

## Traditional use of *Barringtonia acutangula* (L.) Gaertn. in fish farming in Chatla floodplain of Cachar, Assam

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Floodplain ecosystems are of immense important for their social, ecological and economical benefits. Floodplains have been managed and utilized by the traditional fisher communities to secure their livelihood. Besides harbouring fishes floodplains are also an important site for rich vegetation. *Barringtonia acutangula* (L.) Gaertn. locally known as *Hijol* is the dominant tree species growing in the hillocks of the Chatla floodplain. The study was conducted to explore the traditional use of the *B. acutangula* branches in fish farming in Chatla floodplain of Cachar, Assam. A rich tradition of utilization of branches among the *Kaivartas* was recognized. The knowledge of shedding the leaves from branches through sundry and water soaking is practiced by the fishermen for fishery management. Traditional plantation management system through pollarding was observed. The need of incorporation of traditional knowledge before implementation of any rural programme is recommended.

**Keywords:** Fish farming, *Kaivartas*, Pollarding, Assam

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Floodplain ecosystem of tropical and subtropical region of the world provides social, ecological and economical benefits to the local people residing in and around it. The river floodplain interaction is mainly governed by the seasonal pulsing of floodwater from the river onto the floodplain and its subsequent recession back into the river<sup>1</sup>. Seasonally inundated Chatla floodplain comprises a very important landscape in Cachar district of Assam. Besides harbouring capture fisheries that sustain the livelihood of thousands of fishers and traders in monsoon period, fish farming through fishery management is also an important source of livelihood to fisher community in the floodplain area during winter period<sup>2</sup>. The floodplain ecosystem supports the growth of rich and distinctive vegetation due to their recurrent attribute. *B. acutangula* is the dominant tree species growing in the hillocks of the Chatla floodplain. The species grows on the banks of freshwater rivers, the edges of freshwater swamps and lagoons and on seasonally flooded lowland plains<sup>3</sup>. This is an evergreen tree (5-8 m high) belongs to Lecythidaceae family with rough fissured dark grey bark. Throughout its range *B. acutangula* has been

used in a variety of ways by local peoples<sup>3</sup>. The tree has long been used for medicine and timber<sup>4</sup>. More recently, it has become the focus of research for pain-killing compounds. An anecdotal report of the bark being used to quickly relieve pain by aboriginals has led to the discovery of compounds with pharmaceutical promise for pain relief<sup>5</sup>. The study aims to describe the traditional use of the plant in fish farming of the local fisher community of Chatla floodplain.

Chatla floodplain is the catchment of river Ghagra, a tributary of Barak River in Assam. The topography of the area is low lying with numerous small hillocks in between that are inhabited by the villagers. The most important ethnic group of the floodplain is the *Kaivartas*, a fisher cultivator community. They earn their livelihood through fishing in monsoon, and by growing *Boro* paddy after water recedes from the floodplain<sup>2</sup>. The Chatla floodplain wetland is about 15 km south from Silchar town, Cachar district, Assam. Geographically, the wetland lies between 90°45'N and 24°45'E. It has a maximum water spread area of c 1,500 ha when inundated. Subtropical humid climate and semi evergreen vegetation prevails in the study site. The average rainfall of the area is 3,180 mm with average rainy days of 150 per annum.

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## Methodology

For the study of traditional use of *B. acutangula* in fish farming in Chatla floodplain, three adjacent villages, Ratanpur, Barsangan and Bagmara were selected. Twenty respondents from each village were interviewed through a scheduled questionnaire. Selection criteria for the respondents were random sampling. The validity of the responses after interviewing was confirmed through field visits at regular interval.

## Results and discussion

Fishing in the floodplain is the most important source of livelihood for the *Kaivartas*. Fishermen have adopted different strategies for fishing during monsoon as well in winter season. The property regime in the floodplain is of unique nature: when it is covered with water in the monsoon, it is treated as a *Common Property Regime* (CPR) with community fishing rights<sup>2</sup>. In monsoon period as the water overflows from the river tributary, the floodplain get inundated and results in to migration of fish from river to floodplain. Many species of fishes synchronize their breeding activity with the flood season and migrate into the inundated floodplain to feed and spawn, and return to the river in the dry season<sup>2</sup>. Capture and trade of fishes establishes the source of livelihood during the period. Floodplain provides different types of subsistence and commercial goods including fodder, fuel wood, construction materials, and fishes<sup>6</sup>. However, after the water recedes, the land reverts to a *Private Property Regime* (PPR) with restoration of individual property rights<sup>2</sup>. Therefore, to secure the source of livelihood fishermen adopts a different strategy for fish farming during winter season other than growing paddy. Individual fisherman maintains their fisheries in winter season after water recedes from floodplain.

The maintenance of a fishery in the study site has been depicted (Fig.1). During the recession of flood

water from floodplain to river, water also gets stored in the fisheries constructed in the floodplain (Fig.2). Along with the receded water some of the fish population assembles in the fisheries that migrated from river to floodplain and for higher fish assemblage the fishermen use the branches of *B. acutangula* to provide suitable habitat for fishes. For the use of branches in fishery, fishermen first fell it from the tree and allow for sundry for 20 days. After sun drying, the branches are kept in a water body for 15 days to shed all the dried leaves and also to reduce the possible harmful chemical effect of the branches. Use of leaf of the species in fish poisoning has been reported in Tripura<sup>3</sup>. Therefore, the knowledge of shedding the leaves through sundry and water soaking is of paramount important in their fish farming system. Detailed interaction with the fisherman revealed the multiple and complex branching of *B. acutangula* protects fishes from the predator. Moreover, the rough branch surfaces acts as suitable substratum for algae and therefore, an important fish food source. According to fishermen, the branches of the species also decompose slowly. After complete harvest of fishes from fisheries before the onset of monsoon rain, they again maintain the fisheries for fish capture for next winter. During the period, they replace all the aged tree branches with the new ones. The aged branches of previous year are then used as fuel for cooking purpose. Therefore, the multipurpose utility of the branches in fish farming made the fisher community dependent on the plant as a part of their livelihood security. To meet the growing requirement of branches for fish farming the fishermen manage the plantation through their traditional cutting system (Fig.3). Such traditional plantation management system through cutting is similar to pollarding in the scientific forest management system. A managed plantation in the hillocks of the flood plain is shown (Fig.4). Pollarding of *B. acutangula* is a plantation



Fig.1 Use of *B. acutangula* branches for fish



Fig.2 Use of pollard

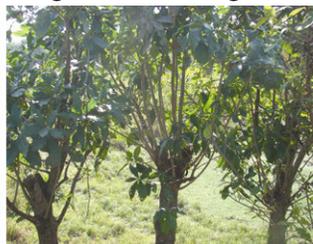


Fig.3 Management of *B. acutangula*



Fig.4 Plantation of *B. acutangula*

management method to encourage the branch development by cutting off the tree stem 3-4m above ground level. The tree is then allowed for regrowth after the initial cut that eventually results in a somewhat expanded top to the tree trunk with multiple new shoots growing from it. The practice of pollarding maintains the supply of new wood for fish farming purpose.

### Conclusion

The traditional livelihood means of fishing-agriculture that sustain the majority of the households is under pressure from the upsurge population pressure. The burgeoning population pressure has also resulted in overexploitation and depletion of fish stock, and a general decrease in the size of landholdings along with the decline in the *B. acutangula* plantation stock through its overuse as fuel wood<sup>2</sup>. Special efforts should be made to restore the *B. acutangula* in the floodplains in order to enhance water and nutrient retention as well as to attract the potamodromous fishes in larger numbers to the floodplains because of increased allochthonous food resources<sup>7</sup>. Therefore, traditional knowledge of plantation management and its use should be given priority before promoting any rural program that in turn can play important role in

socioeconomic upliftment of the fishermen and the region as a whole.

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