

# Livestock, livestock loss and livelihood: a note on Mishing char dwellers of Assam

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**ABSTRACT:** The geography of char (the sandy land areas found within the river or lining at the bank) and their fertile lands create a suitable environment for livestock rearing, significantly contributing to livelihood, income, and nutritional intake for the char dwellers. The study investigates how livestock rearing and losses due to diseases and disasters are related to the livelihood and economy of the char-residing people, with a particular concentration on the Mishing char dwellers of Assam. The study considers two districts of Assam having char areas populated by the Mishing population. Both quantitative and qualitative tools are used to achieve the desired goals. Table and box plot figures are used to present the results. It is found that the loss of livestock is a serious threat to the economy of char dwellers. It contributes the most significant portion of their economic loss. It is also found that the severity is higher in case of disease loss of livestock than disaster loss. The study further suggests possible adaptation strategies for reducing livestock loss in the study area.

**KEYWORDS:** disaster loss, disease loss, economic loss, piggery

## 1. INTRODUCTION

Livestock rearing is one of the essential economic activities of the households of developing countries, the products of which usually have higher values than the traditional crops (Herrero et al., 2013; Nesterova, 2023; Baranowski, 2022; Baranowski & Kopnina, 2022; Baranowski et al., 2023). Animals are often considered the natural capital of the families. The reproductions can be treated as the interest income from the capital (Singh & Kumari, 2017). Apart from this, livestock exhibit their position in the cultural practices of humankind (Alves & Barboza, 2018). According to Steinfeld (2010), “Throughout history, livestock have been kept for a variety of purposes, with the almost exclusive focus on food use of livestock in modern agricultural systems

being a relatively recent development”. Human perceptions, mythology, religion, music, art, literature, etc., reflect the cultural significance of livestock in various societies (Senior, 2009; Streeck, 2023).

Additionally, the livestock sector plays a significant role in reducing food insecurity and thus reduces malnutrition, resilience, and poverty (Enahoro et al., 2019). However, the occurrences of different diseases affect the livestock industry to a large extent (WOAH, 2022). Other types of natural calamities, like floods, drought, storms, etc., also often negatively affect the livestock population and the related livestock industry. This leads to the loss of livestock-dependent populations, making their lives vulnerable. Livestock loss extends its direct and indirect effects on the livelihood of people associated with it. This includes economic losses such as the loss of opportunities to generate income, loss of food security, asset loss, and loss of income from animal husbandry. Livestock loss also leads to reduced scope for participation in different cultural and social activities like various rituals and loss of socially and culturally significant animals (Campbell & Knowles, 2011; Saikia & Mahanta, 2023c).

Assam is a major state of North East India with diverse populations of different communities with their ethnic beliefs and practices. Mishing (also written as Missing) is the second largest Schedule Tribes of Assam after the Bodo, with about 6.80 lakh population (Census of India, 2011). A large portion of the Mishing population of Assam resides in the Char<sup>1</sup> areas of Assam (Charah, 2014; Hazarika, 2018; Pangging, 2020; Pegu, 2021; Thakur, 2021). Char lands are fertile, and a large amount of grazing land creates ample scope for agriculture and livestock rearing (Mondal et al., 2016; Das et al., 2020). However, Char lands are affected by several natural disasters, making the lives in char vulnerable to hazards (Saikia & Mahanta, 2023a, 2023d). Char dwellers are one of the poorest groups in Assam (HDR, 2014). During climate change and climate-induced natural hazards, people have their livelihoods based on primary occupation, and those exposed to these areas are potentially vulnerable (Saikia & Mahanta, 2023b). The livelihood of the Mishing community is widely linked with livestock (Hazarika, 2018); therefore, the loss of livestock may affect their economic well-being. Research on char livelihoods in various regions of India and Bangladesh has been conducted (Baqee, 1998; Islam et al., 2011; Rakib et al., 2019; Lahiri-Dutt & Samanta, 2013; Chowdhury, 2000; Islam, 2000; Islam et al., 2015; Rahman et al., 2017; Kamal, 2011; Lahiri-Dutt, 2014; Uddin & Dhar, 2017). Few studies have also been conducted on the char livelihood in Assam (Hoque, 2015; Chakraborty, 2012; Khandakar, 2016; Kumar & Das, 2019). These studies partially talk about the livestock rearing sector as a source of people’s livelihood. Given that the Mishing community lives in the vulnerable but fertile char areas of the Upper Assam division, there is a dearth of literature on the Mishing community, their way of life, and the socioeconomic and cultural connections between livestock and the Mishing people (Hazarika, 2018; Charah, 2014; Pangging, 2020; Thakur, 2021; Pegu, 2021). Nevertheless, they have only touched on a small portion of the livestock section’s breadth in the lecture, failing

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<sup>1</sup> Char-Chapori areas are “the new riverine lands and islands created by the continual shifting of the rivers, and emerge from the deposition of sand and silt from upstream. Chars are found along all the major river systems, both lining the banks of rivers and as mid-river islands” (DFID, 2000, p. 3).

to convey its significance adequately. Owing to this gap, this research note aims to provide a thorough analysis of the livestock sectors' importance to the livelihood of Mishing char residents and how livestock loss affects their economic standing. The study is significant because it sheds light on a crucial and little-known aspect of the Mishing community's economic well-being in the char regions of Assam. It is anticipated that it will garner enough attention from the decision-makers involved in this community's growth. For the study, we considered the char areas of the Upper-Assam division<sup>2</sup> of Assam state of India. Char land is vulnerable to flood and other natural hazards, yet there is ample scope for livestock farming, and a majority of inhabitants of the char lands of the selected locations are Mishing (Charah, 2014; Hazarika, 2018; Pangging, 2020; Pegu, 2021; Thakur, 2021). The paper is divided into 4 Sections. The article's methodology is presented in section two, while section three covers results and discussion. Finally, the article winds up in section four.

## **2. MATERIALS AND METHODS**

### **2.1. PROFILE OF THE MISHING COMMUNITY: A BRIEF OVERVIEW**

Mishing is referred to as the "People of Water" since "sing" means "water" and "Mi" means "people" in their language (Hazarika, 2018; Thakur, 2021). They can be found in Arunachal Pradesh and the state of Assam. The Mishing are a riverine tribe from Assam who are primarily located in the char-chapori areas of the Brahmaputra and its tributaries in the state of Assam. They are dispersed throughout the Upper Assam division (Pegu, 2021; Thakur, 2021). The Mishing tribe's traditional building design is built with platforms around five feet above the ground, allowing the occupants to avoid flooding (Knwar & Mazumder, 2015). Despite their vulnerability, char areas offer abundant farming and animal-rearing opportunities due to their fertile ground (Mondal et al., 2016; Das et al., 2020). Mishing char residents have enough space for farming and raising cattle because of their environment and geographic location (Hazarika, 2018). Bamboo frames support a thatched roof on stilts, and the flooring is bamboo. Because rivers can flood during the monsoon, it is constructed on stilts. Under the home, domestic animals are maintained (Charah, 2014). In the Mishing community, raising pigs, goats, cows, buffalo, and poultry is a significant source of income, mostly for Mishing women. The women in the home typically handle the proceeds from selling these animals, and they are closely related to livestock rearing (Hazarika, 2018).

### **2.2. AREA OF THE STUDY AND SAMPLING DESIGN**

The study is based on the primary data collected from the sample households from the selected char villages of the study area. We also conducted focused group discussions in the community residing in the chosen char areas for our study. Data collection was done from May to July of the year 2022. We used a multistage sampling technique to

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<sup>2</sup> The states of Assam are divided into five regional divisions: Upper Assam, Central Assam, North Assam, Lower Assam, and Barak Valley. Upper Assam division comprises the districts Dhemaji, Dibrugarh, Charaideo, North-Lakhimpur, Jorhat, Golaghat, Tinsukia, Sivsagar, and Majuli.

access information. From the available literature (Pegu, 2021; Thakur, 2021), it is understood that the Mishing char dwellers are found in the Upper-Assam Division of Assam, which is spread across the two agro-climatic zones: Upper-Brahmaputra Valley and North Bank Plain zones. Therefore, to represent the study’s total population, we consider one district with the highest char population from each agro-climatic zone. Hence, we considered the North Lakhimpur district from the North Bank Plain zone and the Tinsukia district from the Upper Brahmaputra Valley zone.

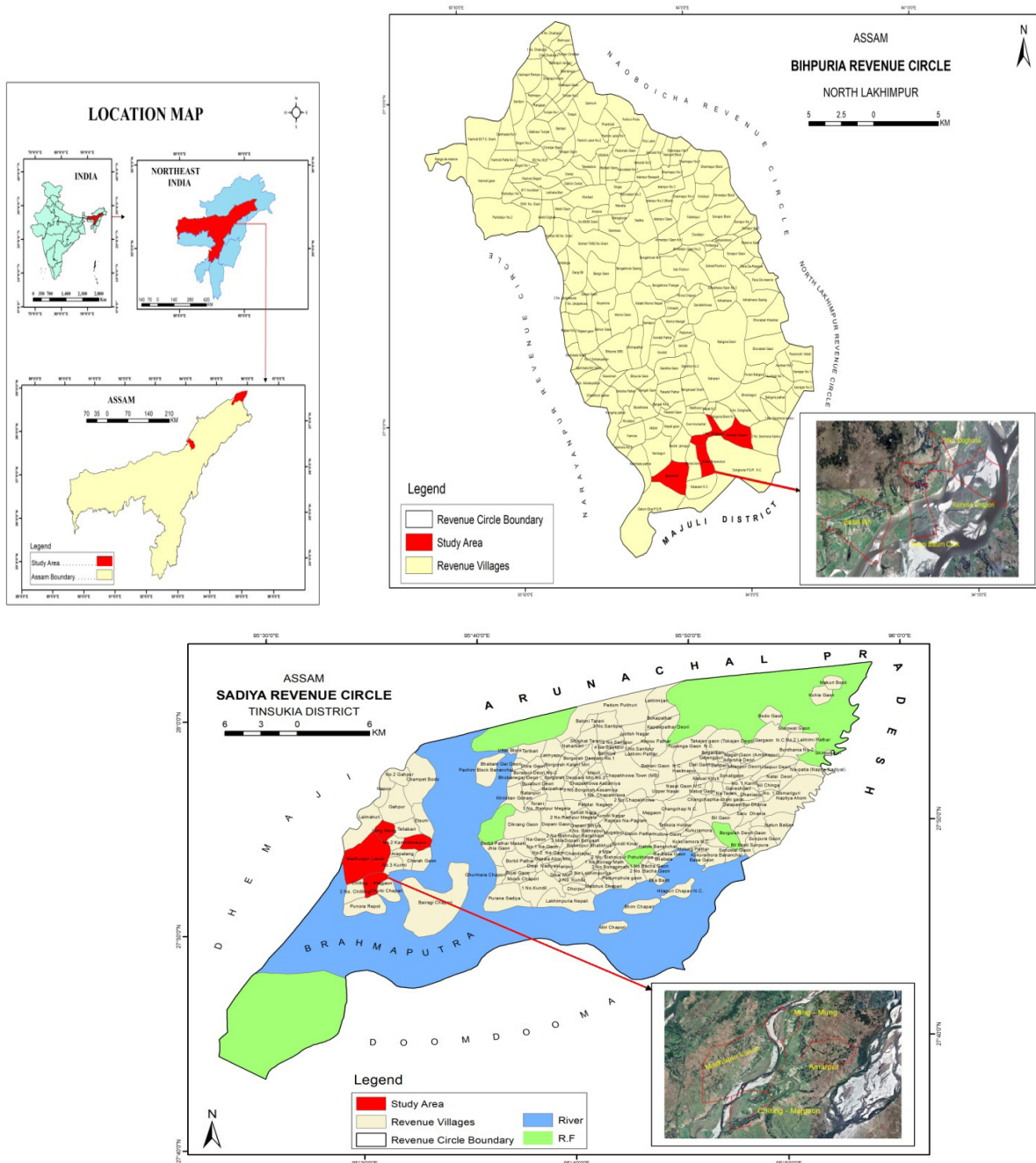


Figure 1: Maps of the study area  
Source: produced by the authors using GIS

From each selected district, one revenue circle with char villages was selected ran-

domly. Four char villages from each revenue-chosen circle were selected randomly, and 10% of the total households from each selected sample village were randomly chosen for inclusion in the household survey. We considered the Bihpuria revenue circle from North Lakhimpur and chose the Sadiya revenue circle from the Tinsukia district. The Amarpur Gaon Panchayat (GP) of Sadiya comprises 38 char villages and is surrounded by water. There is no road communication to the Amarpur GP from the mainland. All transportation is by water. From the North-Lakhimpur district, 83 households and 93 families were chosen for the study in the Tinsukia district. Altogether, 176 households were selected. The study locations are shown in Figure 1. The location maps have been drawn using the Geographic Information System (GIS) to visualize the selected char villages of our study. The regions highlighted in red colour are the study locations of our specific research.

### 2.3. METHODOLOGY

Descriptive statistics and tables are used as quantitative tools, and to know the socio-economic significance of livestock, the information gathered from focused group discussions among the respective community and personal interviews are also used as qualitative tools. The members of the focus group discussion belong to the people of the respective study area, and it consists of all the sections of the char dwellers of the villages based on their gender, age and different levels of education. The Wilcoxon matched-pairs signed-rank test is used to make a comparison of additional attributes among the two districts. It is a non-parametric test that checks the equality of the match pairs of the observations, considering both sets of distributions to be the same as the null hypothesis (Wilcoxon, 1945). Box plot diagrams are used to present the findings and to have a clear idea about the considered objectives. STATA versions 12 and 14 have been used to analyze the data.

## 3. RESULTS AND DISCUSSION

### 3.1. LIVESTOCK AND THE MISHING LIVELIHOOD

Livestock presents a great significance in the Mishing population living in the char areas of both the districts of Assam. Table 1 presents the basic statistics of the profile of the livestock-rearing sector of the study area. From the table, it is clear that a majority of the sample population rear livestock. Villagers in the study area commonly rear cows, buffalo, goats, pigs, chickens and/or ducks. A few households from the Tinsukia district rear buffalo, and the table shows that the most common enterprises for char dwellers are the rearing of cows and pigs.

Table 1 shows that animal rearing is very common amongst the Mishing population of char areas. Almost 40% of the population is rearing at least three types of animals. A notable difference is seen in the keeping of birds in the two districts, specifically in the case of the rearing of ducks. The differences are also statistically proved by the Wilcoxon matched-pairs signed-rank test. The quantity of ducks per household in North Lakhimpur is almost zero. There may be two factors affecting people's de-

cisions regarding whether to keep a duck or not: disease and social faith. Because of the disease, a large amount of birds died during the early phase of the year 2022. Second, the study discovered that certain members of the Mishing community hold the opinion that duck is unfit to be consumed. They believe that eating duck flesh brings the return of the illnesses they once suffered from. As a result, fewer ducks live in the Mishing community's char lands in the North Lakhimpur district. In Tinsukia, as opposed to North-Lakhimpur, people raise ducks, although the majority do so with high breeds, with very few raising native breeds. The residents of Tinsukia believe that the native or local breed is unhealthy and that eating it can cause the resurgence of past illnesses. However, this is not the case for high-breed ducks; thus, they raise them for their own subsistence and meat consumption. These viewpoints highlight the social and cultural strands of the Mishing people and show how they are modifying their cultural values to maintain their socioeconomic status.

Headings	North Lakhimpur	Tinsukia
Rear animal	96.41%	93.50%
Rear at least two types of animal	75.99%	77.41%
Rear at least three types of animal	49.34%	29.17%
Rear at least one bird ***	8.53%	71.84
Number of cows per household	4.88	7.26
Number of pigs per household	2	1.98
Number of goats per household	2.67	2.38
Number of chickens per household ***	3.1	9.39
Number of ducks per household ***	0.02	4.1
Households experience loss of livestock due to disaster	36.15%	46.23%
Value of disaster loss of livestock (in INR)**	22337.35	53021.51
Households experience loss of livestock due to diseases	83.13%	88.17%
Value of disease loss of livestock (in INR)	90277.11	119980.6
Adult pig loss per household due to diseases	2.59	2.76
Piglet loss per household due to diseases	4.27	5.67
Value of pig loss due to disease (in INR)	89843.37	113279.6

Note: a) Results are presented as percentages and mean values.

b) The number of different livestock is presented in quantity, and the values are in the Indian National Rupee (INR).

c) The time frame of the loss is measured as a year from the interview date.

d) \*\* & \*\*\* represent the attributes significantly differing in the two districts at 5% and 1% significance levels.

Table 1: Basic statistics of the livestock profile of the study area

Source: Authors' own findings

Char lands are highly suitable for livestock rearing. The char villages have their char ground outside of the residential coverage of their village. These lands are available in the form of islands or attached land with the villages. Apart from cultivation, these lands are also used for cattle farming as grazing land, and the area where the cattle are reared is popularly known as "Khuti"<sup>5</sup> in the regional language. According

<sup>5</sup> Khuti are the places where rear cows, buffalo, and goats in some large quantities say 30/40 numbers to

to the villagers, Khuti plays a crucial role in the livelihood of the Mishing community living in char areas. Usually, cows are reared in the khuti, and these khuti are mostly available in Tinsukia. As a result, the per-household availability of cows is also higher in the Tinsukia district than in North Lakhimpur. Cows are raised for three basic purposes: for milk, for use in agricultural activity as input, and as a source of income by selling the cows.

Pigs have been found to have a significant sociocultural and economic role in the Mishing char way of life alongside cows. During the focus group discussion, it was revealed that pigs are necessary for the community's many ritualistic rituals. Pigs are required for all cultural events and rituals and are offered to their ritual god. Even the Mishing people raise pigs for various cultural and ceremonial purposes. It also generates a considerable amount of income from selling an adult pig or piglets. Piglets also have great importance in livelihood, acting as the income generating scope for rural women of Mishing people in char areas. The survey reveals that about 69.60% of the Mishing populations of char areas rear pigs, whereas in North-Lakhimpur district, about 62.76% and in Tinsukia, 77.44% of people are rearing pigs. Like the death of birds, diseases also caused the death of pigs, and as a result, the availability of the pig population became zero in some households of North Lakhimpur. Because of their weak financial situation, they are now not able to buy a new pig. This pig exodus also impacts the socio-cultural features of the Mishing people's way of life. If the pig that the residents had been rearing to carry out their ritual practice died, they would have to purchase a new pig for their specific practice, severely impairing their financial situation.

### 3.2. LOSS OF LIVESTOCK AND ITS IMPACT ON LIVELIHOOD

Suppose we consider the households' economic vulnerability as the household's total economic loss in the last year. In that case, it has been found that, on average, about 73.67% of the total economic loss of the surveyed households is due to the loss of livestock, whereas about 60.97% is shared by the loss in piggery only. To better visualise the issue, let us consider the box plot figures of different types of loss incurred by the households of the char. To have a better visualization of the issue, we have taken the log of the total loss of each attribute considered in the box plot.

It is visible from the box plot of Figure 2a that the loss of livestock both due to disease and disaster is capturing the highest share of the total economic loss of the households, leading to a great threat to their livelihood opportunity. The loss of these livestock will reduce their prospect of income and, at the same time, the scope for food and nutrition to remain intact, and their agricultural activities will also be adversely affected. It has also been clear that the share of livestock loss is much higher in case of disease loss than in loss due to disaster. The disease loss of livestock is mostly related to the loss of piggery (both adult pigs and piglets) and, to some extent, the loss of birds. Here, the piggery loss has the most significant share. The same is also visible in Table 1. The loss due to diseases is a severe issue for the livelihood of the Mishing

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more than 100 numbers of cattle.

char dwellers.

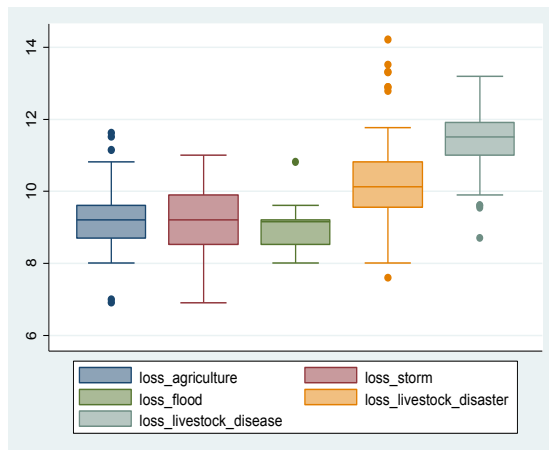


Figure 2a

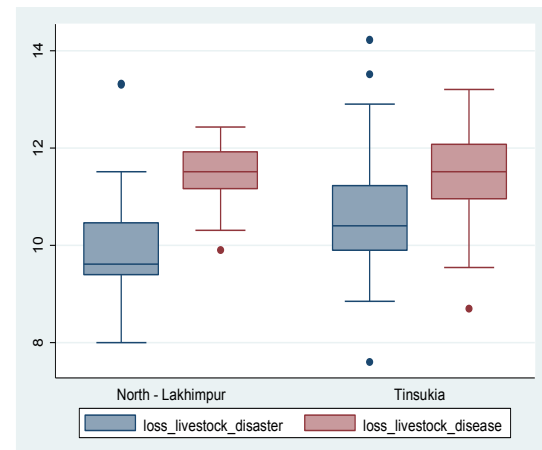


Figure 2b

Note: The vertical line represents the log of loss value in INR.

b) `loss_agriculture` = loss incurred in agriculture due to disaster; `loss_storm` = loss incurred to the char dwellers (other than agricultural loss) due to storm (e.g. destruction of their houses); `loss_flood` = loss incurred to the char dwellers (other than agrarian loss) due to flood (e.g., destruction of their homes); `loss_livestock_disaster` = livestock loss due to disaster; `loss_livestock_disease` = livestock loss due to diseases.

Figure 2. Box plot figure of economic loss due to various factors.

Source: Authors' own findings

Along with diseases, the loss of livestock due to disaster also has a considerable share. The outliers in the box plot indicate that some households have been severely affected by the disaster, which caused livestock loss. Table 1 makes it abundantly evident that the two districts' livestock disaster losses, however, are very different from one another. It has been noted from the focused group discussion and the conversation with the household that many of the Mishing char residents of the Tinsukia district raise their cattle in the Khuti on char grounds that are distinct from their village. A significant number of cows and other animals are lured into the flood when the river rushes with a strong current during the monsoon and periods of severe rainfall, flooding these Khutis. The cattle find it nearly hard to escape the flood once they are lured into it due to the extremely high river currents in the Tinsukia district. This leads to a significant loss of cattle. In the survey, it has been found that some households from Tinsukia have lost more than 50 cows drawn by the flood. Similar effects of livestock loss on the livelihood of these Mishing Char residents are also seen in the North Lakhimpur area. It is, nevertheless, significantly smaller than the Tinsukia district. The results of the study's focused group discussion indicate that both of the study locations have seen an increase in the frequency and severity of floods in recent years. From the empirical findings by different researchers as well (Mahanta and Yamane, 2019; Dekaraja and Mahanta, 2021; Bania, 2022), it has been found that the frequency and intensity of floods and storms have increased in Assam including the districts considered for our study.



The severity of livestock loss due to disease and disaster is higher in the Tinsukia district than in North Lakhimpur (see Figure 2b of Figure 2). There could be several reasons that we explored in our study. One reason may be that more people are involved in livestock rearing since there is more scope for it in the Tinsukia district. At the same time, from the focus group discussions, it was found that the current of the rivers is powerful in Tinsukia, and the floods are devastating. The discussion also revealed that there is very little probability of survival if the livestock falls into flood waters. Secondly, in terms of diseases, it is found that there is no vaccination process for pigs to enhance their resistance capacity against different swine flu. There is no veterinary centre in the Amarpur GP, and people must go far to access veterinary services. In the case of selected char villages of North Lakhimpur, the veterinary centre is very far from the villages. The distance is about 40 to 50 kilometers. It may be assumed that locational remoteness is one of the reasons for the inaccessibility of veterinary services by the char dwellers. This disparity in the severity of livestock loss in the two districts may also be caused by variations in coping mechanisms for livestock loss brought on by illness and disaster. Based on the survey results, it has been noted that when residents of the North Lakhimpur district learn about the presence of diseases, they move their pigs to remote char areas to keep them away from humans and other pigs. Their pigs were, therefore, kept safe and uninfected. The Tinsukia district has not reported any instances of this kind of behaviour. Comparably, while there are plenty of highlands in the North Lakhimpur district's char areas to protect animals from flooding, there aren't as many in the Tinsukia region.

#### 4. CONCLUSION

Livestock has a great significance in the economy of a society from various aspects. Its importance is also high in rural areas where people are associated with primary activities to a great extent. Through this research note, we have tried to show the importance of livestock among the char residing in the Mishing community of Assam and if the loss of livestock impacts the livelihood of the char dwellers. We have employed both qualitative and quantitative approaches to present the issues to the readers.

From the discussion, it has been clear that the livestock sector plays a vital role in the economy of the Mishing community residing in the char areas, and the loss of livestock largely makes them economically vulnerable. From the focus group discussion in the community, we have explored some of the coping techniques used by some households. The methods are mainly the vaccination of the piggery privately, moving the pigs to an isolated area when the households learned about the spread of disease, and constructing some highlands within the char to shift the livestock during the flood. However, it is also to be noted that private vaccination may not be possible for all households with poor economic conditions. Therefore, there is a need for free vaccination programs by veterinary centres or other non-governmental organizations (NGOs). The highlands constructed for the livestock are not yet sufficient in quantity, and it is said that the lands can't resist high flood water with strong intensity. For rural households, especially for the women of the houses, livestock constitutes a significant

source of income. For some char households, we have seen a complete evacuation of the livestock, particularly the piggery. As a result, actions must be taken to assist their livelihood through feasible plans. In Assam, there are a variety of initiatives for the distribution of livestock. A few of the Mishing households in the study locations of 1 No. Doghoriya village in the North Lakhimpur district has also received piglets under one of these programs. However, this isn't spread far enough among everyone. Proper and equitable livestock distribution is necessary to improve the economic situation of these poor char dwellers. Additionally, it calls for intensive and keen observation of livestock loss in the char areas to improve the living conditions of the dwellers living here. Since the char lands give the dwellers ample scope for livestock production, the sector should be encouraged and supported by reducing the risks related to livestock loss.

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