An Empirical Analysis of Income and Livelihood Pattern in Sandbar Areas along the River Brahmaputra in Assam

Deluwar Hoque and Chandan Hazarika

Abstract—**Among the widely diverse geographical areas of Assam, the small river islands locally called 'Char' or 'Chaparies', occupy an important place in terms of their contribution to the economy of the state. These river islands have been an important contributor to the socio economic life of the state. The physical vulnerability is seen as the root cause of this backwardness for which developmental effort always gets a back seat in these areas. The objectives of the present study are to examine various sources of earning and the pattern of livelihood of the inhabitants of char areas and their demographic characteristics and the living standards. Both primary and secondary data were used in this study. Agriculture is found to be the major source of livelihood of the inhabitants in the char areas but it is still remained underdeveloped. There is lack of alternative sources of livelihood. The backwardness of agriculture sector, transport and communication, education, health care, infrastructure, sanitation facilities and high population, very poor literacy, poverty, flood affected and river-bank erosion are the major challenges in the path of development of char areas. There is need of improvement of agriculture sector and also development of transport and communication, education, health care and infrastructural facilities in the char areas. There is need of introduction of organized marketing. Establishing agri-clinics, input supply mechanisms, crop insurance programmes, trainings on modern technology can lead to a high growth of agricultural sector in these areas.**

Index Terms—**Alternative income sources, char, demography, livelihood, poverty.**

I. INTRODUCTION

The state of Assam has a widely diverse geographical area of 78,438 square kilometers in which 31.16 million people (Census, 2011) belonging to different racial stocks, ethnic identity and religious background inhabit. Among these areas sandbars, i.e., the small river islands, locally called *"Char" or "Chaparies"*, occupying an important place in terms of their contribution to the socio-economic life of the state. The economy of *Char* areas of the Brahmaputra Valley of Assam is agro-based and the thus, agriculture is the major source of income of the people living in *Char* areas, (Bhagabati, A. K. *et al.* 2005) [1]. However the development is not in consonance with the potential that these areas have. The main occupation of the char dwellers is seasonal agriculture, including rearing of livestock but the economic condition and the social

amenities are very poor, (Sarma, R. 1992) [2]. Ensuring true sense of economic development in *Char* areas of Assam with its vast geographical limitations is a challenge. Majority of the households are living below poverty line as there is lack of educational, health-care and also transport and communication facilities, which result in very low literacy and high rate of population growth in the *Char* areas of Assam, (Bhagabati, A.K. 2000) [3]. More than 80 per cent people are engaged in agriculture and produces different types of crops like paddy, jute, varieties of pulses, spices, etc. in the fertile alluvial land, but the *char* areas are prone to severe flood and erosion, which are quite devastating hazards as they always cause great damage to standing crops. Channel migration eroded away agricultural land and even from the settlement areas making thousands of people homeless, within a short period a rich cultivator transform to a landless person. The peoples of char areas are compelled to shift their dwellings elsewhere in the state. There is frequent breaching of roads and damage of it by annual flood and erosion. Bicycle is the main means of transport within the *char* areas and during the flood, machine boat, locally called as *'Bhutbhuti'* is used as means of transport, (Bordoloi, N.K. *et al.* 2005) [4]. Thus, the physical vulnerability is seen as the root cause of the backwardness of these areas for which developmental effort always gets a back seat in this area.

If looked into the formation of *Chars*, as evident these are the result of sedimentation of the river 'Brahmaputra' along its course through the plains of the state of Assam. This river also happens to be one of the most sediment-charged rivers in the world and under these circumstances, both the bed-load and suspended sediments of the river water give rise to large number of river islands, locally called *Char*. Normally, they are triangular in shape and unstable in nature. The size, shape and location of most of the *Chars* changes from time to time. Usually, they are subjected to erosion on their upstream part and deposition on downstream end. As a result, the *Chars* migrate downstream. The *Chars* have a unique eco-system surrounding them. The soil is composed of alluvium, freshly laid by the river with little humus, which allows the growth of river grasses. *Simul*, bamboo and *jhaobon* (*Casuarina equisetifolia*) are also a common sight in the *Char* areas. Along with vegetation, the *Chars* are a natural habitat for certain birds both domestic and migratory, and animals too. As a whole, the *Chars* have an ecology and biodiversity of their own, which is slightly different from the surrounding mainland.

The Char Area Development Authority, Government of Assam in its Socioeconomic Survey Report, 2002-03 estimated that there is 3,60,927 hector *Char* land found in

the Brahmaputra River in Assam. According to the Char Area Development Authority, there are around 1000 *Chars* with some degrees of physical stability. According to this report, there are 14 *Char* districts in Assam. On the basis of the report, Barpeta district is one of most important district having 277 Char villages with about 45,792 nos of families living in char areas, out of which 67.00 per cent families are living below poverty line. Means of living in the *Char* areas of Assam are limited which are mostly agriculture based. Agriculture is the main source of livelihood in the char areas. Next to agriculture, wage labour both agricultural and non-agricultural and trade are the other important sources of livelihood. There is less diversification of the economic activities. The other sources of livelihood are fisherman, boatman, rickshaw puller, hand cart puller *(thela),* horse cart puller, etc. There is lack of commercialization of fish production in the *char* areas. (Sarma, G. 2013) [5].

But still these areas have not felt the impact of economic progress, in spite of being an important contributor to the agricultural production of the state. Agricultural activity is still practiced in the traditional method with very little improvement in the practices. No major improvement is seen in the infrastructural facilities even in those *Chars*, which are comparatively permanent. With the intensity of recurring flood, devastating erosion has been continuously taking place on the banks of the river Brahmaputra as well as in the *char* areas causing damages to cultivable land, homestead, public and private properties and prosperous settlements of the state during the recent years, (Hussain, I. (Sr.) 2005) [6]. Infrastructural bottleneck is the major hurdle in the development process in these areas. The literacy rate of the char areas is very low which makes these areas less receptive to change. There is excessive growth of population and the percentage of families living below poverty line is extremely high.

Considering these problems of *Char* areas of Assam, it becomes important that measures should be taken up so that the strengths of these areas are capitalized. The present study is designed to examine the sources of income and the pattern of livelihood in the study area and also to examine their demographic characteristics.

II. RESEARCH METHODOLOGY

Based on the objectives of the present study, both the primary and secondary data have been used for the study purpose. The primary data has been collected through a pretested structured schedule by personal interview method from the sample household. The secondary data has been collected from different published sources such as reports prepared by Government and non-government organizations, statistical handbook, various journals, research works, and library works etc.

A multistage random sample technique has been used to select the sample households. Out of the fourteen identified char districts, Barpeta district has been selected randomly. Among the eleven Development Blocks, Mandia Development Block is selected on the basis of availability of *char* villages and then 5 *char* villages of under the Mandia Development have been selected randomly. While some information has been collected at the village level, the details about livelihood practices have been collected through a household survey from the selected villages. 10% of the households subject to the minimum 10 households from the each sample village have been selected at random. For the present study a total of 220 households (Table I) have been studied and one focused group study done during the field study in the selected char villages of Barpeta district. The primary data have been elicited using a pretested structured questionnaire. Data have been processed and analyzed. Both the tabular and percentage analysis have been done.

TABLE I: SELECTION OF SIZE OF SAMPLE HOUSEHOLDS

Sample Villages	Nos. of Households in Village	Nos. of Sample Households
Kismat Moinbori	378	40
Bhagmara Char No.1	387	40
Kalairdia	350	35
Major Char No.2	338	40
Alopati Char No.3	636	65
Total	2089	220

III. RESULTS AND DISCUSSIONS

With respect to the sources of income and the pattern of livelihood, the present study has analyzed the occupations of the sample household, which are classified as –**Farming**: It includes those who are engaged in agriculture, such as farmers, agriculture labour, etc.

Non-farming-I: It includes services both in public and private sectors, retired or pensioner, self-employed, professionals, etc.

Non-farming-II: It includes petty/small, medium and large business, fishing/fish selling, dairy, poultry farming, livestock production, etc.

Non-farming-III: It includes skilled/semi-skilled labour, small artisan in households and cottage industry, etc.

Non-farming-IV: It includes construction related works, daily wage labour, domestic servant, transport workers, etc.

Others: It includes housewife, students, unemployed, etc. This category is about those who do not earn any income.

TABLE II: OCCUPATIONAL DISTRIBUTION OF THE SAMPLE HOUSEHOLDS

Occupation	Sample Households	
	Nos.	%
Farming	145	65.91
Non-Farming-I	5	2.27
Non-Farming-II	12	5.45
Non-Farming-III	7	3.18
Non-Farming-IV	10	4.55
Others	41	18.64
Total	220	100

Source: Field study data

The occupational distribution of the sample respondents in the study area is presented in Table II. It is found that 65.91 per cent of the sample respondents are engaged in agriculture. Remaining all the sample respondents, 2.27 per cent are engaged in activities of category of Non-farming-I; 5.45 per cent are engaged in Non-farming-II; 3.18 per cent

engaged in Non-farming-III and 4.55 per cent are engaged in economic activities of category of Non-farming-IV. The remaining 18.64 per cent of the total sample respondents are engaged in others non-economic activities, as they do not earn any income.

From the study it is found that the agriculture is the major source of income of the inhabitants of the char areas. Again it is also found that most of the respondents are either illiterate or very less literate, i.e., studied upto class-IV or VIII. Most of the farmers are not only uneducated but also untrained which affects their productivity. Though it is found that some of the respondents earn income from non-farming economic activities especially from fishing, dairy and poultry farming but there is lack of commercialization of these activities, which results in less income to them and a large no. of factors such as underdeveloped transport and communication facilities, lack of marketing facility, uneducated and untrained labour force, affected by flood several times in a year, poor economic condition, high population growth, lack of industrialization specially small and village industries, underdeveloped socio-economic infrastructure, etc. are mainly responsible for it. All these cause a constraint to the inhabitants for engaging other sources of income in the char areas of Assam. Thus, they are forced to engage in agriculture as the major source for their livelihood.

The pattern of land-holdings of the farmers is one of the factors affecting the productivity and economic condition of the farmers. The pattern of size of land-holdings of the sample households in the char areas are presented in the Table III.

TABLE III: SIZE OF LAND-HOLDINGS OF THE SAMPLE HOUSEHOLDS

Land-holdings (in Ha)	Sample Households	
	Nos.	%
0-1	165	75
1-2	50	22.73
2-4	4	1.82
4-10	1	0.45
10 & above	0	0
Total	220	100

Source: Filed study data

It is found that the majority of the households (75.00 per cent) have very low sized land-holding, which is 0-1 hector only. The size of land holdings of 22.73 per cent of all the sample households is 1-2 hectors. 1.82 per cent of all the sample households have land holdings size of 2-4 hectors and only 0.31 per cent of all the sample households have land holding size of 4-10 hectors. None of the sample households in the study area has land-holdings size of 10 hectors and above.

In the present study an attempt is made to examine the types of farmers among the sample households, which is presented in the Table-IV. Farmers are classified into four categories on the basis of the size of land holdings and the classification is made as per the classification of farmers in India, Agriculture Census in India and Agricultural Land Holdings Pattern in India, NABARD Rural Pulse, Issue-I. In the study of types of farmers among the sample households, 62 (28.18 per cent) households are excluded as they are not engaged in agricultural farming. The remaining 158 (71.82 per cent) households are engaged in agriculture farming and thus, they are taken into consideration for the classification of farmers in the present study. It is found that 65.19 per cent of farmers are marginal farmers; 31.65 per cent are small farmers; 2.53 per cent are semi-medium farmers; only 0.63 per cent is medium farmers and there is no large farmer in the study area. The productivity of the farmers and agriculture sector is dependent upon the size of land holdings. The economic condition of the farmers in the char areas of in the study area is found poor because most of the farmers are marginal and small farmers having very low sized land holdings. The very low sized land holding of the farmers is one of the constraints in the use of modern agricultural practices. Again most of the farmers fail to purchase modern equipment for agriculture farming due to their poor economic condition. Thus, they are unable to reap the benefit of modern method of cultivation.

TABLE IV: TYPES OF FARMERS AMONG THE SAMPLE HOUSEHOLDS

Types of Farmers	Sample Households (Excluding of 62 (28.18%) HHs)	
	Nos.	%
Marginal	103	65.19
Small	50	31.65
Semi-Medium	4	2.53
Medium	1	0.63
Large	0	0
Total	158	100

Source: Filed study data

As agriculture is found the major source of livelihood in the study area, therefore an attempt is made to examine the purpose of agricultural production produced by the sample farmers. Sample farmers produce various agricultural products such as rice or paddy, wheat, chili, mustard, jute, pulses, sugarcane, vegetables of different kinds. It is found that 28.48 per cent of the farmers produce agriculture products for their own consumption purposes and the remaining 71.52 per cent of the farmers produce for both the own consumption and selling purposes. Thus, there is lack of purely commercialization of the agriculture in the study area which affects the level of income earned by the farmers from the agriculture farming adversely.

Though most of the farmers (79.11per cent) use fertilizers but not as per the scientific method of cultivation, rather based on the suggestions of the sellers those are also uneducated and untrained. Only 6.82 per cent of the sample households in the char areas have irrigation facility through shallow tube-well. Thus, there is lack of irrigation facility in the char areas, which affect the agricultural production adversely. The farmers are still dependent on weather condition and the season for the agricultural farming. The untrained farmers have failed to reap the benefit of modern technique of agricultural farming.

Though some of the sample households produce fish and also sales fish but it is found that there is lack of commercialization of fish production, which affect the level of income from sale of fish directly. The distribution of income level earned from the fish production by the sample households in the study area is presented in the Table-V and

found that 71.43 per cent of them have earned an income of Rs.10,000-20,000.

TABLE V: LEVEL OF INCOME EARNED FROM FISH PRODUCTION

Income (Rs.)	Sample Households (Excluding of 192 (87.27%) HHs)	
	Nos.	%
0-5000	3	10.71
5000-10000	5	17.86
10000-20000	20	71.43
Total	28	100

Source: Field study data

There are many reasons responsible for lack of commercialization of fish production in the study area such as flood prone area, those who produce fish are untrained and uneducated, underdeveloped transport and communication facilities, lack of store facility, etc. Thus the fish production has a very limited role to play in the household income level and also as an occupation in the char areas.

TABLE VI: LEVEL OF INCOME EARNED FROM THE LIVESTOCK AND POULTRY PRODUCTION

Income Level (Rs.)	Sample Households	
	Nos.	%
0 - 1000	85	38.64
1000 - 2000	70	31.82
2000 - 5000	30	13.64
5000 - 10000	20	9.09
10000 - 20000	15	6.82
Total	220	100

Source: Field study data

The present study has also studied the production of livestock (domestic animals) and poultry (domestic fowls) as an economic activity. It has found that 100.00 per cent of the sample households in the char areas produce livestock such as cow, buffalo, goat, pig, sheep, etc. and poultry (domestic fowls) such as hen, duck, pigeon, etc. but there is lack of commercialization of livestock and poultry production due to various causes such as backwardness of transportation and communication facilities, lack of training facilities for livestock and poultry farming, lack of marketing facility, lack of finance, flood affected area, etc.

The distribution of income earned from the livestock and poultry production by the sample households presented in the Table-VI. It is found that only 6.82 per cent of the sample households have earned an income of Rs.10,000-20,000 from the livestock and poultry production. Thus it is found from the distribution of level of income earned from the livestock and poultry production in the study area that there is a very limited role to play by the livestock and poultry production as an economic activity in the *char* areas. The present study has also found that the members of 67.73 per cent of the sample households in the char areas of Barpeta district migrate to different places of the state in seeking of some economic activities due to lack of alternative income sources in the *char* areas.

On the basis of the field study concerned with the first objective of the present study it is found that agriculture is the major source of income in the char areas of Assam. Though agriculture is the major source of income in the char areas of Assam but it is still remained backward due to many reasons such as natural calamities, i.e., flood, drought, river bank erosion, illiteracy, lack of training facility, use of traditional method of cultivation, small size of land-holdings, less and improper use of fertilizers, underdeveloped transportation and communication facilities, lack of marketing facility, lack of cold storage facility, poverty, underdeveloped financial services, etc. There is still lack of alternative sources of income in the char areas of Assam and the above mentioned problems in the char areas become constraints in the path of alternative sources of income. Thus, agriculture is the main source of income of the char households in Assam.

IV. DEMOGRAPHIC CHARACTERISTICS AND THE LIVING STANDARD

The demographic features are examined on the basis of both the primary and secondary data in the study area. It is found that 51.70 per cent and 48.30 per cent of the members of the sample households in the char areas of Barpeta district are male and female respectively.

The present study has also examined the age composition of the members of the sample households and has found that most of the members of the sample households are belong to economically active age group. Almost 42.15 per cent of the total sample size belongs to the age group of 20-50 years. The religion, community and caste of the sample respondents in the study area is studied and found 100.00 per cent of the sample respondents in char areas of Barpeta are belonging into the religion of Islam, Muslim community and General caste respectively. The marital status of the sample household's members revealed that 44.16 per cent of the sample households are married and 55.84 are unmarried.

The family size and types of the sample households are examined and found that majority, 71.82 per cent have family size of 5-10 members and 71.40 per cent have nuclear family. There is high rate of growth of population due to early marriage, illiteracy, lack of health care facilities and family planning.

The literacy rate of the sample villages has also been studied and it is presented in the Table-VII. It is found that the rate of literacy in the char areas of Barpeta district is very poor.

TABLE VII: LITERACY RATE IN THE STUDY AREA

Sample Villages	Literacy Rate (%)
Kismat Moinbori	18.05
Bhagmara Char No.1	18.36
Kalairdia	18.11
Major Char No.2	17.63
Alopati Char No.3a	17.64
Total in Sample Villages of Barpeta District	17.96

The living standard of people living in a region is dependent on and also affected by various factors. Though 100.00 per cent of the sample respondents in the char areas of Barpeta district have their own house but the quality of house is not good. Most of them have *kutcha* house. Hand tube-well is the only source of drinking water but the quality of drinking water is also good due to availability of arsenic mixed in water. The quality of sanitation facility is also poor. There is no electricity connectivity and also lack of developed transport and communication facility in the char areas. In the present study an attempt has been made to examine the sources of cooking-fuel used by the sample households and found that 98.64 per cent of the sample households in the char areas of Barpeta district use cow-dung, fuel-wood, paddy straw and jute sticks as cooking fuel.

TABLE VIII: ANNUAL INCOME OF THE SAMPLE HOUSEHOLDS

Income Level (Rs.)	Sample Households	
	Nos.	%
0-20,000	46	20.91
20,000-40,000	94	42.73
40,000-60,000	36	16.36
60,000-100,000	34	15.45
100,000-200,000	7	3.18
200,000-300,000	3	1.36
Total	220	100

Source: Field study data

The present study has also examined the household income level which is presented in the Table-VIII and found that majority of the households annual income in the last year are Rs.20,000–40,000. Therefore, the economic condition of the sample households in the study area is poor, which results in low level of saving. There is also lack of financial institutions to mobilize saving and provide loans to the needy customers. In the study, it is found that 20 per cent of the households borrowed money from the relatives, moneylenders and locally formed society.

The present study has also examined the standard of the basic amenities available to the sample households in the study area because it has an impact on the standard of living of the people living in the char areas. The distribution of level of satisfaction expressed by the sample respondents on basic amenities is presented in the Table IX.

TABLE IX: LEVEL OF SATISFACTION ON BASIC AMENITIES

Level of Satisfaction	Sample Households	
	Nos.	%
Sufficient	20	9.09
Barely sufficient	18	8.18
Insufficient	182	82.73
Total	220	100

Source: Field study data

It is observed in the *char* areas of Barpeta district that the level of basic amenities available to 9.09 per cent of the sample respondents is sufficient; the basic amenities available to 8.18 per cent of the sample respondents is barely sufficient and 82.73 per cent of the sample respondents felt that the level of basic amenities available to them is insufficient. Thus, it is realized that if the sample respondents feeling insufficient and barely sufficient about the basic amenities available to them taken together, then the majority of the sample households are found to be living in a very poor condition.

According to the "Socio-Economic Survey Report 2002-2003 of Char Areas of Assam", Directorate of Char Areas Development Assam, there is high rate of poverty in the sample villages and also the entire char areas of Barpeta district, which is presented in the following Table-X. It is found that most of the households are suffering from poverty and thus, living a very poor standard of living.

TABLE X: HOUSEHOLDS LIVING BELOW POVERTY LINE

Sample Villages	Total Households (Nos.)	Households below Poverty Line (Nos.)	Households below Poverty Line (%)
Kismat Moinbori	378	260	68.78
Bhagmara Char No.1	387	263	67.96
Kalairdia	350	238	68
Major Char No.2	338	233	68.93
Alopati Char No.3	636	394	61.95

Thus, from the study it is found that majority of the sample households have a large sized nuclear family, educational standard is very poor and there is very low rate of literacy in the char areas of Barpeta district. The sample households in the study area are suffering from natural calamities, especially from flood every year, which affects the people living in the char areas adversely. There is lack of various facilities in the char areas and thus, the people living in the char areas are living a very poor standard of living.

V. CONCLUSION

The char areas of Assam have a significant role to play in the path of economic development in the state. These areas have been an important contributor to the socio economic life of the state. Around 95 per cent of people of char areas are cultivators but spend their lives in a distressed condition due to lack of modern transport system, education, alternative job opportunities, medical facility and other essential facilities, (Mahmud, S. *et al.* 2005) [7]. The physical vulnerability is seen as the root cause of this backwardness for which developmental effort always gets a back seat in these areas. The people in char areas are deprived of many basic amenities of modern living. Most of them drink contaminated water both by taking contaminated floods water, walk bare-footed on damp soil containing hook-worm and spent most of the time in unclean and unhygienic environment. The foremost obstacle of the people is communication barrier. The level of living standard of the *char* people is very low. The recurring flood destroys houses and sheltering places and also the land for cultivation, (Ahmed, M.H. and Latif, A. 2012) [8].

Agriculture is the major source of livelihood of the *char* dwellers. The cultivators have to engage themselves under adverse conditions in order to reap the benefit of their toil. Most of the cultivators are marginal and landless and untrained in agricultural practices, (Ahmed, H.A. 2010) [9]. Despite a higher cropping intensity and a diversified crop profile, the cultivators in the *char* areas are mostly poor. Skewed land ownership pattern, recurrent threat of flood and accompanying erosion, problems of sand casting, lack of agricultural extension programmes, non-availability of input support, weak marketing linkages, poor transport and communication along with various other factors acts as constraints in the process of earning remunerative price, stable income and sustained livelihood for these people. It is due to these reasons that the *char* dwellers are overwhelmingly poor, (Chakraborty, G. 2009) [10].

There is lack of alternative sources of livelihood in the char areas. Though some of the households involved in production of fish, livestock and poultry farming but there is lack of commercialization of these alternative sources of income. The members of a large no. of sample households in char areas use to migrate to some nearby places in seeking of works such as agricultural labour, construction work, daily wage labour, etc.

The literacy rate is very poor in the char areas of Assam is very poor. There are inadequate educational institutions in the study area and the infrastructure of the existing educational institutions is very poor. The economic condition of most of the households in the char areas is also poor. Problem of mass poverty and unemployment is a common phenomenon in most of the sample char areas of Assam. Most of the poverty stricken households have large sized family. There is still early marriage system prevailing resulting in high growth of population.

Lack of organized marketing, cold storage houses, irrigation, banking, and social and economics infrastructural facilities and suffering from natural calamities like heavy flood frequently and river-bank erosion hinders the economic growth of these areas.

VI. POLICY IMPLICATION

From the results of the present study following policies may be drawn for the socio-economic upliftment of the char areas of Assam.

The government should improve the quality of infrastructure of the existing educational institutions and should also set up more educational institutions to provide adequate educational facilities in the char areas. There is also need of awareness programmes among the people about the role and importance of education in human life.

There is need of setting up of more health-care units in the char areas. Therefore, the government should set up more health-care units such as Primary Health Centre (PHC), Dispensary, Sub-Centre and also Hospitals having all kind of facilities for the treatment in the char areas of Assam. The adequate measures should be taken for the improvement of the infrastructure and other facilities in the existing health-care units in the char areas.

The government should also take proper and adequate measures for the development of the infrastructural facilities, road connectivity, and construction of bridges if possible to establish a direct connectivity between the char areas and the mainland areas, transforming the *Kuccha* road into *Pucca* road in the char areas. There is also need of increase in no. of modern motor boat with all safety measures in the char areas, which is the only means of communication and transportation in between char areas and main-land areas.

The government should take adequate measures such as supplying good quality HYV seeds, fertilizers, and modern tools of agricultural practices, providing training to the farmers, making availability of irrigation facility for the improvement of productivity of agriculture sector. The financial institutions should extend their services in the char areas for mobilizing resources and also to provide agricultural loan to the needy farmers. There is need of introduction of organized marketing and setting up of few cold storage houses to store the surplus agricultural produce in the char areas. Establishing agri-clinics, input supply mechanisms, crop insurance programmes, trainings on modern technology can lead to a high growth of agricultural sector in these areas.

There is need of generating alternative sources of livelihood, which will reduce unemployment in the char areas, the government should encourage setting up of cottage and village industries by providing training, subsidized loan facility to the educated unemployed youths and also girls in the char areas and should also take initiatives for selling the products of these industries in different markets. The government should encourage the educated unemployed for the self-employment by setting up of dairy farming, poultry farming, livestock production, etc. and in this regard the government should also provide training facility and also subsidized loan to those who will set up such farm houses. There is need of taking initiatives by the government and also by the private sector enterprises for marketing of products of cottage and village industries.

The government should take scientific measures to control flood and river-bank erosion in the char areas. The government may also take scientific measures for diverting the flow of river and should also reduce the height of bed of river to control the flood and river-bank erosion in the char areas. The government should have special developmental schemes and implement them efficiently for the overall benefit of the char areas of Assam.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

AUTHOR CONTRIBUTION

Hoque conducted the research, collected the data and both Hoque and Hazarika analyzed the data and wrote the paper. Both authors had approved the final version.

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