

## AQUACROPS OF DARBHANGA DISTRICT IN NORTH BIHAR AND THEIR COMMERCIAL SIGNIFICANCE

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### ABSTRACT

Darbhanga district in North Bihar is characterised by thick alluvial soil, moderately good rainfall, high humidity, ample sunshine and numerous water resources in the form of perennial rivers, tributaries, streams, lakes, ponds, pools and puddles. The aquacrops of this district include several species of commercially important fishes, aquatic cash crops such as makhana (*Euryale ferox*), singhara (*Trapa spp*), lotus, lilly, Khubi etc. and molluscs. This paper highlights the commercial significance of these aquacrops and offers suggestions for their sustained development.

A survey to collect details of the aquacrops in Darbhanga was undertaken during 1988-89. Personal interviews were also held with aquafarmers and local inhabitants of the area. A variety of aquacrops are found in Darbhanga. Not all of them, however, are economically and commercially valuable for mankind. Commercially important species alone are included in this study.

### Aquacrops of animal origin

#### *Fishes*

A large variety of freshwater fishes are found in Darbhanga district. However, from the point of view of commercial significance, Indian major carps, namely, catla, (*Catla catla*), rohu (*Labeo rohita*) and mrigal (*Cirrhinus mrigala*) reign supreme. They contribute as much as 60% of the market arrivals of fishes in the area. The exotic varieties of carps, viz. silver carp (*Hypophthalmichthys molitrix*) grass carp (*Ctenopharyngodon idella*) and common carp (*Cyprinus carpio*) have

become important components of species mix in composite fish culture operations in the area. However, these exotic carps enjoy a subdued market status in the region as compared to Indian major carps.

The air-breathing fishes, specially magur (*Claria batrachus*) singhi (*Heteropneustes fossilis*) and kabai (*Anabas testudineus*) are of special significance in this region as they have a high nutritive and therapeutic value. These fishes thrive in highly eutrophicated swampy and derelict waters of the district. Murrels or snakeheads of which four species (*Channa*

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*marulius*, *C. striatus*, *C. punctatus* and *C. gachua*) are commonly encountered in this area, also come into the category of air-breathing fishes but they do not attract consumers as magur, singhi and kabai do. Featherbacks (*Notopterus chitala* and *N. notopterus*) are also air-breathing fishes. Of the two species, however, *N. chitala*, locally called bhunna is considered as a delicacy and enjoys good consumer preference. The air-breathing fishes collectively contribute as much as 10 to 15% to the market arrivale of fishes in the areas.

The catch of large catfishes, namely, buari (*Wallago attu*) and tengra is generally obtained from the capture fishery operations of natural waters. Large species of tengra include *Mystus seenghala* alone. *Ompok bimaculatus*, locally called banspatta is also a catfish of considerable commercial significance. These catfishes collectively account for about 15% of the fish landings in the area.

Other species of fishes include suha (*Gadusia chapra*), gaincha (*Mastacembellus* sp.), mara etc.

### *Crustaceans*

Several varieties of small prawns and crabs found in Darbhanga are enjoyed as a delicacy. Prawns, as a by-catch, generally come into the cast net hauls of miscellaneous fishes from ponds, pools and ditches while crabs occur in shallow water bodies, especially paddy fields.

### *Molluscs*

*Pila* or apple snail, locally called doka is the most commonly found mollusc of the region. It occurs in ponds, tanks, chours and paddy fields, commonly seen sticking to aquatic plants and other objects in the water bodies. It feeds mainly on succulent water plants and occasionally on dead animal tissues. It is a popular food item amongst poor people. The flesh of *Pila* is believed to help in diluting and flushing out the kidney stone (Verma, 1994). The shell of *Pila* is used for making lime. For this, the shell of *Pila* is burnt and ground into powder form. The powder is then mixed with water to make a paste which is used in betel as also khaini (minced raw tobacco).

The Himalayan tributaries of the Ganga in North Bihar, namely, Bagamati, Burhi Gandak etc. and their sub-tributaries flowing through the calcareous alluvial basin of the district hold substantial population of the bivalve molluscs, namely, *Lamillidens* sp. and *Parryesia* sp. locally known as situa or seep; these bivalves have been used for making buttons and decorative items. These molluscs are also used for making shell mosaic-chips for cemented floors and shell dust for poultry feed and lime. The inner surface of these bivalves have shiny nacreous and show a possibility of producing pearls from them.

### *Aquacrops of plant origin*

#### *Makhana*

Makhana (*Euryale ferox*), a cash crop of the region, grows in shallow water

bodies and is characterised by its huge thorny, elliptical orbicular leaves, floating on the surface of water. Its thick, fleshy and fibrous roots help it to stand in mud. The interior of the fruit is full of round black seeds, locally called as gurri. The popped makhana sold in the market is prepared by processing its seeds.

Makhana serves as a dessert delicacy and is effective against deficiency disease like beri-beri. It acts as cardiac stimulant and has binding action in dysentery. It is known in the East and South-East Asia for its astringent, deobstruent, anti-rheumatic, anti-diuretic and several other medicinal properties (Jha *et al.*, 1991). It also serves as a source of starch for textile industry.

North Bihar is the chief producer of makhana, contributing as much as 90% of the total production of the country. Approximately, 2000 tonnes of popped makhana worth Rs. 10 crore is exported outside north Bihar every year (Kargupta and Jha, 1996). Out of the total production of makhana from north Bihar, Darbhanga district contributes 32%, Madhubani 30%, Saharsa 15% while the rest is contributed from Katihar, Araria, Madhepura, Purnea, Khagaria and Champaran districts.

Makhana cultivation is a source of livelihood for fisherfolk of this area. It is usually grown in age old perennial water bodies having a thick layer of muck at the bottom. The average yield ranges from 1250 to 1500 kg/ha. The dry edible popped makhana is one third of this product. It is a labour-intensive crop even though the expenditure involved in its

cultivation is not very high.

Fisherfolk generally stock their makhana ponds with carps (rohu, catla and mrigal) seed but it hardly provides them with any fish. Carps being water-breathing fishes are not able to thrive under such ecological adversities because the water surface remains covered with makhana leaves for a good part of the cultivation period. It is, therefore, recommended that air-breathing fishes such as magur (*Clarias batrachus*), singhi (*Heteropneustes fossilis*) and kawai (*Anabas testudineus*), which have the capacity to withstand such adverse ecological conditions, be cultured with makhana. Culture trials of air-breathing fishes in makhana ponds have shown encouraging results. Physical improvement, forestalling escape of fish stock from the pond will increase the economic returns from the water bodies under makhana cultivation (Thakur, 1978 and 1996).

### *Singhara*

Singhara or water chestnut as called in English, is a seasonal aquacrop. Botanically, it is known as *Trapa bispinosa*. It is a thickly rooted floating plant with its two third portion remaining under water in floating condition due to air chambers, thereby forming a thick mat in the water column. Only its characteristic leaves having four sided blades, remain floating over the surface. It is grown in ponds, jheels, railway and road side pits. The cultivation is done either by broadcasting

the seeds in May-June or by implanting small pieces of plants in pond water during July-August. During October-November, fruits are harvested. Average yield ranges from 600 to 1000 kg/ha. The net returns are not very impressive, specially when compared to makhana. As suggested by Banerji and Thakur (1980), there is a possibility of improving the economics of water bodies under singhara cultivation by stocking the water with the seeds of air-breathing fishes as recommended for makhana ponds.

### ***Lotus***

Locally called kamal (*Nelumbo nucifera*), it is commonly seen growing in ponds and tanks in Darbhanga district. Its dehydrated root is edible. The powdered form of its root is used as curative for several ailments. Lotus seed, locally called kamal gatta, is highly nutritious and prescribed as energy food, specially for pregnant women. The most commonly used item of the lotus plant, however, is its leaf used as food plate.

### ***Khodhila***

It is a soft-wood plant. Its botanical name is *Aeschynomena aspera*. It can be commonly spotted growing in ditches, shallow uncleaned ponds and other marshy areas; particularly in their marginal zones where water meets the land, retaining permanent wetness. The soft wood of khodhila is variously used for making garlands, marriage caps, toys

and other such decorative items. By virtue of its buoyancy, it is commonly used as floats in fishing nets or as rafts for carrying men in deeper waters.

### ***Koka***

Locally called koka (*Nymphia stellata*), it is the famous water lily, well known for its red, white, violet and variously coloured flowers. It is commonly spotted in ponds, tanks, road side canals and even paddy fields. The stem, petioles and peduncles of koka are cooked as vegetable. Flowers are used for worship. Different parts of the plant are also known for their medicinal properties. Koka appears for sale in daily markets generally during rainy season.

### ***Kalmi or Karmi***

Botanically named as *Ipomoea aquatica*, it is an aquatic herb with long stem trailing on mud floating over the water surface which is used as a vegetable. The juice prepared from its leaves is said to work as mild purgative and blood purifier.

### ***Jalkumbhi***

Water hyacinth, *Eichhornia crassipes*, is an aquatic weed which can be seen carpetting most water bodies of the region. The economic use of jalkumbhi in the region is rather low. It can be very well made use of for making green manure as also as a raw material for paper industry.

**Kush**

Kush (*Desmostachya bipinnata*) is a perennial tall grass growing gregariously in dry, and semi-dry areas on pond embankments. It acts as a good soil binder.

**CONCLUSION**

In order to utilize the available aquacrops of Darbhanga region for better economic returns, the following technologies could be made use of for developing location-specific packages and their subsequent transfer to the actual users.

1. Optimum utilization of ponds and tanks of the region through semi-intensive culture of carps.

2. Popularising culture of insectivorous fishes in makhana ponds for better economic returns.

3. Adoption of pen and cage culture techniques of aquaculture for effective utilization of swampy and derelict water bodies (chaurs, mans etc.) of the region.

4. Utilization of other available freshwater aquaculture technologies such as freshwater prawn farming, pearl culture etc.

**REFERENCES**

- Banerji, S.R. and Thakur, N.K.** 1980. Towards a bumper harvest of Singhara. *Indian Farmers Digest*. **13** (3&8) : 11-13
- Jha, V., Barat, G.K. and Jha, U.N.** 1991. Nutritional evaluation of *Euryale ferox* Salisb. (Makhana). *J.Fd. Sci. Technol.* **28** (5) : 326-328.
- Kargupta, A.N. and Jha, V.** 1996. Makhana (*Euryla ferox*) an aquatic crop with high potential. *The Botanica*, Dept. of Botany, Univ. Delhi : 47-54.
- Thakur, L.K.** 1990. *Aquaculture Resources and Development in Darbhanga district*. Ph.D. Thesis, Ranchi Univ. Bihar : 297 pp.
- Thakur, N.K.** 1978. Makhana culture. *Indian Farming*. **27** (10): 23-27.
- Thakur, N.K.** 1996. In Darbhanga makhana-cum-fish culture may prove a boon. *ICAR News*. **2** (1) : 14.
- Verma, A.M.** 1994. Integrated fish farming with water chestnut (*Trapa bispinosa*). *Fishing Chimes*. **14** : 29.