

**ACCESS TO HEALTHCARE AND PERCEPTION OF SERVICES
RENDERED BY BOAT CLINICS: A STUDY OF *CHARS* AND *CHAPORIS*, IN
LAKHIMPUR DISTRICT, ASSAM**

*Dissertation submitted to Jawaharlal Nehru University
in partial fulfillment of the requirements for
the award of the degree of*

MASTER OF PHILOSOPHY

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2021

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CERTIFICATE

This is to certify that the dissertation/thesis titled **Access to Healthcare and Perception of Services Rendered by Boat Clinics: A Study of Chars..... and Chaporis in Lakhimpur District, Assam**.....submitted by Mr/Ms **Jayanti Saha**.....in partial fulfillment of the requirements for award of degree of **M.Phil/M.Tech/Ph.D** of Jawaharlal Nehru University, New Delhi, has not been previously submitted in part or in full for any other degree of this university or any other university/institution.

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Signature of Dean/Chairperson

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Acknowledgements

This dissertation would not have been possible to complete without the support and guidance that I received from many people.

Firstly, I would like to express my sincerest gratitude to my supervisor Prof Sanghmitra Sheel Acharya for guiding and encouraging me to conduct this study. Her comments helped me out to frame the study and to move forward to do in depth investigation. Every discussion with her makes me curious and sharpen my thoughts to explore further. Her guidance and motivation help me out and made it possible for me to write this dissertation specially during the COVID-19 pandemic.

I would like to thank the faculty members of CSMCH, and the member of the Research Advisory Committee Prof Ritu Priya and Dr Padmini Pani for giving insightful suggestions about the research.

I am highly obliged to the Centre for North East Studies and Policy Research (C-NES) for allowing me to conduct the survey with the boat clinic crew member and helped me to visit the health camps along with the crew members. I would like to extend my special thanks to Ms Bhaswati Goswami, the Communications Officer of the Centre for North East Studies and Policy Research (C-NES) for helping me whenever needed to conduct the study.

I would like to extend my sincere gratitude to the District Programme Officer of the Lakhimpur Boat Clinic, Mr. Tapan Bora, for providing me the necessary help and support. He discussed with me extensively and answered all my queries about the boat clinic. He helped me throughout the study. Any time when I was confused, especially in the wake of the lockdown, he would calmly and patiently advise and reassure me.

I would like to especially thank all the respondents who took part in the study and made this study possible.

I am grateful to the health care workers of the boat clinic who took time out of their busy schedules to share the information and their experiences as crew members of the boat clinic during the interviews. Their insights were the fuel for my thoughts which built the academic arguments.

I would like to thank my friend Miss Aisharya Bhattacharjee for helping me to prepare the maps.

I wish to express whole heartedly, most sincere gratitude to my parents for their love and support throughout my life, especially during the difficult times of COVID-19 induced lockdown, which was affecting the fieldwork and they could sense the tension in me. They were there giving me hope and confidence!

Last, but not the least, I would like to extend my sincere thanks to my friends for motivating and inspiring me as always, to carry out the research even when lockdown was making things uncertain. This work would not have materialized without each one of you supporting me. Thank you all.

Jayanti Saha
12th August, 2021

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List of Abbreviations

AIWC: All India Women's Conference

ANC: Antenatal Care

ANM: Auxiliary Nurse Midwife

ASHA: Accredited Social Health Activist

CHC: Community Health Centre

CNES: Centre for North East Studies and Policy Research

DPO: District Program Officer

GNM: General Nurse Midwife

IEC: Information, Education and Communication

NGO: Non-Governmental Organisation

NRHM: National Rural Health Mission

PHC: Primary Health Centre

PNC: Post Natal Care

RCH: Reproductive and Child Health

SC: Scheduled Caste

SDG: Sustainable Development Goals

SHC: Sub-health Centre

ST: Scheduled Tribe

UHC: Universal Health Coverage

UNICEF: United Nations Children's Fund

VHNDs: Village Health and Nutrition Days

WHO: World Health Organization

CHAPTER-1

INTRODUCTION

1.1 Introduction:

The Declaration of Alma-Ata reaffirmed health as a right in 1978 (World Health Organisation, 1978). Access to appropriate, adequate, and affordable health care is an important factor that determines the health of the overall population (Okuyama et al., 2019). Therefore access to healthcare services has an essential role in promoting health equity and quality of life (Dos Anjos Luis & Cabral, 2016). It is noteworthy that in the year 2013 the WHO and World Bank Group reported that nearly 400 million population do not have basic health care all over the world (World Health Organization and World Bank Group, 2015). Limited geographical access means the distance that one should travel to reach and utilize the health care continues to be a major impediment to achieve the goal of health for all (Jordan et al., 2004; Perrya & Gesler, 2000). Prior studies demonstrated that the geographic location and distance required for traveling from their living place to health care centres often lead to the reduction of utilization of health care centres (Sommers, 1989; Jones & Bentham, 1997; Al- Taiar et al., 2010; Rajpurohit, Srivastava & Srivastava, 2013). Hence the Sustainable Development Goal 3 put emphasizes on universal health coverage and equitable quality health care to address the problem of the population who are unable to use the health care services (United Nations Development Programme, n.d.; Dassah et al., 2018).

In India the rural health care infrastructure follows three tier systems comprising of sub-centres, primary health centres and Community Health Centres (Chokshi et al., 2016). In spite of that the rural health care system faces numerous constraints such as the long withstanding dire shortage of health care resources which ultimately aggravated the challenges of the rural people to access health care (Wan et al., 2018). There are numerous reasons contributing to the impediment of the rural health care system (Weisgrau, 1995). Among many elements the physical geography of the area comprises of distance, terrain, weather, transport type, infrastructure is considered as one of the important dimension of rural and remote health care (Farmer et al., 2010). The degree of remoteness and rural characteristics get intensified when the people living in the river banks experience severe flood and soil erosion every year (Government of Assam Water Resources, n.d.). After the flood people are partially or entirely dislocated from their own home and force to live in a despair condition with extreme difficulties to access water supply, sanitation facilities, electricity,

transportation facilities as well as health care centres and above all it restricts and create obstacles for all the development opportunities of that specific area.

Hence, in resource poor settings when people lives in vast scattered areas and hard to reach with no provision of basic amenities and non-availability of transportation facilities due to geographic terrain such as rivers, streams, rugged terrain, mountains, forest areas as well as during any disasters it becomes very essential to bring health care services at their door steps (Lindgren et al., 2011; Bhopal et al., 2013; Rassekh et al., 2014; Hudale 2016). So, in a situation like this various approaches have been undertaken to increase the health care coverage and travel to the heart of the communities through using numerous sophisticated and customized transportation facilities like aircraft, ships, boats, animals and motorbikes. These vehicles are used to make regular visit to the communities along with skilled health care workers and used globally to accomplish public health issues like infectious disease control, vaccinations and health education for decades (Vos et al., 1990; Hall, 1991; Yu et al., 2017). To reach the remotest population who are under resourced in terms of rural health centres different health programmes have been using the mobile clinic such as ships in the Peruvian Amazon, camel clinic serving the nomads of Kenya, four wheel mobile clinics in rural Malawi, motor mobile ambulance to reach the population (United Nations Office for the Coordination of Humanitarian Affairs, 2010; Lindgren et al., 2011; Sarkar 2020). Mobile health clinics have been used globally to accomplish public health issues like infectious disease control, vaccinations, reproductive health and health education for decades (Vos et al., 1990; Hall, 1991; Stephanie et al., 2017; Guruge et al., 2010).

Therefore, studies have found that mobile health clinic is the most cost effective model to reach and serve those vulnerable populations. Mobile health clinics provide prevention; screening and most importantly connect them into mainstream healthcare (Nancy et al., 2009). It reduces barriers like time, money and trust of the vulnerable communities (Hill et al., 2014). Along with addressing the geographic accessibility barriers this model have been successful to provide health care to the disadvantage population in a holistic manner without any linguistically and cultural barriers (Gibson et al., 2014; Guruge et al., 2010).

1.2 Statement of the problem:

In Assam the Brahmaputra river flowing from Sadiya in the east to Dhubri in the west along with its tributaries continues to influence the social, economic and cultural aspect of the society. The mighty Brahmaputra is the lifeline of Assam but due to the nature of channel shifting it turns out as a serious threat to the life of the people (Nayak & Panda, 2016; Pradhan et al., 2021). Due to the braided channel the Brahmaputra river give rise to the formation of lands in the river through deposition of bed sediment load and this mid channel bars are locally known as *char* (Chakraborty, 2014). As per the Socio Economic Survey Report of *Char* Areas, 2003-04 prepared by the Directorate of *Char* Areas Development, there were 2251 *Char* Villages in 14 districts of Assam with a total population of 24, 90,097. About 9.37 percent of the total population of the state inhabits in the *char* areas (Nayak & Panda, 2016).

Char-chaporis are physically separated from mainland, constituting isolated geographical territory. It constitutes one of the most socio-economically derived horizons in the region of Assam (Khandakar, 2016). The *char-chapori* areas are lacking basic infrastructure and amenities, and are underdeveloped due to various geographical, political, administrative and socio-economic constraints. As a result the people and community in *char-chapori* areas have been trapped in a vicious cycle of poverty and underdevelopment. High growth of population, inadequate physical infrastructure, low literacy, uncertain livelihood opportunities and poor health outcomes together trap the *char-chapori* people in perpetual poverty. All these variables trigger poverty and poverty subsequently causes further deterioration in these variables (Nayak & Panda, 2016).

Therefore, being situated in the ecologically vulnerable riverine areas the people of *char-chapori* areas hardly got an opportunity to avail the benefits of any health programmes as they are mostly beyond the reach of any doctor or health workers. Due to the presence of the river it becomes difficult for the poor people to afford a private means of transport to access health care from the health facilities. Moreover this problem get exaggerated during the rainy season as flood and water induced erosion are the common annual phenomena due to which every year thousands of people are rendered homeless and take shelter in temporary settings after houses get damage or submerge under water. At that time the people faces different problems such as inadequate safe drinking water, poor sanitary condition, shortage of food and lack of shelter (Ahmad et al., 2008). All these condition may adversely leads to direct and indirect health problems among the flood victims. The

direct health effects of flooding are injury, drowning and water-borne diseases. On the other hand vector-borne diseases, psychological problems, malnutrition, are few indirect impacts on health (Bich et al., 2011).

In addition to that destruction of roads and transport network connectivity, the vulnerable people experiencing flood may eventually face difficulties to transportation because in several areas reaching the mainland via boat remain the only option which unfortunately limit the access to appropriate health care services at the time of need. Moreover the complexities to make provision of adequate health care from the supply side also increases while serving in the low resource setting as subsequently after the flood due to the damage of transport network and electricity supply maintaining the logistics including essential drugs and supplies become troublesome alongside the patient load (Du et al., 2010).

Considering the above mentioned scenario it is clear that the people living in the *char-chapori* areas faces immense challenges to access health care facilities. Moreover there is a dearth of studies focusing on the health care facilities in the *char-chapori* areas of Assam. Therefore it is very important to explore the pattern of morbidity in the *char-chapori* areas as well as problems they encountered to access health care facilities. Owing to the fact that providing services in these scattered areas is a difficult task for the health care centres in such condition the alternative innovative outreach model of healthcare adopted to serve this population should also be understood in a more comprehensive way not only the beneficiaries of the boat clinic but also the challenges encountered by the providers sought to be understood in order to identify the gaps in the boat clinic health service delivery.

1.3 Conceptual Framework:

Geographical factors such as climate, terrain and natural resources play a major role in the development of a region. However the areas where both climate and the physical features wreak havoc in the life of the people it leads to huge obstacles on the economic, social, environmental, cultural and political development particularly in the marginalized rural areas (Rakib et al., 2017). Similarly the geographical terrain also cause immense barrier to deliver health care services firstly because the health care professionals were most of the time unwilling to serve in the remote areas due to the lack of transportation facilities and secondly poor standard of living (Dussault & Franceschini, 2006; Panagariya 2014). Additionally due to lack of infrastructure facilities it cause

logistical problem like for instance frequent power cut causing difficulties in maintaining the cold chain and equipments which are very essential to provide quality health care (Chen et al., 2019; Aggarwal & Singh, 1995). During the monsoon season most part of Assam receives excessive rainfall and as a consequence due to the rapid overflowing of river Brahmaputra huge sediments was carried down and many times it spills over its river banks affecting millions of population living in the *char-chapori* areas. Due to the presence of the availability of fertile alluvial soil the people dwells in the *char-chapori* areas but whenever flood and water induced erosion hit these areas the people get disconnected with the mainland areas for several days due to the destruction of transport infrastructure such as roads, bridges, and have to face extreme difficulties to access basic services (Deka, 2015). The severely flood affected populations have to live without potable drinking water, food, shelter and sanitation facilities that ultimately increase the chances of illness episodes and poor health outcomes in the region.

Therefore understanding the impact of flood on the pattern of morbidity variation and access to health care during flood times as well as non-flood times will help the public health care planners to make an effective plan to ensure that each and every person who need the treatment can receive it immediately without any delay. The geographic characteristics has an important role to influence the nature of health care service delivery so it is very essential to study the unique mobile boat clinic serving in the flood prone *char-chapori* areas.

Measuring quality of health care has been receiving prior attention in the health policy (GBD 2016 Healthcare Access and Quality Collaborators, 2018). The perception of the users of the health care is a vital indicator to understand the quality of care as well as to identify the areas which requires improvement of health care services for optimizing the utilization of the services (Grondhal et al., 2018; Patro et al., 2008). To assess the quality of care it is both essential to consider both users and health staff of the health care (Sion et al., 2020). Emphasizing on patients perception on health care can guide to improve the health service delivery (Woo et al., 2011). Many times when the users address their demands for the health services to the providers it might be helpful to improve its quality and meet the demands of the users (Brinkerhoff & Bossert, 2014). However in such situation exploring the perspective regarding the health care between the users and providers can also be helpful to identify the gaps and strengthen the service delivery. The Donabedian model of quality of care forwarded the three major components to evaluate the quality of care i.e., structure, process and

outcomes. Numerous studies have adopted this model to study the quality of care (Sword et al., 2012; Fenny et al., 2014; Gardner et al., 2014; Defar et al., 2020). But in few circumstances like the mobile health clinic serving in the remote locations this model does not be best fitted because this service is unique in itself which tends to serve basic healthcare only once in a month. Nevertheless it cannot be ignored that due to no choice left for the users the perception regarding its quality should not be explored. Moreover along with the users, the health care providers' perspectives to understand the problems faced to render services in the boat clinic and identifying the factors which restricts them to provide health care services in the remote geographical unit will help to improve the quality of the boat clinic.

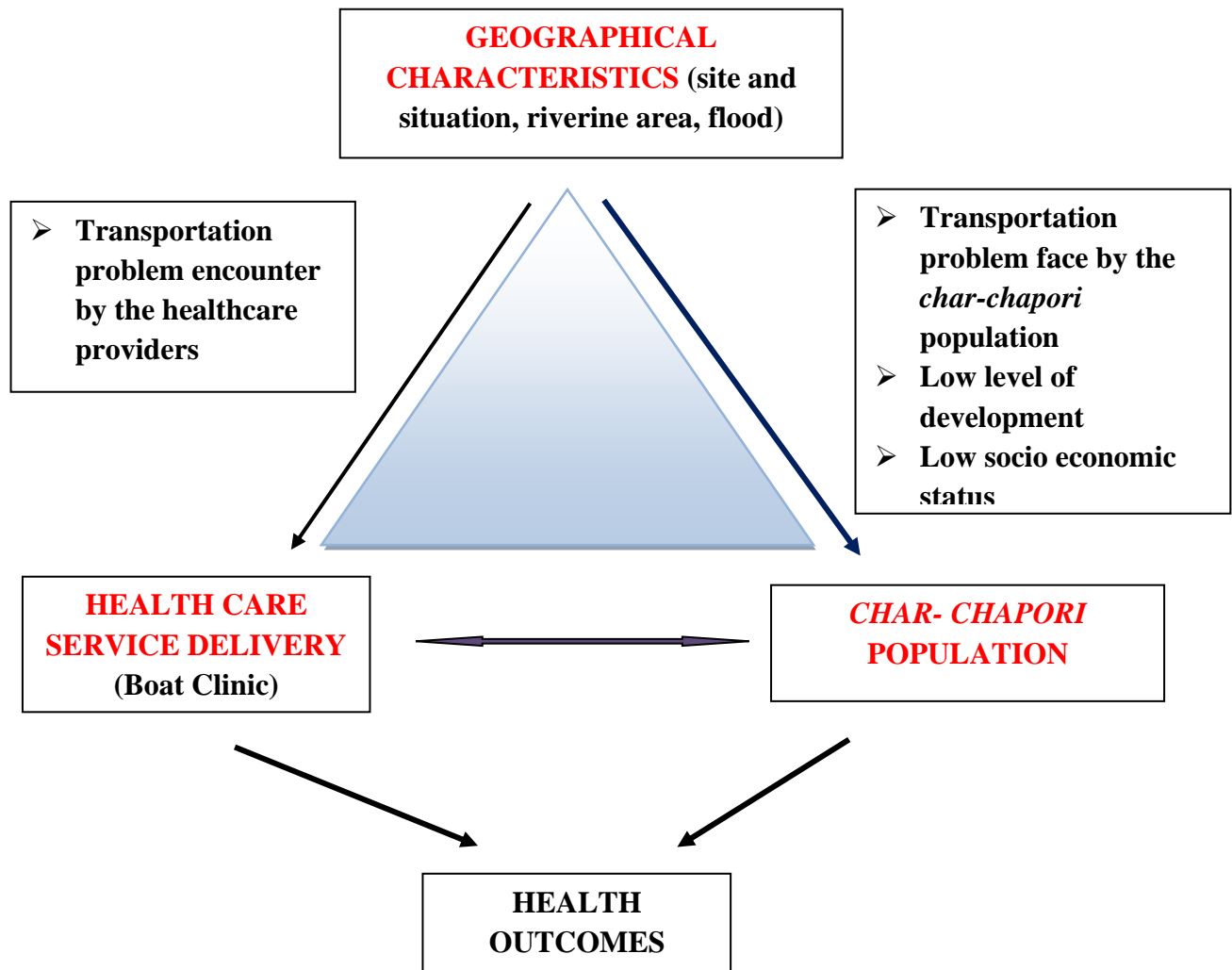


Figure 1.1 Conceptual framework

Source- Prepared by the author

1.4 Objective of the study:

The objectives of the study are:

1. To study the pattern of morbidity and health service utilization across flood affected *char-chapori* villages in the Lakhimpur district, Assam.
2. To explore the users' level of satisfaction on the quality of care received at the boat clinic in the *char-chapori* areas in the Lakhimpur district of Assam.
3. To identify the barriers faced by the full range of health care providers of the boat clinic.

1.5 Research Questions:

1. What is the pattern of morbidity in the flood affected *char-chapori* villages in the Lakhimpur district, Assam?
2. What is the pattern of access to health care of this population?
3. How season affect both the morbidity as well as access pattern of health care services?
4. Are the users seeking care from the mobile boat clinic satisfied with the services provided in the mobile boat clinic?
5. What are the perceptions of the health care providers regarding the challenges encountered by the health care providers while providing services in the boat clinic?

1.6 Research Methodology:

1.6.1 Study setting:

The study was conducted in the Lakhimpur district located in the north eastern part of Assam. The district is situated between 26°48' and 27°53' North latitude and 93°42' and 94°20' East longitude. It is surrounded by Arunachal Pradesh in the northern part, Dhemaji district on the east, Majuli district in the southern part and the Biswanath district lying on its west. This district covers an area of about 2277 square km out of which only 20 square km consist of urban areas and 2257 square km comes under rural. There are altogether seven tehsils in this district and for the study the North Lakhimpur tehsil was selected. According to 2011 census of India there are 2, 50, 643 population residing in this block. About 76 % of the total population of this tehsil is living in rural areas. Scheduled caste and Scheduled tribes population consist of 9.5 % and 23.38 % respectively. Additionally the literacy rate of this tehsil is about 79.24 %.

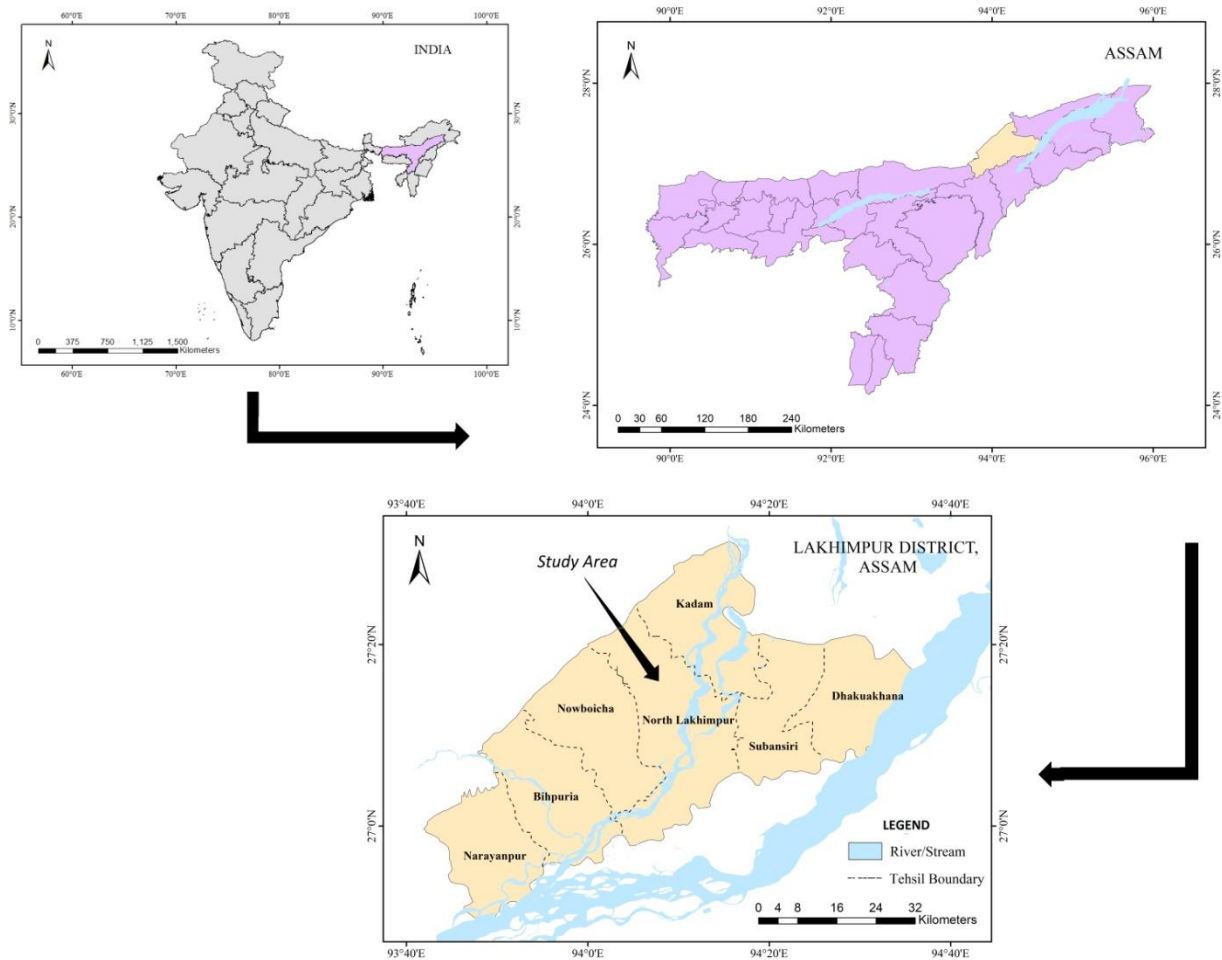


Figure 1.2: Location map of the study area

Source: Prepared by the author

As per as the report of the Assam State Disaster Management Authority, Lakhimpur district falls under five most flood affected districts of Assam. The Figure 1.3 showing the flood hazard map of Lakhimpur district, Assam clearly indicates the vulnerability of the study area as considerably large area comes under high and very high flood hazard zone. The high and very high represents that the area were inundated with flood during the year 1998-2015 thirteen to fifteen times and sixteen to eighteen times respectively (Assam State Disaster Management Authority, n.d.). About 5 % and 1% of the Lakhimpur district total area comes under high and very high flood hazard zone respectively (ibid). The Lakhimpur district comes under flood prone region as it receives heavy flood during monsoon and moreover the braided channel of the river makes the condition worse for those who are settled down in the riverine islands of the Brahmaputra locally known as ‘*char-chapori*’. The

riverine erosion during flood leads to increase in the severity of the problem as it causes shrinking down of agricultural land and displacement of the population. As per Socio-Economic Survey Report, Directorate of *Char* Areas Development, 2002-03, about 16.1 % of its total population in the district was living in the riverine islands. The *char-chapori* areas are characterized with poor infrastructural development, low level of education, poverty, unavailability of health care centres. According to a survey conducted in the year 2018 by Lakhimpur District Health Service about 81321 population lives in the 107 *char-chapori* villages of Lakhimpur.

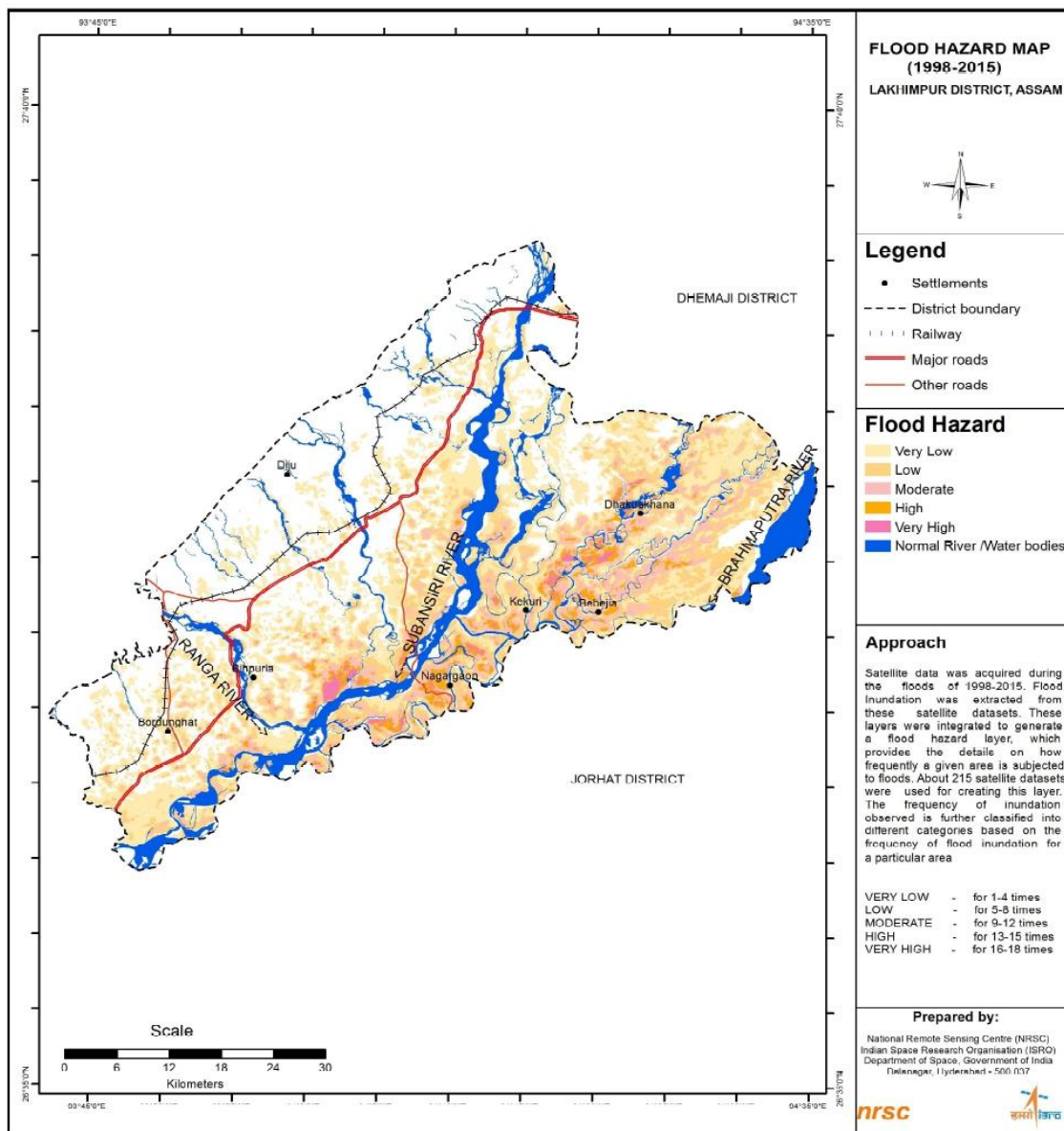


Figure 1.3 Flood Hazard Map of Lakhimpur District, Assam.

Source: Assam State Disaster Management Authority

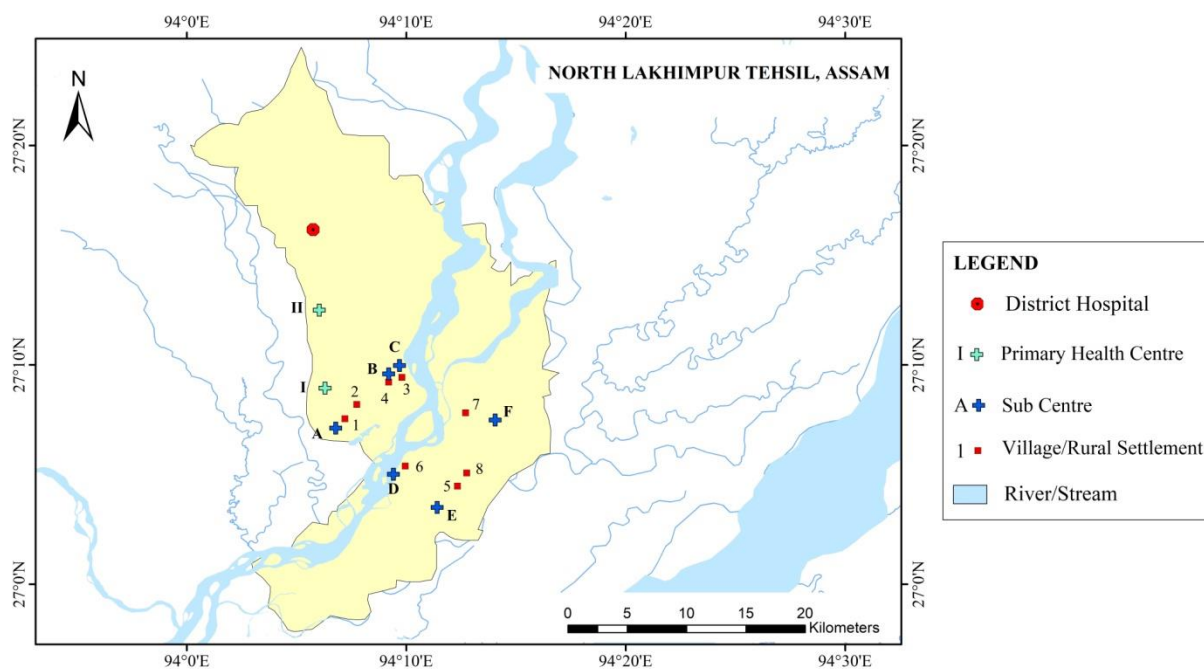


Figure 1.4 Distribution of Healthcare facilities in the study area.

Source: Map prepared by the author

Table 1.1 List of health facilities available in the study area

District Hospital	Village
North Lakhimpur Civil Hospital	1. Amtola PGR
Primary Health Centre	2. No.1 Amtola
I. Panigaon SHC	3. No. 3 Na-Ali Koibarta
II. Azad SD	4. No. 1 Na-Ali Koibarta
Sub-health Centre	5. 1 No. Morton Chapori
A. Amtola Sub-health Centre	6. Na Ali Miri N. C.
B. Morikhabalu Sub-health Centre	7. Guwalbari N.C.
C. Jugalpur Sub-health Centre	8. Major Chapori
D. Na-ali Sub-health Centre	
E. Tamargaon Sub-health Centre	
F. Acharkata Sub-health Centre	

Table 1.2 Distance between the villages and healthcare facilities

Village Name	CHC	PHC	Sub-center
<i>Amtola PGR</i>	> 10 KMS	> 10 KMS	5- 10 KMS
<i>No.1 Amtola</i>	5- 10 KMS	> 10 KMS	NA
<i>No. 3 Na-Ali Koibarta</i>	> 10 KMS	< 5 KMS	NA
<i>No. 1 Na-Ali Koibarta</i>	> 10 KMS	5- 10 KMS	< 5 KMS
<i>1 No. Morton Chapori</i>	> 10 KMS	5- 10 KMS	< 5 KMS
<i>Na Ali Miri N. C.</i>	> 10 KMS	5- 10 KMS	5- 10 KMS
<i>Guwalbari N.C.</i>	> 10 KMS	5- 10 KMS	5- 10 KMS
<i>Major Chapori</i>	> 10 KMS	> 10 KMS	< 5 KMS

Source: District Census Handbook Lakhimpur, Village & Town Directory Primary Census Abstract (PCA), Part XII-B. Census of India, 2011.

From the Lakhimpur District Census handbook 2011 data on the distance between the selected villages for this study and health care facilities has been collected. From eight villages data has been gathered for the study through household and exit interviews. Four villages i.e., Amtola PGR, No. 1 Amtola, No.3 Na-Ali Koibarta are connected to the mainland while the rest of the villages are located in the *char-chapori* areas. The figure 1.4 shows the distribution of health care facilities in the study area. The author collected the coordinates of the villages, health care facilities during the field visits. The table 1.2 clearly shows that except NO. 1 Amtola village all the villages are located at a distance more than 10 kms away from the CHC. Villages situated in the *char-chapori* area namely Guwalbari N.C. and Na Ali Miri N. C. sub-health centres are located 5-10 kms away from the respective villages.

To conduct the survey both primary and secondary data were collected between the months of October, 2019 to August 2020 however the study mostly depends on the data collected through the primary survey. The household survey and the exit interview with the users' of the boat clinic were conducted between October and December, 2019. And the interview with the care providers of the boat clinic were done till August, 2020. A mixed method design was conducted in the study firstly to compare the difference between the pattern of access to health care and challenges encountered to seek health care during flood between villages attached to the mainland and isolated villages. Secondly exit interviews were conducted to gather data from the boat clinic users to understand the level of satisfaction of the uses' and positive as well as negative aspects of the boat clinic. And lastly in-depth interviews were conducted through face to face and telephonic interviews with the

care providers of the boat clinic to explore the challenges faced by them during health care service delivery. The specific methodology will be discussed in each chapter separately.

1.6.2 Ethical Consideration:

Informed consent was taken from the respondents. At first the purpose of the research was explained to the before starting the interview. The respondent was informed that the participation is completely voluntarily. Even if he/she agrees to participate they have the right to withdraw at any time or refuse to answer any question that they do not want to respond. Permission was sought to audio record the interview. It was also informed that the identity of the respondent will be confidential and the quotes of the interview will be used without disclosing his/her identity.

1.6.3 Challenges and Limitation of the Study:

While conducting the survey the researcher faced various problems which are pointed out briefly:

- Numerous challenges faced to reach the study area due to the very inaccessible nature of the region.
- Most of the times were spent in travelling long distances to conduct interview as it was not feasible for the researcher to stay in the study site.
- At the time of survey the Citizen Amendment Act movement had create obstacle to conduct the survey period because during the time the researcher could not visit the field for about 15 days because as a result of the atrocities of the protestors and the police there were an atmosphere of instability in Assam.
- Many times the author was unable to conduct the survey alone with the respondents due to lack of private space because it seems to grab the attention of the members of the household and sometimes the neighbors also during the interview.

1.7 Review of literature:

1.7.1 Flood and its impact on health:

Each and every year flood cause immense devastation on a global scale (Jonkman, 2005). Surprisingly it is one of the disaster which accounts for about 50 % of deaths among all the natural disasters (Ohl & Tapsell, 2000). The World Health Organization stated that people living in the flood plain region, or areas people have lack of information on the flood hazard, weak protection or evacuation capacity of the government are worst affected by flood (World Health Organization

n.d.). It has been witnessed that there is increase in the occurrence and intensity of flood due to rise in population and climate change (Tanoue et al., 2016). Flood can cause detrimental impact on wide range of areas like environmental, economic development, public health and indirectly deferred the development of the society (Jonkman & Vrijling, 2016). Large scale displacement of population due to the submergence of the land with water during flood it becomes difficult to live on those areas. The people affected by severe flood faces huge health risk because of inadequate housing facilities, food, safe drinking water, hygiene and sanitation (Azad et al., 2013). Moreover the major public health crisis faced during and aftermath of flood exaggerated due to the contaminated water, non availability of sanitation facilities, power failure, and disruption of transportation system, damage of nearest health centres (Gautam et al., 2017).

Water-borne, vector-borne diseases along with injury are some of the common problem faced during and post flood (Legome et al., 1995). As flood waters carriers sewage and other pollutants the water gets contaminated leading to increase in the risk of diseases like typhoid fever, cholera, diarrhoea, dysentery, skin infection (Ding et al., 2013). Similarly the standing flood water create suitable condition for the expansion of parasites which can affect ultimately the people of the flood affected area with vector borne diseases such as malaria and dengue. Additionally few long term health impacts for instances mental health problems and malnutrition are found to be occurred among the flood victims (Lee et al., 2020; Friel et al., 2011).

Numerous studies have focused on the difficulties encountered in receiving care from the health facilities at the time of flood (Bich et al., 2011; Collins et al., 2013; Shokri et al., 2020). The health care facilities also meet with many challenges as flood damage buildings, equipments and power cut making them unable to handle the influx of patients and provide routine health care (Landeg et al., 2019). A study conducted in rural district of Vietnam shows that due to lack of early preparedness the primary care system is not able to give preventive and curative healthcare for the flood induced health problems (Van et al., 2014). Haque (2019) study shows that the people experiencing displacement as a result of floods and erosion had significantly few options to seek health care due to various socio economic disadvantage of the population (Haque 2019). In North East India the people are mostly depends on the traditional system to seek treatment for febrile illness in flood affected areas of North East India (Chaturvedi et al., 2009). Goyari (2005) study mentioned that in Assam due to the unprecedented flood most of the districts faced severe loss of agricultural crops, livestock, properties, livelihood etc depending upon the timing as well as intensity of the flood.

Women are considered to be the worst sufferer during flood in terms of sexual and reproductive health when they do not have health care facilities in their proximity because accessing health care is a difficult task for them as they are located in geographically isolated areas with poor socio economic status (Kamal & Uma, 2018). During flood times people in the low lying flood plain areas face extreme difficulties as they do not have access to toilet facilities, water availability which make them compromise with sanitation and proper hygiene specially for the women to take care of their menstrual hygiene (Bhattacharjee 2019).

However the magnitude of impact of flood on health depends upon the location and vulnerability of the household which will determine the capacity to cope up with the disaster through adapting effective flood planning and preparedness (Okaka & Odhiambo, 2019). Although with extremely limited data it is quite difficult to measure the vulnerability of area but to make proper strategy to minimize the level of loss it is very essential to delineate the vulnerable areas (Nasiri et al., 2016).

1.7.2 Vulnerability of *char-chapori* areas:

Assam's physiography can be divided into three parts i.e., Brahmaputra valley, Barak valley, Karbi-Anglong and North Cachar Hills. In the Brahmaputra valley due to the highly braided nature of the river Brahmaputra many alluvial riverine islands (locally known as *chars-chaporis*) are formed extending from Sadiya to Dhubri (Chakraborty, 2009). The *char-chaporis* are formed after undergoing a complex process. Most often *char-chaporis* are the terms used interchangeably for referring the riverine islands of the Brahmaputra. Biswas J. (2011) attempted to distinguish between the two term *char-chaporis* i.e., *chars* are the raised piece of land encompassed by water from all sides and hence when it attains permanency and get attached to the mainland as a result of change in the course of river it is referred as *chapori*. *Chars* are inside the river whereas *chapori* are connected with the mainland (Biswas, 2011). In West Bengal the highly elevated Sundarban delta are also referred as *char* (Rogers & Goodbred Jr, 2014).

According to the Socio Economic Survey 2002-03 conducted by the *Char Area Development Authority of Assam* it was reported that there are about 24.90 lakhs population scattered over 3.60 lakhs hectares of land (Directorate of *Char Areas Development Assam*). It was mentioned that no recent survey has been undertaken. Due to the temporary nature of the *char*, it is difficult to conduct the survey (Singh, 2008). During the colonial period in different point of time from the East Bengal huge population migrated and settled down in the *char-chapori* areas (Khandakar,

2016). Migration continues and the human habitation in the *char-chapori* has been consistently expanding after the partition of India and Bangladesh in 1971. No doubt that most of the *char-chapori* areas were inhabited by the Muslim population but in the eastern part of Assam tribal communities settled down in the chars (Kumar & Das, 2019).

The government took cognizance of this experience of the *char-chapori* areas for the very first time in 1984 by establishing the “Assam State Char Areas Development Authority”. The Authority was assigned to focus on the overall upliftment of the socio economic condition of the people in the *char-chaporis*. Through inclusive development initiatives, the effort was to ensure that everyone gets the window of opportunity to benefit from the developmental activities (*Directorate of Char Areas Development Assam*). However, despite these efforts, the development process has been slow and the outcomes invisible in the *char-chapori* areas. As evident, the *char-chaporis* are not only detached from the mainland area geographically, but are also outside the political will.

The people living in the *char-chapori* confronts an array of problems because every year they have experienced erosion due to severe flood which leads to loss of alluvial cropped land. It cause huge damage in the infrastructure such as transportation facilities, embankment, schools, houses and most importantly it put pressure on the local economy of the areas ultimately affecting the social development of the people living in the chars. A study conducted in the *char-chapori* areas of Bangladesh found that experiencing frequent flood is one of the vital causes of poverty among the *char-chapori* population (Rayhan, 2010). The risk of flood differs based on the socio economic condition of the household like if the household possesses arable land, small family, having higher educated member in the household and if the head of the household is a male the difficulties faced by this population comparatively less than the other people after flood (Sarkar et al., 2015). Though agriculture is the main occupation of the *char-chapori* population fishing is also found to be practiced but during flood these seems to be affected due to the deposition of sand in the agricultural field and wetlands respectively (Hazarika et al., 2016). Islam et al. (2014) study findings revealed that in the *char-chapori* after experiencing flood the tribal children under the age of 5 years faced undernutrition due to the shortage of food and drinking water making them starve and suffer from both infectious and waterborne diseases (Islam et al., 2014). The underprivileged population exposed to flood and erosion are mostly living their life without proper basic facilities like livelihood opportunities, transportation, education, health facilities leading to poverty and low level of development (Khandakar, 2016). Lack of access to health care in the char had been a major

reason for the infant mortality (Chakraborty, 2014). Similarly a study conducted on the *char-chapori* areas of Western part of Assam shows a huge shortage of health care facilities in those areas and suggested the urgency to release funds to develop health infrastructure for the development of the *char* (Kumar & Das, 2019).

Therefore it can be said that the social and physical contexts have the ability to impact health as the characteristics of an area largely determines the health behaviors and outcomes such as disease, stress, obesity, substance abuse, etc (Humphris & Pemberton, 2016). To understand the geographical variation in health the contextual factors i.e., local social and physical environment had a vital role to play (Curtis & Jones, 1998). Curtis and Jones mentioned that physical accessibility is one of the significant contributors of deprivation in the rural settings (ibid). The variations in health care financing, spending and the delivery of services are associated with the geographic location. Those living in the segregated neighborhood are characterized with low availability and quality of health care facilities and providers that accounts to increase in health care disparity (White et al., 2012).

1.7.3. Mobile Health Clinic: Overview

Mobile health clinic is a customized vehicle reaching the doors of the vulnerable communities living not only in the rural areas but also in the urban slums after travelling in the vehicles which have equipments, medicines and skilled health care workers (Hill et al., 2012). Basically mobile health clinic tries to meet the health care needs of the marginalized section of the society through removing the geographical barriers to access health care (Yu et al., 2017). It can be said that mobile health clinic can help to achieve health equity by improving the health outcomes of the disadvantaged population of the society (Braveman 2014). It serves the patients through providing preventive, curative, diagnostic and other public health services along with guiding them to mainstream health care (Khanna & Narula, 2016). It helps to remove the financial barriers, logistical problems like long distance travelling, appointments, long waiting times to seek care (Hill et al., 2012).

Depending on the geographical terrain like hilly areas, deserts, islands various types of vehicles were used to reach in the door step of the disadvantaged population where non-availability of transportation facilities, long travel distances to reach the health care facilities is the main problem. Through well designed vehicles like mobile van, boats, camels are used to serve basic medical

services to the people living in the remote areas (United Nations Office for the Coordination of Humanitarian Affairs, 2010; Post, 2017; Ahmed et al., 2019). For instance in the southern part of Myanmar with the help of well equipped boat one doctor and two nurses visit the remote villages to treat the children as well as the families (Specchio dei tempi, n.d.). Similarly in Kenya the semi nomadic communities residing in the rough geographical settings live their life in remote areas where it is very hard to find any paved roads. People have to travel through vast thorny scrublands hindering them to access health care services in the Samburu district lying in the northern parts of Kenya. So, to reach the population a community based organisation known as Nomadic Communities Trust took the initiated in 2006 to provide medical help Along with dispensing medicines for illness like diarrhoea, malaria, skin diseases they provide family planning services, testing and counseling HIV (United Nations Office for the Coordination of Humanitarian Affairs, 2010).

Due to the presence of the Amazon river and its tributaries the communities living in the interior parts have to access the health services after travelling long time by boats. To reach the community of the Loreto region would do not have any health care access a customized ship was prepared which is supported by the Vine Trust of UK. From 2001 it is providing preventive and medical services such as vaccines, family planning, prenatal care, along with dental care (Mason 2013; Limaye et al., 2018). The World Health Organisation with the help of donations from different funding agencies have been deploying mobile health clinics to the vulnerable displaced Yazidi population of Iraq to meet the health care needs of the population 44 mobile clinics were donated to the non-governmental organization of Syria to make provision of health care in the underserved areas (World Health Organization). And besides these it plays a major role after disasters to give health care during emergency situations in the affected areas (Rassekh & Santosham, 2014; Krol et al., 2007).

Mobile health clinic has come to its existence since long past. In India at the time of Second World War it was used but later on due to its own limitations of extending the health care it did not gain popularity (Venkatesh, 2018). In order to fulfill the medical needs of the vulnerable tribal population who were entrapped with poverty, illiteracy and the All India's Women Conference (AIWC) took the initiative to reach them through the mobile van. In 1945 a fund known as "Skippo" was founded and using that the mobile medical van was customized to reach and remove the plight of many rural areas of India who were unable to access health care facilities and render

services like immunization, antenatal care to the pregnant women (All India Women's Conference, n.d.). Later the Skippo helped to provide family planning programmes along with medical services in the innermost rural areas of India (Ghate, 1982). In the vehicle based mobile clinic there were altogether five health care workers includes a female doctor, nurse, trained health worker and a driver. After the commendable work for strengthening the program in 1952 again the AIWC able to attract funds from different countries like Canada, London and New Zealand and extended its services by adding the number of mobile vans.

The Wockhardt Foundation initiated the Mobile 1000 programme in the year 2007 to provide primary health care free of cost in the slums of Mumbai (Wockhardt Foundation., n.d). And now it has been successful to reach more than 4000 villages among 20 states of India. The objective of these vans are to fill the gap of primary healthcare in rural India through the ADCR formula i.e., awareness, diagnosis, cure and referral. It is creating awareness in the villages regarding the sanitation, hygiene practices, safe drinking water, maternal and child healthcare, diseases like HIV, tuberculosis and diabetes (Wockhardt Foundation, 2019; Mobile 1000, n.d.). At present in India total 200 mobile vans are operating in different states of India under Wockhardt Limited.

Even though most of the health resources are concentrated in the urban areas accessing adequate health care facilities are still a major problem for the population belonging to the lower strata of the society particularly living in the slum areas (Banerjee et al., 2012). Shortages of basic necessities in the slums such as housing, sanitation facilities and water supply cause poor health outcomes (Mberu et al., 2016). Lack of access to public health facilities and high price in private health facilities very often make out of reach of the services (Yadav et al., 2011). Many times the urban poor delay in seeking care and dependent on the informal providers as they are not capable of paying out of pocket cost (Bhat et al., 2018). In urban areas since past mobile health clinic has been playing an important role to reduce the health care gap among the vulnerable population (Jamir et al., 2013). In Gwalior and Bhopal the mobile health clinic were established in 1992 which served the poor population of urban areas. Through provisioning of the family planning services, child and maternal health care it was able to increase the use of family planning services, decline in infant mortality (Morrison, 1996).

In Tamil Nadu mobile health clinic were used for the first time in 1977 under the Primary Health Centers. But in the mid 1980s the mobile health clinics were not culminated as fixed health care

centres were found to be acknowledged more. But when it was come into notice that though health infrastructure was improved but had not reached to the remote areas in 2002 the Government of Tamil Nadu again introduced mobile health clinic and distribute to different districts to provide health care services in the remote inaccessible areas (Dash et al., 2008). In the same year in Orissa also mobile health clinic were introduced in different areas of the state. In 2005 a mobile health clinic was launched in two districts of Uttarakhand i.e., Tehri and Chamoli to serve the hard to reach disadvantaged population of the area that have to travel long distances for reaching the health centres. This program is functioning in collaboration with Uttarakhand Health and Family Welfare Society and Hindustan Latex Family Planning Promotion Trust (Department of Medical Help and Family Welfare).

The mobile health clinic gains its popularity after the commencement of the National Health Mission. In the 6th Common Review Mission it was stated that in India there were 1307 mobile medical units functioning in 349 districts of India (National Health Mission, 2015). It tries to reach the vulnerable population who cannot access health care both in inaccessible rural as well as urban areas (National Health Mission, 2018). In India after the launch of the National Rural Health Mission it tries to increase the access to health care therefore to expand the outreach program through public-private partnership model (Ministry of Health and Family Welfare, 2015). The organization which operates the mobile clinic tries to serve the population who are underserved and not privileged to access modern health care. It has a very important role in bridging the gap between the communities and the health care (Malone et al., 2020).

An outreach program known as Jeewan Jyoti Yojana served the tribal areas since 1988. In the year 2006 the scheme was renamed as Deen Dayal Mobile Health Clinic and expanded its services to reach areas of Madhya Pradesh having high concentration of Scheduled Caste and Scheduled Tribe (National Health Mission Madhya Pradesh, n.d.). It provided basic health care services, awareness on sanitation and hygiene, health prevention on different communicable and communicable diseases to improve the health indicators of the population. Similarly in Rajasthan also the tribal population living in the desert areas faces difficulties to access health care facilities as it is far away from the villages and most importantly the poor socio economic condition makes them unable to afford it. So to reach this population the government of Rajasthan implemented the programme Rajiv Gandhi Rural Mobile Medical Unit in 2008-09. Under this program they planned the monthly health camps and provide free medical checkup and medicines National Health Mission Rajasthan (National

Health Mission Rajasthan, n.d.). Helicopter is one of the vehicles which are used rarely to serve the hard to reach underserved population in villages of North and Dhalai districts of Tripura where people have no health care facilities. Thus the health teams visits the designated villages to serve the sites to provide health care services like immunization, antenatal, postnatal care, awareness campaign on hygiene and other health related issues (National Health Mission Tripura, n.d.).

In Assam there are about three million people living in the riverine islands. Being situated in the vulnerable riverine areas the people of Assam hardly got an opportunity to avail the benefits of any health programmes as they are beyond the reach of any doctor or health workers. Considering the plight of this population in June 2004-2005 the Centre for North East Studies and Policy came up with a major intervention called boat clinic to overcome the geographic accessibility barriers and fill the gap in health services. At first the boat named “Ship of Hope in a Valley of Flood” was introduced in the Dibrugarh district of Assam and able to receive award from the World Bank for its innovative concept. After that UNICEF also helped C-NES to gradually extend its services in other districts. Later on in the year 2008 the National Rural Health Mission, Government of Assam collaborated with C-NES to reach the far-flung riverine islands of the Brahmaputra (Centre for North East Studies and Policy Research, n.d.). On one hand the National Rural Health Mission incur the operational costs as well as payment of the human resource of the boat clinic and on the other hand the C-NES is responsible to take care of the boats such as its construction, insurance (Ministry of Health & Family Welfare, 2010). At present through the public private partnership between the C-NES and the National Health Mission the boat clinic has been functioning in thirteen districts of Assam in order to provide primary health care to the *char-chapori*. It provides basic health care services such as routine immunization, family planning, screening of both communicable (HIV, tuberculosis) as well as non-communicable diseases (diabetics, cataract), vector-borne diseases to the inhabitants of the Brahmaputra islands through a boat equipped with OPD, laboratories, and pharmacies.

Table 1.3 Types of Vehicles Used to Serve Vulnerable Populations over Time across the World

Name of the place service provided	Type of vehicle	Year	Service provided
India (Foundation for Rural Recovery and Development, n.d.)	Mobile van	Second world war	NA
Near Bombay (ibid)	Mobile van	1946	Basic health care, preventive measures foe epidemic, immunization, antenatal care to the pregnant women
Tamil Nadu (Jamir et al., 2013)	Mobile van	1977	Primary health care
Gwalior and Bhopal (Morrison, 1996).	Mobile van	1992	Family planning (FP)
Orissa (H&FWD, n.d.)	Mobile van	1995	Preventive and medical services such as vaccines, family planning, prenatal care.
Sunderbans, West Bengal (SHIS, n.d.)	Floating Boat dispensary	1997	The boat is equipped with X-ray, pathological unit and wireless communication. Both medical and diagnostic services are provided to the people living in remote areas.
South Delhi (Patro et al., 2008)	Mobile van	2001	Provide treatment for minor illness, immunization, antenatal care and preventive care at the household level.
Peru (Loreto region) (Limaye et al., 2018)	Boat clinic	2001	Providing preventive and medical services such as vaccines, family planning, prenatal care, along with dental care
Uttarakhand (Tehri Garhwal And Chamoli district) (Government of Uttarakhand, n.d.)	Mobile van	2004	General check-up for minor ailments, Reproductive and Child Health(RCH), family planning services, Information, Education and Communication(IEC), lab test
Tripura (North, Dhalai and West districts) (National Health Mission Tripura, n.d.)	Helicopter	2004-05	Service delivery for RCH, Village Health and Nutrition Days (VHNDs)
Assam (Centre for North East Studies and Policy Research, n.d.)	Boat Clinic	2005-06	Antenatal care, Routine Immunization, preventive and curative services
Kenya (United Nations Office for the Coordination of Humanitarian Affairs;	Camel Clinic	2006	Family planning services, antenatal care, palliative care, HIV testing

2010)			
Madhya Pradesh (Government of Madhya Pradesh, n.d.)	Mobile van	2006	Basic health care services, awareness on sanitation and hygiene, health prevention on different communicable and non communicable diseases
Slums of Mumbai; and other states (Wockhardt Foundation., n.d)	Mobile van	2007	preventive and medical services such as vaccines, family planning, prenatal care, along with dental care
Rajasthan (National Health Mission Rajasthan, n.d.).	Mobile van	2008	basic services to the villagers and the outreach areas
Kawthaung, Myanmar (Specchio dei tempi, n.d.)	Boat clinic	2016	general health check up

1.7.3. 1 Features of the mobile health clinic:

Mobile health clinic tries to reach out the vulnerable population to deliver health care services. The mobile health clinic is very suitable to remove health care access barriers and reduce healthcare disparities (Hill et al., 2014). This health care model has found to be implemented in both developed and underdeveloped countries around the world to provide care to the vulnerable population who do not have access to health care due to poor socio economic condition. It is mostly used to provide primary health care services for minor ailments, preventive and screening programmes, immunization, emergency health care and health education (Jamir et al., 2013; Peters et al., 2014; Harris et al., 2011; Diaz-Perez et al., 2004; Hill, 2012; Leibman et al., 2002)

Various studies show that due to the movable nature it can travel from one place to another helping to reduce logistical barriers and cost of establishing fixed clinic (Aung et al., 2015). However it was also argued that as the mobile clinics have to take all the things in the vehicle it consumes much time for packing the equipments as well as medicines and traveling to the health camps which deduce the consultations time with the patients (Dyer, 1996). Lack of space has raised many concerns for the delivery of health care services such as privacy of the patients are often found to be compromised in the mobile clinic during the time of consultation indirectly affecting its quality (Peters et al., 2014). As distance to health care facilities pose significant barriers to access health care, reduction of time and cost while receiving care from the mobile clinic remove the inconvenience of the patients particularly the women who often avoid seeking care due to physical access (Balarajan et al., 2011; Vissandjee et al., 1997). Along with delivering care it plays an integral role to bridge the gap between the community and the health care facilities (Malon et al., 2020). While comparing the

mobile clinic it was found that the time required for receiving care is comparatively lesser in the mobile clinic (Gupta, et al., 2017). A trustworthy relationship can be build between the health care worker and the user due to the continuous visit in the same site for long period of time which can be considered to be vital for effective health care delivery (Kahn et al., 2000). Moreover the friendly attitude of the health care workers towards the users also seems to satisfy the users of mobile clinic (Gillispie et al., 2016). The quality of health care improves when there is effective communication between the health care provider and the care seekers during consultation, diagnosis and in different other aspects. Language barrier can lead to create significant communication gap during the service provisioning and many times it is likely to lower the quality of care as it impact on the attitude of the health care worker and the patient in a negative manner ((Schlemmer & Mash 2006; Lazar et al., 2013). Ensuring the users to obtain required level of care through proper referral systems to connect them with the higher level of health care facilities is very essential component of the mobile clinic (Campos & Olmstead-Rose, 2012). But due to the resource constraints it was difficult to keep records of the patients who have been referred successfully (Hill et al., 2012). Furthermore many times referral system was not followed by the patient because the users are already in such a condition who face immense difficulties to reach the health facilities due to lack of resources like transportation, financial and cultural barriers therefore making them unwilling to visit the recommended health facility. It was criticized that it is difficult to make follow up of the patients in the mobile clinic thus to overcome this Kojima N et al. (2017) demonstrated the role of the community to mobilize and motivate the people through explaining its importance and benefits of visiting the mobile clinic (Kojima et al., 2017). Thus the mobile health clinic operating in the low resource setting manages to serve the population by adopting various means of strategy.

Table 1.4 Advantages and disadvantages of mobile health clinic

ADVANTAGES	DISADVANTAGES
<ul style="list-style-type: none"> • Provide health care service in the doorsteps who are beyond the reach of any health care facilities. 	<ul style="list-style-type: none"> • No permanent place of health camps
<ul style="list-style-type: none"> • Low cost of treatment 	<ul style="list-style-type: none"> • Lack of space <ul style="list-style-type: none"> (i) Limited diagnostic test (ii) Difficulties during rainy season (iii) Privacy issue
<ul style="list-style-type: none"> • Remove the location based barriers <ul style="list-style-type: none"> (i) Transportation (ii) Financial problems (iii) No need of treatment 	<ul style="list-style-type: none"> • Referral
<ul style="list-style-type: none"> • Informal health care setting <ul style="list-style-type: none"> (i) Overcome language barrier (ii) Friendly behavior towards patients (iii) Able to build trust among patients 	<ul style="list-style-type: none"> • Lack of government funding
<ul style="list-style-type: none"> • Bridge the vulnerable population to the mainstream health care 	<ul style="list-style-type: none"> • Depends totally on the vehicle therefore if sometime the vehicles breakdown it disrupts the health camps

1.7.4. Patient Satisfaction and its determinants:

The patient satisfaction is the difference between the perception of care they expected and received from the health care (Kasa & Gedamu, 2019). Patient satisfaction is the outcome measures which have been used extensively to assess the health outcome as well as quality of care (Akunne et al., 2019). To improve the health care delivery system understanding the patient satisfaction is very pivotal to explore whether the patients’ requirement are met during the health care service delivery (Sharma et al., 2014). Measuring patients’ perspective has received more focus as it is a very useful indicator to trace the improvement of health service provisioning (Merkouris et al., 2013; Islam et al., 2015; Manzoor et al., 2019).

Though patients’ socio demographic characteristics are the determinants of the level of satisfaction however components like communication between the doctor and the patient, adequate health care resources, availability of drugs, complex administrative work, waiting time, health care settings are the contributing factors to determine the satisfaction level (Mendoza Aldana, et al., 2001).

Studies found that various factors influence the patient satisfaction like for instance age, sex, and socio economic status of the patient (Thornton et al., 2017). Similarly the health care providers' background characteristics found to affect the patient level of satisfaction. Along with this continuity of care in the health care also associated with the patients' level of satisfaction (Fan et al., 2005). A study highlighted that when the patient is dissatisfied with the long waiting time then it get compensated if the physician consultation time (Feddock, et al., 2005).

Not only the technical skills but also the attitude and behaviour of the provider like respect, kindness towards the patients are essential to enhance the quality of the health care service delivery (Ahmad & Din, 2010; Karaca & Durna, 2019). Uncovering the reasons behind the patient dissatisfaction from the patients' perspective helps to improve the quality of care (Farooqi, 2005).

In a country health is one of the major development sector which has been largely affected due to the presence of natural as well as socioeconomic barriers. The people living in the inaccessible areas face various problems to access health care services and simultaneously remoteness and difficult terrain limits the provisioning of the health care services. The population are often found to be remain detach from mainstream healthcare. Therefore the geographical location stands as a barrier to access health care because it manifolds other problems like distance required to travel, travel time, travelling expenditure follow-ups and other logistical barriers which cause low health status of the population. Hence to fill the gap of health disparity alternative types of health care delivery are introduced in the difficult areas to reach those vulnerable populations.

The plethora of studies suggested that the access to health care in the remote flood prone areas is challenging for the inhabitants of the population which ultimately plays the key role contributing to health inequities. Various measures have been initiated to give special focus on the rural areas but still disparities persist. To the best of the author's knowledge, different studies carried out on the problems faced by the *char-chapori* population of Assam but no study has been conducted to understand the access to health care of the *char-chapori* population with comparison to the areas located near the river bank but connected to the mainland. Moreover no investigation undertaken in a scientific manner to understand the users' level of satisfaction and perception on quality of care in the boat clinic along with the problems faced by the health care providers which is an important and unique component of health care serving in these areas.

1.8. Chapter Scheme:

The entire study has been divided into five chapters. The 1st chapter comprises of introduction of the study, statement of the problem, conceptualization, research objectives, methodology, brief overview of the study area, ethical consideration, challenges and limitation of the study and review of literature. The 2nd chapter deals with the patterns of morbidity and access to healthcare services in the flood-prone villages of Lakhimpur district, Assam. The 3rd chapter discusses the users' level of satisfaction and perception on quality of care in the boat clinic. The 4th chapter seeks to portray the challenges faced by the care providers of the boat clinic. Lastly, the 5th chapter presents the major findings of the study, draws out the conclusion along with recommendations.

CHAPTER-2
PATTERNS OF MORBIDITY AND
ACCESS TO HEALTH CARE SERVICES IN THE FLOOD-PRONE VILLAGES OF
LAKHIMPUR DISTRICT, ASSAM

2.1 Introduction:

Among all the disasters floods is considered as one of the common phenomenon causing substantial death, morbidity, damage infrastructure and economic condition across the world (Lowe et al., 2013; Saulnier et al., 2018). India receives 75 % of its total rainfall in the monsoon season due to which annually on an average 8 million populations get affected by flood (Alam & Muzzammil, 2011). A study mentioned that India has been witnessing an increase in the flood prone area with time at the rate of 0.014 million hectares per year (Singh & Kumar, 2013). In India the Assam's Brahmaputra valley is one of the worst floods affecting regions in the country (Singh et al., 2014). The Rastriya Barh Ayog (RBA) had assessed that 39.58 % of the total land area of Assam is flood prone area (Government of Assam). Every year the people living in the Brahmaputra valley of Assam receive hazardous annual floods which bring distress in the life of people residing in the region (Singh et al., 2014). In this valley, the riverine areas locally known as *chars-chaporis* are affected by severe flood annually. These areas are segregated from each other leading to limited accessibility and preventing them from low access to health infrastructure and services as well (Islam et al., 2014). Mahanta and Das (2017) study shows that in the Brahmaputra Valley the households are vulnerable to poverty due to flood (Mahanta & Das, 2017). According to Planning Commissions Poverty Estimate (2011-12), the percentage of the population living below the poverty line in India is 21.92 % whereas compared to the national average the percentage of population below the poverty line is way higher in Assam i.e., 31.8 % (Government of India, 2013). It reveals that compared to other states Assam is still lagged behind. Moreover, annual flood stands as one of the major factors hindering the socio-economic progress of the state. Thus notably the *char-chapori* areas of Assam have a huge concentration of poor population as it had been revealed that 80 % of the *char-chapori* populations are living below the poverty line (Government of Assam, n.d.).

The NFHS 4 data reveals that some of the outcome measures in this state are in a very worse condition like infant mortality rate and under-five mortality rates in Assam is 40.7 and 56.5 deaths per 1000 live birth. 46.9 % of the population states that the absence of a nearby health facility as the

reason for not visiting the government health facility. After giving immense attention to the institutional delivery still in the rural areas 31.6 % of women had home delivery and 54.2 % of women had assistance by a doctor during delivery. These data give a glimpse of the condition of the health facilities of Assam, especially in the rural areas. Moreover, due to annual flood, these conditions worsen when floods washed away their properties and livelihoods. During floods due to lack of basic needs such as food, water and shelter make these poor people more likely to be exposed to water borne and vector borne diseases.

The self-reported morbidity has been used as a proxy measure to know the health status (Paul et al., 2019). Thus it is important to understand the burden of illness in remote flood prone areas more specifically during the flood times. A holistic understanding of the pattern of illness and health care services is necessary to plan and formulate policies better for the flood prone areas to mitigate and meet the needs of health care at times. However, very little evidence is presented to provide insights on the pattern of health service utilization and morbidity in the flood affected areas in Assam. Therefore, the objective of this chapter is to study the pattern of morbidity and health service utilization across flood affected villages in the Lakhimpur district, Assam.

2.2 Methods:

2.2.1 Study design and setting:

The study was based on the data collected from the villages of the flood prone areas in the North Lakhimpur tehsil of Lakhimpur district, Assam. Each year the revenue circle of Lakhimpur kept records of the village inundated with flood on daily basis. The list shows that in 2019 near about 50 villages got affected by flood. Based on the highest frequency of days submerged under the water six villages were selected. Among the six villages, four villages were selected attached to the mainland and rest of the two villages were completely isolated from the mainland (referred to as *char-chapori* locally in Assam).

2.2.2 Data collection and sampling:

A mixed method design was used in this study. At first in each village with the help of key informants, the social map of the villages had been prepared followed by transect walk. A random sampling technique was applied to select the household of the village. From each village 15 samples were supposed to be completed. Ideally, 90 household schedules should be completed from 6

villages but due to the data saturation, final data were collected from 83 households. The total population covered in the study area is 475. Data were collected by the author with the help of face to face interview and to complete one interview about 25 minutes were required.

2.2.3 Study tool:

A household interview schedule was prepared to conduct face to face interviews with the head of the household. The schedule comprises of 6 parts socio-economic status of the household, housing and basic amenities, health facilities in the village, illness episodes and place of treatment for each illness within 6 months from the survey in normal time, the illness caused due to flood and seeking care in the year 2019, problems and property damage due to flood in the last five years. The households' general questions were asked from the head of the household and the reported illness data were collected from the individual who was suffering or suffered from any illness but in case of the person below 18 years of age or not present during the survey then the household head was the respondent.

2.2.4 Selection and Definition of the Variables:

Morbidity:

In the study based on the duration the illness had been classified into two type namely acute and chronic illness. The duration of illness lasting not longer than 30 days is termed as acute illness and on the other hand the duration of chronic illness is longer than 30 days (Dilip, 2002).

Public health facilities:

It includes health camps, sub center, primary health center, and community health center.

Private health facilities:

It includes private hospitals, private doctors or clinics.

Boat Clinic:

It is the mobile health clinic providing services to the remote *char-chapori* villages of the Brahmaputra islands with the help of boats where primary health care services are provided.

Other health care provider:

It comprises of quacks, traditional healer, pharmacy and home treatment.

2.2.5 Data analysis:

The quantitative survey data were analyzed using STATA version 14(StataCorp LP, College Station, Texas, USA). Descriptive statistics of both frequency and percentage were shown for categorical as well as continuous variables. To understand the barriers faced by the population of the study area qualitative data was collected using open ended questions in the household schedule. During the face to face interview, handwritten notes were taken. After that these notes were transcribed and a thematic framework was developed to interpret the data.

2.3 Results:

The study covered 241 males (50.74 %) and 234 females (49.26 %). In each household on an average there were 5.72 members. Among the entire sample, 53.47 % population were married and 42.95 % were single. Children up to 5 years were 9.05 % and 4.84 % were above the age of 60 years. The total percentage of the adolescent population was 18.32 %. Only Hindu and Christian religion were found but the majority of the population belongs to Hindu religion (96.39 %). This study covered 47 % of the share of Scheduled Caste population, 37 % of Scheduled Tribe and 15.66 % of other category. 14.32 % population above the age of 10 years had not even completed their primary education. 32.63 % of the population completed the primary level of education. Only 1.26 % of population had education above graduation.

Table 2.1 Demographic characteristic of the study sample

Demographic characteristic	Frequency	Percentage
Sex		
Male	241	50.74
Female	234	49.26
Marital status		
Single	203	42.95
Married	254	53.47
Separated/Divorce	2	0.42
Widow	15	3.16
Age group (in years)		
Below 5	43	9.05

6-9	42	8.84
10 -19	87	18.32
20-39	183	38.53
40-59	72	15.16
60-83	48	10.11
Religion		
Christian	3	3.61
Hindu	80	96.39
Caste		
Scheduled Caste	39	46.99
Scheduled Tribe	31	37.35
Others	13	15.66
Level of education		
No education	68	14.32
Primary	155	32.63
Secondary	97	20.42
Higher Secondary	48	10.11
Graduate	15	3.16
Post Graduate	6	1.26
Main occupation of the household		
Crop production	17	20.48
Livestock rearing	5	6.02
Agriculture labour	18	21.69
Self employed	9	10.84
Non-agricultural casual labour	13	15.66
Salaried work	11	13.25
Fishing	10	12.05
Annual income of the household		
Below 100000	41	49.4
100000-150000	26	31.33
151000-200000	9	10.84

Above 200000	7	8.43
Total (N)	475	100

Source: Tabulated by author based on primary data (fieldwork, 2019)

In the study area, the percentage of agricultural laborers found highest i.e., 21.69 %. About 20.48 % of households produce crops. One of the common occupations among the Mishing tribe is fishing and livestock rearing. Self employed in works such as own shop, vendoring. Only 13.25 % of the households engaged in salaried work. The results highlighted that the majority of the households had income below Rs 100000 (49.4 %) and 31.33 % had income between Rs 100000-150000.

2.3.1 Pattern of basic amenities in the households:

The majority of the households have Kutcha house (91.57 %). And of 92.77 % households used tube well to drink water. 4 houses have been found who drink water from the river. About 47 % of households do not have any toilet facility as a result the open defecation is very high in the study area. Only 23 % of households have a pucca toilet.

Table 2.2 Pattern of basic amenities in the households

Households' basic amenities	Number of Households	Percentage
Type of house		
Kutcha	76	91.57
Pucca	7	8.43
Type of drinking water facility		
Piped water	2	2.41
Tube well	77	92.77
River	4	4.82
Have toilet facilities		
Yes	44	53.01
No	39	46.99
Toilet type		
Open defecation	39	46.99
Kutcha	17	20.48

Semi Pucca	8	9.64
Pucca	19	22.89
Total (N)	83	100

Source: Tabulated by author based on primary data (fieldwork, 2019)

Land affected by flood and erosion:

The study found that 57.83 % of the households have agricultural land. And more than 60 % of households had lost their land in the last five years due to floods. The land has been eroded and silted and unfortunately some households have land where the river is flowing over the land. About 7 % of the households had lost more than 10 bigha land due to floods in the last 5 years.

Table 2.3 Percentage of agricultural land owned by the household and land affected by erosion as well as flood in the study area.

Variables	Frequency	Percentage
Own agricultural land		
Yes	48	57.83
No	35	42.17
Land affected flood and erosion		
Yes	50	60.24
No	33	39.76
Land lost due to flood and erosion in last 5 years		
1 bigha	10	12.05
2 bigha	12	14.45
3- 5 bigha	16	19.27
6-10 bigha	6	7.22
Above 10 bigha	6	7.21
Total (N)	83	100

Source: Tabulated by author based on primary data (fieldwork, 2019)

Availability of government health facilities:

In the study area, four villages representing the village attached to the mainland shows all the respondents of Amtola and No. 1 Amtola replied that they have government health facility near to their village. The respondents from No.1 Na- Ali Koibarta and No. 3 Na- Ali Koibarta replied 30.77 % and 92.31 % respectively have government health facility i.e. sub-center. And except No. 1 Na- Ali Koibarta and No.3 Na-Ali Koibarta none of the villages has an emergency ambulance facility.

Table 2.4 Percentage of households’ response on government health facility in their village

Variables		Village Name					
		Amtola PGR	No.1 Amtola	No.1Na-Ali Koibarta	No. 3 Na-Ali Koibarta	1 No. Morton Chapori	Na Ali Miri N.C.
<i>Have government health facility near to your village</i>							
Yes	Frequency	15	12	4	12	0	10
	Percentage	100	100	30.77	92.31	0	66.67
No	Frequency	0	0	9	1	15	5
	Percentage	0	0	69.23	7.69	100	33.33
<i>Have emergency ambulance facility in the village</i>							
Yes	Frequency	0	0	4	7	0	0
	Percentage	0	0	30.77	53.85	0	0
No	Frequency	15	12	9	6	15	15
	Percentage	100	100	66.23	46.15	100	100

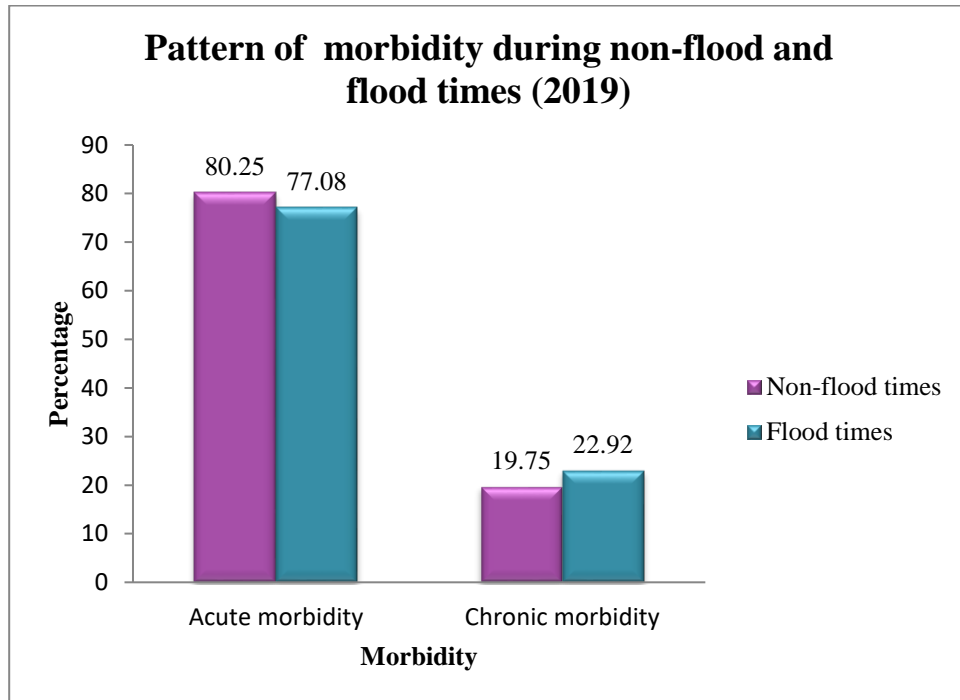
Source: Tabulated by author based on primary data (fieldwork, 2019)

2.3.2 Pattern of morbidity in the flood prone areas:

Based on the duration the illness had been classified into two types. They are acute and chronic illness. The duration of illness lasting not longer than 30 days is termed as acute illness and on the other hand the duration of chronic illness is longer than 30 days.

The result show that in both non-flood and flood times the percentage of acute morbidity is high. In flood times the acute morbidity is 77.08 % and chronic morbidity is 22.92 %. And in the case of non-flood the acute morbidity is 80.25 % which is slightly higher than the flood times.

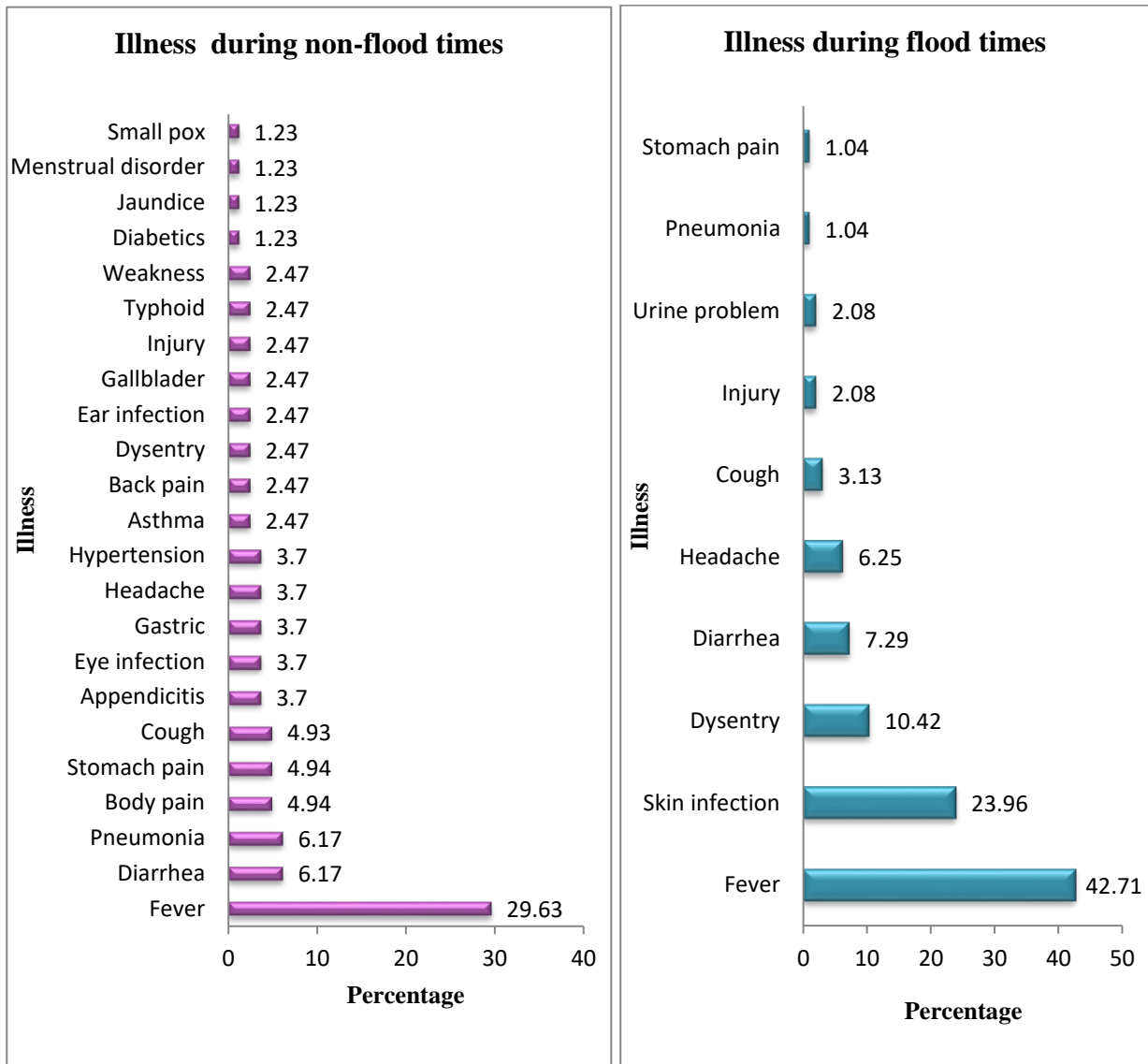
Figure 2.1 Pattern of morbidity during non-flood and flood times in the study area, 2019



Source: Calculated by author based on primary data (fieldwork, 2019)

In response to the questions of illness during the flood in the study area total of ten types of the disease have been found. The percentage of fever is highest in both non-flood (29.63 %) and flood times (42.71 %). The proportion of people suffering from skin infection is high (23.96 %) in the flood times while this illness was generally absent during non-flood times. Diarrhea and pneumonia rank second (6.17 %) in terms of percentage of the illness during non-flood times. The percentages of dysentery and diarrhea increase up to 10.42 % and 7.29 % respectively in flood times.

Figure 2.2 Pattern of illness during non-flood and flood times in the study area, 2019



Source: Calculated by author based on primary data (fieldwork, 2019)

Acute morbidity:

During non-flood times it was found that among the four villages attached to the mainland almost all the households have most of its members suffering from acute illness. In both flood and non-flood times No. 1 Amtola has the highest percentage of population suffering from acute illness. Compared to males the percentage of population suffering from acute ailment is high among the females. Acute ailments were found more whose age was between 0-9 years. And similarly in flood

times both the children below 5 years of age and people above 80 years of age were found to suffer more in the flood. With an increase in the households' annual income the percentage of acute illness decreases. The acute illness was high among the households within the income category of Rs 1 lakh to Rs 1.5 lakh. And the percentage is highest among the population whose income is above Rs 2 lakh.

Chronic morbidity:

Chronic illness was highest in the village of No. 3 Na-Ali Koibarta. Male members were found to be suffered more from a chronic ailment. Among the age group of 40-59 years of age members of the household had the highest chronic ailment. The households with income of more than 20000 shared the highest percentage of chronic ailments.

On the other hand in the flood times, it was observed that in most of the villages the percentage of chronic illness increased. And its rate of increase was high in the *char-chapori* village i.e., Na Ali Miri N.C. (35.29 %). Compared to non-flood times the females were more affected with chronic illness in flood (21.67 %).

Table 2.5 Pattern of morbidity and their socio-economic characteristics during non-flood and flood times in the study area, 2019

Morbidity	During non-flood times		During flood times	
	Acute morbidity N (%)	Chronic morbidity N (%)	Acute morbidity N (%)	Chronic morbidity N (%)
Village				
Amtola PGR	12 (80)	3 (20)	16 (76.19)	5 (23.81)
No. 1 Amtola	12 (100)	0	13 (100)	0
No. 1 Na-Ali Koibarta	11(84.62)	2 (15.38)	10 (76.92)	3 (23.08)
No. 3 Na-Ali Koibarta	9 (69.23)	4 (30.77)	14 (77.78)	4 (22.22)
1 No. Morton Chapori	10 (71.43)	4 (28.57)	10 (71.43)	4 (28.57)
Na Ali Miri N.C.	11(78.57)	3 (21.43)	11 (64.71)	6 (35.29)
Sex				
Male	28 (73.68)	10 (26.32)	34 (75.56)	11 (24.44)
Female	37 (86.05)	6 (13.95)	40 (78.43)	11 (21.67)
Age group (in years)				
Below 5	3 (100)	0	12 (80)	3 (20)

06-09	9 (100)	0	6 (66.67)	3 (33.33)
10-19	8 (72.73)	3 (27.27)	8 (80)	2 (20)
20-39	28 (82.35)	6 (17.65)	27 (77.14)	8 (22.86)
40-59	9 (64.29)	5 (35.71)	13 (76.47)	4 (23.53)
60-83	8 (80)	2 (20)	8 (80)	2 (20)
Caste				
Scheduled Caste	33(84.62)	6(15.38)	39(82.98)	8(17.02)
Scheduled Tribe	23(79.31)	6(20.69)	21(67.74)	10(32.26)
Others	9(69.23)	4(30.77)	14(77.78)	4(22.22)
Annual income				
Below 100000	32 (82.05)	7 (17.95)	42 (79.25)	11 (20.75)
100000-150000	23 (88.46)	3 (11.54)	23 (76.67)	7 (23.33)
151000-200000	6 (66.67)	3 (33.33)	5 (71.43)	2 (28.57)
Above 200000	4 (57.14)	3 (42.86)	4 (66.67)	2 (33.33)

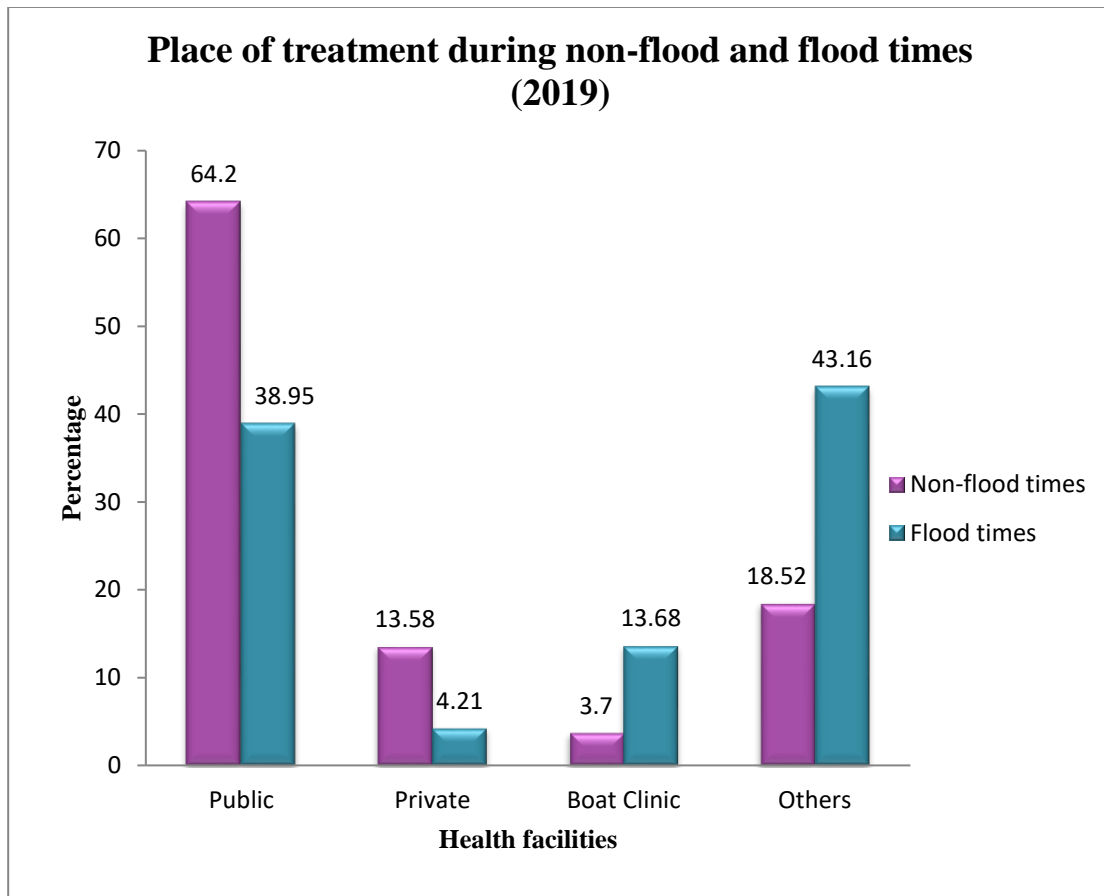
Source: Tabulated by author based on primary data (fieldwork, 2019)

2.3.3 Treatment seeking:

The respondents were asked about the health care facility that they visited during reported illness. Along with the place of treatment the barriers faced to access healthcare were asked. Public health facility includes CHC, PHC and sub-centers. Private health facilities were private hospitals and clinics. Others cover the informal health provider i.e., quack and traditional healer. In the study 64.2 % of the individuals seek care from public health facilities. About 13.58 % of the individuals sought treatment from private health facilities. Compared to male the female counterparts were more likely to utilize public health facilities whereas private health facilities and boat clinics were used more by male.

During flood times there were sharp decline in the use of public health facilities because about 38 % of patients seek treatment from public health facilities. But in the study area about 43 % of the individuals visited the quack, traditional healer and pharmacy for their treatment. Another health facility used by the population was the boat clinic i.e. 13.68 %.

Figure 2.3 Place of treatment during non-flood and flood times in the study area, 2019



Source: Calculated by author based on primary data (fieldwork, 2019)

Table 2.6: Place of treatment during non-flood and flood times in the study area by demographic characteristics, 2019

Health facilities	During non-flood times				During flood times			
	Public N (%)	Private N (%)	Boat Clinic N (%)	Others N (%)	Public N (%)	Private N (%)	Boat Clinic N (%)	Others N (%)
Village Name								
Amtola PGR	9 (60)	4 (26.67)	0	2(13.33)	14 (66.67)	0	0	7 (33.33)
No. 1 Amtola	11(91.67)	0	0	1(8.33)	8(61.54)	0	0	5 (38.46)
No. 1 Na-Ali Koibarta	10(76.92)	1 (7.69)	0	2(15.38)	8 (66.67)	0	0	4 (33.33)
No. 3 Na-Ali Koibarta	8 (61.54)	2 (15.38)	0	3(23.08)	4(22.22)	2(11.1)	0	12(66.6)

1 No. Morton Chapori	7 (50)	2 (14.29)	1(7.14)	4(28.57)	1 (7.14)	1 (7.14)	4(28.57)	8 (57.14)
Na-Ali Miri N.C.	7 (50)	2(14.29)	2(14.3)	3(21.43)	2 (11.76)	1 (5.88)	9(52.94)	5(29.41)
Sex								
Male	20(52.63)	7(18.42)	2(5.26)	9(23.68)	14(45.2)	4(12.9)	8(25.8)	5(16.13)
Female	32(74.42)	4(9.3)	1(2.33)	6(13.95)	23(71.9)	1(3.13)	5(15.62)	3(9.38)
Age group (in years)								
Below 5	3(100)	0.00	0	0.00	4(36.36)	0.00	4(36.36)	1(9.09)
5-9	5(55.56)	1(11.11)	0.00	3(33.33)	6(46.15)	0.00	1(7.69)	2(15.38)
10-19	9(81.82)	2(18.18)	0	0	4(40)	0.00	1(10)	0.00
20-39	20(58.82)	5(14.71)	2(5.88)	7(20.59)	13(37.1)	0.00	3(8.57)	2(5.71)
40-59	10(71.43)	2(14.29)	0	2(14.29)	7(41.18)	3(17.6)	3(17.65)	1(5.88)
60-83	5(50)	1(10)	1(10)	3(30)	3(30)	2(20)	1(10)	2(20)
Caste								
Scheduled Caste	30(76.92)	5(12.82)	0	4(10.26)	29(96.6)	1(3.33)	0	0
Scheduled Tribe	14(48.28)	4(13.79)	3(10.3)	8(27.59)	4(16.67)	2(8.3)	13(54.2)	5(20.83)
Others	8(61.54)	2(15.38)	0	3(23.08)	4(44.44)	2(22.2)	0	3(33.33)

Source: Tabulated by author based on primary data (fieldwork, 2019)

2.3.3.1 Distance travelled to seek treatment:

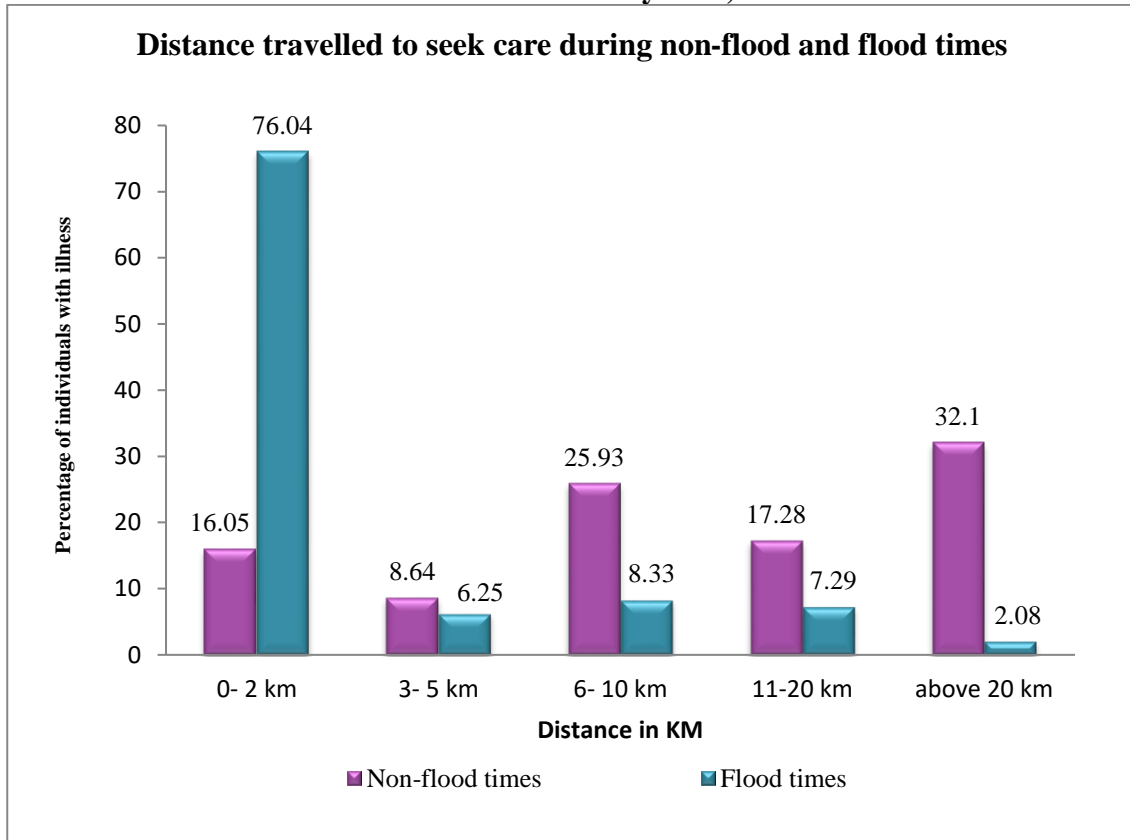
Figure 2.4 shows that majority of the individuals of the study area travel above 20 km to seek care during non-flood. While on the contrary the percentage of population traveling more than 20 km decreases in the flood times. Due to the lack of transportation facilities, the majority of the population (76.04 %) replied that they travelled generally 2 km to seek treatment in flood times.

Table 2.7 shows that during the flood times there were sharp increase in the travel distance between 0-2 km by the male as well as female compared to non-flood times. On the other the travel distance above 20 km to seek care declines. Similarly during non-flood times the children below the age of 5 years were found to travel more than 6 km which got restricted to only 2 km at the time of flood. It also shows that compared to the Scheduled tribe and others majority of the Scheduled caste respondents with illness had travelled between 0-2 km during the flood times. There was no respondent from Scheduled tribe traveled above 20 km during the flood times.

The figure 2.5 shows that during non-flood 5.77% of individuals traveled upto 2 km and 40.38 % travel above 20 km respectively. To seek care from a private provider they had to travel above 6 km. Boat clinic was the nearest health facility they got each month just near to the village.

Eventually, during flood it was found that there was sharp increase in the percentage of population utilizing public health care (54.05 %) that includes health camp with travel distance 2 km. And in case of other health care provider, the distance travel in flood decreases to 5 km.

Figure 2.4 Distance travelled to seek care during non-flood and flood times in the study area, 2019



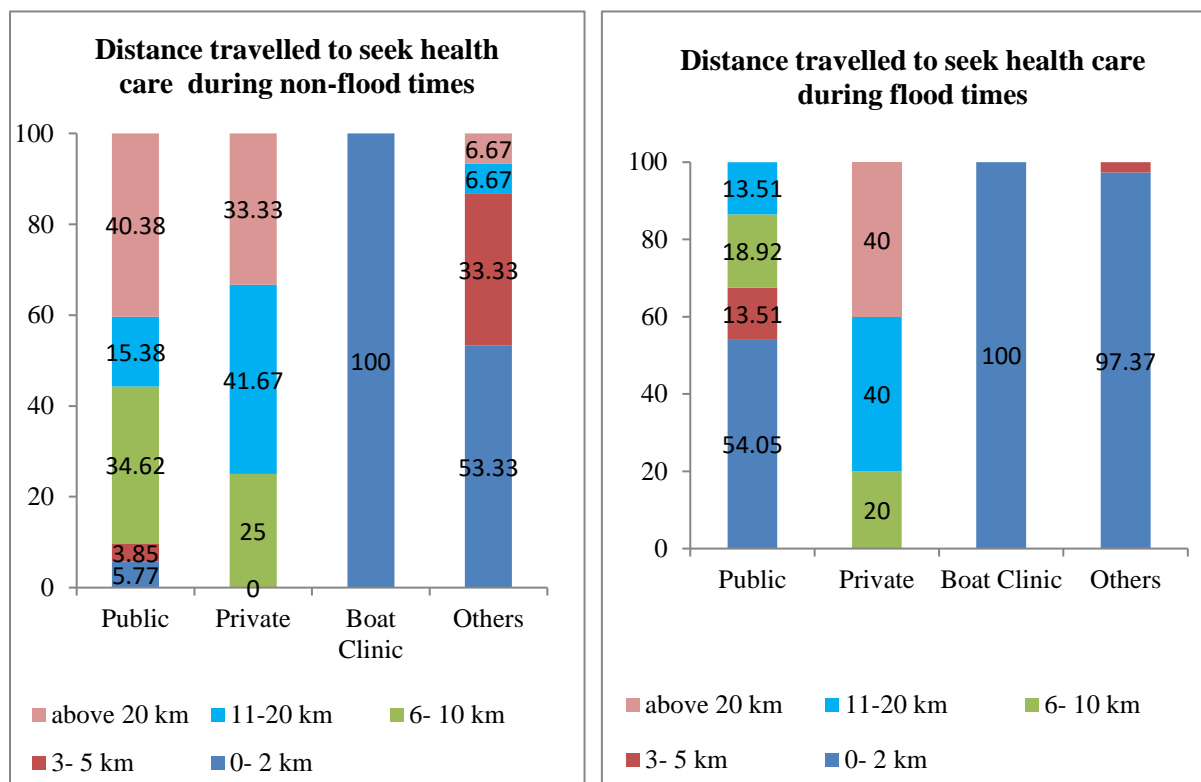
Source: Calculated by author based on primary data (fieldwork, 2019)

Table 2.7 Distance travelled to seek health care during non-flood and flood times in the study area by demographic characteristics, 2019

Variables	During non-flood times					During flood times				
	0- 2 km N(%)	3- 5 km N(%)	6- 10 km N(%)	11-20 km N(%)	above 20 km N (%)	0- 2 km N (%)	3- 5 km N (%)	6- 10 km N (%)	11-20 km N (%)	above 20 km N(%)
Sex										
Male	9(23.68)	4(10.53)	7(18.42)	5(13.16)	13(34.21)	35(77.78)	1(2.22)	4(8.89)	4(8.89)	1(2.22)
Female	4(9.3)	3(6.98)	14(32.56)	9(20.93)	13(30.23)	38(74.51)	5(9.80)	4(7.84)	3(5.88)	1(1.96)
Age group (in years)										
Below 5	0	0	1(33.33)	1(33.33)	1(33.33)	11(100)	0	0	0	0
5-9	1(11.11)	2(22.22)	2(22.22)	3(33.33)	1(11.11)	12(92.31)	0	0	1(7.69)	0
10-19	1(9.09)	0	3(27.27)	3(27.27)	4(36.36)	6(60)	2(20)	2(20)	0	0
20-39	5(14.71)	3(8.82)	8(23.53)	2(5.88)	16(47.06)	27(77.14)	2(5.71)	3(8.57)	3(8.57)	
40-59	2(14.29)	2(14.29)	6(42.86)	2(14.29)	2(14.29)	10(58.82)	1(5.88)	2(11.76)	2(11.76)	2(11.76)
60-83	4(40)	0	1(10)	3(30)	2(20)	7(70)	1(10)	1(10)	1(10)	0
Caste										
Scheduled Caste	3(7.69)	4(10.26)	20(51.28)	4(10.26)	8(20.51)	28(87.5)	0	1(3.13)	2(6.25)	1(3.13)
Scheduled Tribe	9(31.03)	3(10.34)	0	5(17.24)	12(41.38)	31(67.39)	6(13.04)	6(13.04)	3(6.52)	0
Others	9(31.03)	3(10.34)	0	5(17.24)	12(41.38)	14(77.78)	0	1(5.56)	2(11.11)	1(5.56)

Source: Tabulated by author based on primary data (fieldwork, 2019)

Figure 2.5 Pattern of distance travelled to seek health care from different types of health providers during non-flood and flood times in the study area, 2019



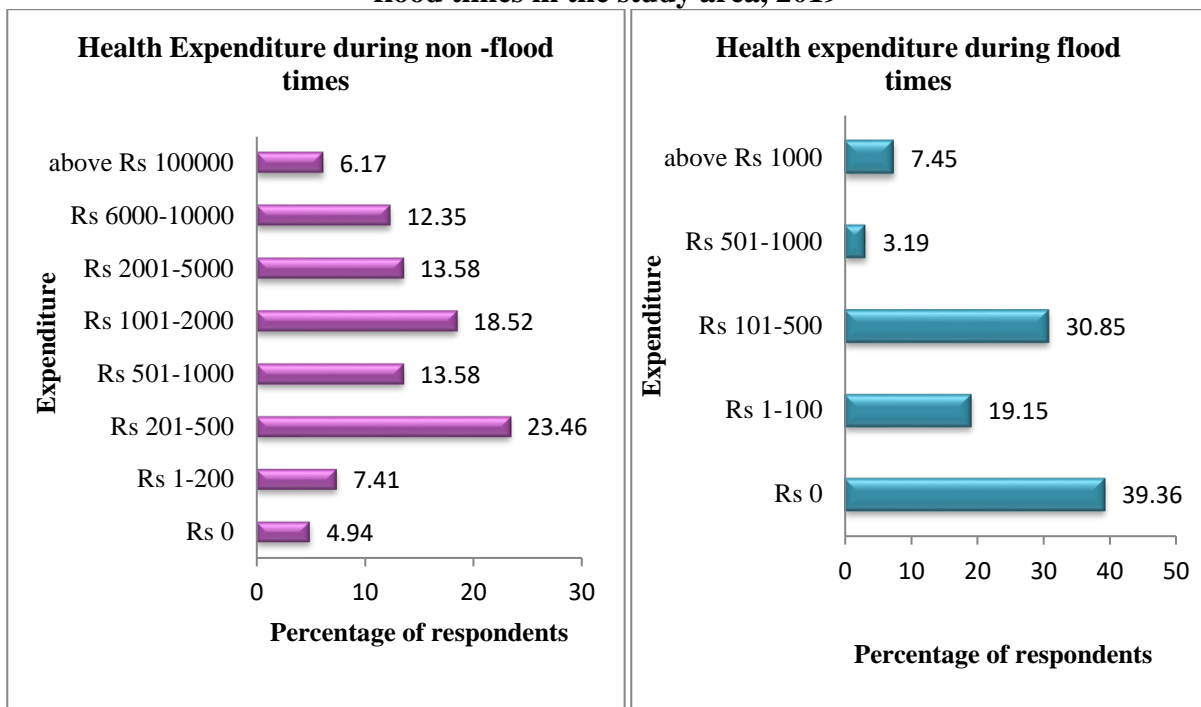
Source: Calculated by author based on primary data (fieldwork, 2019)

2.3.4 Expenditure on illness:

The figure 2.6 shows that 23.46 % of individuals had spent about Rs 201 to Rs 500 for their treatment. It is surprising to notice that less than 5 % of the individuals receive treatment without spending a single penny. The expenditure incurred for illness found to be more between Rs 201-500.

Except for health camps and boat clinics, the households having illness episodes during flood had to spend money. Figure 2.6 show that 39.36 % of the individuals did not spend money as they receive services at their doorsteps without any user fees. Among the study participants, 30.85 % of respondents spend Rs 101 to Rs 500.

Figure 2.6 Health expenditure during non-flood and flood times in the study area, 2019



Source: Calculated by author based on primary data (fieldwork, 2019)

2.3.5 Health problems faced to access healthcare during flood:

Conversations with the respondents in the field confirmed that the households located in the remote areas receiving flood every year face various constraints such as transportation facilities, non-functional sub center and lack of money to access health care service.

(a) *Lack of transportation facilities:*

The majority of the households responded that the distance between the village and health care facility is the prime obstacle faced by them. And this condition gets more worsen during the flood when the road gets damaged. The utilization of health care services largely depended on access to transportation. In the rural areas when the distance to travel is more and no proper transportation facility is available it ultimately leads to low utilization of public health care services and increase in their out of pocket health expenditure:

As described by participants how they faced problem due to unavailability of transportation facilities:

I was sick during the flood but as the ferry service was closed for 7 days at that time due to increase in the level of water in the river, I could not able to go to the health center and unfortunately, I seek care from a quack of our village because there is no any permanent health center available near to our village. And for treatment, we cannot solely depend on the boat clinic which visits only once in a month. (N41, Age- 40 years, Male, Vill- 1 No. Morton Chapori,)

Another woman explained her experienced about the obstacles faced during her delivery due to lack of transportation facilities:

Two months back in the early morning my labor pain started while I was at home. But to reach any health center from our village we had to always face challenges of crossing the river in an emergency situation. As I belong to a poor family, they cannot manage money to take me urgently in the health center. We had to wait for the public ferry to start but unfortunately, before crossing the river I had to deliver my baby. I felt like there was no chance of my survival and it's a very uncomfortable and awkward moment in my life as without any privacy I delivered the baby in front of the ferry passengers. (N14, Age- 28 years, Female, Vill-Na Ali Miri N.C.)

Similarly, other participants also said about the transportation problem faced to seek treatment from healthcare facilities:

It was rainy season when I fell down and my leg was injured. During flood all the road networks broke down and our temporary bridge too. It was too difficult to take me to the health center. But the villages with lots of hurdles somehow carry me and walk for about 8 km, and then when we reached the proper road I saw the ambulance was waiting and I was taken to the health center. From this, I can say that just because of the bad road connectivity of our villages we have to face many problems not only in the rainy season but also in dry season also. (N35, Age-50 years, Male, Vill- 1 No. Morton Chapori)

We are living in a place where we are connected to the mainland only through the waterways so whenever we have to visit the health centre enough time and money are required to reach

the health facility because we have to cross the river through the ferry and after that we go by autorickshaw. Hence people like us who are always struggling with the financial crisis cannot spend money for minor illness. I remember few months back during the flood times most of the members of our family suffered from dysentery so as we were unable to visit the health facilities we went to our neighbouring village and approached the traditional healer to sought treatment. (N2, Age-42 years, Female, Vill-Na Ali Miri N.C.)

In our village, those who do not own any vehicles have to walk a long distance as due to poor road connectivity no public transport facility is available. As I went to town for some work I seek treatment from a private clinic along with my friend but my wife who was ill too did not go to the health center, she sought care from a quack of our village. (N15, Age-30 years, Male, Vill- Na Ali Miri N.C.)

(b) Non- functional sub centers:

The sub centers presented in the concerned study area are found that none of the sub centers have residential facilities for ANM. The ANMs mainly travels from the urban areas to the sub centers. Compared to the sub centers in the mainland village the sub center in the *char-chapori* areas is in a worse condition. The basic infrastructure for the functioning of the sub center is not available. As a result most of the time it was found that the sub centers is only open during the time of vaccination and immunization camp. As highlighted in these quotes we can understand the non-function ability of the sub centre in the study area:

There is no point in visiting the sub center and wasting our time as we do not get cured of it because the medicines are of poor quality and sometimes medicines are not available. (N 63, Age- 35 years, Male, Vill-No. 1 Amtola)

Walking for 30 minutes while you are sick and not sure about whether the health personnel will be available or not in the health center. So, instead of going to the sub center most of the time we prefer to go to the primary health center directly. (N76, Age-70 years, Male, Vill-No. 1 Amtola)

The sub center is only open for 8 hours but when there is an emergency and the sub center is closed we have to call the quack from the distant village and they use to come and treat us at our home. (N71, Age-60, Female, Vill- Amtola PGR)

The sub center of our village is for those who are pregnant and the child for immunization.
(N27, Age- 65 years, Male, Vill- No. 3 Na-Ali Koibarta)

(c) Lack of money:

The villagers depend mainly on primary occupation and most of them are daily wage labor. In a year most of them get unemployed during the rainy season. They used to borrow money in the rainy season and in the winter they give the money to the lenders. But this condition repeats again when they receive flood as a result they fall into the trap of money constraint. In such condition when they do not have money if a member of household falls sick, the health care was compromised as they are unable to manage the cost of treatment. The citations below manifested how due to the lack of money their problem to access health care intensified:

My son was suffering from stomach pain for a few days so after taking advice from the doctor we diagnose him in the CHC at first and the very next day took the report. We came to know he had appendicitis. But due to lack of money, I am unable to do treatment of my son though the doctor asked me to do the immediate operation. During flood, I already lost my livestock; crops and my land get eroded. I am in a very miserable condition as I am the sole bread earner, whatever I earn the whole day I have to spend to feed my family if I do not work a single day all my family members have to starve. I already spend around Rs 1000 for his diagnosis. It is very difficult for us to go to the town and stay in the hospital because it needs a huge amount of money. So, I am trying to borrow money to start his treatment. (N42, Age-50 years, Male, Vill-1 No. Morton Chapori)

Similarly, another respondent explained

I was not satisfied with the treatment provided in the health camp so I wanted to do check up in a good health center. But at that time my house was washed away with flood so we were staying on road. I was in despair because for three months I was not getting any work. Each day we have to struggle for food, water, toilet facilities. In such a condition I could not manage money for my treatment and took the medicine provided in the health camp. (N62, Age-50 years, Male, Vill-Amtola PGR)

2.4 Discussion:

This study was based on the analysis of the data on the pattern of health service utilization collected from the flood-prone villages of Lakhimpur district. The mixed method applied in the study will help to explore the pattern of health care utilization and the barrier faced to utilize health care in the context of rural flood-prone areas. It is a well known fact that the utilization of health care is affected by multiple factors like for example availability, cost, travel distance, quality of care, social structure and health beliefs (Muhammad, S., Chowdhury et al., 2017). Globally it was found that people residing in rural areas face different barriers while accessing healthcare services (Anticono Huaynate et al., 2015). Likewise, the present study also reveals that like other villages in the remote areas the populations of the study area have to face similar problem but these problems get magnified as it receives severe flood in each year.

It was identified that illnesses like fever, skin infection, diarrhea, dysentery are linked to flood. Saulnier et al. (2018) study shows that during the time of flood there was an increase in the number of visits in the health centers for the treatment of skin infections and diarrhea (Saulnier et al., 2018; World Health Organisation, 2010). A study done in Pakistan also shows that the common disease found in the flood affected are the water borne diseases such as skin infections and diarrhea (Sriram, 2019).

The sanitation conditions in the villages are not in an improved condition. Hence poor sanitation has a direct impact on the condition of health (Nilima et al., 2018). Open defecation was practiced in all villages and it increased mainly during the flood. Moreover along with other household properties damage, the tube wells submerged under the water at the time of the flood, people settled down in the road and highland areas in a temporary tent so as they were displaced the households did not have any option to collect water they had to face difficulties to collect clean drinking water. There were few households found in the study area who used dirty floodwater without any kind of purification. Studies revealed that as it creates unhygienic condition the chance of suffering from diarrhea supposed to increase among the population (Lakshminarayanan & Jayalakshmy, 2015; Nilima et al., 2018). Om Prakash Gautam et al. states that due to flood the water and sanitation facilities get destroyed and as result the diarrheal diseases rise as people used the contaminated drinking water and open defecation was practiced (Gautam et al., 2017). Along with sanitation may be low level of education among the population increase diarrhea morbidity. Studies found that

those people with the low level of education had less awareness about health prevention measures (Joseph et al., 2016). The study revealed that during flood times there was slight increase in chronic morbidity compared to normal condition which could be probably caused due to problems faced to access health facilities, financial as well as transportation barrier making them unable to cure the illness. The study found that in normal times compared to males, females are at higher risk of acute morbidity. But in flood times there was a similar pattern of morbidity among both male and female. But Navaneetham et al., (2009) study on the morbidity pattern in Kerala shows results of female having higher morbidity because females are two times more prone than male for diseases like bones and joints pain, hypertension (Navaneetham et al., 2009).

The results show that the respondents from the village No 1 Morton Chapori replied that there was no health facility near to their village. But in the rest of the villages, the respondents' replies about the availability of health facilities near to the village differ across the village. The probable reason for that is many respondents do not feel the existence of the sub center in their village because they think it is difficult to reach the health center, the sub center meant for only the pregnant women and most of the time the medicine are not available. It goes in line with Saleem et al., (2017) study that it was difficult to travel to the sub center and complain against the non-availability of medicine (Saleem et al., 2017). A study done in Andhra Pradesh highlights that about 73 % of people in remotest area travel more than 5 km from their village to reach at Sub-centers.

Compared to normal times there were an increase in the use of both the boat clinic in the villages where boat clinic service was provided and other informal health providers in all the villages.

Long back it has been identified that the travel distance of the patients to seek treatment is a major determinant of health care utilization (Stock, 1983). The study found more than 33% of the patients had to travel more than 20 km to seek care. Studies show that difficult geography as well as long distance walk leads to poor access in health care services (Wagle et al., 2004; Ahmed et al., 2017). A study done in Ethiopia shows that the perceived physical barriers like long distance, lack of transportation, uneven distribution of health centers, the topography of the area determine the behavior of rural women for seeking care for maternal health care (Mesele, 2019). Awoyemi TT et al. (2011) study suggests that transportation problem and the cost stands as the major barrier for the repeated visit for treatment (Awoyemi et al., 2011). In India, the ambulance services provided to take pregnant women, children as well as patients who are need of emergency medical care have

not been well improved (Human Rights Law Network, 2016). The aim of an ambulance is to reach any place within 15-20 minutes after getting the distress call and transporting the patient to a healthcare facility within 20 minutes (Singh, 2015). In the *char-chapori* villages due to its geographical location, they were deprived of availing these ambulance facilities. However, though connected to the mainland the two villages named Amtola PGR and No. 1 Amtola they have to walk more than 5 kms to reach the ambulance due to poor road facility.

Overall it was found that for both acute and chronic illness the patients mostly sought treatment from the public health facility. However, the study confirmed that next to the government health center for the treatment they visited quack and traditional healers whom they meet in the periphery of their village and sometimes they travel from house to house as well as the village to provide services in the doorstep. This finding is similar to the studies that one of the major providers of basic health care in the rural area is the informal health care provider (Rohde & Viswanathan, 1994; George, 2010). Additionally one of the interesting health facility found in the study area is the boat clinic that provides primary care once in a month to each of the *char-chapori* villages. As the road connectivity damaged the respondents reported that they could not visit the higher health facility as a result the visit to informal health care providers and boat clinic increases in flood times.

Therefore the challenge in the flood affected area is how to solve the issues faced by these communities. In order to solve the problems it can be recommended that firstly the transportation facilities should be improved which will increase the mobility of the health care provider as well as the user. Residential buildings for the health workers in the sub center should be constructed. It will help the service provision timing and during emergency at night the villagers can avail the service. Early flood preparedness should be one of the prime responsibilities among the service provider. Because it was found that in the health camp the villagers' complaint about the non-availability of medicine. Awareness programmes on the use of sanitation and hygiene practices should be done throughout the year.

2.5 Conclusion:

It can be concluded that the poor economic condition combined with the flood in the rainy season has a very negative impact on the health condition and health service utilization in the study area. The data reveals that in both villages located in the mainland areas as well as isolated areas faced difficulty in utilizing the health services. However, the challenges get intensified during the flood

times. The transportation facilities and the non-functional sub-centers were some of the causes along with the financial constraint to avail the health care facilities. The sub-centers are the only nearest available public health care facilities to the rural areas. But during the non-flood times, people opting to seek treatment from the sub-centers found to be low whereas at the time of flood due to lack of choice they were forced to visit the sub-centers. There is a sharp decline in the use of public health services during flood compared to non-flood times. Interestingly, this gap is fulfilled by the services from the quack providing services within a short travel distance from the villages. Along with the quack, the use of the mobile boat clinic providing services to the isolated *char-chapori* villages had also been increased during the flood times.

CHAPTER-3

USERS' LEVEL OF SATISFACTION AND PERCEPTION ON THE BOAT CLINIC

3.1 Introduction:

The Alma Ata Declaration of 1978 identified primary health care as the key to attain the goal of “Health for All” by 2000 in the world (WHO and UNICEF, 1978). As the target was not achieved, again in 2015 the Sustainable Development Goals (SDGs) have tried to pursue the desired goal through emphasizing Universal Health Coverage (UHC) (Fullman, et al. 2018). UHC has been defined as access to quality healthcare services those who are in need of healthcare without incurring any kind of financial hardship (WHO, 2015). However, it has been found that after completion of more than 40 years of Alma Ata Declaration despite of so much effort still providing health care services in the remote areas is one of the difficult tasks in the world. Under such circumstances, mobile health clinic stands as the alternative to reach the unreached and underserved population as the people living in those areas are disenfranchised in terms of accessing the health care services (Yu et al., 2017). Mobile clinics are defined as ‘customized vehicles that travel to the heart of communities’ (Hill, 2014). They overcome barriers of time, money and trust and provide community tailored care to the vulnerable populations. Mobile health clinics provide prevention; screening and most importantly connect them into mainstream healthcare (Oriol et al., 2009).

According to the socio economic survey (2002-03) in Assam, there were approximately 24.90 lakhs populations in the riverine areas which are locally known as *char-chaporis* (Government of Assam, n.d.). Most of the population living in the *char-chaporis* of Assam are impoverished and have a lack of resource setting because each year they face severe flood in the rainy season which causes destruction of infrastructure (ibid). Being situated in the vulnerable riverine areas the people of Assam hardly got an opportunity to avail the benefits of any health programmes as they are beyond the reach of any health facilities (Chakraborty, 2014). They neither have any access to fix health care centers nor well developed transportation facilities.

Considering the vulnerability of the population in 2005 the Centre for North East Studies and Policy came up with a major intervention called boat clinic to overcome the geographic accessibility barriers and fill the gap in health services. It provides basic health care services to the dwellers of

Brahmaputra islands through a boat equipped with OPD, laboratories on board as well as pharmacies (Centre for North East Studies and Policy Research, n.d.).

Those areas where resources are scarce and no convenient alternatives to seek health care are available it is found that patients from low socio economic category continue to visit in the same health care regardless of their dissatisfaction (Jalil et al., 2017).

The level of patient satisfaction has been recognized as a prime component for people centered care (Hemadeh et al., 2018) and used enormously to evaluate the quality of health care (Al-Sakkak et al., 2008; Xiong et al., 2013). Patient centered care can be defined as the care in which the doctor respond to patients and ask them to express the purpose of his/her coming, including symptoms, feelings, thoughts and expectations (Henbest & Stewart, 1990). Donabedian noted that the effectiveness of the quality of care can be validated by measuring health and satisfaction (Ware et al., 1978).

A plethora of studies show the association between various indicators of patient level of satisfaction and their background characteristics like age, sex, level of education (Ma Margolis & Al-Marzouqi, 2003; Jaber, 2008; Rahmqvist & Bara Ana-Claudia, 2010; Alshammari, 2014). A study conducted in Bangladesh show that more than 50 % of the patients were unsatisfied with the drugs they received (Islam et al., 2015). The quality of communication between the patient and the provider determines the overall satisfaction of the patient and re-visiting the same health clinic (Weisman, 1986). With a decrease in the physician time spent with their patients there is also a decrease in the level of satisfaction from both the doctor and the patients (Lin et al., 2001).

There is very limited number of studies conducted on the boat clinic of Assam. Earlier an exit interview of beneficiaries from the boat clinic was done which mainly deals with the parameters such as percentage of respondents' medicines received; waiting time, level of satisfaction (Regional Resource Centre for NE States, 2013). However, no study has been done yet which can show the level of overall satisfaction of the boat clinic taking into account different indicators of satisfaction. Moreover to the author's knowledge, no study was done taking into account the impact of seasonal variation and level of satisfaction of patients from health care. Therefore, this chapter aims to understand the level of satisfaction of users' on the quality of care received at the boat clinic in the *char-chapori* areas in the Lakhimpur district of Assam.

3.2 Methodology:

3.2.1 Study design:

The study follows mixed method design. A cross-sectional study was carried out in the riverine flood prone *char-chaporis* area of Lakhimpur district in Assam to assess the users' level of satisfaction and their perception on the boat clinic service. Health care seekers who approach the boat clinic were included as the respondent for the study purpose.

3.2.2 Study population:

The beneficiaries visiting the boat clinic above 14 years of age, who can speak and understand the Assamese language was selected for the study.

3.2.3 Data collection and Sampling:

The data was collected from four health camps i.e., Guwalbari N.C., Major Chapori, 1 No. Morton Chapori, Na Ali aunibari village located in the bank of the river Subansiri in the North Lakhimpur tehsil. The health camps were selected randomly to do the exit interviews in order to understand the level of satisfaction and perception of the boat clinic service. From each camp site about 15 to 20 samples were collected. None of the interviewees refused to participate in the study.

Face to face in-depth interviews were conducted with the help of semi structured interview schedule where both open and close ended questions were asked. The structured close ended questions were used to measure the users' level of satisfaction. The interview schedule included questions related to demographic, economic, illness, distance travel to reach the boat clinic, mode of transport, expenditure, level of satisfaction on the amount of drugs, privacy during health check up, skill and attitude of the health care providers, waiting time to receive care, time given by the doctor to consult, satisfaction with the overall service, service during flood, and other season except flood, positive and negative aspects as well as feedback on the boat clinic.

The interviews were conducted about 20 meters away from the boat clinic so that their responses were not affected by the presence of co-workers. Informed consent was taken and the participants were informed that if they felt uncomfortable with any questions they have the right not to respond. After completing the interview the next sample was selected who had completed their check up. Each interview took approximately 8 to 10 minutes.

To understand the user's perception on the quality of care in the boat clinic, qualitative data was collected using open ended questions in the interview schedule. An in-depth face to face interview was conducted. Handwritten notes were transcribed and a thematic framework was developed to interpret the data.

3.2.4 Data Analysis:

The data were analyzed using STATA version 14(StataCorp LP, College Station, Texas, USA). The users' level of satisfaction of the respondents has been calculated with respect to the service they received from the boat clinic. A composite score on the level of satisfaction has been constructed based on nine dimensions includes satisfaction with the (1) amount of drugs (2) privacy during health check-up (3) skill of the health workers (4) attitude of the health workers (5) the waiting time (6) consultation time given by doctor (7) service during flood (8) service during other season and (9) the overall service from the boat clinic. Each of the items was scored using four-point Likert scale (Margolis, et al. 2003). This scale is often used to measure the latent continuous variable that represents the attitude or perception of the respondents (Chakraborty, 2014). The scoring of the scale was 1= very dissatisfied, 2= dissatisfied, 3= satisfied, 4= very satisfied. The total possible score range from 9 to 36.

To measure the overall users' level of satisfaction all the respondents rating on the scores of the nine measured dimensions were summed up and after that the mean score was calculated. The value above the mean was considered as '*satisfied*' and vice versa '*not satisfied*'.

3.4 Results:

The results of this study have been explained into two parts. The first part covers the results of the quantitative method in which patients' level of satisfaction from the boat clinic has been analysed. And in the second part it deals with the qualitative, which discusses the perception of the users' on the boat clinic.

3.4.1 Demographic characteristics:

In the study total 70 samples had been interviewed. The majority of the respondents belong to the age group of 20 to 30 years (44.29%) and only 2.86 % of the respondent's age was more than 60. Comparatively more females had visited the boat clinic than the male i.e., (male 35.71 % and female 64.29%). Almost 70 % of respondents were married and single were 25.71 %. About 17.14

% of respondents had no education. Notably, in the study area, less than 2 % of respondents were graduate and maximum respondents had completed the secondary level of education i.e., 27.14 %. The respondents residing in these villages seeking care from the boat clinic were belonged to the Mising tribe. Therefore, it was found that half of the total respondents engaged in the primary activities i.e., 18.57 % and 31.43 % in livestock rearing and agricultural worker respectively. About 4.29 % were engaged as self employed in different activities like vendors, grocery shop, tailoring, etc. 10 % of the respondents are a salaried worker in government and private jobs, in the former the respondents who get pension were also included. And 35.71 % of the respondents were unemployed and students. 50% and 41.43 % of the respondents had a total monthly income in the household between Rs 10000 to Rs 20000 and below Rs 10000 respectively. Only 4.29 % of respondents had monthly income in the household above Rs 40000.

Table 3.1 Characteristics of respondents visiting boat clinics during the period of survey.

Variables	Frequency	Percentage
Age (in years)		
Below 20	10	14.29
20-30	31	44.29
31-40	12	17.14
41-60	15	21.43
Above 60	2	2.86
Sex		
Male	25	35.71
Female	45	64.29
Marital Status		
Single	18	25.71
Married	49	70
Widowed	3	4.29
Level of education		
No education	12	17.14
Primary	12	17.14
Secondary	26	37.14

Higher Secondary	19	27.14
Graduate	1	1.43
Occupation		
Livestock Rearing	13	18.57
Agriculture Worker	22	31.43
Self Employed	3	4.29
Salaried Work	7	10
Others	25	35.71
Monthly income of the respondent household		
Below 10000	29	41.43
10000-20000	35	50
21000-40000	3	4.29
Above 40000	3	4.29
Total (N)	70	100

Source: Tabulated by author based on primary data (fieldwork, 2019)

3.4.2 Users' Level of satisfaction:

In the table 2 the respondents' level of satisfaction were given in detail. The respondents satisfied with the amount of drugs were 52.86 % and 38.57 % were very satisfied. The respondents who perceive they were not satisfied with the privacy were 20%. Notably, compare to the male respondents, the female respondents were more not satisfied with the privacy 26.67 %. More than 32 % of the respondents were very satisfied with the privacy while among the nine variables privacy records the highest percentage in terms of respondents very dissatisfied (4.29 %). Among the 70 respondents, 54.29 % and 61.43 % were very satisfied with the skills and attitudes of the health worker respectively. However, none of the respondents were dissatisfied with the waiting time. About 71.43 % of the respondents were very satisfied with the waiting time in the health facility. The proportion of respondents very satisfied with the duration of time given by the doctor was 35.71 %. The study found that the level of satisfaction was more during the time when there was no flood (51.43 %) while at the time of flood the percentage of respondents very satisfied were

only 27.14 %. Finally, out of all respondents 38.57 % reported very satisfied with the overall service provided in the boat clinic.

Table 3.2 Distribution of the Respondents' Level of Satisfaction

Variables	Frequency	Percentage
<i>Satisfied with amount of drugs</i>		
Very Dissatisfied	2	2.86
Somewhat Dissatisfied	4	5.71
Somewhat Satisfied	37	52.86
Very Satisfied	27	38.57
<i>Privacy during health check up</i>		
Very Dissatisfied	3	4.29
Somewhat Dissatisfied	11	15.71
Somewhat Satisfied	33	47.14
Very Satisfied	23	32.86
<i>Satisfied with skill of the health worker</i>		
Very Dissatisfied	0	0
Somewhat Dissatisfied	0	0
Somewhat Satisfied	32	45.71
Very Satisfied	38	54.29
<i>Satisfied with attitude of the health worker</i>		
Very Dissatisfied	0	0
Somewhat Dissatisfied	0	0
Somewhat Satisfied	27	38.57
Very Satisfied	43	61.43
<i>Satisfied with waiting time to receive care</i>		
Very Dissatisfied	0	0
Somewhat Dissatisfied	0	0
Somewhat Satisfied	20	28.57
Very Satisfied	50	71.43

<i>Satisfied with time given by doctor for consultation</i>		
Very Dissatisfied	0	0
Somewhat Dissatisfied	1	1.43
Somewhat Satisfied	44	62.86
Very Satisfied	25	35.71
<i>Satisfied with service during flood</i>		
Very Dissatisfied	0	0
Somewhat Dissatisfied	12	17.14
Somewhat Satisfied	39	55.71
Very Satisfied	19	27.14
<i>Satisfied with service during other than flood</i>		
Very Dissatisfied	0	0
Somewhat Dissatisfied	1	1.43
Somewhat Satisfied	33	47.14
Very Satisfied	36	51.43
<i>Satisfied with the overall service</i>		
Very Dissatisfied	1	1.43
Somewhat Dissatisfied	5	7.14
Somewhat Satisfied	37	52.86
Very Satisfied	27	38.57

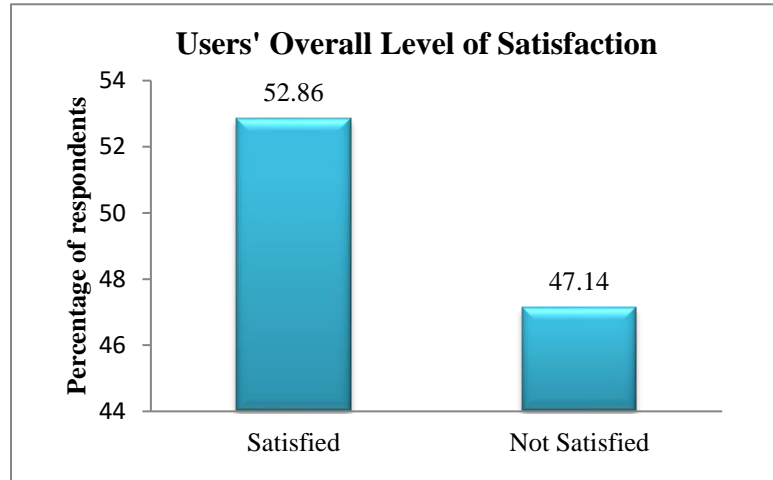
Source: Tabulated by author based on primary data (fieldwork, 2019)

3.4.3 Users' Overall Level of satisfaction:

The result shows that the overall satisfaction of the respondents ranged from 23 to 35. And the mean score of the level of satisfaction of the 70 users were 30.45. The respondents were categorized as satisfied with the boat clinic services having value more than 30.45 and not satisfied when the value was below 30.45. The study reported that overall 52.86 % of the respondents were satisfied while rests of the 47.14 % were not satisfied with the service. The village 1 No. Morton Chapori had the highest percentage of good satisfaction (76.47 %) on the other hand respondents from the Major Chapori village reported the lowest percentage of good satisfaction (42.11 %). Figure 3.1 shows the male respondents' (60 %) were more satisfied than the female respondents' (48.89 %). In

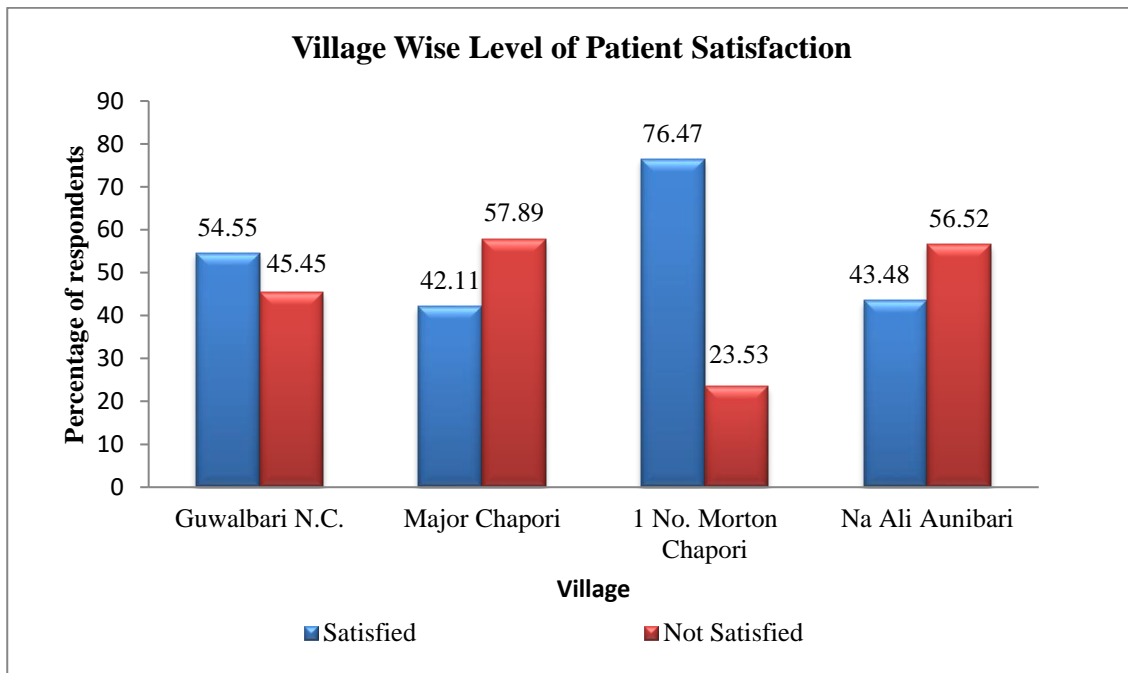
the age category of 41-60 years, the percentage of good satisfaction was highest (80 %) and none of the respondents above the age of 60 years had experienced good satisfaction.

Figure 3.1 Users' Overall Level of Satisfaction with boat clinic



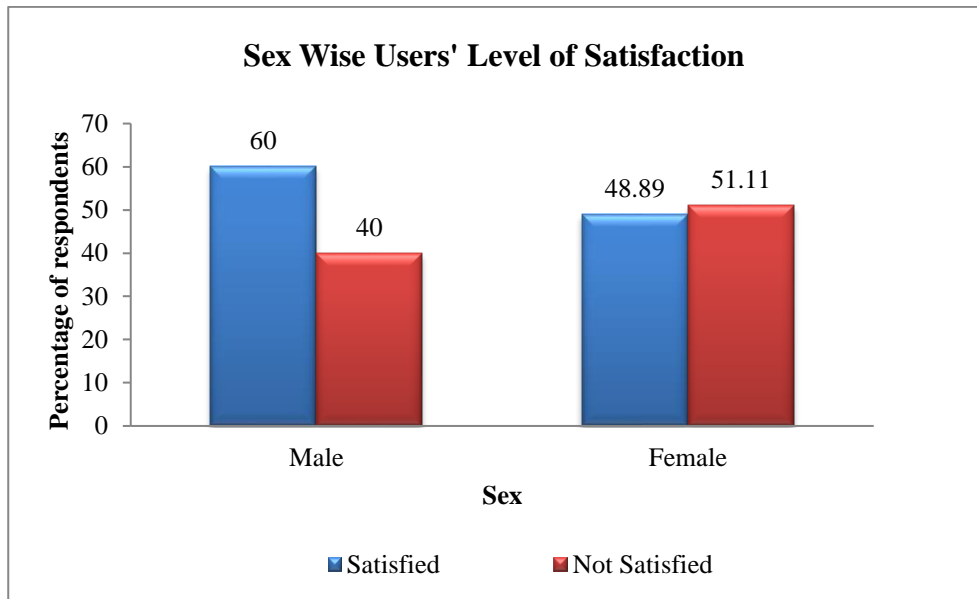
Source: Calculated by author based on primary data (fieldwork, 2019)

Figure 3.2 Village wise Users' Level of Satisfaction with boat clinic



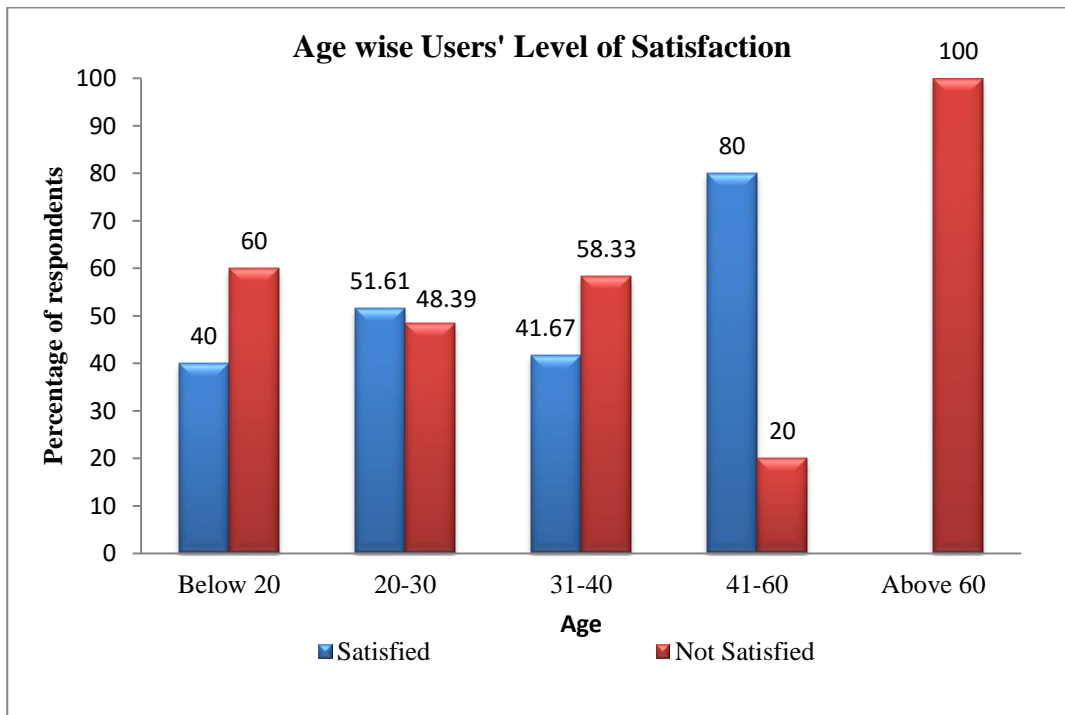
Source: Calculated by author based on primary data (fieldwork, 2019)

Figure 3.3: Sex wise Users' Level of Satisfaction with boat clinic



Source: Calculated by author based on primary data (fieldwork, 2019)

Figure 3.4 Age wise Users' Level of Satisfaction with boat clinic



Source: Calculated by author based on primary data (fieldwork, 2019)

3.4.4 Users' perspective of boat clinic health services:

In the exit interview open ended questions were asked on the positive and negative aspects of the boat clinic. Different viewpoints of the users' on the boat clinic come to light from the interview. Thematic analysis has been used. Mainly under two major themes i.e., positive and negative aspects of the boat clinic from the users' perspective have been discussed.

The interview schedule included questions on the positive and negative aspects of the boat clinic. Different themes were extracted from the qualitative data collected in the exit interview.

'Positive side' of the boat clinic:

Under the theme positive aspects of the boat clinic majority of the respondents perceived three positive features of the boat clinic. They are-

- (a) No user fees
- (b) No language barrier
- (c) No out of pocket payments
- (d) Less waiting time in the boat clinic

No user fees:

It was found that the villagers are visiting the boat clinic as there they do not have any user fees. The citations from the different respondents mentioned below helps us to understand clearly about it.

It's a great pleasure for us that the boat clinic team come to our village and provides health care services at free cost. (N10, Age-24 years, Male, Vill- Na Ali Aunibari.)

As soon as I come to know that the boat clinic is here I crossed the river and come for a health check up because it is easy to cross the river than going to health check up in town, here the service is free. (N56, Age-50 years, Male, Vill- Guwalbari N.C.)

No language barrier:

Effective and high quality healthcare gets hindered due to the language barrier (Wolz, 2015). Therefore removing the language barrier is one of the major components of patient centered health care (Ali & Watson, 2017). In this study majority of the respondents reported that all health providers are compassionate with the patients while explaining and understand the nature and symptoms of the health related problem.

We feel difficult to communicate with the health personnel in town but in the boat clinic, there is no problem during a conversation with the doctor or other health personnel. (N54, Age-55 years, Female, Vill- Guwalbari N.C.)

Sometimes if we do not understand or fails to explain the health problem the community health workers help both the doctor and us to explain and understand the health problems and treatment solutions. (N62, Age-28 years, Female, Vill- Guwalbari N.C.)

In general, we speak in the missing language (tribal language) at home; we cannot speak in the Assamese very fluently. But it is not a matter of concern when we come to the boat clinic because unlike the other health services such as PHC, CHC we can ask the question repeatedly until and unless we understand it completely. (N65, Age- 60 years, Male, Vill- Guwalbari N.C.)

No out of pocket payments:

In India out of pocket expenditure stands as the serious obstacles to access health care services and it poses barrier mainly for the poor (Bhojani et al., 2012; Prinja et al., 2018).

If the boat clinic is not available we have to travel at least 20 km where we have to cross the river in a ferry and go through tempo to reach the health center and additionally we have to spend more than Rs 100 for transportation, so when the boat clinic comes it saves both our money and time. (N44, Age-21 years, Female, Vill- 1 No. Morton Chapori)

When we go to PHC or other health centers to seek health care, along with the patient at least two people have to accompany his/her, so going from the village to the health center even in minor illness also we have to spend large amount of money. Due to this earlier, we compromised the treatment until the illness become severe. Hence if we do not go to the other

health center now we know that without going out of the village and spending money we can seek treatment from the boat clinic in our door step. (N24, Age- 40 years, Female, Vill-Major Chapori)

Being a daily wage labour if we go to the town to visit a doctor it takes the whole day and our wage gets lost. Because of this boat clinic now we neither lost the daily wage nor our health checkup. (N45, Age-45 years, Male, Vill- 1 No. Morton Chapori)

One day I remember that I was working in the agricultural field and my younger son came to inform me that the community health workers told if any one of us needs health check comes to the boat clinic as soon as possible. Though I went late and they were about to leave the health camp but still they did my check up. (N50, Age-62 years, Male, Vill- Morton Chapori)

Less waiting time:

The satisfactions of the patients are largely determined by the waiting time in health care (Probst et al., 1997). In this study, the patients are satisfied that they do not have to wait in a long queue for their health check up.

The boat clinic helps us to overcome different logistical barriers such as in other health centers we have to wait for a very long time but here it hardly takes 30 minutes. (N58, Age-15 years, Female, Vill- Guwalbari N.C.)

The friendly behavior of the health providers in the boat clinic makes us feel more comfortable here. (N29, Age-35 years, Male, Vill-Major Chapori)

Negative side of the boat clinic:

The users' in the boat clinic interviewed expressed dissatisfaction in some spheres like

- (a) No availability of specialist doctor
- (b) Irregularity
- (c) Lack of information dissemination and
- (d) Privacy.

No availability of specialist doctor:

In the boat clinic, one MBBS doctor is available so the users' feel that more specialist doctor should come along with them and most importantly as the burden of illness is high during flood only one doctor is not sufficient.

As the sub center is not functional anymore the boat clinic should come along with more specialist doctors. (N7, Age-50 years, Male, Vill- Na Ali Aunibari.)

More doctors should come during flood because the number of patients is very high at that time. (N51, Age-26 years, Female, Vill- 1 No. Morton Chapori)

The service of boat clinic is good for minor ailments like fever, headache, gastric, etc. but for other diseases we have to go to CHC. (N46, Age-28 years, Female, Vill- 1 No. Morton Chapori)

No doubt the primary care is good but now it should expand its services with more specialist doctors. (N49, Age- 24 years, Female, Vill- 1 No. Morton Chapori)

Irregular:

Most of the users perceive that the boat clinic visit once in a month is not enough because except one day in a month they are dependent on other health care services.

It should come at least twice a month. (N3, Age-25 years, Female, Vill- Na Ali Aunibari.)

It should be regular otherwise we have to spend money to go to the PHC or other health facilities because for us boat clinic is the only source of health care. (N38, Age-28 years, Female, Vill- 1 No. Morton Chapori)

I have to wait for so long, last month they did not come. (n=54, Age- 55 years, Female, Vill- Guwalbari N.C.)

One cannot rely on the boat clinic as it comes only once in a month and sometimes do not come. (N67, Age- 45 years, Female, Vill- Guwalbari N.C.)

Once in a month is not sufficient especially during the flood and it is not regular. (N63, Age- 29 years, Female, Vill- Guwalbari N.C.)

As it comes once in a month unfortunately we are still dependent on the traditional healing and home remedies for the other days in the month. (N51, Age-26 years, Female, Vill- 1 No. Morton Chapori)

Lack of information dissemination:

Lack of information dissemination about the health camp schedule is one of the major problems that cause loss of valuable time and money. Some of the concerns raised by the users' of the boat clinic like-

They should provide information earlier because sometimes we get engaged in other activities and cannot visit the health clinic. (N22, Age- 21 years, Female, Vill- Na Ali Aunibari)

ASHA seldom informs us when the boat clinic will come but as I live near the river bank it does not matter to us, but sometimes it is difficult for those who live inside the village and do not get any information that the boat has come today. (N10, Age- 24 years, Male, Vill- Na Ali Aunibari)

At least it should be fixed the same date because in the morning I come to know and may be occupied with other works for which I miss out my health checkup and have to wait till the next visit. (N26, Age- 25, Female, Vill- Major Chapori)

I was suffering from illness for two days and today morning I was supposed to go to the PHC, but due to some other issues I did not go. Today as the boat clinic come to our village I walked to and had my treatment. If I would go to PHC I might feel regret as I would lose both time and money. So, if I knew the proper date and time we will not be in dilemma anymore. So, I want to say that there is a need for correct information flow of the boat clinic arrival schedule in every village. (N28, Age- 56 years, Male, Vill- Major Chapori)

As my illness is not severe I have not visited any health facilities but if it gives us information before 2 to 3 days when it will come then at least we would plan that we should visit other health facilities or wait for the boat clinic. (N60, Age- 35 years, Male, Vill- Guwalbari N.C.)

Privacy:

In the study lack of privacy is a concern raised by both male and female respondents. Though there was one respondent who feels more comfortable in the open space, the majority of the respondents

told that for the women especially, the boat clinic should come along with a female doctor and additionally one extra private chamber should be there for them.

As the boat clinic team focused mainly on MCH, so atleast one female doctor should be there to make the mothers feel more comfortable. (N8, Age- 25 years, Female, Vill- Na Ali Aunibari.)

Health check up in the open space is good because it makes me feel safer. (N38, Age- 28 years, Female, Vill- 1 No. Morton Chapori)

The boat clinic is good for the pregnant women and the child but for the check up of the pregnant one extra chamber is required. (N16, Age-24 years, Male, Vill- Na Ali Aunibari.)

3.5 Discussion:

This study was carried down to explore the level of satisfaction of the users and understand the positive as well as negative aspects of the service of the boat clinic in the Lakhimpur district of Assam.

The study reveals that the majority of the respondents are satisfied with the overall services provided in the boat clinic. Skills like doctor's communication with patients play an important role to satisfy the patients (Sah & Kumar, 2015). Along with the skills providing adequate time to talk and listen to the patients also shapes the patient's level of satisfaction. The result shows that majority of the respondents are satisfied with the skill of the health care workers. More than 85 % of the respondents are satisfied with the time given by health care providers. Paddison et al., (2013) study found that the doctor communication with the patients has the strongest relationship with the overall satisfaction (Paddison et al., 2013). Another study shows that more than technical competency the behavior of the health care providers mainly respect and politeness is the strongest predictor of the patient level of satisfaction (Manzoor et al., 2019). The finding is consistent with the study done in Bangladesh also shows that more than three fourth of the respondents state that the doctor had given enough time to them (Islam et al., 2015). In this study one of the major causes of the respondents' good level of satisfaction because about 70 % of the respondents had waited to receive services not more than 10 minutes. As a result, none of the respondents are dissatisfied with the waiting time which somehow shapes patient satisfaction. Similarly studies done in Bangladesh and Latin America showed that as the waiting time is shorter and consultation time is longer it

might be some of the causes of good patients' satisfaction (Omer et al., 2011; Alarcon-Ruiz et al., 2019).

In this study, it is found that gender affects the level of satisfaction. Compared to the male respondents the level of satisfaction is less among the female respondents. Similarly, Shinde & Kapurkar, (2014) study states that men were more satisfied than women (Shinde & Kapurkar, 2014). Karaca and Durna (2017) suggest that may be cultural characteristic plays a crucial role because compare to man the women notice more about care and hygiene (Karaca and Durna, 2019). However, Margolis S. A. et al. found that there exist an equal level of satisfaction between men and women (Margolis et al., 2003). Some of the possible explanations for the low level of satisfaction among female is lack of privacy and preference of the same gender. About 61 % of female respondents prefer the same gender on the other hand only 12 % of male respondents prefer same gender. Another factor probably may be a lack of privacy during check up in the boat clinic. Unlike other studies, the study found more dissatisfaction among the old age respondents but next to them the young respondents' age below 20 years has bad satisfaction. This goes in line with the studies that the old age patients are less satisfied may be because more the age of the patients they want more time to spend with the doctor (Lin et al., 2001; Xiong et al., 2018).

The data highlights that compared to flood the users' are more satisfied with the services during the time of the dry season. Because the demand for the boat clinic is more during rainy season as at that time disease like fever, diarrhea, cold and cough, headache are more pronounced and found in almost every family however the boat clinic which is the only way to seek health care without crossing the river, there visit only once in a month in a health camp is not sufficient for the people living in those *char-chapori* areas especially in rainy season. This in line with a study done in Vietnam that noted that there exists a relationship between flood and the number of illness cases moreover the challenges to cure them are high as the infrastructure of the health center also gets affected (Rocklov et al., 2014). A study done in Brazil shows how developing the skills of the health care workers is necessary as people living in flood areas suffer from mental trauma which should be taken care of (Prosdocimi & Witt, 2018).

The study had explored multiple positive and negative aspects of the boat clinic. It reveals different issues like free service, cost and no long waiting time as some of the aspects of the former while lack of availability of specialist doctor, irregular service, lack of privacy and information

dissemination gap are the concern for the later. User fees stand as one of the major barriers to access healthcare especially for the poor people (James et al., 2006). Studies reveal that after the removal of user fees in the health service, the frequency of patients had been increased (Watson et al., 2016). A study done on UNICEF consultation about user fees in the health care services highlights that when the user fee introduced it mainly had a negative effect on equity of access and as a result, the poorer section of the society was more affected (Yates, 2009). This study finds out that majority of the users are accessing the boat clinic as they do not have to pay any user fees and they consider it as one of the favorable aspects to visit the boat. In case if the boat clinic introduces the user fee the number of attendees in the clinic may be comparatively lesser. It can be said that the boat clinic is one of the approaches to achieve universal health coverage and maintain equity.

Based on the needs of the communities the mobile health clinics offer flexible services (Mobile Health Map, 2016). But it was often found that it fails to incorporate with extensive health care system like specialty clinics, ancillary services, etc to ensure that the users are receiving the care they required (Yu et al., 2017). As patients suffer mainly from a skin infection, ear and nose problem so, to deal with this at least sometimes specialist doctor should make a visit along with them.

The study explores that except the pregnant women most of the respondents express that there is a lack of information gap between the boat clinic and villagers about the timing of their health camp. Saprii et al. (2015) study noted the motivation of the ASHA to work for their community somehow affected by the incentives because when the ASHA links the pregnant women to ANC and institutional delivery care they will get incentives as a result it limits the participation of ASHA in the non-incentivized roles like community mobilization, social activism, home visits, etc (Saprii et al., 2015). It can be said that in the study area as all the ASHA are overburdened with work it is difficult to inform the whole village as she also come to know about two days before their visit. In this regard both the boat clinic team and the community should improve the coordination and some different strategies should be adopted in order to reduce the information gap between those who are in need of healthcare.

Affordability is one of the major determinants of access to health care and it is directly associated with a different dimensions of poverty. The cost of treatment can be categorized into the direct and indirect costs. The indirect cost of treatment covers the opportunity cost of time and income of the

patients and the accompanying person, transportation cost and expenses on food and lodging (Peter et al., 2008; Levesque et al., 2013). Geographic accessibility of services is also a crucial the factor for service utilization like for instance the distance and transport cost affect health access in the studies of rural West Bengal (Barman & Dutta, 2013). The barrier to transportation facilities stands as the major constraint to access healthcare particularly for the poorer section of the society (Syed et al., 2013). It has been found that the distance require to travel stands as the obstacle for the utilization of health services (Al-Taiar et al., 2010). This study demonstrated that the boat clinic helps to remove not only the direct cost but also the indirect cost of treatment.

3.6 Limitation of the study:

Due to the limited number of samples, the study cannot apply any statistical association between level of satisfaction and the background characteristics. As the study applied both quantitative and qualitative methods there is a chance of cross overlapping of variables. In the qualitative survey, most of the narratives came from the young and middle age respondents. It was difficult for the old aged people to express their view due to the lack of language proficiency other than their own tribal language.

3.7 Conclusion:

In conclusion, the findings revealed that the majority of the patients were satisfied with the services provided in the boat clinic. Along with the free service, the affordability, the skill and friendly behavior of the health care providers attracts the users to visit the boat clinic. The results highlights] areas for the betterment of service provisioning in the boat clinic such as the introduction of a new mechanism to remove the barriers of providing information to the villagers about their health camp schedule, at least before 1 week the villagers should get information on health camp, efforts should be put to visit each of the villages twice in a month, some specialist doctor depending on the prevalence of illness in the area should visit occasionally, at least two doctors should be present among which one should be female doctor, one extra room should be available for checkup especially for pregnant women.

CHAPTER-4

CHALLENGES FACED BY CARE PROVIDERS OF THE BOAT CLINIC

4.1 Introduction:

Access to proper health care for people living in the remote and rural areas is still a global concern (Strasser, 2003; World Health Organization, 2010). The people living in the remote areas are reported to be equally disadvantaged in terms of health condition and disenfranchised with regard to adequate health care facilities (Goodridge & Marciniuk, 2016). The vulnerability increased with the degree of remoteness which is measured in terms of how far one has to travel to centres of various sizes (Australian Institute of Health and Welfare, 2004). Additionally it implies both physical distance i.e., rough topography, harsh climate, connectivity to urban areas and social exclusion in terms of the distance from the mainstream society to the remote communities (O'Reilly et al., 2017).

Globally India records the highest overall burden of disease where still about 66 % of its total population inhabits in the rural areas (Ohlan, 2016; Kumar et al., 2020). Furthermore there is a huge rural urban gap in the distribution of health care resources as most of total health infrastructure; human resources are concentrated only in urban areas (Patil, 2002). Therefore like many other developing countries India also faces the challenges of maintaining the World Health Organization recommended standard ratio of 1:1000 (doctor to population ratio) (Pallikadavath et al., 2013). Hence the shortages of the health care providers across all cadres lead to poor performance of the rural health care sector. A major share of illness left untreated in the rural areas because of the fact that there are lack of diagnostic facilities in their proximity (Barik & Thorat, 2015).

In Assam about 3 million people lives in the geographically isolated rural and remote riverine islands of the Brahmaputra River. Using the NSSO 2011-12 estimates Karan A. et al. study stated that Assam has one of the lowest density of human resource for health i.e., 11 including physician, surgeon, nurse per 10,000 of population while the national average is 21 per 10, 000 of population (Karan et al., 2019).

The combination of both geographical location as well as shortage of health workers further aggravates the situation that resultened into low access and quality of health care which consequently leads to poor health outcomes of those underprivileged people. Along with these other factors such as financial, logistical, technical challenges create serious barriers in delivering health care services in the riverine islands. Therefore to provide health care facilities in those remote riverine areas boat clinic is the only

primary health care facility reaching the underserved population. Due to the boat clinic it has been possible to reach every nook and corner of the *char-chapori* areas of Assam in fifteen districts at least basic services in the designated villages once in a month.

However providing health care services in these areas are an arduous task for the health care workers due to the complexities prevailing in the remote settings (Humphreys et al., 2003). Therefore providers' perspective is necessary to unveil the existing supply side barriers and challenges experienced faced by the health care provider in order to improve and guide the provisioning of health care services (Bhattacharyya et al., 2015). Moreover with the identification of the different barriers faced by the health care providers it will help to address those issues.

The objective of this chapter is to explore the challenges and the barriers faced by the health care providers of the boat clinic.

4.2 Methods:

4.2.1 Study Population:

The care providers serving in the 18 char-chapori villages covering 10,000 population of the Lakhimpur district through the boat clinic were selected for study. Seven respondents were interviewed in the study includes district programme officer (DPO), medical officer, ANM, GNM, pharmacist, laboratory technician and one community health workers employed in the respective boat clinic. Several efforts were undertaken to contact the health care providers of the boat clinic through face to face contact, mobile phones and messages to schedule the interview date and time according to their convenience.

4.2.2 Data Collection:

At the very initial stage a permission letter was sent by e-mail to the Centre for North East Studies and Policy Research (CNES) giving a detail description of the purpose of the study. Permission was received to carry out this research. The reports of the C-NES on boat clinic had given helpful guidance the number of health workers working in each of the boat clinic was found. For the study different level of health care providers working in the Lakhimpur boat clinic was selected. Health care providers from different hierarchies will help to extend the understanding of the challenges faced by the team from various points of view. The author conducted total 7 in-depth interviews with the care providers of the boat clinic in Lakhimpur district. Qualitative approach has been used in the study. Semi structured interview schedule were prepared to conduct in depth interviews with the participants in order to

explore the challenges and the barriers faced by the health care provider of the boat clinic. Efforts were made to interview the participant alone and if the criteria are not fulfilled the interviews were conducted over the telephone. The interviews were conducted in the Assamese language i.e., the local language of the study area and then translated into English. Before starting the interview verbal informant consent was sought from the respondents and additionally anonymity as well as confidentiality of the participants was strictly maintained.

4.2.3 Data analysis:

Qualitative approach had been used to collect data. A semi structured interview guide was prepared. Both telephonic and face to face in-depth interviews had been conducted with the health care providers of the boat clinic team at a time convenient to the study participants to explore the challenges and the barriers faced by the health care provider of the boat clinic.

All the interviews were audio recorded and field notes were also taken. Each of the interviews duration lasted between 25 minutes to one hour. Transcriptions of the interviews were done subsequently. Prior to coding the transcripts of all the recordings were ratified through repeated listening. With the help of coding various issues were identified from the narratives of the respondents. All the important data related to the topics were systematically organized. Different themes have been emerged from the data analysis.

4.3 Results:

Profile of the respondents:

Out of 7 participants interviewed in this study five participants were male and two were female. The age of the health care providers varies between 25 to 45 years. Respondents have work experience between 6 months to 10 years. From the data analysis different themes were identified and discussed in detail below.

- i. Geographical location
- ii. Seasonal issues
- iii. Lack of infrastructure
- iv. Delay of funds
- v. Poverty among the *char-chapori* population

As the field survey got extended up to the COVID-19 period the author has tried to capture the challenges faced by the care providers of the boat clinic during the pandemic. Two themes were identified i.e,

- vi. Shortage of doctors
- vii. Increase in overall workload.

(1) Geographical Location:

Many participants mentioned about the geographical location of the study area as the prime barrier to provide health care services in the study area. As a result of the frequent shifting of river channel of the mighty Brahmaputra river many fragmented landforms are formed in which many people are dwelling their life. The channel shifting of the river cause severe annual flood in the *chars-chaporis* due to which these areas remains one of the most underdeveloped areas of Assam. Therefore in order to deliver health care services in the physically inaccessible areas waterways is the only mode of transportation to reach those underserved population.

One of the respondents mentioned about challenges faced due to the location of the area

The physical environment poses serious difficulties and makes us restricted to deliver health care services upto a limit. Though the Brahmaputra river created problems to serve those areas but due to the presence of the natural waterway it is feasible to provide health care services in those villages because except boat clinic none of the other health care providers are willing to serve and stay there permanently due to various logistical issues.

Other health care providers explained whatever services they are providing in these area is the maximum they can give because the capacity of the river is not much huge to navigate a large boat where the entire infrastructure will be available.

The area is prone to annual flood and erosion it can result into damages of the infrastructure and additionally maintaining all the logistics of the infrastructure also get hindered due to its location because the area neither have the capacity to give a conducive environment for the human resource to stay their permanently nor convenient transportation facilities so construction of residential facilities were not encouraged in the char-chapori areas.

One of the respondents replied:

The geographical terrain does not support to build a mini PHC because there is high possibility that erosion will destroy the buildings.

Therefore as they do not have any place to stay in the nearby areas it causes them time limitations of health camp because they are staying in the urban areas and have to return on the same day to their residents before getting dark. Additionally the route of the health camps always changes owing to the fact that they are providing services to the villages far away from each other.

(2) Seasonal issues:

India has a tropical climate characterized with wet summer and dry winter season (Anta et al., 2015). This climatic variation makes the health care providers of the boat clinic to be confronted with several challenges in different seasons. The difficulties of the boat clinic team gets aggravated as they are providing services in the riverine areas of Assam where there is dearth of adequate infrastructure. The findings of the study were sub divided into two groups which elucidates the barriers in health care service delivery due to its nature of seasonal variability: transportation barrier and over workload.

(a) Transportation barriers:

In the flood prone *char-chapori* areas transportation is a serious problem due to the absence of adequate surface roads as well as lack of connectivity with the main lands. The health care providers mentioned:

Compared to the rainy season they faced extreme challenges during winter because in this season the water level of the river goes down which ultimately prevents the boat to move ahead in the interior parts.

On the other hand the result shows that despite of different difficulties faced by them in the rainy season for transportation purpose it turns out to be more comfortable to travel in the *char-chaporis* upto the river bank because:

We can take the boat directly to the villages without any hindrance as the level of water during that time remains high which allow us to go to the interior part of the village.

But unfortunately the boat clinic team had to face immense difficulties in both wet and dry season because there are many villages which are located away from the river bank so they travel to the interior villages by different vehicles according to their convenience. A respondent stated:

We have to travel by motorbikes in roads covered with full of sand in the dry season and mud in the rainy season for which we had met with many minor injuries.

Another provider explained:

As we cannot take the boat in the interior parts most of the times we have to anchor the boat far away from the village and through motorbikes we used to go to the villages. Therefore while travelling the motorcycle we sometimes go via agricultural field as a result we had always the fear in our minds that the villagers will scold us for using the field as their route.

A very important dimension of the constraint faced by the providers of the mobile health clinic has been described

We have to face huge difficulties while travelling by motorcycle to far distance village to do the health camp and carry all the things very carefully such as vaccine bag, syringe, cotton, weight machine, blood pressure machine, with us and travel by bike in far distance places as we have to carry loads of stuffs very carefully.

There difficulties were found to be more when the severe flood causes hindrances of their travelling from the river bank to the village.

There is no weathered road in the villages for which in the rainy season the roads become impassable due to the floodwater and mud. Sometimes we have to go more than 1 foot deep in mud to reach the village because of that sometimes we get sick for couple of days.

Boat clinic is providing services to extreme interior land where the villagers hardly seen any doctor. Because earlier the remote and isolated villages were most of the time remain underserved before the introduction of the boat clinic.

No one will go to serve the village as it is very inaccessible therefore though we face difficulties to go we somehow manage to provide services there.

(b) Work burden

In the rainy season the burden of the work of the health care workers increased because of the fact that in the months of monsoon, the burden of communicable and infectious disease is very high (Kumari et al., 2012).

Flood is the annual problem that is faced by the *char-chapori* villages of this district. Since, after flood there is huge possibility of outbreak of infectious disease which ultimately cause child mortality. The doctor revealed the overload that they have during the rainy times and stated:

Our aim is to complete the vaccines of every child as soon as possible so that if in any circumstances during flood we miss our monthly health camp there will be very minimum drop out of child routine vaccination.

Furthermore the nurse mentioned that

To complete the vaccination sometimes we have to wait for very long time and have to extend our timing of the health camp.

The reason behind the drop outs of vaccination is mainly due to the displacement of the population because due to the annual flood and the river bank erosion many residents of the village leave their houses and get shifted to other places. As mentioned by one of the respondent

During flood displacement of the people living in the village is a common phenomenon. Many people whose houses get destroyed they used to shift in their relatives home in different place as a result of this it leads to the rupture of the routine child vaccination and ANC, PNC.

One of the major concerned identified in the study was the time constraint for consultation specially during the summer season.

We know for proper diagnosis more time is required but considering the health camp set up and patient load it is not possible for us to give enough time specially in the summer season as the volume of patients were high. Moreover we are providing services to many villages for which we have to follow different routes. Therefore keeping in mind the next day health camp we have to return to the river sideways to anchor the boat as soon as possible before it gets dark.

One of the concerns raised regarding difficulties faced to carry the medicine while travelling in the rainy days.

Travelling to the remote places and packing all the things increase the workload. While we move from one place to another sometimes the labels of the medicine bottles get peeled off when it was soaked in the rain water. So, while travelling we have to pack all the medicines very carefully.

In the summer season the numbers of patients are very high because of which we have to extend the time of our health camp. And in the flood times when we are unable to manage the patient load additional health care providers accompany to help us.

(3) Infrastructure

The C-NES has few boats funded by some philanthropist and the rest of the boats were hired. However compared to the hired boats those boats owned by the C-NES have more facilities. As the boat clinic of Lakhimpur district is hired by the C-NES the facility of the boat is at very minimum level. Thus like other mobile health clinic the boat clinic of the study area also had its own constraint of lack of infrastructure such as manpower, advanced medical equipments and shortage of space.

The hired boat used for the health camp is not in good condition because there are many incidents where the boat not works properly and the engine stopped in the middle of the river which consequently makes us encumbered to travel our home and make us worried especially when it gets dark.

One of the health care providers said:

Supposedly if the boat gets changed also the service we are providing will be unfortunately the same because in a big boat if we make all the facilities available it will need more manpower, specialized doctor, diagnostic equipments, radiologist, water, electricity supply and so on. Providing and managing all the logistics are not feasible in the boat clinic.

The respondent further expressed how the shortage of space in the boat clinic makes trouble in the service delivery.

I have to counsel the patients in the boat clinic where it is difficult to manage the privacy of the patient as there is no chamber to do the health check up. Thus if sometimes I have to do the check

up of pregnant women most of the time I asked the ASHA and the female health workers to take the patient in a room and close all the windows in the boat. The problem is that the health workers are already overburdened with their work and managing all the things takes huge time. So, if a room for examination is there it will reduce our work and help in the efficient delivery of health care services.

Lack of space was also again highlighted

The place becomes too much congested to counsel the eligible couple for family planning.

Another important issue raised by the lab technician about the inadequate infrastructure of the laboratory room. He highlighted:

As we do not have the proper laboratory room its cleanliness is not maintained, moreover the equipments we use shows the result which is not very exact.

The boat clinic is constructed in such a way that in the little space we can manage our service delivery. But in every two years we have to repair the boat which requires few months to fix it. Therefore at the time of repairing we have to hire a normal ferry boat for few months that cause chaos during service delivery especially when in a rainy or sunny day because the boat does not have any roof.

(4) Poverty among the char-chapori population:

The main occupation of the *char-chapori* population of the study area is based on primary activities. Each year severe flood and land erosion destroy their livelihood as well as houses which cause shrinking of their fertile agricultural land and displacement of the people. The health care providers revealed that the deeply stricken poverty of the population stands as a challenge:

No matter how much we try to make them understand about hygiene and other things they are unable to practice it because there impoverished condition forcing them to live in a very poor housing condition, unsafe potable water, and lack of hygiene indirectly increases the risk of health problems.

As stated by one of the health care provider:

In the sowing season most of the people engaged in agricultural work therefore even if we reached the health camp on time the people started to visit the camps after one hour before

people like them who earn their living from the agricultural field only it becomes more important to them rather than health check up. Additionally sometimes after the visit by the community health worker numerous times we somehow manage to bring the mother or father along with the child for vaccination in the health camp.

We know the people do not have money so sometimes though we refer the patients for higher health facility they ignored it as for them doing treatment in distant health facility will require out of pocket expenditure such as travelling expenditure, medicines, etc which is difficult for them too bear.

(5) Irregularity of funds:

The funds for the health camp released in every three months. All the expenditure on manpower, drugs, boat maintenance and the funds to organize the camps are incurred by the Government of Assam under National Rural Health Mission (Prasad et al., 2016). But very often the funds have been delayed which create disruption in the service delivery as the continuity of the services impeded for lack of funds.

Initially the boat clinic was not accepted by the villagers but after prolong time after making people aware about the importance of the clinic they gradually started to belief on us. But due to delay of the funds for the health camps it leads to breaking of the trust of the community towards the boat clinic which is achieved after working there for long time. We experienced that after discontinuation of the health camps the villagers start to lose the trust on us.

If we miss the health camp due to lack of funds it becomes very challenging for us to follow up the patients. For a pregnant woman, first trimester is a critical period for which she needs health check up and additionally the ASHA workers also gets performance based incentives but due to the discontinuity of the health camp it leads to various challenges when we get back to the health camp after long period of time.

Despite of all the constraint they had stated that mobile health clinic is the most effective intervention to provide health care services. We understand the services that we are providing is not sufficient to them but in such area it is not possible for us to provide higher level of services as it requires enough logistics and funds.

(6) Shortage of doctors:

Due to the COVID-19 many of the members were shifted to the COVID-19 quarantine and care centre. At the initial stage of the outbreak during the month of April the care providers of the boat clinic were in the COVID-19 duty as a result there were no health camps conducted in the month of April. Moreover as per the guidelines when they have COVID-19 duty, for specific days they were allowed to quarantine themselves for about 14 days which again took long time. Hence they were unable to come immediately and resume their duty in the boat clinic again. Therefore it can be said that because of COVID-19 since they were in other COVID-19 related work duty so there is a huge impact in the functioning of the boat clinic.

Some of the health care providers expressed;

I was in COVID-19 duty for few days. After completing it though I tested negative I had self quarantine myself for at least 7 days as I have the fear that if I had the infection start to go to the camp there would be a huge possibility of me becoming a super spreader of the disease in the remote villages.

Being a pharmacist I am trained to give medicines to minor ailments such as gastric, ring worms, etc. keeping in consideration with my limits when there was no doctor during the health camp.

(7) Increase in overall workload:

The COVID-19 pandemic has caused drastic change in the health care service delivery to reduce the risk of the coronavirus transmission either from the providers or care seekers. Therefore in the same manner different preventive measures had been adopted to combat the deadly coronavirus in the boat clinic as well.

To reduce the transmission of the disease new guidelines had been imposed and strictly followed. So, after the COVID-19 though the numbers of patients were reduced in the camp but the time requires treating per patient has been increased.

Respondents mentioned that

To reduce the transmission we asked the patients to wash their hands properly and wear the face mask before visiting the health camp. For this we have to keep our eyes peeled on the visitors whether they are following the instructions properly or not.

Due to the pandemic after treating the patient the doctor has to sanitize his hands as well as the stethoscope and blood pressure measuring instrument, similarly the nurses, lab technician and pharmacist have to disinfect their hands and the area. To complete the whole process it consumes huge amount of time per visitor.

One of the health care providers expressed increase in work burden after the COVID-19

As in the month of April we were unable to conduct any health camp and even if we started our camp in the month of May the number of patients visiting the clinic was very negligible. Therefore, in the last three months i.e., May to July, 2020 the burden of work has been increased as we are giving vaccination to the children.

4.4 Discussion:

The study tried to explore the perspectives of health care workers providing services in the boat clinic of Lakhimpur district. Different studies manifest that the rural areas have a scarcity of health care facilities due to the resource constraint, lack of funds and underdevelopment of rural infrastructure which impoverished health condition of the rural population as well as problems related to health care access (Strasser, 2003 condition that ultimately leads to water borne diseases. The findings are similar with the study conducted in Bangladesh that mainly low economic condition, lack of availability of safe drinking water, and other inadequate hygiene practice lead to different diseases (Kunii et al., 2002). In this study the health care providers pointed out that during and after flood they have to face many difficulties because people get displaced as flood often causes destruction of their houses. Due to the displacement of the villagers the health care providers mentioned that there is huge possibility of children and mothers getting drop out from vaccination. It is a fact that displaced population faced different health related problems due to the lack of housing facilities, drinking water, and sanitation (Noji, 2005). A study done by K. Walker-Springett et al. (2017) revealed that dislocation and evacuation of the people affected by flood contributes to negative impact on their condition of the health (Walker-Springett et al., 2017). The mortality and morbidity of the children become very high which were preventable by vaccination (Ekezie et al., 2020; Yadav et al., 2009; Pappachan &

Choonara, 2017; Mohan & Kumar, 2019). The findings were divided into five different themes: Geographical location, seasonal issues, lack of infrastructure, poverty, delay of funds. The result sheds light on the difficulties faced by the health care providers to work in the interior areas where only waterways are the mode of transportation to reach the *char-chapori* villages. The study reveals the importance of geographical location as one of the factor determining the type of health care service delivery and its availability. Tayyab Ikram Shah et al. (2017) states that limited access have huge impact on the availability of health care personnel. Therefore physical accessibility becomes a major cause of deprivation in the rural areas (Curtis & Jones, 1998; Kumar et al., 2014).

Yao et al. (2013) suggested that geographical barrier to access are found in the presence of rivers, forests, mountains as it generates obstacles between the health centers and the particular population who are need of the services. The study explored that not only from the patient side but also the health care providers rendering services from village to village face tremendous difficulties due to the river and its related vulnerabilities such as flood and river bank erosion.

The findings clearly highlights that the transportation problem is a crucial issue in both rainy and dry season though the problem varies with season. In fact in the rainy season the transportation of the boat clinic become considerably easier as it can travel to the proximity of the village but at the same time few health camps are conducted in villages where they have to travel significant distances. They have to face immense difficulties while walking along the muddy roads due to the absence of weathered road which eventually increase their length of travel time, risk of accident and diseases of the team members of the boat clinic. The study results corroborates with the study that the distance to health facilities get magnified and pose barrier with inadequate transportation facilities (Dassah et al., 2018; Singh et al., 2018). Different studies show the problem faced to access health care especially during the monsoon (Ager & Pepper, 2005).

Along with other factors it becomes more arduous when the people face heavy rainfall while travelling in difficult terrain (Tsegay et al., 2015). At the time of severe flood whenever the ferry service was not allowed they were unable to provide services as it become difficult for the people also to come and visit the camp due to the flood (Edmonds et al., 2012).

During the monsoon the *char-chaporis* received heavy precipitation leading to flood due to which the workload of the health care providers increase for the following reasons; rise in the patient load, time duration of the health camp. Flood becomes a common annual phenomena in the study area for which

these health care workers have to face the problem due to enormous rise in the number of patient mainly after flood. The reason behind the number of outpatient increases is due to rise in the water borne disease and other diseases (Siddique et al., 1991; Okaka & Odhiambo, 2018). The finding is similar with the study done in Cambodia that during flood times and flood there was a significant increase of patient due to diseases like skin infection, diarrhea, etc (Saulnier et al., 2018).

In the summer season except severe flood the navigation of the boat is quiet easier than the winter because the high level of water makes the boat to go close to the villages on the other hand in the winter season due to the low level of water they have to anchored the boat far away from the village and take the help of The health care providers highlighted the complex and critical condition to make them live in a very deteriorate other vehicles which again consume huge amount of their time. As the study suggest that weather condition has an impact on the navigation of the inland waterways and revealed that low level of water affect the navigation of the boat (Schweighofer, 2014).

In the harvesting period most of the people mainly the women gets engaged in their agricultural activities for which they do not want to lose their wage as a result the health workers have to wait or frequent household visit to bring the mothers along with their children for immunization. In the previous studies also it was found that heavy workload of the mothers' stands as a cause for dropout of vaccination of children (Vohra et al., 2013; Zewdie et al., 2016). Moreover during the harvesting season also the heavy workload over load of the women affects the maternal antenatal check up (O'Connell et al., 2015; Begum et al., 2018).

The health care providers revealed very clearly that lack of space leads to consumption of time during health camp because the consultation of the users are usually done in the boat which is done in an open space and while examination is necessary they have to prepare a room to examine the patient so they strongly recommended that if a room for examination is already available in the boat clinic then it will make their work much easier to maintain the privacy of the patient. The problems faced due to lack of infrastructure were also highlighted by Bhattacharyya et al. (2015) as insufficient spaces, electricity supply, quality and quantity of equipments cause serious concern during health service delivery and in the minimum space it becomes a difficult task to maintain the privacy of the users.

There is an interrelationship between poverty and isolation as both public and private investment in remote rural settings is low due to various social, economic and political factors (Bird & Shepherd, 2003). The respondents draw attention to the fact that remoteness with regard to distance leads to lack

of development of the villages which ultimately creates low level of awareness on government facilities, geographical barrier and most importantly financial constraint to access higher health facility. The marginalized population who are socio economically deprived are unable to live minimum standards of living as a result it increase their risk of health related problems (Barik & Thorat, 2015). Hence it is very important to improve the economic condition of the population and uplift them from the trap of poverty to raise the living standards.

Golechha (2015) mentioned that one of the possible causes for impecunious health system is the poor investment level (Golechha, 2015). Along with flood many times delay in funds has create significant disruption in the health care services. The health care providers rightly highlighted that due to the fund crisis sometimes they are unable to continue the health camps which ultimately leads to break down of the trust of the communities and can takes years to build the trust. Similarly in the AIDS prevention programme also there were shortages of funds which cause disarray of the programme and it subsequently impact on the trust that the health workers build with the communities (Reuters, 2015). Lack of consistency of the health camps convince people to rely on other types of health care services. Moreover it became apparent that when the services are not regular it is highly possible that the pregnant women may have delay in timely antenatal checkup which can resultened into complexity of pregnancy. Therefore it is very necessary to provide the required fund in time without delay to continue the health camp with no interruptions.

The care providers clearly highlighted that due to the COVID-19 they have to face immense challenges during the healthcare service delivery. The doctor was engaged most of the times in Covid-19 care centre and home quarantine to curb the spread of infection due to which there were non-availability of doctor in the boat clinic. Additionally the other care providers of the boat clinic were also engaged in the COVID-19 duties. Similarly different studies also mentioned that there was disruption of ambulatory services during the pandemic of COVID-19 which cause delay in care (Garg et al., 2020; Rukmini, 2020). Rawaf S., et al. (2020) and WHO (2020) also mentioned that the manpower of primary care was shifted to COVID-19 related works as initially combating the virus to not reach the community level was the main focus of the country (Rawaf et al., 2020; World Health Organization, 2020).

The Ministry of Health and Family Welfare (2020) also recognized the shortage of doctors in the rural and remote areas therefore took different initiative to address the issue. To ensure the universal

immunization in the hard to reach remote settings is already a difficult task for the health care workers. As the health care providers were stretched in other COVID-19 related works like duties in COVID-19 quarantine and care centres no health camps were conducted in the month of April, 2020. Due to this there was disruption of the boat clinic service delivery and as a consequence the universal vaccination got delayed. Therefore as a result of disruption of the service caused by the outbreak the vaccination activities had been shifted to the later months where the health care providers had to do mass vaccination along with following all the norms set by the national and state guidelines on preventive measures which ultimately led to increase of workload of the health care providers (Ministry of Health and Family Welfare, 2020).

Moreover the boat clinic team had to do the awareness campaign on the various preventive measures to be followed by the users' in the health camp as well as they conducted door to door visit at the residents because none other than the boat clinic team were appropriate for this work because they have been serving in the villages for long period of time and hence make them connected and familiar with the respective villages. However it was reported that as they were busy in door to door awareness campaign on COVID-19 they were not in a situation to do other health related awareness campaign which they used to conduct before the pandemic in each health camp.

4.5 Conclusion:

This chapter reveals a unique perspective of the challenges confronted by the health care providers serving through boat clinic in the remotest underserved *chars-chaporis* of Assam characterized with very meager level of development. As there are very limited evidences about the difficulties faced by the providers' side rendering services in the isolated settings this study adds to the literature about the concern raised from the health care providers' side serving in the remotest rural areas to improve the health care services in those areas. The providers of the boat clinic faced many challenges while delivering services in the *char-chaporis* and moreover their complexity get multiplies due to its geographical location, annual flood, lack of infrastructural facilities, delay of funds and destitute condition of the villagers' resultened into limiting the provision of health care. Therefore, the prime obstacles encountered by the providers should be taken into consideration and addressed for more efficient and quality health care in the boat clinic.

CHAPTER-5

CONCLUSION AND RECOMMENDATION

5.1 Summary of the findings:

This study finding reveals that like other remote areas across the globe the study area also faced challenges to access health care and additionally it get more intensified during the flood times. Thus the study attempts to elaborate the impact of season on various aspects like pattern of health care services, morbidity and health care expenditure. Additionally no doubt the mobile boat clinic plays a significant role to serve the *char-chapori* population but it has its own limitations as it cannot always fulfill the needs of population when the healthcare service is required. Moreover apart from the challenges faced by the users of the boat clinic the study tries to capture the barriers encountered by the health care providers of the boat clinic. From the study following findings are drawn which are as follows:

- (a) As flood is the common annual problem faced by the *char-chapori* population it had caused negative impact on the health of the population.
- (b) Though throughout the year the study population have to experience difficulty to access health care due to lack of transportation facilities, financial crisis, non-availability of health care providers in the sub-centers but all these problems get exacerbate during flood times because after flood the patient load increase and the damage to infrastructure to transportation facilities cause substantial barrier to access health care both user and providers.
- (c) The livelihood of the people most of the time get affected at the time so the financial distress make them unable to visit health care services especially those who require to sought care from higher health facility located at distant places.
- (d) The poor sanitation facilities like open defecation, drinking unclean water, food shortage lead to increase the morbidity of the people like fever, diarrhea, skin infection, etc.
- (e) Most of the respondents reported that they had no emergency ambulance facility.
- (f) Compared to normal times the use of public health facilities located closed to their proximity i.e. the sub-centre increases at the time of flood. On the other hand the people travelling to distant places to seek care from far distance are low which indicates that the people are not comparatively going less in primary and community health centres which were quite high at normal times.

- (g) As a result to difficult of mobility the population along with the increase in the use of sub-centers people seek care from the quacks and the boat clinic relatively more at the time of flood.
- (h) The study revealed that most of the users were satisfied with the services they received from the boat clinic.
- (i) Various positive sides perceived by the users regarding the boat clinic were the free service, no out of pocket payments, language barrier, less waiting time.
- (j) The boat clinic is quite successful to remove the language barrier as they involve the community health workers who can speak their native language to interact with them.
- (k) However many negative aspects of the boat clinic were also identified among which the irregularity of the service was quite common response from the users. The respondents had highlighted that the information about the health camp schedule was often received lately.
- (l) Users' privacy while consulting with the doctor in the boat clinic is found to be absent.
- (m) Lastly the investigation with the health care providers of the boat clinic had thrown light on challenges encountered by them while delivering services in the *char-chaporis*. It revealed that due to the geographical characteristics of the area their problems get magnified to serve health care in these setting. Furthermore other factors which stand as the obstacle for the providers were annual flood, lack of infrastructural facilities, delay of funds and poor socio-economic condition of the villagers.

Based on the findings above it can be said that as there are very limited studies on the health care services in the *char -chaporis* this study has added an important piece of evidence to bring into light the problem faced by the char-chapori population to access health care.

5.2 Conclusion:

It is clear from the study that the people living in the flood prone *char-chapori* areas are marginalized in terms of accessing health care facilities. Every year severe flood and flood induced river bank erosion causing serious havoc in their life. During the rainy season on one hand there was an increase in the chronic morbidity and on the other hand there were decline in the utilization of public health facilities particularly primary health centres which were found to be used more in non-flood times. This was because due to disconnection in the transportation network and lack of money they were unable to visit distant health facilities. At that point of time flooding caused devastation of transportation networks because of which people face immense difficulties to avail health care services both in

mainland areas and *char-chapori* areas. But interestingly the boat clinic plays an important role to fill this gap by navigating to the doorsteps of the remotest areas to provide primary health care services throughout the year. It able to overcome several barriers pertaining to healthcare services as it provides free health care services, reduce out of pocket expenditure. However the study also found out various areas where there is the need to improve its health care delivery.

It also demonstrated that due to the presence of the geographical features, occurrence of flood not only its residents face multiple disadvantages but also the health care providers face immense challenges at the time of provisioning of health care facilities. Unlike other mobile health clinic such as mobile van, the boat clinic has its own limitations, it often found to have lack of infrastructure facilities because within a very limited space it is extremely difficult to expand its service and most importantly financial crisis is also a major concern. The evidence found in this study helps us to understand the complexities encountered varies across different seasons as well. Therefore this study indicated that along with planned interventions it should try to cope up all the limitations through establishing dense mobile health clinic network. Though boat clinic is able to serve the population in a limited manner it cannot be denied that as health is right to every citizen of the country with appropriate measures the government should plan to increase their health care access through more investing in the mobile clinics as one boat clinic is not sufficient to cater their health needs. Nevertheless in order to achieve the universal health coverage of the country it is a very unique and effective model to reach the rural remote underserved population who do not have access to health care.

5.3 Recommendations:

To provide equitable health care services it is very necessary to strengthen the health care facilities and the following specific recommendations are made:

- (a) To improve the health condition of the *char-chaporis* it is very necessary to put emphasis on strengthening the sub-centres through increasing infrastructures, equipments and adequate human health resource which is the first point of care of the villagers.
- (b) The sub-centers should be constructed in a planned way so that during the flood times the building should not get affected. Flood cause destruction of the road connectivity henceforth the boat clinic should make early preparedness plan in order to enhance its capacity to provide services to the mass people.

- (c) To overcome and meet the expectation of the users' of the boat clinic through the following ways it may help to overcome the problem.
- 1) Information dissemination about the health camp schedule turned out to be a serious problem for the users therefore to address this particular concern in different sites of the village there should be few permanent display boards to announce the date of the health camp before atleast three days prior to the visit.
 - 2) Boat clinic should made the effort to visit the concerned villages atleast twice in a month because visiting once in a month is not enough to take care of the health needs of the population who do not have any access to health care facilities except the boat clinic.
 - 3) To take care of the privacy of the users' especially for the female one extra room should be make available for health checkup as well as consultation.
- (d) The study suggested that the flow of funds should be regular because any delay of funds has an adverse impact on the health camps such as irregular camps which ultimately not only increase the complexities of the health care providers but also reduce the users trust on the boat clinic.

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A. Demographic Details of Households Members

1.1 Name of the Respondent: _____

1.2 Name of the household head: _____

same as respondent= 1

other than respondent=2

1.3 Religion of the head of the household. _____ Hindu=1 Muslim=2 Christian=3 Sikh=4 others=4

1.4 Name of caste/jati and sub caste/sub jati he/she belongs to? _____

1.5 Social Category: _____ (SC=1, ST=2, OBC=3, Others=4)

2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.8a	2.8b
HH	Name of the HH	Relation to	Gender*	Age	Marital	Level of	current	If the
Members	members	the			status**	education	residence	answer
i.d.		head of the				complete	#	is 2,
		household				@		reason
								for
								staying
								away.#
								#

*Gender: Male=1; Female=2

**Marital Status: Single=1; Married=2; Separated/Divorced=3; Widowed=4; other=5 (specify)

@Level of education: primary=1; secondary=2; higher secondary=3; graduate=4; post graduate=5

#Current Residence: This house=1; Other than this house=2

##Staying away: work=1; study=2; marriage=3; Other (specify)=4

B. Economic Activities of Household Members (repeat the household member i.d.)

HH mem bers i.d.	Name of HH member	Main activity (6 months or more involved)*	Specify the main activity (for Code 5 to 8)	Gross income earned during 2018-19 (Rs)	Second important activity (less than 6 months)*	Specify the activity (for Code 5 to 8)	Gross income earned during 2018-19 (Rs)

*Activity code: Crop production=1; Livestock rearing=2; Agri casual labour=3; Agri permanent labour=4; Self employed in household industry=5; Self employed in services=6; Non-agri causal labour=7; Salaried work=8; Pension=9; Unemployed=10; Student=11; Other (Specify) =12

C. Housing and other amenities:

Q. No	Questions	Coding Characteristics
1	Is the land on which your house is built owned by you?	Yes=1 No=2
2	What is the type of this house structure?	Kutchra=1 Semi Pucca=2 Pucca=2
3	What is the main source of drinking water for members of your household?	Piped water=1 Tube Well or Borehole=2 Dug well=3 Rainwater=4 River=6 Other (specify)_____ =7
3a	Where is the source of water located?	In own dwelling=1

		In own yard=2 Elsewhere=3
4	Do you have toilet facilities?	Yes=1 No=2
4a	What kind of toilet facility do members of your household usually use?	Open defecation= 1 Kutchra=2 Semi Pucca=2 Pucca=3
5	Does any member of the households own agricultural land?	yes=1 no=2
6	If yes, how much agricultural land own?	yes=1 no=2
7	Did you lease in land for cultivation during 2018-19? If yes how much	
8	Did you lease out land for cultivation during 2018-19?If yes how much	
9	Does your household own any of the following animals:	total number cow/bul/buffaloes horses/donkeys/mule goats chicken/ducks pig fishery

D. Health facilities

Q. No	Questions	Coding Characteristics
1	Is there any health centre near to your village?	Yes=1 No=2
2	Do you have emergency ambulance facilities in your village?	Yes=1 No=2
3	What is the distance of nearest health facilities from home?	less than 1 km= 1 between 1 to 2 km= 2 between 2 to 5 km= 3 more than 5 km = 4
4	Does any member of your household suffer from illness in last six months?	yes=1 no=2
5	If yes who was ill? Specify the HH member id.	
6	From which illness he/she has been/was suffering from?	
7	What is the duration of illness?	1-3 days =1

		4-10 days=2 11-20 days=3 21-30 days=4 more than 30 days=5
8	Did he/she seek treatment?	Yes=1 No=2
9	If yes, where did you approach?	Public Health Sector GOVT./MUNICIPAL HOSPITAL= 1 CHC/RURAL HOSPITAL/BLOCK PHC =2 PHC / ADDITIONAL PHC =3 SUB-CENTRE =4 VAIDYA/HAKIM/HOMEOPATH (AYUSH) =5 ANGANWADI/ICDS CENTRE =6 ASHA= 7 GOVT. MOBILE CLINIC = 8 BOAT CLINIC= 9 OTHER PUBLIC SECTOR HEALTH FACILITY= 10 NGO OR TRUST HOSPITAL/CLINIC= 11 PRIVATE HEALTH SECTOR PVT. HOSPITAL = 12 PVT. DOCTOR/CLINIC = 13 PVT. PARAMEDIC = 14 VAIDYA/HAKIM/HOMEOPATH (AYUSH) = 15 TRADITIONAL HEALER = 16 PHARMACY/DRUGSTORE =17 DAI (TBA) =18 OTHER PRIVATE SECTOR HEALTH FACILITY= 19 HOME TREATMENT = 20 OTHER(SPECIFY)_____ =2 1
10	Whom did you approach?	Doctor= 1 ANM=2 ASHA=3 Anganwadi worker= 4 Other(specify)_____ =5
11	What is the distance required to travel to seek treatment?	less than 1 km= 1 between 1 to 2 km= 2 between 2 to 4 km= 3 more than 4 km= 4

12	What was the mode of transportation used by you to reach the health facility?	government ambulance = 1 other ambulance= 2 car= 3 Motorcycle= 4 Tempo/Auto/Tractor= 5 Cart=6 On foot= 7 Boat = 8 Other (specify) _____=9
13	Mention the reason for the visit the above said place.	Reputation= 1 Cost= 2 Physical accessibility to the health care provider= 3
14	Had the patient cured there?	Yes=1 No=2
15	If not, is any alternative treatment you sought?	Yes=1 No=2
16	If the patient had not seek treatment, why?	no nearby health care facility= 1 facility timing not convenient= 2 health personnel often absent= 3 waiting time too long= 4 poor quality of care= 5 other reason (specify) _____ = 6
17	How much did it cost you out of your pocket for transportation?	Rs. _____
18	How much did it cost you out of your pocket for the treatment?	Rs. _____
19	How the out of pocket cost was met?	Bank accounts/savings= 1 Borrowed from friends= 2 Selling property= 3 Selling Jewellery= 4 Insurance= 5 Other= 6
20	Can you please share your experiences on the difficulties faced to access health care?	

F. Impact of flood

Q. No	Questions	Coding Characteristics
1	Did flood damage your area this year?	Yes= 1 No = 2
2	Was your house get damaged by the flood?	Yes= 1

		No = 2
3	Did the floodwaters stay in your area?	Yes= 1 No = 2
3a	If yes, for how long?	
4	Did the floodwaters stay into your home?	Yes= 1 No = 2
4a	If yes, for how long?	
6	Did you leave your house as soon as the flood came?	Yes= 1 No = 2
6a	If yes, where did you go?	
6b	For how many days you and your family members stayed there?	
7	Did the government provide you shelter to stay?	Yes=1 No = 2
8	Did you get any medical help from anyone?	Yes= 1 No = 2
9	Did you experience any shortage of food?	Yes= 1 No = 2
10	Did the government provide you food?	Yes= 1 No = 2
11	In last 5 years which year you think more destruction happened.	
12	Did crop get damage or affected due to flood?	Yes= 1 No = 2
13	If yes, how much crop is damaged/affected for this flood?	
14	What was the cost of total loss in cash crop damage in the flood?	
15	In case of livestock, what types of damage or problem are you suffered during the flood?	
16	What type of problems did your family face during the flood in case of water supply?	
17	What type of problems did your family face during the flood in case of sanitation?	
18	How many days were you unable to go to work?	
19	How many earnings have you lost as a result of flood?	

G. Health problems and health facilities during and after flood

Q. No	Questions	Coding Characteristics
1	Did you suffer any health problems as a result of the flood?	Yes= 1 No = 2
2	If yes who was ill? Specify the HH member id	
3	From which illness he/she has been/was suffering from?	
4	What is the duration of illness?	1-3 days =1 4-10 days=2 11-20 days=3

		21-30 days=4 more than 30 days=5
5	Did he/she seek treatment?	Yes=1 No=2
6	Where did you go when you were ill?	Public Health Sector GOVT./MUNICIPAL HOSPITAL= 1 CHC/RURAL HOSPITAL/BLOCK PHC =2 PHC / ADDITIONAL PHC =3 SUB-CENTRE =4 VAIDYA/HAKIM/HOMEOPATH (AYUSH) =5 ANGANWADI/ICDS CENTRE =6 ASHA= 7 GOVT. MOBILE CLINIC = 8 BOAT CLINIC= 9 OTHER PUBLIC SECTOR HEALTH FACILITY= 10 NGO OR TRUST HOSPITAL/CLINIC= 11 PRIVATE HEALTH SECTOR PVT. HOSPITAL = 12 PVT. DOCTOR/CLINIC = 13 PVT. PARAMEDIC = 14 VAIDYA/HAKIM/HOMEOPATH (AYUSH) = 15 TRADITIONAL HEALER = 16 PHARMACY/DRUGSTORE =17 DAI (TBA) =18 OTHER PRIVATE SECTOR HEALTH FACILITY= 19 HOME TREATMENT = 20 OTHER(SPECIFY)_____ =2 1
7	If not sought care? What was the reason for the compromised?	no nearby health care facility= 1 facility timing not convenient= 2 health personnel often absent= 3 waiting time too long= 4 poor quality of care= 5 lack of money=6 Road damaged= 7 Health centre destroyed= 8 Not enough health care professionals= 9 Transport unavailable= 10 other reason (specify)_____ = 11

8	Distance travelled to seek care?	less than 1 km= 1 between 1 to 2 km= 2 between 2 to 4 km= 3 more than 4 km= 4
9	What was the mode of transportation used by you to reach the health facility?	government ambulance = 1 other ambulance= 2 car= 3 Motorcycle= 4 Tempo/Auto/Tractor= 5 Cart=6 On foot= 7 Boat = 8 Other (specify)_____ =9
10	Mention the reason for the visit the above said place.	Reputation= 1 Cost= 2 Physical accessibility to the health care provider= 3
11	How much did it cost you out of your pocket for transportation?	
12	How much did it cost you out of your pocket for the treatment?	
13	How was the out of pocket cost met	Bank accounts/savings= 1 Borrowed from friends= 2 Selling property= 3 Selling Jewellery= 4 Insurance= 5 Other= 6
14	Did you receive any help from the boat clinic?	Yes=1 No=2
15	If yes, what you received?	
16	For how many days you were not able to go to work?	
17	How much wage lost due to it?	
18	Can you please share your experiences on the difficulties faced to access health care during flood times?	

Exit interview

Q. No.	Questions	Coding characteristics/ Responses
1	Name of the respondent	
2	Sex of respondent	male = 1 female = 2 others=3
3	Age of respondent	_____ years
4	Marital Status	single = 1 married = 2 separated/ divorce = 3 widowed = 4 others= 5
5	Caste Name	
6	Social Category	SC = 1 ST = 2 OBC = 3 Others = 4
7	Religion	Hindu= 1 Muslim = 2 Christian = 3 Sikh = 4 Others = 5
8	Place of residence	
9	Level of education completed	primary = 1 secondary = 2 higher secondary = 3 graduate = 4 post graduate = 6
10	Occupation of the respondent	Crop production = 1 Livestock rearing = 2 Agri casual labour = 3 Agri permanent labour = 4 Self employed in household industry = 5 self employed in services = 6 non -agri casual labour = 7 salaried work = 8 pension = 9 unemployed = 10 student = 11 Others _____=12
10	Monthly income of the respondent	Rs _____

10. a	Monthly income of the respondent household	Rs _____
11	Are you suffering from any illness?	yes = 1 no = 2
11a	If yes which illness?	
12	For how long you are suffering from this illness?	1-3 days =1 4-10 days=2 11-20 days=3 21-30 days=4 more than 30 days=5
12. a	If more than 3 days duration of illness, have you consulted with any health personnel, if yes, with whom?	
12. b	If not, why you have not consulted?	
13	What services have you received from the boat clinic?	
14	How much distance you travelled to reach the boat clinic?	less than 1 km= 1 between 1 to 2 km= 2 between 2 to 4 km= 3 more than 4 km = 4
15	How much time required to reach the boat clinic?	less than 5 minutes = 1 5 to 10 minutes = 2 10 to 20 minutes = 3 more than 20 minutes= 4
16	What was the main mode of transportation used by you to reach the health facility for delivery?	car= 1 Motorcycle= 2 Bicycle=3 Tempo/Auto/Tractor= 4 Cart=5 On foot= 6 Boat=7 Other (specify) _____=8
17	Where else have you gone for health care services?	Public Health Sector GOVT./MUNICIPAL HOSPITAL= 1 CHC/RURAL HOSPITAL/BLOCK PHC =2 PHC / ADDITIONAL PHC =3 SUB-CENTRE =4 VAIDYA/HAKIM/HOMEOPATH (AYUSH) =5 ANGANWADI/ICDS CENTRE =6 ASHA= 7 GOVT. MOBILE CLINIC = 8 OTHER PUBLIC SECTOR HEALTH

		FACILITY= 10 NGO OR TRUST HOSPITAL/CLINIC= 11 PRIVATE HEALTH SECTOR PVT. HOSPITAL = 12 PVT. DOCTOR/CLINIC = 13 PVT. PARAMEDIC = 14 VAIDYA/HAKIM/HOMEOPATH (AYUSH) = 15 TRADITIONAL HEALER = 16 PHARMACY/DRUGSTORE =17 DAI (TBA) =18 OTHER PRIVATE SECTOR HEALTH FACILITY= 19 HOME TREATMENT = 20 OTHER(SPECIFY)_____ = 21
18	From where you come to know about boat clinic?	friends = 1 relatives = 2 ASHA = 3 Anganwadi worker = 4 others _____=5
19	Who told you that it will come today here?	friends = 1 relatives = 2 ASHA = 3 Anganwadi worker = 4 others _____=5
20	Did you spend any money here today?	yes = 1 no = 2
21	Were you able to get the prescribed medicines from the boat clinic?	yes = 1 no = 2
22	If yes, are you satisfied with the amount of medicine given to you?	very dissatisfied = 1 somewhat dissatisfied = 2 somewhat satisfied = 3 very satisfied = 4
23	If not able to acquired the medicine, from where will you purchase?	
24	Did the health worker teach you how to use/take the prescribed medicine?	yes = 1 no = 2
25	Do you think you had to wait too long to seek care from the boat clin today?	yes = 1 no = 2
26	For how long you have waited?	less than 5 minutes = 1 5 to 10 minutes = 2 10 to 20 minutes = 3

		more than 20 minutes
27	Are you satisfied with the waiting time to receive care?	very dissatisfied = 1 somewhat dissatisfied = 2 somewhat satisfied = 3 very satisfied = 4
28	Can you please tell me how much time the doctor spends with you?	less than 2 minutes = 1 2 to 5 minutes = 2 5 to 10 minutes = 3 10 to 20 minutes = 4 more than 20 minutes = 5
29	Do you think the health worker understood your problem as explained by you?	yes = 1 no = 2
30	Are the health personnel friendly towards you?	yes = 1 no = 2
31	Did the doctor reply to your query?	Yes = 1 No = 2 Not asked = 3
32	Are you satisfied with the time given by doctor for consultation?	very dissatisfied = 1 somewhat dissatisfied = 2 somewhat satisfied = 3 very satisfied = 4
33	Are you satisfied with the privacy during the consultation?	very dissatisfied = 1 somewhat dissatisfied = 2 somewhat satisfied = 3 very satisfied = 4
34	If you had a choice will you prefer the healthcare provider that attended to you to be of the same gender with you?	yes = 1 no = 2
35	Are you satisfied with the skill of the health worker that attended to you?	very dissatisfied = 1 somewhat dissatisfied = 2 somewhat satisfied = 3 very satisfied = 4
36	Are you satisfied with the attitude of the health worker?	very dissatisfied = 1 somewhat dissatisfied = 2 somewhat satisfied = 3 Very satisfied = 4
37	If you had a choice, would you prefer to go elsewhere?	yes = 1 no = 2
38	If yes where will you go?	
39	What are the services you received during flood from the boat clinic?	
40	Are you satisfied with the boat clinic service during flood?	very dissatisfied = 1 somewhat dissatisfied = 2

		somewhat satisfied = 3 very satisfied = 4
41	Are you satisfied with the boat clinic service in normal days?	very dissatisfied = 1 somewhat dissatisfied = 2 somewhat satisfied = 3 very satisfied = 4
42	Are you satisfied with the overall service you received from the boat clinic?	very dissatisfied = 1 somewhat dissatisfied = 2 somewhat satisfied = 3 very satisfied = 4
43	According to you what are the positive aspects of boat clinic?	
44	According to you what are the negative aspects of the boat clinic?	

APPENDIX 3

M.Phil Dissertation Questionnaire

CONFIDENTIAL
For research
purposes only

Access to healthcare and Perception of Services Rendered by
Boat Clinics: A Study of Chars and Chaporis, in Lakhimpur District, Assam

Interview Schedule for the health care providers of the Boat Clinic

Introduction and Informed Consent: (to be read to each individual the first time the individual is interviewed):

Namaskar. My name is_____. I am pursuing M.Phil in Social Medicine and Community Health from Jawaharlal Nehru University. I am conducting a survey on access to health care services among char-chapori villages to study the health seeking behavior of the residents and to understand the perception of health care with special reference to boat clinic. The information that I collect from you will be required to write my M.Phil dissertation. I would like to ask you some questions regarding your perception and challenges faced while rendering services on the boat clinic. The questions usually take about 20 minutes. I will be recording and use your comments to enhance understanding of the topic. All of the answers you give will be confidential and will not be shared with anyone. Your participation in the study is completely voluntary. If I ask you any question you don't want to answer, just let me know and I will go on to the next question or you can stop the interview at any time.

If you have any questions about this survey you may ask me.

Do you agree to participate in this survey?

SIGNATURE OF INTERVIEWER_____ DATE_____

RESPONDENT AGREE

RESPONDENT DOES NOT AGREE

TO BE INTERVIEWED....1

TO BE INTERVIEWED . . . 2 →END

If 1, BEGIN INTERVIEW

First Interview Date: Day/Month/Year

Respondent identification:

Respondent ID_____

- 1) Name of the respondent: _____
- 2) Age of the respondent: _____ years
- 3) Sex of the respondent: (a) male (b) female (c) others
- 4) Social Category of the respondent:
(a) Scheduled Caste (b) Scheduled Tribe (c) OBC (d) Others
- 5) Religion:
(a) Hindu (b) Muslim (c) Christian (d) Sikh (4) Others
- 6) Place of residence: _____
- 7) You are working here as a Code: _____
 - a) District Program Officer
 - b) Medical Officers
 - c) Auxiliary nurse midwives
 - d) General nurse midwife
 - e) Pharmacist
 - f) Laboratory technician
 - g) Community Workers
- 8) For how long you are working here? _____
- 9) In a month how many days you have to visit the boat clinic? _____ days
- 10) Do you receive any training? (a) yes (b) no
- 11) If yes, from where you received the training? _____
- 12) And when did you receive the last training? _____
- 13) What type of training it was? _____
- 14) What are the problems faced while providing services in this remote settings?

- 15) Do you think the infrastructure availability is fairly well in the boat clinic? (a) yes (b) no
If not according to you what are the things required in the boat clinic?

16) What are the problems you faced during flood times as well as in dry season?

17) What are the other challenges faced in providing healthcare in the boat clinic?

18) What are the things you think required in the boat clinic to provide the services in a better way?

APPENDIX 4



Photo 1: House inundated with flood. *Source: The Author*



Photo 2: Toilet facilities submerged during flood. *Source: The author*

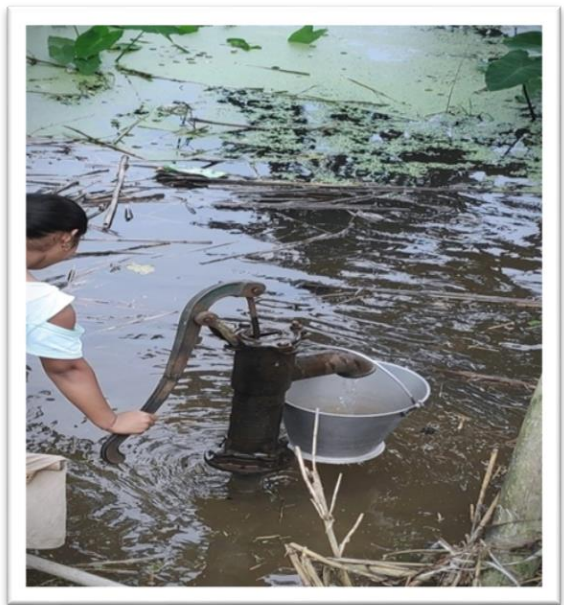


Photo 3: Submersion of tube well under flood water which is the main source of their drinking water. *Source: The author*



Photo 4: The only single way to connect the *char-chapori* population with the mainland.
Source: The author.



Photo 5: A pregnant women waiting on the boat to deliver the baby in the hospital. *Source: Tarun Pegu (a local resident of the study area)*



Photo 6: Woman gave birth in the boat. *Source: Tarun Pegu (a local resident of the study area)*



Photo 7: The patient was carried on a stretcher made of bamboo by 4 men on their shoulders from his house to the ferry boat. *Source: Tarun Pegu (A local resident of the study area).*



Photo 8 & 9: Skin infection after the flood. *Source: The author*



Photo 9: Boat Clinic of Lakhimpur district, Assam. *Source: The author*



Photo 10 & 11: Patients seeking healthcare from the Lakhimpur boat clinic. *Source: The author*

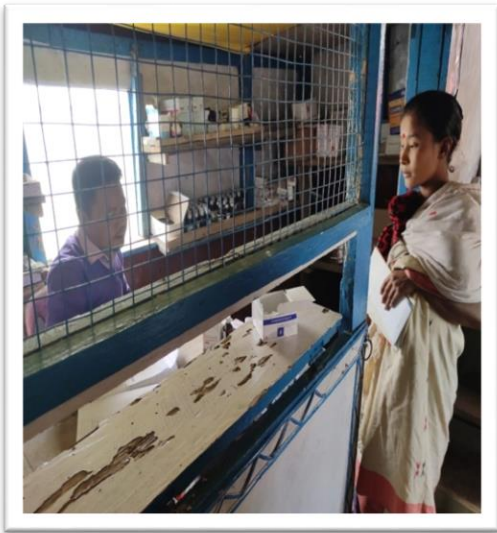


Photo 12: Patient procuring medicine from the pharmacist of the boat clinic.
Source: The author.



Photo 13: During hemoglobin test of the pregnant woman in the boat clinic. *Source: The author*



Photo 14: Awareness programme on hand washing conducted by the boat clinic team of Lakhimpur, Assam.
Source: The Author