

Aquatourism in floodplain wetlands as a potential alternative livelihood option for the fisherfolks - A case study of Deepor beel in Assam

Arun Pandit · Anjana Ekka · Deepak Kumar Biswas ·
Lokenath Chakraborty · Birendra Kumar Bhattacharjya

Received: 12 February 2018 / Accepted: 15 June 2018

© IFSI, Barrackpore, India, 2018

Abstract Wetlands offer a range of recreational activities and hence, they have great potentials to attract tourists. The aquatourism in wetlands is an upcoming avenue for resource generation. Assam, being the hub of floodplain wetlands has the great opportunity to use these resources as attractive tourist spots. Deepor beel near the Guwahati city harbours one of the largest concentration of aquatic birds in Assam. The neighbouring hills and forests are the home of many endangered and rare species of animals and insects. All these factors could make the beel an important tourist destination. Fishermen can be involved in the enterprise which can supplement their livelihood.

Primary survey showed that fisheries is the major occupation of most of the fishers households of the beel. Majority of them don't possess agricultural land and livestock. On the other hand primary survey also indicated that at present the students, Govt. employees, Businessmen, Pensioner, Auto rickshaw driver/owner were the major group of visitors of the beel. Travel Cost Method was used to estimate the economic use values associated with Deepor beel ecosystems that are used for recreation. Family size and

monthly income were found to be highly significant factors in explaining the variances of number of visits. The estimated consumer surplus was found to be Rs.160/visitor and the tourism value was estimated to be Rs. 16 lakh. However, this value could go up substantially if proper infrastructure put in place. Visitors suggested a couple of measures to enhance the tourism value. Fishers can be employed in various sectors of aquatourism like boating, managing parking lots, transporting visitors from city by non-polluting vehicles like e-rickshaws, establishing eateries, input and service providers for angling etc. The arrangement can considerably reduce the fishing pressure on the beel and enhance their livelihood status. The authority is trying to develop the core area of the beel as wild life sanctuary which is a welcome step towards enhancing tourism value. The fishing pressure from the core areas can be lessened by employing the fishermen in this potential sector of aqua-tourism.

Keywords floodplain wetlands, aquatourism, fishers, livelihood, willingness To Pay

Introduction

Floodplain wetlands (locally known as beels in Assam and W.B.) are shallow, nutrient rich water bodies formed due to changes in river courses from time to time. In country 2.0 lakh ha is under this resource with Assam constituting 1 lakh ha. They occupy important position in inland fisheries of India, due to their magnitude,

A. Pandit(*) A. Ekka · D.K. Biswas · L. Chakraborty
ICAR-Central Inland Fishery Research Institute, Barrackpore,
Kolkata, W.B., India
B.K. Bhattacharjya
ICAR-Central Inland Fishery Research Institute, Regional
Centre, Guwahati, Assam, India
e-mail: arunpandit74@gmail.com

production potential and habitat for large number of species of fishes. They are mainly located in the states of Assam, West Bengal, Bihar and Uttar Pradesh and represent lucrative areas for fisheries in these states. In addition to fisheries and other aquatic organisms, wetlands provide array of other important ecosystem benefits including storage and retention of water; micro climate regulation in term of greenhouse gases, temperature, precipitation, and other climatic processes; groundwater recharge and discharge; flood control, storm protection; pollution control and detoxification; sediment retention and accumulation of organic matter; storage, recycling, processing, and acquisition of nutrients; etc to name a few. The aquatourism in wetlands is also an upcoming avenue for resource generation.

Wetland areas have great potentials to attract tourists. Wetlands offer a range of recreational activities Sunbathing, swimming, boating, diving, snorkeling, sport fishing, duck hunting, photography, birdwatching, and simply enjoying the land scape (Chandrasekhar, 2013) are some of them. Globally, the tourism expenditure linked to wetlands was estimated at around USD 925 billion each year. The economic value generated by tourism to wetlands is truly enormous if we add the domestic tourism and recreational day trips to that (Ramsar). The uniqueness of wetland tourism has become a significant component in the tourism industry, particularly in developing countries (Khoskam et al. 2014). Assam, being the hub of floodplain wetlands has the opportunity to use these resources as attractive tourist spots. Besides, its green forests, blue hills, enchanting rivers are favourable for developing eco-friendly tourism in the state.

As per the report of the Directorate of Tourism, the footfall of 45 lakh domestic tourists and 20,000 foreign tourist were recorded in Assam during 2014 (Govt. of Assam, Tourism Deptt. website). Reports says that leisure and holiday was the purpose of visit for 60.5 percent of domestic and 70.8 percent of foreign tourists in Assam (Govt. of India, 2006). International studies showed that use of inland waters for capture fisheries tends to change to the use for recreational purposes in the economically developed regions (Smith, 2018). Therefore attractive tour packages involving the wetlands may generate huge employment and livelihood for the stakeholders especially the fishers. However, there is little quantitative data and information about the potential of aquatourism and how fishers livelihoods

will be improved though this sector. This lack of information may be responsible for negligence of this sector by the policy makers.

Methodology

The present study was conducted by collecting primary and secondary data during the year 2013-14 to 2015-16. The data were collected from randomly selected 109 fishermen households. Assam Fisheries Development Corporation (AFDC), Fisheries dept. Forest Deptt, Guwahati Municipality, Guwahati University were also visited for discussion and secondary data collection. The beel provides a means of livelihood to a number of local families. The fishermen organized themselves as Deepor Beel Panchpara Coop. Society Ltd. (1976-77). It was found that nine villages in the vicinity of the beel and around 850 households were involved in fishing. Moreover, during Feb-March fishers from neighboring villages also fish. To estimate the tourism potential of the beel a sample of 100 visitors of the beel, selected randomly during 2015-16 were interviewed.

Results and discussion

The study area

Deepor beel is a permanent freshwater lake, located in the south western part of Guwahati city. It is the only Ramsar site in Assam and situated in the Kamrup Metro district of Assam. The administrative responsibility was with AFDC. Recently it has been transferred to the Deptt of Forests. The wetland as a whole lies on 50-56.4 metres above MSL and the core area covers 414 hectares. The beel harbours one of the largest concentration of aquatic birds in Assam. The neighbouring hills and forests are the home of many endangered and rare species of animals and insects. Due to these, and being situated in the vicinity of the city, the beel has also lot of tourist importance. Fishers and their livelihood.

Survey found that the average age of head of the fishers' household was around 45 years. The average size of the family was around 5, among them 1-3 members are engaged in fishing. Agricultural land holding and possession of livestock were not significant among the fishers. The occupational pattern study indicated that fisheries is the only occupation of 54% of the households. Moreover, fishery is also the significant contributors of family income to another 22% households.



Deepor beel

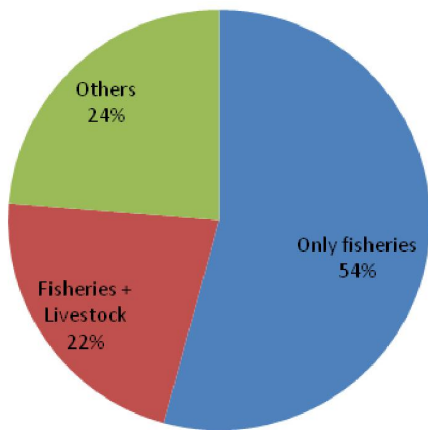


Fig. 1 Occupational pattern of the fishers of the Deepor beel

It was already spotted that the beel provides a means of livelihood to a number of local families. Nine villages in the vicinity of the beel and around 850 households are involved in fishing. Moreover, during Feb-March fishers from neighboring villages also fish. Fishing is done by all the fishermen and it constitutes important contributor of the livelihood. It was found that to the 44% of the fishermen households fishing in the beel is the only livelihood source. As stated earlier, the crop farming is practiced by very few fishermen. Moreover livestock rearing is also not very popular among the fishermen households. Fishing contributes 80 to 100% livelihood to 31% households and no household was found below 40% group. In employment generation it was estimated that employment generated through fishing was 65.3 thousand mandays per year

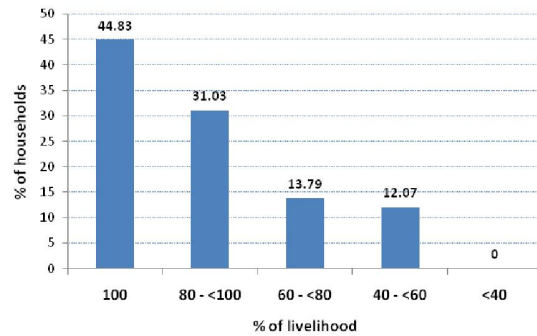


Fig. 2 Contribution of the Deepor beel to the livelihood of the fishers

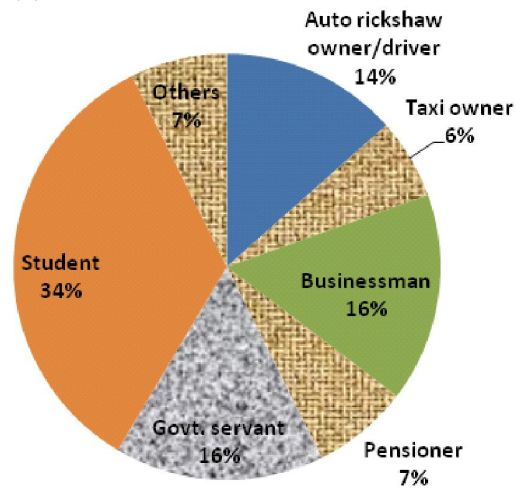


Fig. 3 Type of visitors to the beel (%)

and the beel provided full time employment to 45% of the households.

A number of migratory birds visit the beel every year and the authority is trying to develop the core area as wild life sanctuary. However, the beel provides livelihood to many fishermen. Hence, there is requirement of reducing the fishing pressure on the beel. In this direction aqua-tourism can be a potent option. The fishing pressure from the core areas can be lessen by employing the fishermen in this potential sector of aquatourism which may be developed to harness the potential. The aquatourism in the Deeper beel has the good potential since the wetland is situated in the vicinity of the great Guwahati city and lot of migratory birds visit here.

3.3 Tourism potential

Employing travel cost method (TCM) the tourism potential of the beel was estimated. This study was undertaken by interviewing a sample of 100 visitors of the beel during 2015-16. The investigation shows that student, Govt. employee, Businessmen, Pensioner, Auto rickshaw driver/owner were the major group of visitors of the beel. The average age of the visitors was around 34 and 82% of them were male.

3.3.1 Travel cost method

Travel Cost Method was used to estimate the economic use values associated with Deepor beel ecosystems that are used for recreation. The TCM is widely used to estimate the tourism potential of water bodies and other natural resources (for example Lamsal et al. 2016; Khan, 2006, Badola et al., 2010, Marawila and Thibbotuwawa, 2010). In the present study the relationship between number of visits and other variable was regressed using primary data. By applying the concept of utility function, the functional equation was expressed as:

$$\text{VISITS_NUM} = f(\text{FS, INC, EDU, GEND})$$

ANOVA models are used to assess the statistical significance of the relationship between quantitative and qualitative variables and can be accomplished within the framework of regression analysis. For present analysis, the following model was applied:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 D + U_i$$

Where, Y = Dependent variable

$$\beta_0 = \text{Intercept}$$

X_1, \dots, X_3 = Quantitative independent variable

D = Dummy or qualitative variable for gender; male =1, otherwise 0

$$U_i = \text{Error term}$$

The no. of visits in a year was the dependent variable. The explanatory (independent) variables were of 2 categories viz, quantitative variables and qualitative variable. The quantitative variables included Family size, Monthly income and Money spent on visiting Deepor beel. The qualitative variables were Gender and Education for which dummy variables were used.

Estimates of the variables indicated that family size, monthly income are highly significant factors in explaining the variances of number of visits. Large family size provides more leisure time and more monthly income provides affordability to visit the site more number of time. Male gender has got positive effect, signifying that male tends to visit more than their female counterparts.

3.3.2 Estimation of Consumer Surplus

Peoples' willingness to pay to visit the site can be estimated based on the number of visits that they make at different travel costs. By finding consumer surplus of the individual visitors we can estimate the tourism potential of the tourism site. The study showed that the estimated consumer surplus was Rs.160/visitor and the tourism value was estimated to be Rs. 16 lakh. However, this value seems to be in lower side keeping in view the enormous size and strategic location of the beel. This value could go up substantially if proper infrastructure put in place and advertizing is done.

Suggestions to improve the tourism potential

Presently, except a watch tower and bill board showing list of the birds visiting the beel, no infrastructure was

Table 1. Variable Estimates

Variable	Coefficients	Standard Error	p-value
Intercept	-7.796	5.517	0.1617
Gender	6.074	3.3961	0.0776
F Size	3.215	0.914	0.0007
Education	4.229	2.866	0.1441
M_income	7.2E-05	3.80617E-05	0.0084

N = 82, R²=0.58



Migratory birds at the Deepor beel, Guwahati

Table 2 Visitors suggestions

Facility	% of visitors suggested wanted
Improved Road Condition	19.51
Provision of Toilet/Lavatory	93.90
Improved Transportation facilities	50.00
Precautionary signs for bathing	42.68
Parking facility	74.39
Food Stalls/ drinking water	76.83
Boating facility	74.39
Toy train facility	30.49
Provision of accommodation/cottage	24.39
Waste Disposal/ Cleanliness	91.46
Parasailing facility	1.22
Bird watching place	4.88
Angling facility	1.22

visible. Therefore an attempt was made to elicit the visitors' suggestion to increase the potential of tourism.

Majority of them suggested providing facilities like toilet/lavatory, parking, food stalls/ drinking water, boating and waste disposal/cleanliness. When asked how they would be financed majority of them (76%) told that money could come from imposing entrance fees and financing by the Govt. Another 23% visitors added 'donation to a fund' with the above mentioned two measures. The study found that on an average each visitor were willing To Pay (WTP) Rs.33.75 for bird sanctuary and Rs.13.17 for picnic spot of the beel as entrance fees. Fishermen can be gainfully employed to tap the potential. They can be employed in boating, managing parking lots, transporting visitors from city by non-polluting vehicles like e-rickshaws, establishing eateries, input and service providers for angling etc. The arrangement can considerably reduce the fishing pressure on the beel and enhance their livelihood status.

Conclusions and suggestions

Apart from numerous ecosystem services, the floodplain wetlands, if strategically situated, are excellent resources for developing aquatourism enterprise. Employing fishers in the aquatourism reduces the fishing pressure on the beel and enhance their livelihood status. The Deepor beel being situated at the vicinity of a big city, the tourism potential is huge. Add to that, it is a bird nesting place for the migratory and local breed birds. It creates a very interesting place for the nature enthusiast and bird lovers. Report says

that in winter season for a single day 19,000 water birds are counted (Mitra and Bezbaruah, 2014). Naturally Deepor beel is listed in Birdlife International's list of Important Bird Areas (IBA) for its diversity of bird's habitat. Hence, Government may take steps to provide necessary infrastructure for creating a good ambience for aquatourism in the beel.

However, encroachments, dumping of Municipal solid wastes, sewage water from the Guwahati are degrading the beel day by day. Strict enforcement of law is the need of the hour. For better management of aquatourism, fishermen cooperative societies may be involved as partner towards effective conservation of the environment, its biodiversity and natural resources that will make a difference to livelihoods and local economies.

Acknowledgements Cooperation from fishermen of Deepor Beel Panchpara Coop. Society Ltd., visitors of Deepor beel, Assam Fisheries Development Corporation (AFDC), Govt. Fisheries Dept., Govt. Forest Deptt, Guwahati Municipality, Guwahati University, Director of ICAR-Central Inland Fisheries Research Institute and Dr. P.K. Katiha, Principal Scientist, ICAR are thankfully acknowledged.

References

- Badola R, Hussain SA, Mishra BK, Konthoujam B, Thapliyal S, Dhakate PK (2010) An assessment of ecosystem services of Corbett Tiger Reserve, India. *The Environmentalist*, 30(4): 320-329
- Chandrakumar Anand (2013) Wetlands as a sustainable tourism destination. *The economics of ecosystems and biodiversity*. <http://www.teebweb.org/wetlands-as-a-sustainable-tourism-destination/>
- Chaudhery Prem et. al. 2016. Restoration and Development of Water Bodies in Guwahati:
- Deepor Beel . Silsako Beel . Sarusola Beel, Tourism Assessment Khan H (2006) Willingness to pay for Margalla Hills National Park: Evidence from the travel cost method. *The Lahore Journal of Economics*, 11(2): 43-70
- Gogoi Priyanka (2016) Saving Deepor Beel: Assam's lone Ramsar Site. *Journal for Environmental Law, Research and Advocacy*, 1 (2016)
- Govt. of India. 2006. Ministry of Tourism, MRA Division. Collection of domestic tourism statistics for Assam, Final report. Intercontinental consultancies, Delhi, pp-134
- Tourism policy of Assam, 2017 <http://www.assamtourisonline.com/pdf/tourism-policy-2017.pdf>
- Khoshkam M A, Marzuki, Z Arzjani (2014) Wetland Capabilities In Enhancing Wetland Tourism In Gandoman, Iran. *Int. J. Sus. Dev. Plann.* Vol. 9, No. 3 (2014) 362-375. D10.2495/SDP-V9-N3-362-375

- Lamsal Pramod, Kishor Atreya, Krishna Prasad Pant, Lalit Kumar (2016) Tourism and wetland conservation: Application of travel cost and willingness to pay an entry fee at Ghodaghodi Lake Complex, Nepal. *Natural Resources Forum*. (2016). DOI: 10.1111/1477-8947.12089
- Marawila TD, Thibbotuwawa M (2010) To develop or to conserve? The case of the Diyawanna Oya Wetlands in Sri Lanka. SANDEE Working Paper No. 52 - 10
- Mitra Subhro, Achintya N, Bezbaruah (2014) Railroad impacts on wetland habitat: GIS and modeling approach. *The journal of transport and land use*. 7(1): 15-28
- Ramsar. Wetland tourism: a great experience. Responsible tourism supports wetlands and people. Ramsar, WWD and UNWTO. <https://www.ramsar.org/sites/default/files/documents/library/ramsar-wwd2012-leaflet-en.pdf>
- Smith Simon Funge (2018) Review of the state of the world fishery resources: Inland fisheries. FAO. Rome. Pp 397