Flood, Erosion and Outmigration as a Livelihood Strategy in the Char areas of Barpeta district, Assam

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Abstract

Agriculture remains a cornerstone of Assam's economy, significantly contributing to employment, livelihood, and food security for the rural population. However, Barpeta, one of the most flood and erosion-prone districts in Assam, faces substantial challenges. According to the Assam Flood Hazard Atlas (2011), 55.13% of Barpeta's land area is classified as flood hazard-prone, with 218 villages categorized under very high and high hazard zones. The district is home to 277 Char villages (Directorate of Char Areas Development, Assam 2002-03), which suffer severe damage from recurrent floods and erosion annually. This precarious situation compels many residents to migrate permanently to non-Char areas for alternative, non-farm employment. Temporary migration of individual members outside the state for employment opportunities has also become increasingly common among these Char households. This paper investigates the extent to which farming households in the Char areas continue to adopt agriculture as their primary livelihood and the alternative livelihood strategies employed by both migrated and non-migrated households.

Keywords: Erosion; farm and non-farm works; migration; Char; livelihood

1. Introduction

Agriculture has long been the backbone of Assam's economy, providing employment and food security to a large portion of the rural population. In districts like Barpeta, agriculture is more than just an economic activity; it is a way of life. However, the district's geographical vulnerability to floods and erosion has made agriculture increasingly unsustainable, leading to significant socio-economic challenges. The

frequency and severity of floods in Assam have significantly increased over the years, posing a growing threat to the state's population. While historical records show that major floods occurred every seven to ten years, recent decades have witnessed a concerning trend of more frequent and devastating deluges. Data from the Assam government's Water Resources website reveals a steady rise in the number of people affected by floods since the 1950s (Deka, 2020). From an average of 8.5 lakhs during the 1950s, the annual figure climbed to 15 lakhs in the 1960s and further to 20 lakhs in the 1970s. The decade of the 1980s saw a dramatic increase to 45.50 lakhs, and by 2005, the number had reached 45,86,000. In 2020 alone, as of mid-July, an estimated 40 lakhs people across 27 districts were already affected by the floods. With the possibility of additional flood waves before the year's end, the situation remains critical. The escalating impact of these floods underscores the urgent need for effective flood management strategies and infrastructure development in Assam (Deka, 2020).

The Char areas of Barpeta, comprising riverine islands formed by the Brahmaputra River, are particularly vulnerable. These areas are characterized by dynamic landscapes where the land itself is subject to frequent changes due to the river's shifting course. The annual monsoon season exacerbates this instability, causing severe flooding and erosion that disrupts agricultural activities and threatens livelihoods. In this context, the local population has been forced to explore alternative livelihood strategies, including migration.

Assam had historically been on the migration interface of diverse population streams. This is what has created the great differentiations of language, religion, culture and society that we see today in Assam state. This in-migration trend has continued into current times, with Assam receiving a large number of refugees from East Bengal/East Pakistan, Tibet and Burma professing different religions, speaking different languages and bearing different cultures. In case of Assam it is in-migration over the longer period of time that has led to violent upsurge of reaction and displacement. Often, it was the descendants of the in-migrants who were displaced. The conflict-induced displacement is of more recent in origin. The perennial flood induced internal displacement in Assam’s

plains is an older problem that continues to engage attention of local social scientists, political parties as well as the general public. Every year, the gushing waters of the Brahmaputra inundate and erode the river-banks and river islands on which thousands survive carrying out subsistence agriculture. The erosion of the river banks and *Chars* (midstream river islands) displaces thousands of people, who then migrate to neighbouring 'mainland' areas in search of home and livelihood (Hussain, 2000).

In the context of Assam, we have sufficient literature on immigration rather than on internal migration. More over a very few literatures have been noticed which are exclusively on migration in *char* areas of Assam in general and Barpeta district in particular. Probably Goswami (1963) for the first time pointed out the problem of immigration into Assam. He estimated the total number of immigrants from East Pakistan on the basis of 1961 census. Alam (1981) has restricted his study to the adverse impact of the unprecedented growth of population caused mainly by the incidence of heavy influx on the various sectors of the economy of the state. Bhuyan (1979) analyzed how international migration is a significant factor for high population growth rate in Assam after partition of the country. Gogoi (1984) studied in detail the various streams of intra-state, inter- state and international migration into Assam and found out various push and pull factors behind it. He also tried to find out the impact of these different categories of migrants on the economic development of Assam.

There are two critical aspects to the problem of internal displacement along the Brahmaputra in the Assam Plains. Firstly, even at the best of times, internally displaced persons (IDPs) are unwelcome in any society anywhere in the world, and this is true of the *Char*-displaced as well, as they try to rebuild a life in the mainland of Assam. Secondly, the problem of IDPs in this instance is intrinsically linked/overlapped with the politically contentious issue of illegal immigration into Assam from East Pakistan/ Bangladesh (Dasgupta, 2000). She also observed that the labours in urban areas like rickshaw pullers, thela-pullars are IDPs from neighbouring *Char* areas. In 1989, out of a total of 7000 rickshaws in Nagaon town in middle Assam, no more than 2450 were licensed, the rest un-licensed and illegal (Dasgupta, 2001).

Bhagaboti (2004 and 2005) in his article discussed the challenges for the sustainable development in the *Char* areas of Assam. In his article, he studies the physical context of the *Char* areas, its background of humanization which is of recent origin and the agricultural situation he opines that a systematic approach integrating the entire natural and human elements in a contextual frame work can only ensure a development which may be ecologically and socially acceptable and economically viable in the context of the delicate environment which the *Char* dwellers have been sharing.

Sarma (1992) in his study conducted the production pattern of *Char* area of Barpeta District of Assam analysis the existing pattern of resource use on the farming system and production pattern. The study covers the aspect of demography and land tenure system in the *Char* area. Out of the total sampled farms more than 90% are Bengali speaking Muslims and rest is Bengali speaking Hindus. A mixed farming system is prevalent in the area with an average cropping intensity of 184.47%. Land during kharif season kept fallow on account of recurrent occurrence of floods. Human labour in the farm is surplus whereas capital is a constraint.

Shahid (1993) observed that despite a higher cropping intensity and a diversified crop profile, the *Char* areas are mostly poor. There is severe dearth of data concerning char areas despite the presence of the *Char* dwellers in Assam for over a century. This results a information gap about these areas and their inhabitants, which ultimately lead to the generation of several 'hysterical-myths' among the population of the mainland.

Some of the most economically underdeveloped areas of Assam, in 1983, the Assam government formed the Assam State *Char* Areas Development Authority to work for the upliftment of people living in char areas as a Special Area Programme. In 1996, this authority was converted into the Directorate of *Char* Areas Development (AARC, 2005).

Chakraborty (2009) reported that Socio-economic Survey Reports concerning the C*har* areas of Assam, during 1992- 93 to 2002-03, the number of *Char* villages of the Brahmaputra has rose by 7.75 per cent whereas the decadal growth rate of population was 55.63 per cent compared to 18.85 per cent for Assam (1991-2001). He also reported that during 1992-93, when the first survey was undertaken Barpeta district had the highest

number of *Char* villages and population followed by Dhubri and Jorhat. However, during the next survey in 2002-03, Dhubri district had the highest number of *Char* villages and *Char* population followed by Jorhat and Barpeta. The *Char* areas cover 4.6 per cent of the total land area of the state. Only 4 per cent of the state's cultivable land is located in these areas. Cultivable land as percentage of total land has declined from 70 per cent to 67.13 per cent during 1992-93 to 2002-03 and there has also been a simultaneous decline in the per capita availability of cultivable land.

The *Char* villages account for one of the largest concentrations of illiterate population in Assam. Between 1992-93 and 2002-03 their literacy level has rose from 15.45 to 19.31 per cent. It is surprising to note that during this period there has been a fall in literacy rate among the *Char* villages of four districts namely, Bongaigaon, Kamrup, Dhubri and Tinsukia. The economic condition of the *Char* area was also found depressing. It was observed that the population residing below the official poverty line increased substantially from 48.89 per cent to 67.89 per cent, which for the state declined to 36.09 per cent. (Chakraborty, 2009).

Assam is severely affected by natural calamities which lead to large scale migration of the people to metropolises. Loss of agricultural land and other standing crops people were come out for alternative livelihood option and fall in the grabs of traffickers. A majority of the victim's hail from the *Char* areas of Barpeta, Dhubri, Bonaigaon, Kokrajhar and Kamrup districts and the number increasing in areas like Lakhimpur, Dhemaji and other disaster-prone areas. The average age of the victims is 12 to 22 years of age and they generally belong to poor families and have low levels of literacy (Dutta, 2013).

It is because the river basin is so densely populated that the population here is so vulnerable to natural disasters, and so easily displaced. Chakraborty (2009) reported a very high density of population in the *Char* area (690 persons per sq.km), which was more than double the state average (340 persons per sq.km.).

In *Char* villages of the Barpeta district, according to the estimates of the *Char* areas Development Authority, only 17.76 percent of the land is under *meadi* or permanent settlement, whereas 38.76 percent under *touzi* and 43.48 percent under

ekchonia settlements (Goswami, 2000). Studying the problems of land revenue and patta in the *Char* of Assam Sheikh (2005) found that the land system of the *Char* areas is beset with a large number of populations. Erosion of the *Char* areas and their re-emergence is a continuous problem.

The objective of this study is to examine the agricultural practices in the Char areas, the extent of their adoption amidst these challenges, and the alternative strategies, particularly migration, employed by the affected households. The study provides insights into the resilience of these communities and the socio-economic impacts of outmigration.

2. Materials and Methods

2.1 Study Area

Barpeta is located in the lower part of the Brahmaputra Valley, one of Assam's most flood-prone regions. The district's topography, coupled with the river's unpredictable behaviour, makes it highly susceptible to floods and erosion. The Char areas, where the study is focused, are riverine islands within this district, inhabited by communities that depend heavily on agriculture.The district's economy is predominantly agrarian, with rice, jute, and mustard being the major crops. However, the frequent flooding and erosion pose significant challenges to agricultural productivity. The Assam Flood Hazard Atlas (2011) highlights that over 55% of Barpeta's land area is prone to flooding, with many villages in the Char areas being the worst affected.

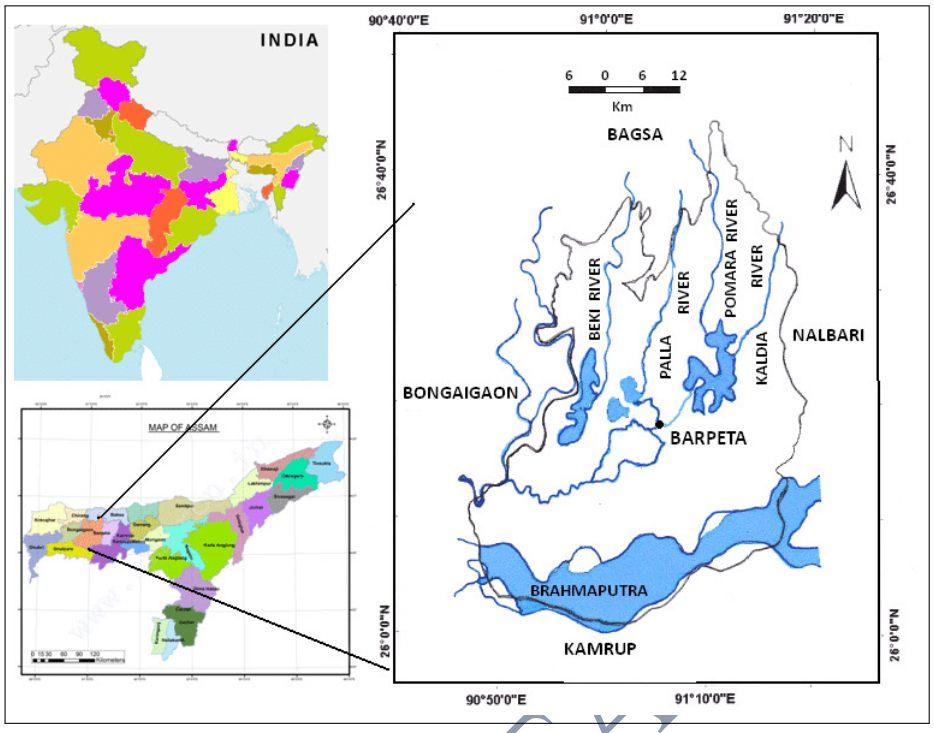

Figure1:Locational map of Barpeta district with major rivers
(Source: Baruah and Saikia, 2015)

2.2. Methodology

This study employs a mixed-methods approach, combining qualitative and quantitative data.Secondary data was gathered from government reports, research papers, and other relevant literature to contextualize the findings and provide a comprehensive overview of the challenges faced by these communities. Data analysis was conducted using descriptive statistics and thematic analysis to identify key trends and patterns.

3. Results and Discussion

3.1 Agricultural Practices in the Char Areas

Agriculture in the Char areas is traditionally characterized by subsistence farming, with rice as the primary crop. Farmers rely on monsoon rains for irrigation, which, while abundant, also brings the risk of floods. The soils in the Char areas are fertile due to silt

deposition from the river, but this fertility is often compromised by the erosion of topsoil during floods.Crop diversification is a common strategy among farmers to mitigate the risks associated with flooding. Besides rice, farmers also cultivate mustard, jute, and vegetables. However, the short growing seasons, coupled with the unpredictability of floods, limit the scope for agricultural expansion.

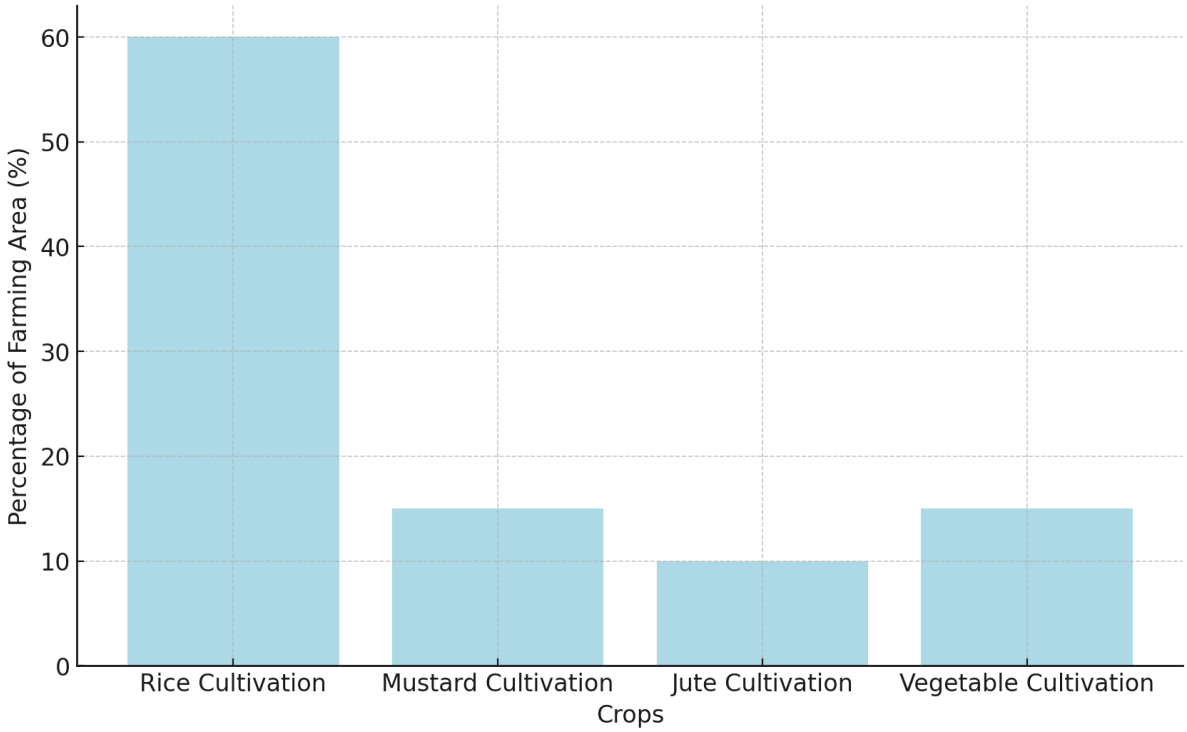

Figure 2: Agricultural practices in Char areas

Source: Author's survey

3.2 Impact of Floods and Erosion on Agriculture

The recurring floods in Barpeta have a profound impact on agriculture in the Char areas. The destruction of crops, loss of arable land, and damage to infrastructure are common occurrences. The erosion of riverbanks further exacerbates these challenges, leading to the displacement of entire villages. The economic losses due to crop damage and land erosion are significant. Many farmers, already operating at subsistence levels, find it

difficult to recover from such losses. This situation is compounded by the lack of access to modern agricultural technologies and limited government support.

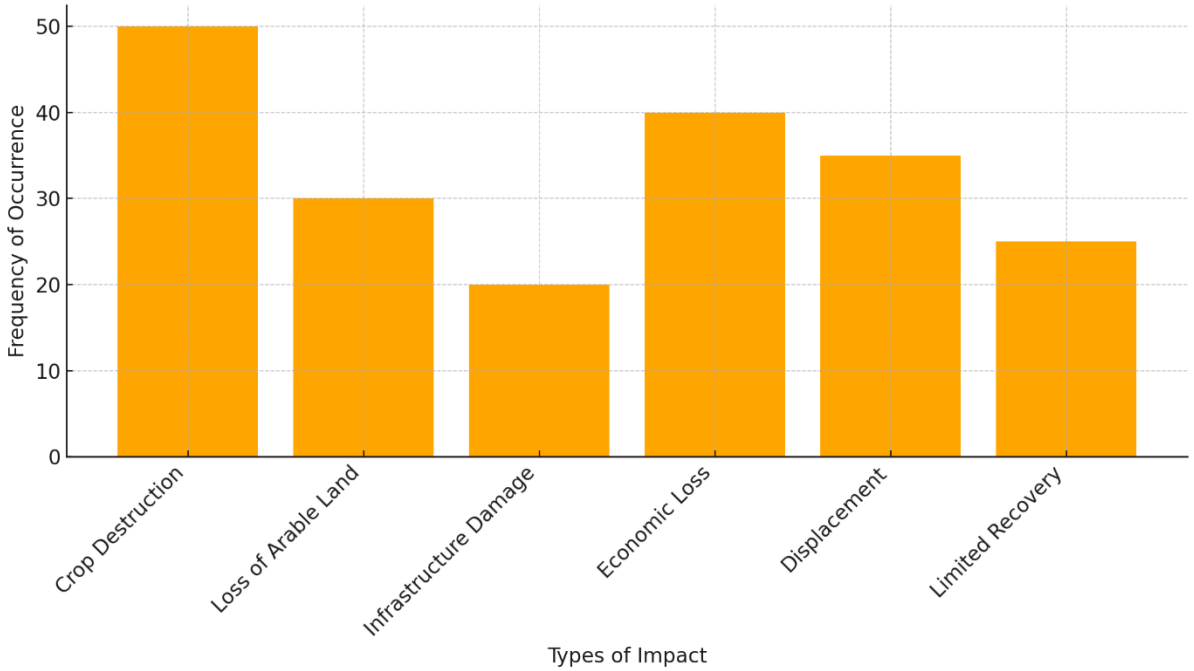

Figure 3: Impact of floods and erosion on agriculture in Char areas
Source: Author's survey

3.3Adaptation Strategies

In response to these challenges, farmers in the Char areas have developed various adaptation strategies. These include the use of flood-resistant crop varieties, staggered planting, and the construction of temporary embankments to protect crops. Community-based initiatives, such as shared labour during planting and harvesting, also play a crucial role in mitigating the impact of floods.

Despite these efforts, the effectiveness of these strategies is limited. The scale and frequency of floods often overwhelm local coping mechanisms, leading to a gradual decline in agricultural productivity. This decline has prompted many households to explore alternative livelihood options.

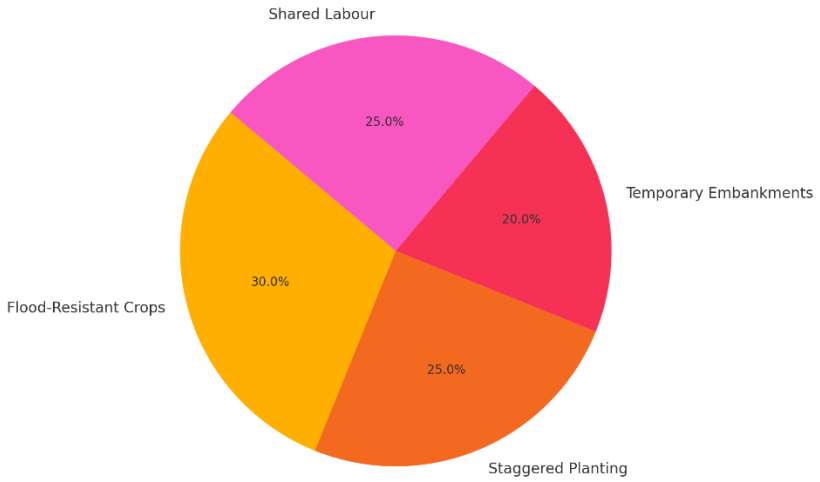

Figure 4: Adaptation in Char areas
Source: Author's survey

3.4 Migration as a Livelihood Strategy

Migration from the Char areas of Barpeta is primarily driven by the need to secure alternative livelihoods in the face of declining agricultural productivity. The recurrent floods and erosion have made it increasingly difficult for households to rely solely on agriculture. As a result, migration has emerged as a key strategy for coping with economic uncertainty.

Table1: Multidimensional Poverty Indicators for selective spatial diversity groups in Assam

Poverty Indices/		Spatial diversity	groups	
Spatial diversity groups	Char	Flood-prone	Hill	State
Head Count Ratio of Multi-dimensional poor(%)	44.59	27.74	33.70	30.10
Head Count Ratio of Vulnerable (%)	17.60	17.78	21.21	16.54
Multi-dimensional Poverty Index (MPI)	18.57	11.70	13.86	12.49

Source: Assam Human Development Report, 2013,pp.198.

The decision to migrate is influenced by several factors, including the extent of land loss due to erosion, the availability of non-farm employment opportunities, and the socio-

economic status of the household. For many families, migration is seen as a means to diversify income sources and reduce the risk of livelihood failure.

Table2:PovertyIndicatorsinthedimensionsofIncome,Education,andHealthforselecti vegTable 2: Poverty indicators for different graphical areas in Assam

Sl. No.	Poverty Indicators	Geographical areas		
		Char Areas	Flood-ProneAreas	Hill Areas
1.	APCI(Rs)	21,156	23,604	18,060
2.	MYS(Yrs)	4.76	6.54	5.25
3.	EYS(Yrs)	11.76	11.90	11.87
4.	LEB(Yrs)	63.80	50.22	67.42
5.	MMR(per lakh Live birth)	330	-	-

Source: Assam Human Development Report, 2013, pp.95-96&191
(LEB=Life expectancy at birth, MMR=Maternal mortality ratio, MYS=Meanyearsofschooling,EYS=Expectedyearsofschooling,APCI=Annualpercapitaincome).

3.5 Types of Migration

Migration from the Char areas can be categorized into two main types: permanent migration and temporary/seasonal migration. Permanent migration typically involves the relocation of entire families to non-flood-prone areas within Assam. These families often move to urban or peri-urban areas where they can find employment in construction, trade, or services. The decision to migrate permanently is usually made after repeated experiences of severe flooding and land loss. Besides, temporary migration is more common among younger members of the household, particularly males. These individuals migrate to other states, such as Delhi, Kerala, and Gujarat, in search of seasonal work. The remittances sent back by these migrants are a vital source of income for the families remaining in the Char areas.

Table 3: Migration patterns from the flood-prone Char areas of Assam

Year	Migration Type	Destination Region	Migrants Involved (Approximate)	Primary Reason for Migration	Main Sectors of Employment
2010-2015	Permanent Migration	Urban/Peri-urban Assam	100,000+	Recurring Floods, Erosion	Construction, Services
2010-2015	Temporary Migration	Within Assam	150,000+	Seasonal Work, Lack of Local Jobs	Agriculture, Construction
2015-2020	Permanent Migration	Urban Assam	150,000+	Land Loss due to Floods	Trade, Small Businesses
2015-2020	Temporary Migration	Within Assam	200,000+	Seasonal Work, Floods	Seasonal Labour (Agriculture, Services)

Source: Author's survey

3.6 Economic and Social Impacts of Migration

Migration has both positive and negative impacts on the households involved. On the positive side, remittances provide a crucial financial lifeline, enabling families to meet their basic needs, invest in education, and improve their living conditions. Migration also helps reduce the pressure on local resources, particularly land.

However, migration also has significant social costs. The absence of young males from the household can lead to increased workloads for women and elderly family members. There is also the risk of social disintegration, as extended periods of separation can weaken family bonds.

Table 4: Economic and Social impacts of migration from Char areas

Impact Type	Aspect	Description
Positive Impact	Financial	Remittances provide financial support, enabling families to meet basic needs.
Positive Impact	Education	Families can invest in education with the remittances received.
Positive Impact	Resource Management	Reduced pressure on local resources, especially land.
Negative Impact	Workload	Increased workload for women and elderly due to absence of young males.
Negative Impact	Family Structure	Extended periods of separation can weaken family bonds.
Negative Impact	Social Disintegration	Risk of social disintegration as families are separated for long periods.

Source: Author's survey

3.7 Alternative Livelihood Strategies of Non-Migrated Households

Non-Farm Employment

For households that remain in the Char areas, non-farm employment has become an essential component of their livelihood strategies. This includes daily wage labor, small-scale trade, and services such as transportation and retail. The availability of non-farm work is, however, limited and often seasonal, making it an unreliable source of income.

Government and NGO Interventions

Various government schemes and non-governmental organization (NGO) initiatives have been implemented to support the livelihoods of people in the Char areas. These include the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA), which

provides wage employment, and schemes focused on skill development and micro-enterprise promotion.

Table 5: Alternative livelihood strategies of Char area population

Livelihood Strategy	**Description**	**Number of Beneficiaries (Approx)**	**Seasonality (%)**	**Income Contribution (%)**	**Average Wage/Benefit (INR per day)**
Non-Farm Employment	Daily wage labor, small-scale trade, and services like transportation and retail. Availability is limited and seasonal.	15000	70	30	300
Government Interventions	Government schemes like MGNREGA provide wage employment, skill development, and micro-enterprise promotion.	50000	Not Applicable	25	200
NGO Initiatives	NGOs support skill development, micro-enterprises, and provide essential services to Char residents.	25000	50	15	250
Community-Based Initiatives	Community initiatives like cooperatives and SHGs provide access to credit, savings, collective marketing,	10000	Not Applicable	20	180

	and disaster preparedness.				

Source: Author's survey

Community-Based Initiatives

Community-based initiatives, such as cooperatives and self-help groups (SHGs), have also emerged as important mechanisms for livelihood support. These groups provide members with access to credit, savings, and collective marketing opportunities. In some cases, they have also played a role in disaster preparedness and response, helping communities to better cope with the impacts of floods.

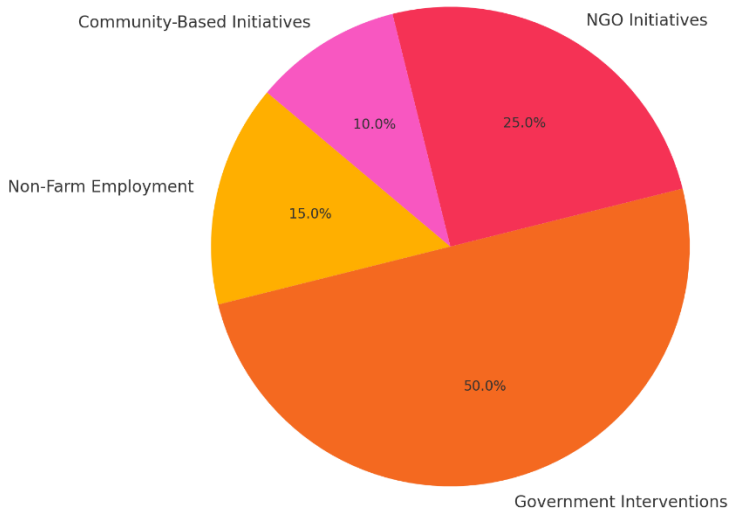

Figure 6: Distribution of beneficiaries by livelihood strategy in Char areas
Source: Author's survey

4. Policy Implications and Recommendations

4.1 Enhancing Agricultural Resilience

To sustain agriculture in the Char areas, there is a need for targeted interventions aimed at enhancing agricultural resilience. This could include the introduction of flood-resistant crop varieties, improved irrigation infrastructure, and access to modern farming

technologies. Extension services should be strengthened to provide farmers with the knowledge and skills needed to adapt to changing environmental conditions.

4.2 Supporting Livelihood Diversification

Given the challenges associated with agriculture, promoting livelihood diversification is crucial. This could involve the development of non-farm sectors, such as small-scale industries, handicrafts, and eco-tourism. Training and capacity-building programs should be implemented.

Conclusion

The study highlights the intricate relationship between agriculture, flood and erosion, and migration in the Char areas of Barpeta district. While agriculture continues to be the primary livelihood for many, the increasing frequency and intensity of floods have made it increasingly unsustainable. Consequently, migration—both permanent and temporary—has emerged as a vital strategy for securing livelihoods. The findings underscore the need for targeted interventions to support agricultural resilience in the Char areas and to develop sustainable livelihood options for both migrated and non-migrated households. Addressing the challenges of flood and erosion through improved infrastructure, flood management, and livelihood diversification programs will be crucial in enhancing the socio-economic resilience of the Char communities in Barpeta.

References

AARC. (2005). Report of the Assam Administrative Reforms Commission (AARC), Government of Assam, *http://www.assamgovt.nic.in/aarc/index.html*.

Alam, K. (1981). Population Explosion and its impact on the Economy of Assam. In: Dutta Ray, B. (ed.) The Pattern and Problems of population in North East India,

migrating with a pre-arranged job and the initial duration of urban unemployment: An analysis based on India data on rural to urban migrants, *Journal of Development Economics*, V:36(2), pp.337-351.

Bhattacharya, Basabi (1996). Inter- District Migration in Response to Disparities is Human Development-A Case study of West-Bengal, *In:* Raychaudhuri, A. and Debjani Sarkar. (eds): "Economy of West-Bengal: Problems and Prospects", Allied publishers Ltd. Calcutta.

Bhagaboti A.K. (2004). Cultural adaptation in the river Island (*Char* areas) of Brahmaputra (Assam), *In*: Grover, N. and Singh, K.N. (ed.) '*Cultural Geography : form and process'*, pp. 438

Bhagaboti A.K. (2005). The *Char* areas of Brahmaputra valley, Assam: challenges for sustainable development, *In:* 'Socio-Economic life of the *Char* people, Assam, Barpeta'. (ed.) CAWSSER

Chakraborty, G. (2009). Assam's Hinterland: Society and Economy inThe Char areas, New Delhi: Akansha Publishing House

Dasgupta, A. (2000). Political Mythmaking in Postcolonial Assam, *In:Himal South Asian*, (Kathmandu, August, 2000), Amalendu Guha, '*AsomNomore, AmiyuNomoru'* Guuwahati, 1997.

Deka, M. (2020). A brief note on Floods and Erosion in Assam: Problems without Prospects. Refugee Watch Online, Calcutta Research Group (CRG).

Dasgupta, A. (2001). An ethnographic study of migrant Muslim communities in middle Assam *Chars.* In: '*Emergence of a Community: Muslims of East Bengal Origin in Assam in the Colonial andPostcolonial Period'*, unpublished thesis, (Gauhati University).

Dutta, T. (2013). Changing Livelihood, Disaster and Human trafficking - A Study of the Disaster affected areas of Assam. *Intl J. Humanities and Social Sci. Invention***V**: 2 (8), pp 1-4

Gogoi, J.K. (1984). Migration and Economic Development in Assam 1951-1971. Unpublished Ph.D thesis, Centre for the Study of Regional Development, School of Social Sciences, Jawaharlal Nehru University, New Delhi

Goswami, A. C. (2000). *CharAnchalorEtiArthonaitikSamikhya*. *In:* Hussain, I (Sr.) and Hussain, A. (ed.), '*Char-ChaporirJibonCharyya'* (Guwahati: Natun Sahitya Parishad), pp. 54-60

Goswami, P.C (1963). Immigration into Assam, Economic Weekly, **V: 15** (44), November, pp. 1827-1833

Goverrnment of Assam (2003). Socio-economic survey report of *Char* areas of Assam 2002-2003, Directorate of *Char* Area Development of Assam, Guwahati-6

Hussain, M (2000). State, Identity Movements and Internal Displacement in the North East, *Economic and Political Weekly*, p. 4519

Hussain, M.K. (2012). River Erosion and its Socio-Economic impact in Barpeta District with special reference to Mondia Development Block of Assam. *Int. J. Engg. Sci*., **Vol:1** (2), pp. 177

Saikia, A. Goswami, H and Goswami, A (2003) Population Growth in Assam 1951-1991 With Focus On Migration, Akansha publishing House, New Delhi.

Sajastad, L.A. (1962). Income and Migration in the United States. (Unpublished Ph. D. dissertation, University