AND DISCOMFORTS

In the interview process, the information that will be interrogated and the function that will be performed i.e., participant observation to the best of my knowledge

will not be impressionable and may not contribute an uncomfortable situation to you anyway. Notwithstanding, during the interview process at any point, if you feel uneasy and want to leave off the research you can do it freely.

5. POTENTIAL BENEFITS TO SUBJECTS OR COMMUNITY

As a participant of this study, you may not be benefitted directly. Nonetheless, the information obtained from you in the long run may contribute to get a comprehensive understanding about the reality and vivid scenarios of your community that may help government and policy makers to implement policy to the development of your community.

6. PAYMENT FOR PARTICIPATIONS

Participants in this research project will not be offered remuneration. However, occasionally refreshments can be done during the study periods if possible. Researcher will not think the violation of rights or penalty if you wish to pull up participating the interview at any stage of the research.

7. CONFIDENTIALITY AND ANONYMITY

In this study, any information that obtain from you traced or identified you will be strictly anonymized. As a participant, all respondent's names will be coded in the transcription, keeping it inconceivable to identify your identity by other. All the transcribed data will be marked alphabetically and correlate it with a respondents list and stored anonymously in another hard disk device. Moreover, hard copies of all documents such as photographs, field notes, transcription notes, analytical notes etc. will be deposited in a secured file under lock in safe place. Likewise, in the academic publication and other reports, pseudonyms will be used as nobody can identify your name in the research. In any stage of research project, your identity will not be disclosed and keep it under pseudonyms and only researcher can access to this.

A personal laptop with secured password will be used to store all data collected from the field and keep a backed up of this data to an external hard drive-in safe place with password protected. Recoded data will be deleted after transcribing and analyzing it. The findings of this study solely used for academic purpose and a dissertation will be written for public accessibility through Pao Yue Kong Library of The Hong Kong Polytechnic University. The Hong Kong Polytechnic University takes reasonable precautions to prevent the loss, misappropriation, unauthorized access or destruction of the information you provided. Several scholarly articles will be developed from the results/findings of the study and published in scientific international

journals. None of the cases, participant names will be used. From the laptop, all transcribed data including hard copies of the data will be completely erased and deleted after five (5) years of the study.

8. PARTICIPATION AND WITHDRAWAL

In this study, respondent can enjoy the full liberty about taking decision whether he/ she participates the research or not. As a volunteer participant, you may withdraw your participation at any point of the study without facing any consequences. You may also refuse to answer any question if you wish and still have in the study. Notwithstanding, investigator can withdraw you if find any tangible cause of this action.

9. IDENTIFICATION OF INVESTIGATORS

About this study project, if you have any inquiry or concerns, under the following situation, please feel free to contact Principal investigator:

- 1) If you have any other questions in relation to the study;
- 2) If, under very rare conditions, you become injured as a result of your participation in the study; or
- 3) If you want to get access to/or change your personal data before (the expiry date).

Principle investigator

Dr Ku Hok-Bun, Ben (Associate Professor, Department of Applied Social Sciences, The Hong Kong Polytechnic University, Hong Kong)

Email address: ssbenku@ Telephone: (+852) 2766 4553

Co-investigator

Joydeb Garai (PhD candidate, Department of Applied Social Sciences, The Hong Kong Polytechnic University, Hong Kong).

Email address: Joydeb.garai@

Telephone: (+852) 6848 Hong Kong, (+88) 0191 Bangladesh

10. RIGHT TO RESEARCH SUBJECTS

As a voluntary participant in this study, you can possess the right to withdraw your participation at any stage of the research. This means not like that you will be punished or waiving any of your legal claim, rights or remedies due to your withdrawal. Your request for accessing to and making correction of your provided personal information in the study will be cordially appreciated.

The project has been approved by Human Subject Ethics Sub-committee (HSESC) (or its Delegates) of The Hong Kong Polytechnic University (**HSESC Reference number: HSEARS20190826003**)

In the event you have any complaints about the conduct of this research study, you may contact the Human Subjects Ethics Sub-Committee of The Hong Kong Polytechnic University in writing (c/o Research Office of the University) stating clearly the responsible person and department of this study as well as the HSESC Reference Number.

Thank you for your interest in participating in this study.

11. SIGNATURE OF RESEARCH PARTICIPANTS

This is to certify that the study has been clearly explained to me the participant by Joydeb Garai in a language I understand (English/Bangla/other) and I took the opportunity to participate the interview and answered all the questions to my satisfaction.

I hereby give my consent voluntarily to participate the research. A copy of this form has been given to me.

Name.....

Signature

Date/Place...../.....

Appendix 2

Checklists for Fieldwork to indigenous people

Hazards, Vulnerabilities and Responses of Chakma Indigenous People: A Case Study from Rangamati Districts in Bangladesh in the Period of Covid-19 Pandemic

Broad objectives

1.To find out the impacts and vulnerabilities of climate change extremity on indigenous people in Bangladesh

- a) What do you mean my climate change?
- b) What do you mean by climate change induced natural hazards?
- c) What types of natural hazards occurred in your locality?
- d) What do you mean by climate change impacts?
- e) What types of impacts you face in your everyday life?

- f) What do you mean by vulnerability?
- g) What types of vulnerability you face in climate change extremity?
- h) All community members face this vulnerability? Why or why not?
- i) When people face vulnerability more and why?
- j) Who are responsible for your vulnerability and why?
- k) Can you get proper supports to overcome this vulnerability?

Specific objectives

2.To examine the ways in which indigenous peoples' culture, religion, and way of living are endangered due to climate change extremity

- a) Do you think that climate change affect your socio-cultural life? How?
- b) Have you changed your religious activities due to climate change?
- c) Do climate change impacts on your income opportunity? How?
- d) Can you get support from local govt/NGOs to maintain your socio-cultural life in climate change extremity?
- e) Do you face any discrimination and exclusion by the mainstream society? Why and how?
- f) Have govt taken any initiatives to sustain your socio-cultural practices in extremity?
- g) Do you think that climate change is endangering the cultural practices of your community?
- h) Do you think that you cannot get proper support from concerned authority to save your cultural practices?
- i) What is your suggestion to protect the cultural practices of your community?

3.To examine the representativeness of indigenous people in local and national politics for decision making and role playing in climate change adaptation

- a) Do you involve in local politics in your locality?
- b) Have you any power to take decision in your locality?
- c) Why cannot take decision ?
- d) Have there any representative of your community in political parties?
- e) Do political parties support any welfare activities in climate change?
- f) In your distress, can local govt hear your voice to help you?
- g) Do you have any community leader who have connection to government?
- h) Do you think that you have rights to get support from govt in your distress?

- i) What role local govt play in climate change adaptation in your locality?
- j) During and after the hazards, do community leader/local govt authority visited your house to support you?
- k) Are community leaders able to convince govt to get support in emergency period?

4.To examine the nature of experiences of managing natural resources and coping strategies of indigenous people in Bangladesh

- a) How can you maintain the subsistence of your life?
- b) Do you have access to natural resources in your locality?
- c) Do you face any difficulty to access the natural resources of your locality?
- d) How can you manage natural/forest resources in your locality?
- e) Climate change hazards decline this resources? How ?
- f) What is the coping strategies you adopt in this adverse situation?
- g) What is the coping mechanisms you use to overcome this adversity?
- h) How can you learn this strategies to overcome vulnerability?
- i) Do you get any institutional support/training to perform it?
- j) Do you get any governmental supports to tackle this adverse situation? What types of supports you get?
- k) Do you have any formal training for climate change adaptation strategy?

5.To explore the types of social exclusion and discrimination indigenous people experience during the post-disaster period in terms of relief distribution, foods, and so on

- a) Have you experienced social exclusion and discrimination in your life?
- b) What types exclusion and who commit this?
- c) Do you get relief or supports during or aftermath of natural hazards?
- d) What is your opinion of not getting relief in your locality?
- e) Do you think mainstreaming people get relief during and after hazards?
- f) Local govt and NGOs workers visit in your locality after hazards?
- g) Do you get any long term and emergency supports from this people to overcome vulnerability?
- h) Do you face any discrimination of getting relief, foods from this organization during emergency
- i) Do you think that being Tripura indigenous people you face this discrimination?
- j) What is your suggestion to stop this discrimination?

- k) Have there any organizations/NGOs to work for reducing this discrimination and getting access to supports in climate change?

6.To explore the social security and factors of migration of indigenous people to other countries in the world.

- a) Do you face any security problem during and after the hazards of your locality?
- b) What types of problems you face in natural hazards?
- c) During and after the hazards, do you think unsocial activities (such as robbery, sexual harassment etc.) increase in your locality?
- d) Do you feel insecure to protect your belongings in this situation?
- e) Do the people of your community migrate to other places due to natural hazards?
- f) Where they migrate and do they back after a certain periods of hazards?
- g) What are the major factors of their migration?
- h) Do mainstreaming people enforce community people to migrate other places?
- i) Do govt or NGOs support in your community to stop migration?
- j) Who are mostly migrated to other places?
- k) According to your opinion, how this migration can be stopped?
- l) Do you think govt should take some initiatives to stop this migration?

Appendix 3

Checklists for Fieldwork to stakeholders

Hazards, Vulnerabilities and Responses of Chakma Indigenous People: A Case Study from Rangamati Districts in Bangladesh in the Period of Covid-19 Pandemic

Broad objectives

1.To find out the impacts and vulnerabilities of climate change extremity on indigenous people in Bangladesh

- l) What do you mean my climate change?
- m) What do you mean by climate change induced natural hazards?
- n) What types of natural hazards occurred in your locality?
- o) What role you/your organizations play to minimize natural hazards in your locality?
- p) What do you mean by climate change impacts?

- q) What types of impacts people face in your locality in everyday life?
- r) Do you / your organizations take any initiatives to reduce this impact of climate change?
- s) What do you mean by vulnerability?
- t) What types of vulnerability people face in climate change extremity?
- u) According to you all category/class of community members face this vulnerability? Why or why not?
- v) Do you / your organizations take any initiatives to reduce this vulnerability of climate change?
- w) When people face vulnerability more and why?
- x) Who are responsible for this vulnerability and why?

Specific objectives

2.To examine the ways in which indigenous peoples' culture, religion, and way of living are endangered due to climate change extremity

- j) Do you think that climate change affect people's socio-cultural life? How?
- k) What role you / your organizations take to protect socio-cultural life of Chakma community?
- l) Do you think that climate change influence people to change religious activities?
- m) Do you think that climate change impacts on people's income opportunity? How?
- n) What activities you/ your organizations take to maintain socio-cultural life of indigenous people in climate change extremity?
- o) Do you think that indigenous people face discrimination and exclusion by the mainstream society? Why and how?
- p) Have you/your organizations taken any initiatives to sustain indigenous people's socio-cultural practices in extremity?
- q) Do you think that climate change is endangering the cultural practices of your community?
- r) What problems you/your organizations face to save cultural practices of indigenous community?
- s) What is your suggestion to protect the cultural practices of this community?

3.To examine the representativeness of indigenous people in local and national politics for decision making and role playing in climate change adaptation

- l) Do you involve/follower local politics in this locality?
- m) Do you exercise any power to take decision in your NGOs /organization?
- n) What problem you face to take decision?
- o) Do Government or other organizations help you/ your organizations to the welfare of indigenous community?
- p) Have there any representative of your organization in political parties?
- q) Do political parties support any welfare activities in climate change?
- r) In natural hazards, what role you/your organizations play in the community?
- s) Have your organizations any leader who have connection to government?
- t) What role local govt play in climate change adaptation in your locality?
- u) What role your organizations play in climate change adaptation in your locality?
- v) During and after the hazards, do you /your organizations/local govt authority visited affected area to support indigenous people?
- w) Are community leaders/NGOs able to convince govt to get support in emergency period?

4.To examine the nature of experiences of managing natural resources and coping strategies of indigenous people in Bangladesh

- l) How can indigenous people maintain their subsistence?
- m) Do they have access to natural resources in this locality?
- n) Do they face any difficulty to access the natural resources in this locality?
- o) How can they manage natural/forest resources in this locality?
- p) What role you /your organizations play to manage natural resources in this locality?
- q) According to you, climate change hazards decline this resources? How ?
- r) What is the coping strategies Chakma people adopt in this adverse situation?
- s) What is the coping mechanisms they use to overcome this adversity?
- t) What role you /your organizations play to overcome adverse situation?
- u) Do you/ your organizations help them to learn this strategies to overcome vulnerability?
- v) Do your organization/institutions have capacity to support/train indigenous people?

- w) Do your organization get any governmental supports to tackle this adverse situation? What types of supports you get?

5.To explore the types of social exclusion and discrimination indigenous people experience during the post-disaster period in terms of relief distribution, foods, and so on

- l) Do you think that Chakma people experience social exclusion and discrimination in their life?
- m) What types of exclusion and who commit this?
- n) Can you provide relief or supports during or aftermath of natural hazards?
- o) What problem authority/NGO workers face to provide relief in this locality?
- p) Along with you, other Local govt and NGOs workers visit in this locality after hazards?
- q) Do you / your organizations provide any long term and emergency supports to this affected people to overcome vulnerability?
- r) According to you, Chakma people face any discrimination about getting relief, foods from this organization during emergency?
- s) Do you think that for being Chakma indigenous people they face this discrimination?
- t) What is your suggestion to stop this discrimination?
- u) Have there any other organizations/NGOs to work for reducing this discrimination and getting access to supports in climate change?

6.To explore the social security and factors of migration of indigenous people to other countries in the world.

- m) Do you think that indigenous people face security problem during and after the hazards in their locality?
- n) What types of problems they face in natural hazards?
- o) During and after the hazards, do you think unsocial activities (such as robbery, sexual harassment etc.) increase in their locality?
- p) Do indigenous people feel insecure to protect their belongings in this situation?
- q) Do you see people of this community migrate to other places due to natural hazards?
- r) Where they migrate and do they back after a certain periods of hazards?
- s) What are the major factors of their migration?
- t) Do mainstreaming people enforce community people to migrate other places?

- u) Do govt or NGOs support in your community to stop migration?
- v) What initiatives you/your organizations take to stop this migration?
- w) Who are mostly migrated to other places?
- x) According to your opinion, how this migration can be stopped?
- y) Do you think govt should take some initiatives to stop this migration?

Appendix 4

Checklist for Covid 19 and indigenous people

1. What is the perception of covid 19 to indigenous people?
2. Impact of covid 19 to indigenous people
3. How lock down affects their life?
4. What they do for livelihoods in lock down time?
5. How people see COVID-19 patients in indigenous community?
6. What is the quarantine procedure in indigenous community?
7. What experience people gather in quarantine period?
8. How COVID 19 patients become well in the community?
9. Have indigenous religious power make people strong to overcome COVID-19?
10. How people adapt to the new situation after covid 19?
11. What is the coping strategies/mechanisms of indigenous people to overcome covid 19?
12. Recommendation to controls covid 19 in indigenous community