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## Migration-A genesis to ecological conflict: The case of river islands adjacent to burhachapori wildlife sanctuary

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### Abstract

The mighty Brahmaputra of Assam is a braided river. It carries a huge amount of sand from upstream which gets deposited on its beds. Almond-shaped River islands are formed out of these alluvium deposits which are locally known as *chars* or *tapus* and are home to many wild animals and birds. The vast areas of arable and fertile lands of the chars of Brahmaputra attract marginal and landless people, mainly the migrant Muslim people of East Bengal origin, from various parts of the state. These poor and marginal people settle on the *tapus* and with the passage of time creates ecological imbalances in the chars. This paper basically is an investigation of the migration to the chars of river Brahmaputra near Burhachapori Wildlife Sanctuary under Nagaon Wildlife Division of Assam. Through a primary survey, the study aims to identify the source areas of migration and also to delineate the factors responsible for their migration decision. The study finds that the human settlement on the *tapus* breaks out a multi-dimensional conflict between the migrants and the wild animals as well as between migrants and forest managers and local khuti dwellers.

**Keywords:** char, migrants, *tapu*, *khuti*, ecological imbalance, *matabbar*

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### Introduction

The developing countries, of late, are facing a much more challenging issue of management of natural resources. We have been witnessing violent conflicts around the world which are triggered by the exploitation of high-value and non-renewable resources. Moreover, increasing competition for diminishing natural resources such as land, forests and water, etc., that are used by both humans and wildlife, has also been soaring culminating in conflicts among different stakeholders including wild animals. Such conflicts may be termed ecological or human-wildlife conflict which refers to any instance in which the resource demands of humans and wild animals overlap, spurring competition for food, space, and water and thus creating tension between people and wildlife (Peterson, *et al.*, 2010, Woodroffe, *et al.*, 2005) <sup>[11, 17]</sup>. These conflicts involve local communities against a local government because of the poor state of the natural environment protection system of the local government and the neglect of the issue by the politicians (Kurek, 2001) <sup>[8]</sup>. Sabadash and Denysenko (2019) <sup>[14]</sup> attribute scarcity of natural resources, their uneven distribution and unequal access as well as unfavourable economic, social and cultural-historic factors to be the underlying cause of ecological conflict. In other words, the ecological conflict arises from divergent expectations from the ecology by various stakeholders. In particular, society's expectations can sometimes conflict with forest expectations in terms of ecology or economy. The ever-increasing human population has raised the demand for natural resources (Boon, 2011) <sup>[1]</sup> and thus, public access to a forest or forest area may be facilitated to the detriment of biodiversity preservation. Therefore, large-scale land acquisition in the forested areas by the ever-increasing population for the production of basic necessities leads to accelerated ecological conflict (Pichler and Brad, 2016) <sup>[12]</sup>.

The ecological or human-wildlife conflict is often the physical expression of socio-political human-human conflict (Matema and Andersson, 2015; Dunnink *et al.*, 2020) <sup>[9, 4]</sup>. The issue is now of global conservation concern (Gusset *et al.*, 2009). The crop raid by herbivores or livestock depredation by carnivores results in substantial damage to human livelihoods and sometimes lives of both humans and wildlife (Pillai and Pillay, 2017; Jeffrey *et al.*, 2020) <sup>[15, 6]</sup>. Thus, in a world of shrinking habitats, we have been noticing an untoward and increasing competition and conflict for diminishing natural resources among human beings and wildlife (Pooley *et al.*, 2017) <sup>[13]</sup>. As a result, human-dominated landscapes have intensified natural habitat degradation and fragmentation, and wildlife populations are now in regular competition with human people for resources, thus eliciting human-wildlife conflict (Pillai and Pillay, 2017) <sup>[15]</sup>. This is further aggravated by environmental degradation, population growth, and climate change. The mismanagement of land and natural resources is contributing to new conflicts and obstructing the peaceful resolution of existing ones.

Human-Wildlife Conflict or Environmental Conflict or Ecological Conflict is a global issue afflicting both developing and developed countries which are resulted from degradation caused by human activity or mismanagement (Dokken and Graeger, 1995; Mekonen, 2020) <sup>[3, 10]</sup>. Characteristics of HWC incidences depend

upon the types of wildlife in the region and the farming practices that are typical for that area (Pillai and Pillay, 2017) <sup>[15]</sup>. Developing countries experience a wide variety of conflicts with wildlife such as regular crop-raiding by mega-herbivores, livestock depredation by tigers, etc.

The Brahmaputra is an extremely braided river. An enormous volume of sand and silt flow with the water and get deposited on river banks and the river beds. Almond-shaped River islands are formed out of these alluvial deposits (Chakraborty, 2012) <sup>[2]</sup>. Thus, the Brahmaputra and its tributaries of Assam are replete with numerous sandbars, locally called chars. People migrating and settling down in most of these chars in order to undertake agricultural activities are quite common in Assam. One estimate shows that chars are home to nearly 10 percent population of Assam. Damaged by recurrent floods and soil erosion, chars are generally impermanent structures where migrant Muslim people of East Bengal origin generally live (Kumar & Das, 2019) <sup>[7]</sup>. Devoid of the very fundamental infrastructure these char dwellers live an extremely precarious life. The migration has a long history and to cut it short it was patronized by the British and was also encouraged by the local Zamindars, especially in Goalpara, in order to generate and maximize land revenue.

There is a dearth of studies on char areas of Assam and its inhabitants and therefore the short and long-run implications of such human settlement on the ecology of the river, water, and forests are not known. Thus, the present paper attempts to explain the migration of the human population into the river islands of Burhachapori Wildlife Sanctuary of Assam in North East India as an intrusion hindering the natural movement of wildlife from one forest area to the other. The broad objectives of the paper are to:

- Study the sources and extent of human immigration prevalent in the river islands of Brahmaputra adjoining the Burhachapori WLS.
- Analyse the anthropogenic activities operating in these islands and assess the existence of conflicts arising from these anthropogenic activities.
- Suggest strategies for mitigating the socio-ecological conflicts.

## Material and Methods

### 1. Study area

#### 1.1 Brief background of Burhachapori Wildlife Sanctuary

The Burhachapori Wildlife Sanctuary (BWLS) under Nagaon Wildlife Division located in Central Assam district of Sonitpur of North East India covers an area of 44 sq km in the flood plain of the mighty river the Brahmaputra. Burhachapori was originally a professional grazing reserve and was declared wildlife Sanctuaries in the year 1996. The sanctuary is ideal habitat for various key species of plants, reptiles, birds and endangered mammals like Rhino, Wild Pig, Buffalo, Royal Bengal Tiger, Elephants, and Bengal Florican, etc. The natural and perennial wetlands here have been functioning as the breeding ground for various fish species that attract a large number of avifauna (both endemic and migratory) to the sanctuary and is one of the prime attractions to tourists. Though Burhachapori Wildlife Sanctuary is very strategically located between Kaziranga (towards East) and Orang (towards North West) National Parks, the sanctuary is highly degraded despite its protected area status. The degradation of the forest ecosystem of the sanctuary started during the early part of the eighties in the twentieth century (Sivakumar *et al.*, 2013) <sup>[16]</sup>. The world-famous one-horned rhino met its unfortunate fate of local extinction in both Burhachapori and adjoining Laokhowa Wildlife Sanctuaries due to the poaching of 35 rhinos in 1983 by the vandalistic gunners which compelled other rhinos to flee. It heralded an ominous beginning of exertion of huge anthropogenic pressures in the form of relentless and ruthless cutting of trees, illegal collection of fuelwoods, and other NTFPs, such as construction materials, fish, simul cotton pods, etc. Massive unregulated domestic (non-inoculated) cattle grazing, destructive fishing, trapping of birds for consumption, etc. by the resource-poor peripheral people are very pervasive. A part of the massive pressure came from the human population migrating and residing on the river islands, popularly known as the *chars* or *tapus* of the mighty Brahmaputra River which is part of the BWLS. Consequently, it led to wanton destruction and depletion of the floral and faunal diversity from the once rich forest ecosystems of BWLSs. As a result, the bio-diverse sanctuary has been metamorphosed into beleaguered scrubs languishing for survival.

#### 1.2 The river islands

The study has been carried out in the river islands, i.e., *chars* or *tapus*, of the mighty Brahmaputra River flowing North of Burhachapori Wildlife Sanctuary. The river islands act both as temporary habitats and migratory corridors for the wild animals between Kaziranga and Orang National Park. Hence, understanding the degree of unwanted pressures put into the sanctuary by the immigrants residing in the river islands is of utmost importance for designing a meticulous strategy for restoring its past glory. Also, it is extremely necessary to know where and why such a huge population has been attracted and settled in these river islands despite the absence of the basic infrastructure for a decent life.

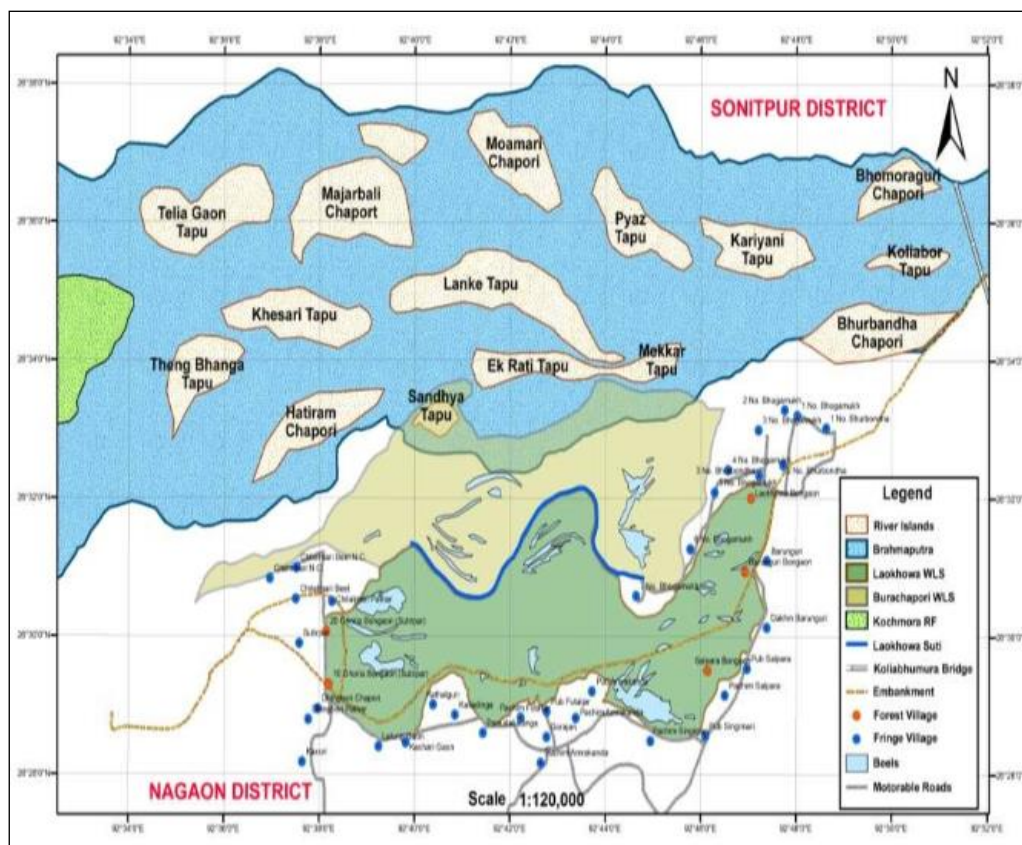
A detailed investigation was conducted in 15 river islands of Brahmaputra starting from Kaliabhomora Bridge near Tezpur to Singri Hill, near Dhekiajuli towards North of Brahmaputra. The GPS was used during the survey in order to locate the river islands and to construct map by using GIS technology. The islands studied are presented in Table 1.

**Table 1:** List of the river islands studied

Sl no	Name of the river islands	Area (sq km)	Habitation status	Total households
1	Bhomoraguri Chapori	2.64	Uninhabited	
2	Koliabar Tapu	1.11	Inhabited*	10
3	Bhurbandha Chapori	5.23	Inhabited	800
4	Kariyoni Tapu	4.34	Uninhabited	
5	Pyaj Tapu	4.19	Uninhabited	
6	Mekkar Tapu	3.98	Inhabited	1100
7	Ek rati Tapu			
8	Lanke Tapu	9.14	Inhabited	1300
9	Moamari Chapori	5.56	Uninhabited	
10	Sandhya Tapu	1.07	Inhabited	300
11	Hatiram Chapori	4.46	Inhabited	50
12	Khesari Tapu	9.12	Inhabited	1600
13	Theng Bhanga Tapu.			
14	Majbali Tapu	10.72	Inhabited*	
15	Teliagaon Tapu	7.43	Inhabited*	

\*Khuti settlement.

Out of fifteen chars studied eleven *chars* are found to be inhabited by human population. Besides human habitation, Kaliabar, Majbali and Teliagaon *tapu* records the presence of a large number of *khuti* (cattle camp) consisting of huge number of cattle and buffalo population reared primarily for exporting to other parts of the state and country. The fertile lands of these *chars* are utilized for growing large-scale agricultural products of various kinds and sent to markets such as Chullung, Dhing, Sutipar, Nagaon, etc. to fetch a better market price. The inhabitants of the *chars* are also engaged (both legally and illegally) in large-scale fishing activities in the river. Both these activities are carried out by the migrant people round the year as their livelihood activities. The location of the *tapus* have been presented in Figure 1.

**Fig 1:** Map of the river islands studied

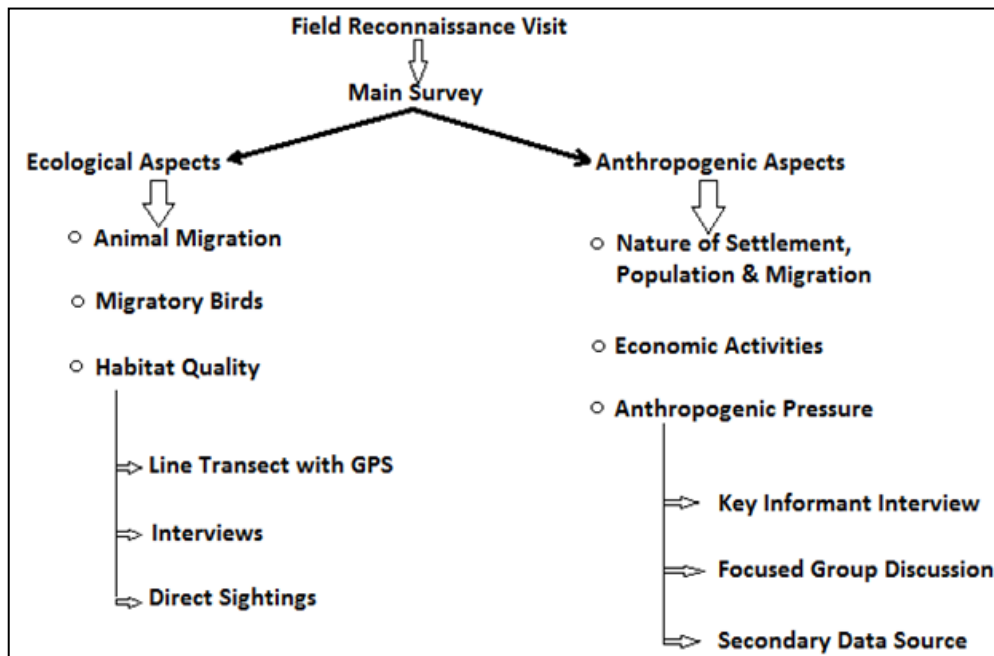
#### Ecological significance of the *chars/tapu*

The Burhachapori Wildlife Sanctuary and the adjacent river islands are crucially located between the Kaziranga National Park and Tiger Reserve and Orang National Park. It, thus, acts as a safe corridor for animals migrating between the two national parks. Moreover, the islands themselves offer ideal habitats for a range of flora and fauna of the region. During the transect walk pug marks of Royal Bengal Tiger, and hoof or footmarks of

animals like Deer, Otter, and elephants were found. River Dolphin, Asiatic Water Buffalo, various types of birds (both endemic and migratory), and snakes were also observed in both the water and the islands during the transect walk. Moreover, the locals reported during the FGD of having sighted the endangered Bengal Florican besides deer, elephants, buffalo, snakes, etc. A large number of domestic cattle killed or lifted by the Royal Bengal Tiger were also reported during the FGD. Thus, these islands of Brahmaputra are found to have immense ecological significance as a migratory river corridor for wild animals.

## 2. Methods

Figure 2 describes the methodology administered for the study.



**Fig 2:** Methodological framework

A reconnaissance visit was conducted for selecting the islands to be studied followed by the main survey. Two aspects, namely, ecological and anthropogenic aspects were studied. Animal migration, migratory birds and habitat quality were documented in ecological aspects while nature of the settlement, population and migration, economic activities and anthropogenic pressures were studied in the anthropogenic aspects. For this purpose, a number of Participatory Rural Appraisal tools were administered (Figure 2) in conducting and eliciting the required information on the ecological conflict. PRA tools such as key informant interview, Focus Group Discussion (FGD), line transect walk and direct observation were of tremendous help for eliciting the conflict data.

The paper, thus, is based mainly on the primary data. The only secondary data regarding the wildlife sanctuary and its habitat has been elicited from the Management Plan of the Burhachapori Wildlife Sanctuary. Data, so collected are analyzed using GIS and Remote Sensing techniques.

## Results and Discussion

### 1. Factors of migration

The process of inhabitation in *chars* is intimately linked to the history of British rule in Assam. Migration of peasants from East Bengal started in the late nineteenth century and picked up in the early twentieth century, especially after 1905 when Bengal was partitioned and Assam was merged with East Bengal. The settlement of these migrants fulfills the very basic principle of the British to maximize land revenue. However, the situation has changed over the years and the *chars* now confront the problems of huge local migration. A study by Kumar and Das (2019) <sup>[7]</sup> reports six factors, namely erosion, household size, job opportunities at the site of immigration, dependency ratio, and location of the households, to be the most dominant for such migration to char areas. For the sake of simplification, we have classified the factors contributing to such local migration under two broad heads i) the push and ii) the pull factors.

#### 1.1 Push factors of migration

The factors which compel the people of one region to migrate to another region are termed push factors. In the context of the study area, high population growth, limited livelihood opportunities, limited skills to qualify to be absorbed in secondary and tertiary sectors of the economy, and natural hazards such as soil (riverbank of the mighty Brahmaputra) erosion are found to be the dominant push factors of local migration. Located at the margin of the margin, the villages have registered a lackluster record of human population among the migrants.

Thus, out of all the factors mentioned above, the rapid growth of the population can be termed as one of the most important and leading factors of migration in the context of the study area, which is corroborated by the high fertility rate and large household size (Kumar and Das, 2019) <sup>[7]</sup>.

### 1.2 Pull factors of migration

On the other hand, the main pull factors found during the study are vast tracts of uninhabited arable lands, lack of implementation of land regulations, family linkages, and easy availability of government schemes. Broadly speaking, it appears that land is a very important determinant which attracts a large population into a particular char. Kumar and Das (2019) <sup>[7]</sup>, in this regard, claim it to be very normal since most of the char residents are petty peasants, who are desperately dependent on the land for their livelihood.

An interesting story of the land transaction came out during the Participatory Rural Appraisal (PRA) exercise. The story goes with a *matabbar*, a self-proclaimed leader, who is the primary agent of land transactions in the *chars*. The *matabbar* is a person who migrates clandestinely from a nearby revenue village and settles down in the interiors of an un-inhabited *char* in order to grab a vast tract of fertile arable land. He starts growing agricultural products near the channels of the Brahmaputra and uses it as a ‘demonstration plot’ and invites other landless farmers to see how productive the lands of the *chars* are. Once seen by his own eyes, the farmer gets convinced and expresses his willingness to purchase land. Thus, the *matabbar* sells land which he doesn’t own. One plot of land consists of 8 bighas termed locally as a *Sam* and is sold the entire *Sam* at around Rs 20 – 30 thousand. Once, the story gets mouth publicity lot of other farmers, having family linkages, come and purchase lands and settle down. Not only the people from the nearby villages but also from other distant districts like Dhuburi, Goalpara, Barpeta, Marigaon come and settle here.

## 2. Sources of migration

Historically, these immigrants were brought from the then East Bengal in the late nineteenth century after the partition of Bengal. The state witnessed a huge influx since then and especially during the late twenties and thirties, in the guise of the “Grow more food” campaign. However, migration has changed its face, of late. Most of the *char* dwellers in the study areas are from different parts of the state and the majority are from the nearby villages located on the south banks of the mighty Brahmaputra and especially in the fringe of both Laokhowa and Burhachapori Wildlife Sanctuaries. Thus, migration here is evolved to be an inter-district and local phenomenon.

### 2.1 Inter-district migration

The study area attracts a huge number of poor people from various other districts of the state. Besides Nagaon, the other districts from where the poor people congregate in these *chars* are Dhuburi, Goalpara, Bangaigaon, Barpeta, Marigaon, Sonitpur and Darrang. Upon enquiring most of such migrants are found to be a flood and erosion-affected landless people. Figure 3 shows graphically the source districts of the state from where the people migrate to the river islands of Burhachapori Wildlife Sanctuary.

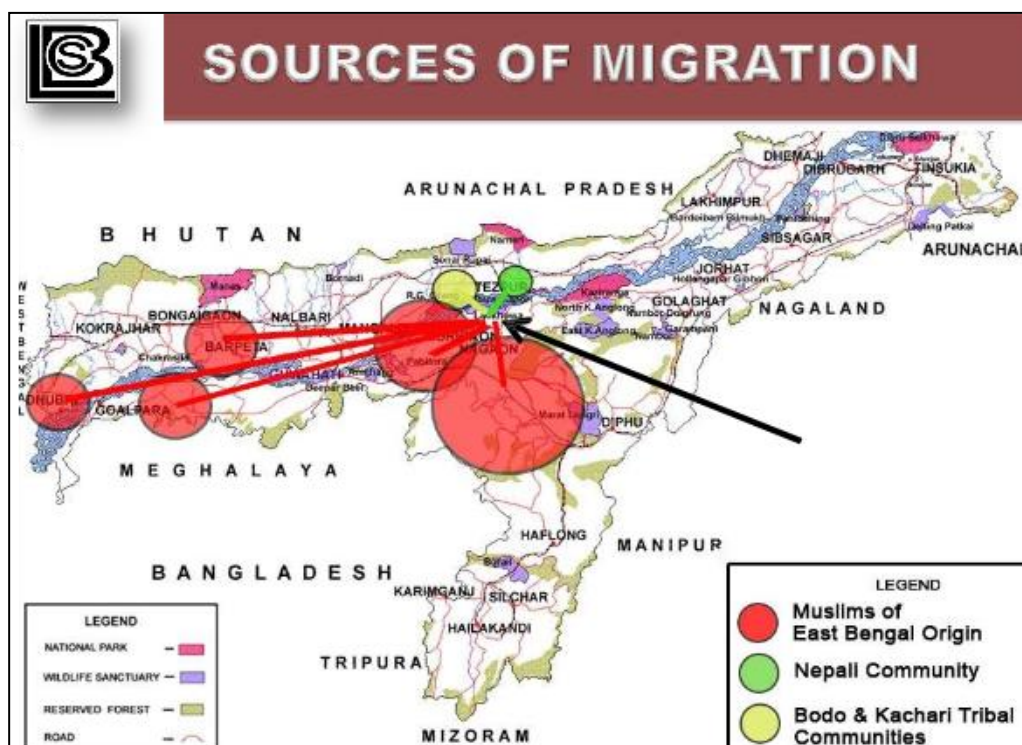


Fig 3: Source districts from where the people migrate to Burhachapori islands

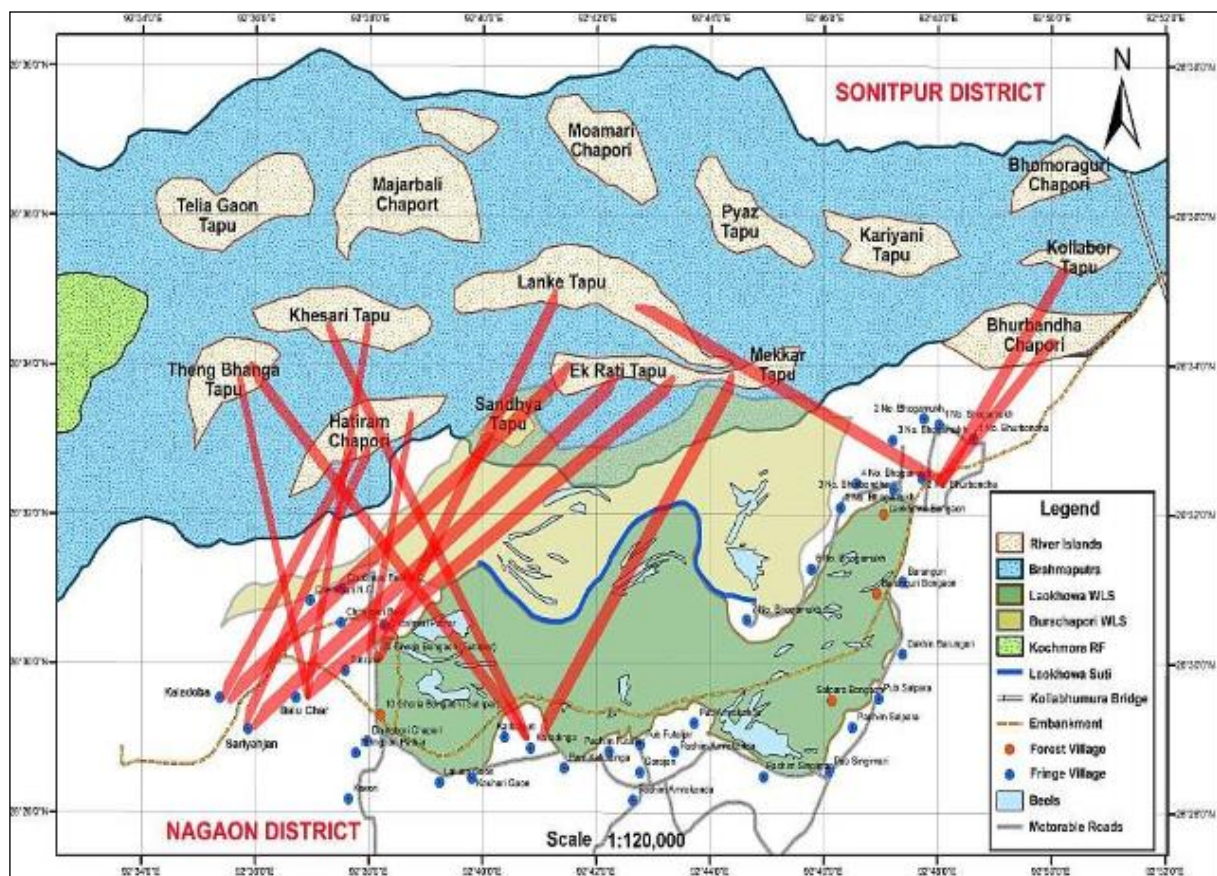
**Box 1: Case of Jamsher Hussain**

**The case of Jamsher Hussain:** During the PRA exercise one Mr Jamsher Hussain disclosed that he came here in 2012 from Dhuburi district in search of his younger brother who was missing for some years then. “I was informed that my brother was living here and I came to meet him. When I met him, he was living here as an agricultural labourer. My mother was sick and she wanted to see him and hence I convinced him to go home. However, looking into the vast area of fertile and arable land here, I stayed back. After a couple of years, I brought my wife and children too to live along with me. I purchased some land and somehow got hold of some more later. Since then, I have been undertaking agriculture and growing various crops round the year such as rice, jute, pulse, and different kinds of green vegetables.”

**2.2 Local migration**

The villages located on the south bank of Brahmaputra and especially in the fringe of Laokhowa and Burhachapori Wildlife Sanctuaries are extremely populous. The low educational attainment of the people of these villages has circumscribed them into unskilled laborers. There is little demand for such unskilled laborers which are in abundance in the locality and hence they are compelled to migrate out of their villages. The high fertility rate among the villagers has contributed to the soaring population culminating in an extremely low land-man ratio. Though some of the youths move out of the state to places like Bangaluru, Kerala, Hyderabad, Mumbai, etc. a substantial portion of the village migrants also move to the nearby *chars* in order to grab the unclaimed land and sometimes by purchasing land through *matabbar*.

It is apparent from Figure 4 that the fringe villages of Burhachapori and Laokhowa Wildlife Sanctuary, which is adjacent to Burhachapori, are the primary source of migration to the river islands of Burhachapori WLS. The villages from where people settle in the *chars* are Sariyohjan, Balu Char, Kaliadinga, Kathalguri, Dhingbori Chapori, Kaladoba, Bhurbandha, etc.



**Fig 4: Source villages of migration**

Systems of child marriage and polygamy are very much prevalent in the fringe villages due to lack of scientific education (39% according to the 2011 census) which are primarily responsible for the rapid growth of the

population. Agriculture, fishing, and agricultural laborer and wage-earning are their prime livelihood activities. The surplus populations are compelled to move out of their villages and some of them try and grab the unclaimed land of the river islands illegally and sometimes by paying only a nominal price. Such land grabbing and settlement, unfortunately, also receive political patronage sometimes.

### 3. Nature of conflict

#### 3.1 Conflict with *khuti* (cattle camp) dwellers

A few of the *chars* are inhabited by people who keep a large herd of cattle and buffalo. The *chars* as well as the adjacent Burhachapori WLS act as grazing ground for those large herds. Thus, land grabbing by these *khuti* (cattle camp) dwellers is not unusual leading to the shrinking of grazing ground for the wild ungulates of the sanctuaries culminating in an unwanted competition for fodder. In this process, the possibility of carrying diseases by the wild animals is also quite high.

However, the *khuti* dwellers regard themselves as friends of the forest since they report to the forest officials any kind of illegal happenings inside the forest. The migrants of the *chars* see the *khuti* dwellers as a threat as the *khuti* dwellers are suspected of passing information of illegal activities to the forest department and hence, theft and poisoning of *khuti* cattle by the migrants are quite common. The conflict, thus, was found to be multi-dimensional involving local forest management of Burhachapori WLS, *Khuti* dwellers, and the migrants of the *chars*.

#### 3.2 Conflict with the forest department

The population of the migrants increases rapidly due to the high fertility rate and practice of polygamy and they start putting immense pressure on the forests. Encroaching forest land, poaching of wild animals of Laokhowa and Burhachapori WLSs, huge non-timber-forest products (NTFP) collection, poisoning of large water bodies of the sanctuaries for catching fish (since they are not allowed to indulge in illegal fishing inside the forests) are some of the major anthropogenic pressures the migrants put on the forest. Besides, the construction of houses by the immigrants in the midst of the *tapus* delinks the habitat of the wild animals by disrupting the animal movement through the natural corridor.

#### 3.3 Intra-community conflict

Raising of new *chars* (river islands) and destruction of old ones are very common in the mighty river the Brahmaputra. Thus, the creation of *chars* is said to be mostly a temporary phenomenon. Therefore, high population growth and erosion of the existing *chars* compel the inhabitants to migrate to the nearby *chars*. The land-man ratio goes down. The land mafias or *matabbars* take advantage of the situation and sell unclaimed land. This creates intra-community tension resulting in conflict between the old and new migrants.

#### 3.4 Ecological conflict

All the conflicts discussed above culminate into an ecological conflict. Plying of large numbers of motorized country boats on a regular basis, which is the only mode of connecting with the mainland markets, for transporting goods and human population; indiscriminate cutting of thatch and other tree species for agriculture and construction of houses and thereby clearing the natural habitat of the wild animals are two major negative impacts of migration into the char areas. Both these activities delink the habitat of the wildlife and most importantly the animal corridors between Orang and Kaziranga National parks restricting severely the smooth movement of the wild animals between the two parks. The anthropogenic pressures, thus, put on the habitats and corridors are responsible for the extinction of various floras and faunas. The grassland here is one of the important habitats of the endangered 'Bengal florican' which, ironically, is locally extinct now due to habitat degradation. The movement of the endangered 'river dolphin' has been significantly restricted due to growing anthropogenic disturbances, due to plying of a large number of country boats, that have severely degraded the river ecology too.

### Conclusion and recommendation

Ecological conflict or human-wildlife conflict is one of the most pressing issues of the present. The nature of conflict in the river islands or *chars* is different from that of the land. In low-income rural sets up humans are disproportionately affected by a negative interaction with large predators which often leads to retaliatory killings and persecution of the animals. However, in the case of the char areas, the conflict leads to degradation of the river ecology and also affects severely the population of the water animals and grassland birds besides restricting primarily the movement of the large animals, such as tiger and rhinoceros, etc., between important habitats, for e.g., in case of the present study between Kaziranga and Orang National Parks. Therefore, conflict resolution should be the primary objective of the concerned management. Conflict resolution refers to short-term and often immediate environmental diplomacy measures that are aimed at preventing or containing the imminent escalation of a conflict.

In the case of the ecological conflict that has been discussed in the perspective of Burhachapori Wildlife Sanctuary, the following measures could be suggested for the prevention of the conflict.

- a. **Securing the area by assigning property rights to the BWLS management:** The study area, since regarded as an important corridor for the movement of the wild animals between Kaziranga and Orang

National Parks, need to be secured by adding it as a part of the Burhachapori Wildlife Sanctuary. The addition would entrust the management with utmost authority to contain all kinds of illegal activities under its jurisdiction. The absence of anthropogenic pressures would give a much-needed boost to revive the habitat and the corridor.

- b. **Eviction of the illegal settlers:** Scientific documentation and studies need to be undertaken in order to understand the issues of conflict. However, identification and eviction of the illegal settlers from the sanctuary areas needs to be carried out immediately.

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