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**Research Article**

# Rehabilitation Within Buxa Tiger Reserve: A Case Study

Dr. Mili Acharya[1*]

[1*]Assistant Professor (Geography), Netaji Mahavidyalaya, Arambagh, Hooghly, West Bengal, India

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**ABSTRACT**

Man-environment relationship is interdependent. From the beginning of our civilization we can see the coexistence of human habitation and wildlife at the same place. But with the passing time the relationship become an issue of conflict between human and wildlife coexistence.

Present study is conducted in the Jayanti village in the core area of Buxa Tiger Reserve that deals with the preference of wild animals over human existence. The village is now considered for rehabilitation as it is under the core area of BTR. BTR is declared as tiger reserve from the year 1983 and the village is come under the core area of BTR since then. But the habitation was existed there for more than 80 years as there was dolomite mine and also rail communication since 1957. Now it is the issue of the present inhabitants who lived there from their ancestors that they have to rehabilitate and have to settle in a new place. Now, here the conflict comes as a preference of nature over human existence. Environmental impact on them in both ways physical as well as social is interpreted here.

**Key-words:** BTR (Buxa Tiger Reserve), relocation, rehabilitation, environmental impact

## INTRODUCTION

The Buxa Tiger Reserve is located in Alipurduar district, West Bengal. It covers an area of about 760 sq. Km with a core area of 385 sq. Km and a buffer zone 375sq.km. The reserve lies between the latitudes of 26°30' N and 26°55'N and longitude 89°20' E to 89°55'E. The reserve stated about 50 kms in length from East to West and 35 kms from North to South. It is located in the confluence of 3 major Bio-Geographic zones – Lower Gangetic plain, Central Himalaya and Brahmaputra valley. It is a very rich biodiversity zone.

Since 1940, forest villages settled in forest to supply mainly labour for timber operation, plantation and tending operation. Employment was also generated for dolomite mining, boulder collection and MGNREGS. Many people come from Bihar, Odissa, Nepal and surrounding places and settled down. There were also railway lines which connect Jainty to Siliguri. After declaration of Tiger Reserve, such operation has stopped and they faced unemployment.

Again, according to the Forest Act, villages within the core area should be relocated to give disturbance free wildlife zone. According to the report of Forest Department, relocation is adopted for 15 villages within BTR since 1983. But only two villages have relocated ( Bhutiabasti, Gangutia) till now. The aspects is relatively different for the villages to be relocated because, some of the villages are forest village like BhutiaBasti , on the other hand some with FD holding and century old village like Jayanti.

## OBJECTIVE

### The main objectives of the study are

- To understand the co-existence of wild animals and human in BTR
- To understand the necessity of relocation of the villages
- To understand the impact of relocation on the villagers

## METHODOLOGY

The present study involves both primary data collection from the field as as well as secondary data collected from various offices. Questionnaire is made for collecting information from the inhabitants and also interprets their views in the form of environmental impact assessment.

## FORMATION OF BTR

The Buxa forest formed over an area of 758.78sq. kms vide Government of India's Notification No. J-11025/18/B/FRY (PT) dated 16.02.1983. Subsequently 2.09 Sq. kms resumed tea garden forest land was transformed by the district magistrate, Jalpaiguri, in 1989. Thus total area of Buxa Tiger Reserve becomes 760.87Sq.kms. The forest becomes a Tiger Reserve in 1983. Again in 1986 an area of 314.52 Sq. Kms was declared as Buxa Wildlife Sanctuary. In 1997, an area of 117.10 Sq. Kms of Sanctuary was notified as National Park.

Further 459.13 Sq. Kms area has been notified as Critical Tiger Habitat of Buxa Tiger Reserve vide Notification No. 6027-For dated 18.12.2007 where some buffer areas came under Critical Tiger Habitat Zone and some core areas were de-notified.

## Status Area in sq.km

1. Buxa National Park 117.23
2. Buxa Wildlife Sanctuary + Reserve Forest 300.32

**Total 417.5**

## LEGAL BOUNDARIES

The core area stretches from the western most boundary of the Tiger Reserve bordering Pana range of BTR to the eastern most boundaries fringing the state of Assam. The eastern boundary is demarcated by Sankosh River and western boundary is fringed by Tea Estate. The Reserve is demarcated on the north by the International boundary of Bhutan. The southern boundary is mainly fringed by the agricultural fields and different Tea Estates and the National Highway (NH-31/c) running east-west.

## ECOLOGICAL BOUNDARIES

The ecological boundary of this region is demarcated by the continuous distribution and ranging of wild animals e.g. Elephants, Tigers and Gaurs in the Reserve and in its vicinity, it is seen that the ecological boundary in the north extends within Bhutan across the Indo-Bhutan border. In the south-west the ecological boundary extends upto Chilapata Range and Jaldapara National Park of wildlife III Division. In the south, the ecological boundary coincides with legal boundary as there is no natural habitats further south . The eastern boundary of the Reserve demarcated by Sankosh River and it again extends upto Manas Tiger Reserve in Assam and some extends upto phipsu Wildlife Sanctuary in Bhutan.

## GEOLOGY

The Buxa Tiger Reserve is situated st the foothills of the Himalayan Range. It consists of the Himalayan Formation of Darjeeling Gneiss at an altitude of 1800 mt. the Great Boundary Fault (Gondwana) lies just south of it followed by stimulences of Siwalik hills.

## TERRAIN

The Reserve is mainly situated in Bhabar and Terai areas consisting of slightly undulating land with a general inclination from North to South. It extends in some places into the outer range of Himalayas and reaches an elevation of 1800 mt. the hilly tracts are steep and precipitous. The forest of this Reserve is intersected by numerous rivers originating both from hills and plains with a general flow from North to South.

## CLIMATE

The area lies in the moist tropical zone. The average temperature varies from 12°C-21°C from November to February and between 27°C-32°C from May to September and between 24°C-27°C for the rest of the month.

The Reserve receives maximum rainfall from mid June to September. December is the driest month with minimum rainfall and March receives maximum winter rain. The average rainfall is about 410cm in this Reserve.

## RIVER SYSTEM

The principal rivers that flow through this Reserve are Sankosh, Rydak, Jayanti, Bala, Dima and Gabusbasa etc. These rivers are become full and fierce during rains but are shallow and narrow in the dry season.

## SIGNIFICANCE OF THE RESERVE

The Reserve is biologically very rich. It possesses significant potential for the research work and field study in all aspects as it has diverse types of flora and fauna, many endangered species, socio-economic issues and ethnic diversity.

## FLORA

According to Champion Seths classification the forest is considered as Tropical Moist Forest. According to National Tiger Conservation Authority the forest has 352 species of trees, 133 species of shrubs,189 species of herbs, 108 species of climbers, 144 species of orchids 46 species of grasses,16 species of sedges, 6 species of canes and 4 species of bamboos .

## FAUNA

According to National Tiger Conservation Authority 68 species of mammals, 41 species of reptiles, more than 246 species of birds, 4 species of Amphibians along with 103 species of fishes and around 500 species of insects have been recorded so far in Buxa Tiger Reserve.

The main carnivores include: Indian Tiger (Panthera tigris tigris), Leopard (Panthera pardus),Clouded Leopard (Neofelis nebulosa), Hog badger (Arctonyx collaris), Jungle Cat (Felis chaus),Leopard Cat (Prionailurus bengalensis), Sloth Bear (Melursus unsinus), Fishing Cat (Prionailurus viverina), Civet Cat (Viverricula indica), Hyaena (Hyaena hyaena), Jackal (Canis aureus),Mongoose (Herpestes edwardsi), Indian fox (Vulpes bengalensis) and Wild dog (Cuon alpinus). The Marbled Cat (Pardofelis marmorata) and the Golden Cat (Catopuma temmincki) were reported
earlier but have not been sighted in the recent past.(report: National Tiger Conservation Authority, 2015)
The herbivores include: elephant, gaur, sambar, spotted deer, barking deer and hog deer. Besides, there are other faunal species like: wild pig, porcupine, rhesus macaque, common pangolin and the Chinese pangolin. The numerous rivers and streams in the habitat contain a variety of fishes including the Mahseer. The reptiles include: King Cobra, Russel's viper, Black Krait, Indian python, reticulated python. The habitat is rich in avifauna and the important ones are hill myna, crested serpent eagle, black francolin, horned bills and various species of water fowl. (Report: National Tiger Conservation Authority, 2015). Hence the study is still going on.

## STATUS OF TIGER IN BTR

The Reserve Forest was first announced as tiger reserve in 1983.
In BTR, tigers were distributed through the Reserve including southernmost ranges and fringe areas but BTR categorically falls under the low tiger density zone. The Tiger Census conducted in 2007, came up with presence of a minimum of 12 tigers from the pugmarks, scats collected. The census report showed that the tigers were distributed throughout the Northern, Central and North-Western part of the Reserve in areas like Pana, Adma, NRVK, SRVK, Kumargram, Jayanti, Newlands and Raimatang blocks.
According to 2007 census-Scat DNA Analysis, the minimum population of tigers to be around 12 comprising of 6 female and 4 male and 2 cuts.2010 Tiger Census-Scat DNA analysis method stated that the total number of tigers after analysis by both the institutes stood at 12 to 15 with not so encouraging sex ration of 9 males and 3 females.2011 Tiger Census-Scat DNA analysis method revealed that the presence of 20 individuals tigers with sex ratio of 16 male and 4 female. The study revealed the presence of the tigers in neighbouring Jaldapara National park also.
The report published in 2012 give a final conclusion that 3 tigers in Buxa Tiger Reserve or in Entire North Bengal Landscape.
From the survey it is found that the villagers of the core area are witnessed less or no tiger since 1998. But according to Forest Department, in 2021 trace of tiger is captured by their camera. After that, the Forest Department started the relocation programme and relocated two villages BhutiaBasti and Gangutia in December 2023.

## TIGERS IN BUXA TIGER RESERVE IN DIFFERENT CENSUS

| YEAR | NUMBER OF TIGER | REMARKS |
|---|---|---|
| 1992 | 29 | PUG MARK METHOD |
| 1995 | 31 | |
| 1997 | 32 | |
| 2007 | 12 | |
| 2010 | 12 | DNA SCAT METHOD |
| 2011 | 20 | |
| 2014 | 03 | |

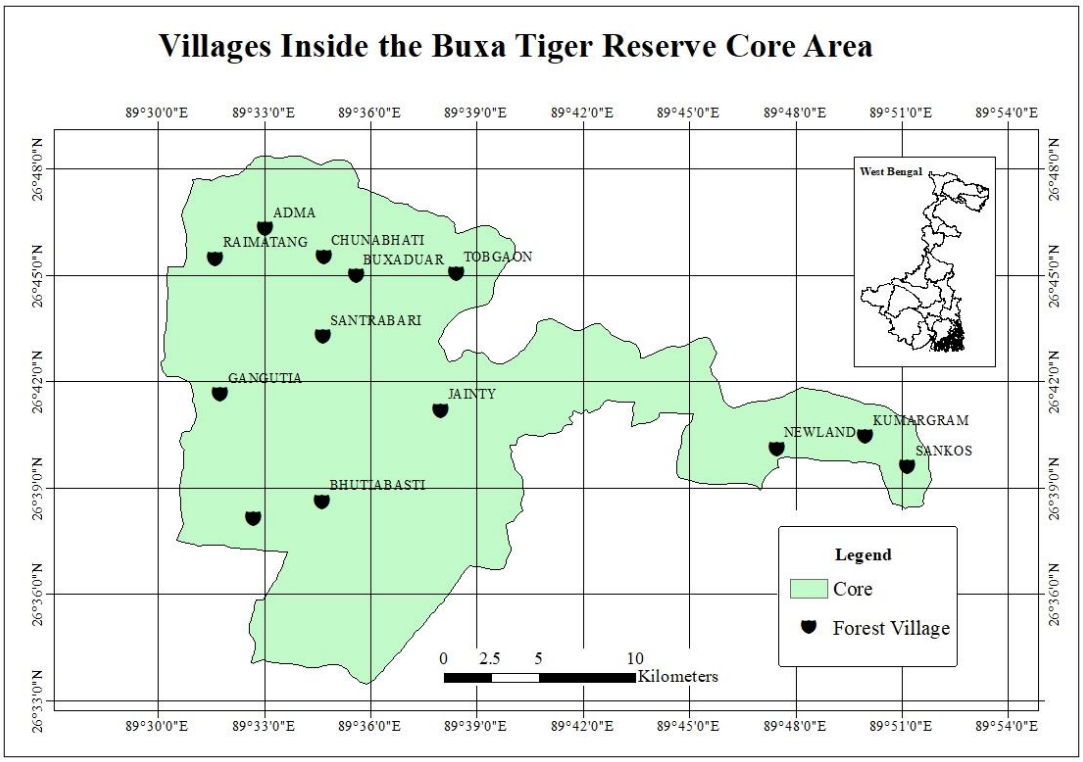
**(Source: Tiger Conservation Plan, 2015-2024)**

## RELOCATION OF VILLAGES

On an average a tiger requires 40-60sq km of territory for successful breeding. Pressure of human habitation within the Reserve is therefore detrimental for increasing of Tiger population. According to a report by NTCA, 65% Tiger population of India resides in tiger reserves. Average area of tiger reserve in the country is 1456 sq. km and the average area of core is 803 sq. km. inhabitants within the forest are largely dependent on forest resources. With increasing population ecosystem and biodiversity is also degraded. So the need of rehabilitation of settlement from the core area is obvious.

The report on Tiger Conservation (2015-2024) says that the relocation sites should be chosen ongoing special priority to the value of Tiger Reserve. The authority has decided to relocate such villages to provide complete disturbance free space for tiger and wildlife.
BTR has several villages lying adjacent to the core area or within the core area. The authority has decided to provide complete disturbance free zone for tiger and wild life. According to them the relocation proposals will be taken up only after settlement of Rights under Forest Acts is completely settled. After due consultation with the villagers and with their willingness the main villages identified for relocation are -

1. 28tth & 29th Mile Forest Village
2. Santarbari Forest village
3. Jainti Fixed Demand Holders
4. Bhutia Basti Forest village
5. Pampa Basti
6. Pana Forest village Raimatang
7. Bhutri Forest village
8. Raimatang
9. Gangutia
10. Adma
11. Kumargram
12. Newlands
13. Chunabhati
14. Lepchakha (Tashigaon)
15. Buxaduar FD holding




**(source: Tiger Conservation Plan 2015-2024)**

## NEED FOR RELOCATION

In 1986 an area of 314.52 sq.km was declared as the Buxa Wildlife Sanctuary. In 2007 459.13sq.km area has been notified as Critical Tiger Habitat of Buxa Tiger Reserve.

1. It is already stated that a tigress need 40-60 sq. km territory for successful breeding. Apart from that the Wildlife Sanctuary faced another problem also. BtR is rich in both flora and fauna varieties, they also need sufficient land and disturbance free habitat.
2. Illicit felling and collection of NTFP s is a major problem of BTR. It occurs mainly in the outskirts of Reserve near settlement. It leaves an adverse impact on the habitat of the forest.
3. The recurrent flood in the river of Jayanti, Bala, Sankosh, Rydak during the monsoon destroys the wildlife habitat. The riverbed is very shallow and narrow. It brings riverbank erosion in the monsoon season. The villages situated onnthe riverbank also faced the problem of bank erosion and flood during monsoon period. It is a threat to their existence now.
4. Another problem of this area is grazing by cattle. It reduces the availability of fodder and exposes them to the risk of cattle born diseases.

## REAL FACTS OF RELOCATION

The fact is that many of these villages are more than a century old and are home to diverse ethnic group lie Nepali, Garo, Rabhas, Oraon, Santhals, Rajbangshis, Bhutias.
Relocation is not easy for the forest villages. It has to be benefied to the local communities.
There are 114 settlements in and around BTR among them 37 forest villages within the reserve forest, (buffer zone), 8 forest villages within the core area, 44 revenue villages and 25 tea garden. These huge settlements comprise a diverse ethnic population of Rava, Bhutia, Boro, Garo, Mech, Nepali, Santhali.
On the other hand, it should be kept in mind that the forest villagers have some restriction within their use of resources and extraction of forest product. They also have lack of access to modern facilities. Even no developmental activities is allowed within the territory.
Dolomite mining was practiced in before 1993 was stopped. Collection of boulder from the river bed is also stopped since 2017-18.

## ABOUT JAYANTI

Jayanti settlement is inhabited by 215 household. But the numbers of FD holder families are 92 only. Among 215, 68 families having one member each who work outside the settlement on full time job (census 2011). There are 1041 individuals of which 36.41% is adult male and 33.24% population is adult female. Of these 52.52% are depend on forest and commercial activities of harvesting and selling of NTFPs. (Source: Report of BTR)
Annually 40,000-50,000 tourists visit this area mainly for nature and adventure tourism. Jayanti is the most famous tourist spot within the BTR. Most of the families are shifted to eco- tourism since 1993 after the closing of dolomite mines. Several home stays are developed there to flourish ecotourism. Most of the families are dependent on home stays, either directly or indirectly. At present there is about 32 home stays in Jayanti, though their work also restricted. The villagers also work as forest guide or driver of jungle safari. (Source: Field visit)

BTR has a good picnic spot all over, but Jayanti is the most popular. The picnic season is noticed from 25$^{th}$ December to 26$^{th}$ January. However in Jayanti picnic is restricted.

## PRESENT CONDITION OF REHABILITATION

Two villages , Bhutia Basti and Gangutia is already relocated too a new place. According to BTR proposed relocation plan, Gangutia has 68 FD holding family, BhutiaBasti 72 and Jayanti has 92 FD families to be relocated. (Source: Forest department, West Bengal) Recent data shows that 191 families of Gangutia and 51 families of BhutiaBasti is already relocated and shifted to a new place. A total amount of 15 lakh per family is given to them as compensation.According to the district magistrate of Alipurduar, Rs. 7.5 lakh is already released to each of the families and the remaining amount will release soon. The total process of shifting will complete within next six month according to their proposal.NTCA gives some guidelines regarding relocation from the Core Area of Tiger Reserve. Following this guidelines the West Bengal Forest Department went to the villagers of BhutiaBasti and Gangutia and they opt for relocation of the villages.

NTCA offers two option for the relocation of villages- Option I and Option II.

| OPTION I | OPTION II |
|---|---|
| Rs. 15 lakh<br>Land and property valuation | Rs. 3 Lakh for Home Construction (20%)<br>Land and property valuation (30%)<br>2 Ha of land developed for agriculture (35%)<br>Rs. 75 k as incentive (5%)<br>18 Village Amenities (10%) |

**(Source: NTCA)**

## RELOCATION IN BHUTIABASTI

The NTCA prioritize relocation of villages from core areas to a safer place. They offers two option for the relocation. With the conversation of the Forest Deoartment, villagers of Bhutiabasti choose the Option I, receiving a substantial compensation of Rs. 15 lakh per adult (18 years and above).
If we consider the relocation in BhutiaBasti, the mindset will be differ from the mindset of people of Jayanti. More than 90% people of BhutiaBasti is agreed to relocate. The main reason for that is, most of them are working as casual labour and have no land or fixed income throughout the year.
The amount of money that is allocated for them i.e. Rs. 15 lakh per family is a lucreative amount for them. According to the Forest Department, the Alipurduar District Administration provided each beneficiary family with land ownership in a non forest land called Bonochaya village. According to the Forest Department, they envisaged a smooth transition for dismantling and transporting their homes to Bonochaya. They also informed that the village Bonochaya is envisioned with essential structure like- reliable water supply, electricity, schools, roads, streetlights etc.

## RELOCATION IN JAYANTI

In Jayanti, about 96% families have signed in the agreement to relocate in a new and safer place. The reason behind the agreement is not the Tiger Reserve but the problem of flood. Jayanti River is very shallow and narrow because of siltation in the river. But it takes a different shape during the rainy season. In 1993, a devastated flood occurred in Jayanti River and many villages lost their home during this time. As the river bed is thinning day by day, the chance of occurrence of flood is also increasing.
The negative side is that, most of the families in this village are staying here for more than a century. They have their own land and they are mentally also attached with the place. There is a High school in Jayanti since 1957. It is a century old village and people are economically independent than the people of BhutiaBasti.

## IMPACTS OF REHABILITATION

When it is a choice between nature and human, we always try to give preference or importance to human. But in this Tiger Reserve, the special preference should be given to the wild animals. The ecosystem and the food chain should be maintained perfectly so the Tiger reserve should get its tiger back. So, relocation must be the first priority of this area. The reserve is announced as Tiger Reserve in 1983. But the relocation of the villages is started in 2023, though the relocation of 15 villages was proposed since 1983 onwards. The impact of relocation should be framed both environmental and socioeconomic.

- The environmental impact of relocation from core areas is the decrease of disturbance and human pressure. An example from Corbett TR is cited that, after relocation of 411 families from Corbett TR in Uttarakhand, 52% of tiger population has increased in the period of 1984-2002 (MOEF 2006).
- Another impact is the decrease of forest fires and human–wildlife conflicts. It will lead to better conservation of natural resources and restoring of ecosystem. But sometimes this is long understanding of human interaction with the resources.
- The century old villages will lost its location, identity. The people are staying here with the wild life for centuries. The physical aspect of this village will lost with the relocation.
- On the other hand, the authority provided them only land and money. But they will be jobless then. They have to search new job for their survival.
- The amount of money is not sufficient to start a new life in a new location. As the total habitation is changed, the chance and priority is also changed. So it is a challenge for them to maintain the same socio-economic condition in the newer location.
- Another problem is the problem of drinking water. In the new village they will face the problem of drinking water.
- Problem of education is another issue. In Jayanti there is a High school within the village. But after relocation the educational provision should be depend on the proposed site. It will take long time to establish another school for the school going children. So it is big problem for the future of new generation of the settlements.
- People have to leave their century old location and have to shift to a new place. They have to adjust with the new location with limited opportunity.
- According to the survey, the people of old generation will faced maximum problem to adjust in the new location. They will also face challenged in socio-economic condition as they will not provide job security in the new location.

## LIMITATION OF THE STUDY

In this writ up secondary report are used available from offices and also from Forest Department. But some offices are unwilling to give any detail records and it affects the research work to understand the facts and

find out the solution for it. Villagers have their own opinion that should not match with the reports. The data is also found varies from source to source.

## SUGGESTION AND CONCLUSION

The Buxa Tiger Reserve is rich in ecological resources. Ecological resources refer to all plants, and animal in terms of individual, species, communities, habitats and ecosystem (C.C. Park, 1980). Ecological resources are considered to be the 'real wealth of nation' (S. Singh, 1995). To maintain the ecological resource richness and to give disturbance free environment for flora and fauna and specially a wide accessible zone for tiger (panthera tigris), relocation of forest villages is an important part.

Core area means to strict reserves for wilderness. But it does not mean without intervention, but can be submitted to protective management depending on their specific conservation objectives and on the character of the reserve. Core areas should naturally exclude the human habitation (S. Singh, 1995). The core area and the buffer zone is operating under a single administrative unit.

The buffer zone includes some activities to protect the core area. This includes particular research, environmental education and training and also the required management activity for the area.

Relocation of settlement from the core area is a priority task to increase the number of tiger in BTR as it is a low tiger zone. This will benefitted the wild animals for their disturbance free movement. In a recent report in Sariska Tiger Reserve (STR, Rajasthan) number of tiger jumped to 40 within 16 years. The tiger Task Force (2005) reported that 80 villages with a population of46341 of 2904 families are relocated so far. Though the figure is need to be verified yet the history of relocation is not suitable for all the TR so far.

In Dudhwa National Park and TR in Uttar Pradesh (declared National Park in 1977 and TR in 1987) 24 families from the village Surma relocated outside the TR (MOEF, 2006). But the villagers lodged complain and a filled a petition in the court as financial help for the construction of houses is not implemented.

To restore the ecological resources as well as to maintain the human requirements after relocation some strategies are suggested here-

- A detailed database should be prepared for relocation of villages and families of the area.
- Management and authority should give suitable option and with proper association of the villagers the plan should be implemented. The plan must be discussed properly with the villagers and with agreement from them the work will progress. The work must be done with proper transparency.
- The new site is chosen wisely so that both the socio-economic and other prospect can maintained properly. Provision of drinking water, land for agriculture, school, and health centre must be in priority list of relocation.
- In the new location site there should have also access to employment opportunity. It will definitely compensate the loss of previous income security.
- Finally the people will face psychological trauma after resettlement. The villages like Jayanti , a century old village and the inhabitants has naturally a special attraction for the place as their forefathers also reside there and they also live there till birth. This is also to be taken care.

The concept of CCAS (Community Conservation Area) initiated in India in 2003. The local inhabitants of the forest decided to conserve the Nature and Natural resources and the Biodiversity to secure their livelihood. There is more than thousand evidence of such community conservation area is in India. Hence their recognition is not yet considered by the government. It should be a considered in the future with proper participation of the villagers under Buxa Tiger Reserve.

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## REFERENCES

1. Bandopadhaya, N.G. & De, G.C. 2002. Draft final report on consulting services for studies Bengal,Bhattacharya Sayan, environmental Survey and Photographic Documentation of a Forest Edge Hamlet Situated in Buxa Tiger Reserve, India, European Scientific Journal, April 2017/ SPECIAL/ Edition ISSN :1857-7881
2. Bhujel, R. 1996. Studies on the Dicotyledonous Flora of Darjeeling District. Ph.D. Thesis, Biswas, K. 1967. Plants of the Darjeeling and Sikkim Himalayas. Government Press, West Chakrabarti, M.; Sarkar, A.; Ghosh, S.R. & Sarkar, A. 2002. Forest structure, resource use and Champion, H.G. & Seth, S.K. 1968. A revised Survey of the Forest Types in India. Govt. of

3. Choudhary, R.K.; Oh, S. & Lee, J. 2011. An ethnomedicinal inventory of knotweeds of Indian Choudhury Koushik , Wildlife Management in Buxa Tiger Reserve, West Bengal, September-October 2009 College, Darjeeling.
4. Das Abbhaya Prasad, Sarkar Animesh, Contribution of Forest Flora in Rural Livelihood: A Study in Jayanti, Buxa Tiger Reserve, West Bengal, East Himalayan Soceity for Spermatophyte Taxonomy, pg. 132-140, 2012
5. Eco-Development Project. Alipurduar College, Jalpaiguri.
6. Himalaya. J. Med. Pl. Res. 5(10): 2095 – 2103.
7. https://www.vedantu.com/question-answer/which-one-of-the-following-is-related-to-exsitu-class-12-biology-cbse-5fb2c5e4b7fb205f4fd97bf5
8. https://www.gktoday.in/royal-bengal-tiger-sighted-at-buxa-reserve
9. https://www.researchgate.net
10. India Publications, Delhi. India.
11. Centre for Rural Economy Appropriate Technology and Environment, St. Joseph's institutions: site report from Jayanti-Bhutia Basti, Buxa Tiger Reserve, Jalpaiguri, Lasgorceix Antonie, Kothari Ashis, Displacement and relocation of Protected Areas: A Synthesis and Analysis of Case Studies, Economic and Political weekly, 2009 North Bengal University.
12. on aquatic flora, fauna and hydro-biology of wetland in Buxa Tiger Reserve under Singh Savindra, Environmental Geography, 1991, Prayag Pustak Bhavan, Allahabad Tiger Conservation Report 2015-24, Buxa Tiger Reserve , Bhaskar .j.v IFS, Kalyan Rai IFS Tiger Conservation Report 2016-17 to 2026-27