



# EXPERIENCE OF PERIPHYTON-BASED AQUACULTURE SYSTEMS

Practical Action Bangladesh

Aquaculture is one of our key activities and hence Practical Action Bangladesh (formally ITDG Bangladesh) has been facilitating cage culture in open and closed water bodies (large ponds, canals, small river sites), pond aquaculture (seasonal and perennial ponds), rice-fish culture, pond nursery, hapa breeding of GIFT and investigating livelihood context, production and conservation options of small indigenous fish (and other native fish). The Periphyton-based system already exists among pond fish farmers (also among fishers) as an unseen practice which needs to be evaluated for improvement and to obtain sustainable and diversified benefit. In a low input aquaculture system periphyton-based system has advantages for the poor fish farmers. In conservation practices of fish (in sanctuaries) poor fishers might benefit if they get more information on substrate and periphyton.

## Observations on periphyton-based aquaculture

Practical Action Bangladesh has not conducted any systematic assessment on periphyton based system, but initiated some observation on existing practices followed by farmers. It was observed that approximately 25-30% of our targeted fisheries household use different substrates in their ponds for protection and shelter of fishes. Among the fishers we discussed (16 fishers in Faridpur Sadar) 20% knew that fish feeds on the fish gathering devices.

Some of the old farmers understand that fish feed on the substrates/plants, but they cannot exactly mention what they feed on. They were found to use whatever substrate is available to them. But, some of them have been selective. They prefer "Babla" tree (Gum tree) and "Gab" tree (local name) branches. They also reported that fishes feed on vertiber grasses in the slope of ponds. In community (fisher, fish farmer) managed systems, mainly Babla tree and Gab tree branches are used in the deeper ditches (kua) to gather and protect fishes.

## Suitability of different substrates

Substrate	Observations by the fishers and farmers
"Gab" tree (local name) branches	External surface does not rot easily - an advantage. Algae (shaowla) easily attached on the external surface. They have seen fish to feed on the substrate.
Mango tree branches	External surface quickly decomposed. Algae attachment is less on the exposed internal smooth surface. People may not often allow cutting of mango tree branches as it is a favourite fruit tree.
"Babla" tree (Gum tree) branches	Decomposes slowly. Better performance as a substrate than mango branches tree branches. Multi angular fine branches

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technical brief

	prevent large predators from predating on small fishes. This substrate is commonly planted in the flood prone areas like Faridpur
Bamboo branches/Kanchi	Bamboo branches are gummy/sticky in water. Less attachment of algae (shaowla) was observed.
Pani Kachu ( <i>Colocasia esculenta</i> )	Farmers cultivate pani kachu next to a canal or a pond or in low lands. Fish can be cultured in Kachu field if the pond holds at least 1 ft depth of water for 6-7 months. Attached algae in the kachu might be a source of fish feed.
Mandar and Zika (local name) tree branches	Also used in ponds to protect poaching.

### Future programmes related to periphyton

1. Investigating the role of indigenous aquatic plants in small-scale aquaculture and fish conservation, with particular emphasis as substrate for periphyton.
2. Evaluation of farmer/fisher identified substrates (availability, competition, environmental effect in small and semi-closed water bodies (low land rice-pond system), economics/commercial viability, integrated use of substrate and periphyton) in different aquaculture and fisheries management systems.
3. Livelihood and sustainability issues of periphyton based system.
4. Use of indigenous fishes or self recruiting species as candidate species for the exploitation of periphyton/periphytic detrital aggregates.

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