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Economic Potential of Kapla Beel of Barpeta District, Assam

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Article Info
Volume 83
Page Number: 7006 - 7012
Publication Issue:
March - April 2020

Abstract:
Assam is gifted with many Extensive water bodies commonly known as "Beels" that are only source of fish for the poor people in the surrounding villages. The Barpeta district of Assam has about 97 wetlands (ARSAC), out of which Kapla beel is one of the most important for its rich biodiversity. The beel contains a great number of flora, fauna and avian species. The latitudinal and longitudinal extension of Kapla beel is $26^0 18' 12''$ to $26^0 25' 7''$N and $91^0 08' 42''$ to $91^0 14' 50''$E. A large number of people of its surrounding villages directly and indirectly depend upon the beel for their livelihood. People collect fish and fodder for their domestic purpose. The beel is a key source of livelihood in terms of agriculture, fishing, tourism etc. Apart from its aesthetic significance, its ecological value in terms of recharge the ground water, mitigating flood hazard etc. cannot be undermined. Survey was conducted around the beel in 10 villages and in depth interview was conducted with government officials using questionnaires. Results shows that, due to the encroachment of people in the surrounding areas of the beel, the resources of the beel have dwindled to a great extent in the recent years. This has brought a tremendous impact on the livelihood pattern of the people especially the fishermen. The proposed study may be carried out by primary data followed by secondary data. Primary data may be collected through primary survey in the villages and beel areas with the help of survey schedules. Data thus collected will be processed and tabulated with meaningful statistical and cartographic techniques.

Article History
Article Received*: 24 July 2019*
Revised*: 12 September 2019*
Accepted*: 15 February 2020*
Publication*: 05 April 2020*

Keywords*: Beel, livelihood pattern, biodiversity, fish and fodder, ecological value.*

I. Introduction

Wetlands ecosystems are considered as the most diverse and productive ecosystems on Earth and include fresh water bodies of different sizes and shallow marine water [1]. Wetlands are termed as 'the kidneys of the earth' because of its services to maintain the ecological balance of the planet. Apart from its ecological services, wetlands provide many benefits to the human life. Some of the services provided by wetlands are mainly fish, edible plants/flora for human consumption, fodder for domestic animals, water supply for irrigational purpose, eco – tourism etc. [2]. However, increased anthropogenic activities such as intensive agricultural practices, over – fishing, disposal of industrial effluents and domestic sewage have changed the physical, chemical as well as biological values of the wetlands [3]. The north – eastern part of India, where Assam is located, is very famous for various fresh water fishes. Barpeta district of Assam has a large number of floodplain wetland, which is providing various benefits to the society from a long period. The district covers an area of 3301 ha. Under wetlands (ARSAC) [4]. Kapla beel which is one of the largest beel of Barpeta district has been supporting many threatened species of flora and fauna and providing livelihood to the society mainly the fishermen sections of the people [5]. However, the beel is now under immediate challenge because of human activities and climate change. This present paper is deals with the valuation of wetland, how it

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has been importance to the local people in sustaining livelihood as well as to identify the relationship between the natural ecosystems.

II. Study Area

The beel is located in the south eastern part of the district at a distance of 25 km. from Barpeta town. The latitudinal and longitudinal extension of Kapla beel is $26^0 18' 12''$ to $26^0 25' 7''$N and $91^0 08' 42''$ to $91^0 14' 50''$E. the annual rainfall of the Barpeta district is 300 cm. with an average temperature ranges from 8^0 in winter to 36^0 in summer (Meteorological Research Centre, Guwahati). The has an area of 642 bigha (103 ha.). the beel is bounded by Haldhibari, Baniyakuchi, Bengapara villages in the north side, sursuriya and byaskuchi villages in the south, Hillepara Amrikhowa, Chinadi villages in the east and Kapla village in the west.

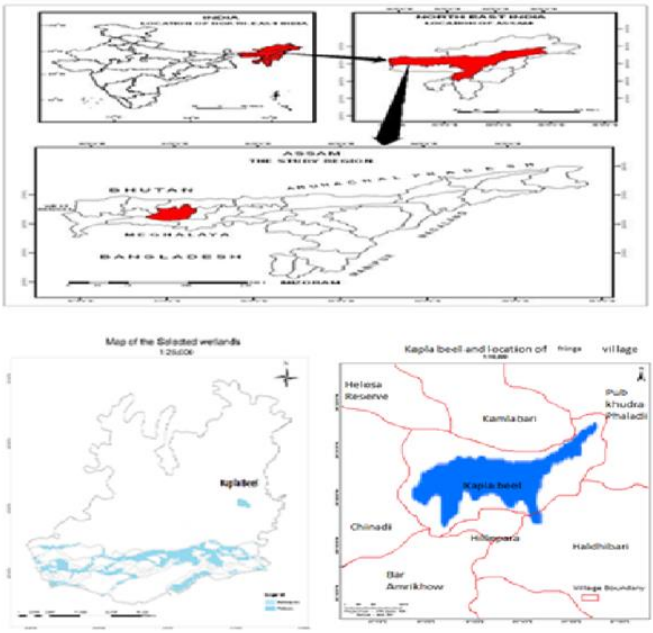

Fig 1: Location map of the study area

III. Objectives of the study

- To study the resource dependency of the community on the beel resources
- To study the changes in the status of beel resources overtime

IV. Methodology

The study is based on both primary and secondary data. Primary data was collected through primary survey using a well-designed questionnaire. In total 1035 households of 10 villages (30% of total population) were surveyed during the study. Random sampling techniques has been considered for the household selection. The secondary data was collected through literatures and other related research papers. Villages have been under studied based on the proximity from the village to the wetland which is within the distance of 1 kilometre.

V. Results and Discussion

Historical information shows that beels were once the common property of the community and conservation ethics were followed. Catching and killing of brood fish and juvenile were prohibited [6]. Beels in the study area also had a character of common property. Due to change in government policy the ownership of the beels went to the hands of group of people. This has adversely affected the wetland ecology as well as the relationship of the society with beels [7]. The sense of belongingness for the beels has changed for such changes. Majority of the population in the surrounding villages of

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Kapla beel is belongs to Hindu community. The total number of population in the surveyed villages are 3452, out of which 63% of the population is under UR (Unreserved category) and remaining 37% are SC (Scheduled caste) population. The Scheduled caste people are mainly related with the fishing and fish trading occupation while the most of the unreserved people are related with agricultural and service sector.

Table 1: Purpose of beel use of the fringe villagers

Name of the villages	Agriculture	Fishing	Aquatic vegetables collection	Extraction clay	Bathing	Tourism
Barkapla	30.56	24.65	21.43	16.86	3.96	2.54
Haldhibari	32.56	21.76	18.67	13.65	7.95	5.45
Hillepara	27.67	25.76	21.43	14.65	8.55	1.75
Amrikhowa	38.34	17.55	19.56	15.45	6.76	2.34
Sursuriya	32.65	24.76	11.76	12.87	16.87	1.09
Byaskuchi	35.76	21.76	12.67	10.65	11.76	7.4
Baniyakuchi	29.65	23.87	15.87	13.65	8.86	8.4
Kamlabari	32.76	25.76	15.87	18.76	5.87	1.98
Chinadi	26.67	25.76	21.43	15.65	7.55	2.75
Belbari	31.56	23.65	20.43	17.86	3.96	2.54

Source: Field Study

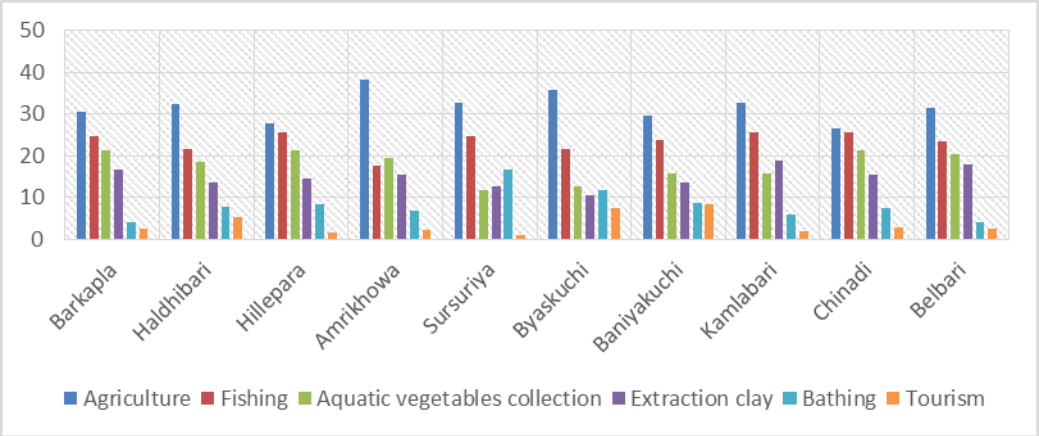

Fig 1: Purpose of beel use in the fringe villages

Dependency on agriculture

The study shows that the majority of population practices agriculture. The 'Boro' rice cultivation is mainly practised in this villagers. In Assam, rice cultivation is done 2 times in a year but, in these area rice cultivation is done only once in a year because paddy fields are flooded in most of the time. The paddy fields are located periphery of the wetland ranging within the proximity from 0 to 800 meters. From the study it has been revealed that most of the farmers do paddy cultivation only for self – consumption and only few farmers are engaged in self and commercial purpose. During the Bodo paddy cultivation people generally drain out the beel water to the agricultural field. This activity is harm full for beel ecology [7]. It has been seen that many farmers use pesticides and other chemical fertilizers in their paddy fields and the chemicals are drains to

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the beels with rain water which are causes species loss. Some of the farmers are aware about the facts that using chemical fertilizer and pesticides impact the water, soil and human health, but they have no other option as the poorer sections of the people are sustaining practicing agriculture.

Dependency on fishing

Fish is a common food supplement in the basic diet of the people of Assam. People in this part of India prefer to have non vegetarian foods and consume both fish and meat. Due to abundance of water bodies fish is found in every parts of this region. People of the state generally consume fish with their normal diet (Das, 2018). Reportedly 90percent of the population of Assam eats fish and per capita consumption of fish is 5kg per year. The beels in the Brahmaputra valley are capable of producing about 500kg fish/Hectare/year against the present rate of production100kg fish/hectare/year [8]. Fish catching is the second important occupation of the people of these villages. As shown in the table 1 that 25% of the total respondents are engaged in fishing. Mainly the scheduled caste people are very expert to use a special kind of fishing gear. This is a very laborious activity as they need to be in water for a long time. From the survey it has been revealed that 37% of people are engaged in fishing for self-consumption, 17% only for commercial purpose, and 46% people are depending on for both commercial and self – consumption which reveals that more than 50% of the people of surrounding villages of Kapla beel earn their cash income by selling fish. Most of the fisherman responded saying that the fish of Kapla beel has a higher value in market due to its good taste. Though there are some modern fishing techniques has been implemented but most of the fishermen prefers the traditional techniques of fish catch. Clarious magur, Heteropneustes Fossilis, Ompok pabo, Wallagu attu, Channa marulius, Xenontodon cancilla, Labeo Rohita, Labeo gonius, Labeo bata, Catla Catla, Chirhinus mrigala, Hypopthalmichthys molitrix, Chanha maruilius, Channa stratius, Channa punctatus etc. are commonly found in the beel. Fishing is restricted from the month of March to May because of the breeding period of fish. The fishermen are often infected by various diseases due to their tiresome work. Respondent says that sometime they are also bitten by snake and they are always exposed to leech. Various types of skin diseases are very common among the fish catchers along with problems in their nails.

Plate 1: Fishing with boat

Plate 2: Fishes of Kapla beel

Dependency on aquatic vegetables

From the long time the surrounding villagers of Kapla beel has been collecting various aquatic vegetation for various purposes. These aquatic plants have numerous value as they used it for their food and some of great medicinal value [9]. From the survey it has been reveals that 90% villagers collects the flora for their self-purpose and 10% of people collects for commercial purpose. The people can collect the vegetables from the beel at free of cost thus it is become a profit making business. Some of the names of those aquatic vegetables have been identified in their local name with the help of local

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villagers and those are Pani tengesi, Kar Meteka, Pani Meteka, Bhet Meteka, Digholi Kona, Pani Likori, Podum, Pani lajuki, Boga Bhet, Ronga Bhet, Bhet, Pani chuli, Bora Chuli, Bora puni, Bihlongoni, Pothorua bihlongoni, Kolomou, Kuhila, Mati kanduri, Tita Helochi, Kola Kochu, Tora, SoruPuni, Amarlata, Dol Ghah, Erali Bon, Nikori, Helosi, Bih Meteka etc. Some fishermen also collect some flora for making some fishing gears which are used in the beels. Water hyacinth is one of the weeds found in the beels of the study area. It is a menace for the beels in the study area but this weed can be used as an alternative source of livelihood for the rural people. At present water hyacinth has become a use full raw material for crafting industry. This raw material is available, rural women in the study area is more or less familiar with weaving technique. Water hyacinth industry in the study area can be an alternative livelihood option to the economically deprived section of the society and it will supplement the income of the people. It rapidly grows in water temperature 28-30 degree Celsius and water PH of 4 to8 and a luxuriant growth of water hyacinth is found in the beels [7].

Extraction of clay

Extraction of clay is one of the very important dependency of some people. In the surveyed villages some house is still seen to have been made out of clay or mud. People extract clay from the beel to construct their houses. In some villages people often use the muds to cover the bamboo walls of their houses to prevents the rain water and winds. However, the frequency of extraction is very less now a day as many people started construction from mud to brick. In the Hillepara and Kamlabari villages making idol is one of the important occupation of some villagers. The state is mostly dominated by Hindu religion so these idols are being sold in bulk specially during festivals and puja. So, this clay is used to collect for making idols. Though the clay for the idols is collected only once in a year but they extract it in a huge amount.

Bathing

Villagers of the surrounding villages of Kapla beel has been using the beel for bathing purpose. Though now a day, villagers have their own hand pump and tube well still some people goes to beel for bathing. The beel is also used for the bathing of their domestic animals. But some respondent says the beel is no longer use of bathing because some people often experience skin disease. Earlier the people also used the beel water for drinking purpose but now they don't use the beel water for drinking.

Tourism

Some villagers also benefited through tourism. The 'Krishnaguru Ashram' is a source of attraction which is located near to the beel. People comes from the various places of the state and from the country every year to this place. The natural beauty of the beel attracts the visitors and specially the boat riding which provide opportunity to the villagers for earning cash. This place can be converted to a beautiful tourist place by proper management.

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Plate 3: Scenic beauty of Kapla beel

The Biodiversity

The beel is very rich in biodiversity. Apart from fish and aquatic vegetation the beel is a home of many turtle, snake, mongoose, tortoise, water lizard, water snake, python and migratory birds [10]. Some common birds of the beel are Open bilStorke, Common Teal, Mallard, Shoveller, Spotbilled duck, Little Grebe, Spotbilled pelican, Large cormorant, Oriental Darter, Purple Swamphen, Large Egret, Intermediate Egret, Cattle Egret, Common Shelduck, Purple heron, White Wagtail, Greylag, Goose, Citrine Wagtail etc. From the survey it has been revealed that the bird population is decreasing day by day due to the climate change and poaching. This wetland provides all the categories of ecosystem services recognised in the Millennium Ecosystem Assessment such as provisioning, regulating, cultural and supporting to the people living on its banks which help people sustaining their lives and livelihoods in various ways and means.

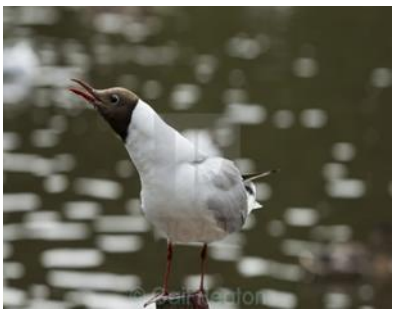

Plate 4: Some bird species of Kapla beel

VI. Conclusion

From the study it has been revealed that there is a decrease in the availability of the wetland resource in Kapla beel. Extensive agriculture in the fringe areas of the beel is the main cause of the degradation of the wetland. The beel is highly affected by macrophyte infestation. Due to the decomposition of water hyacinth every year, the beel is gradually becoming shallower. Extensive growth of water hyacinth also led to fish depletion in the beel. Due to the decreasing of fishes most of the fishermen are compelled to shift their occupation and thus the daily

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wages labour is becoming high. The beel is given to lease to the leaseholder by Assam Fishery Development Corporation. The leaseholder tries to catch maximum fish for maximization of their profit which is also important cause of fish depletion. In the beel, pen and cage culture is practised by the government but the result is not become satisfactory. From the study further attention can be drawn to sustainability model the ecosystem such as diverting the agricultural runoff from entering the beel ecosystem to prevent eutrophication and infiltration of foreign wastes, introduction of agro – forestry to support livelihood of the natives which in the long run will maintain green cover of the area, introduction of pisciculture in some pockets of the beel considering the indigenous fish varieties found there to promote livelihood opportunities. The involvement of the forest department is not actively seen in this area. As recommendations for further research, studies should be taken further incorporating both scientific and social (historical, ethnographic) aspects. The fishing community which is more dependent on the lake than the other communities should be another field of research. The impact of new technology and techniques on the paddy cultivation is likewise important; documentation can thus be achieved regarding the change from traditional practises.

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