Weed based aquaculture system

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Concept: The weed based system refers to the use of some inputs from plant sources, eg., weeds or grasses or leaves or macrophytes like duckweeds, Azolla etc. as supplemental feed in fish production. These inputs are consumed first as feed by herbivorous fish and subsequently a part of the semi digested faecal matter of the macrophytes feeding fishes are consumed by the other fishes and the remaining part will be recycled in food chain as nutrients for primary production, thus they have potentiality to increase the total fish production of aquaculture system. Weed based system may be a good option as a low cost, environment friendly sustainable aquaculture technique in Bangladesh (Grover *et al*., 2000).

Importance of weed based system as low cost aquaculture technique: Nutrient rich feed (specially higher protein content in diet) is one of the important factors to intensify the fish production. Fish feed generally constitutes 60–70% of the operational cost in intensive and semi-intensive aquaculture system. The fish feed used in aquaculture is quite expensive, irregular and short in supply in many third world countries. These feeds are sometimes adulterated, contaminated with pathogen as well as containing harmful chemicals for human health. Naturally there is a need for the development of healthy, hygienic fish feed which influences the production as well as determines the quality of cultured fish. Aquatic weeds are highly nutritious with protein content of 20-30%, when cultivated in nutrient rich waters. Importantly, they are preferred food of a wide range of herbivorous fish such as grass carp (*Ctenopharyngodon idella*), silver barb (*Barbonymus gonionotus*), tilapias (*Oreochromis niloticus*, *Tilapia rendalli*, *Tilapia zillii*) and rohu (*Labeo rohita*). Aquatic weed can be collected or produced at little cost. And thus weed based system is considered as low cost environment friendly technology.

Table 1: Aquatic macrophytes used as fish feed in weed based aquaculture

Sl. No.	Scientific name	Local name	Characteristics
1	*Azolla pinnata*	Azolla	The species is typically triangular measuring about 1.5 to 3.0 cm in length, 1 to 2 cm in breadth. Newly form leaves are green but aged leaves are brown in color. With roots.
2	*Spirodela polyrriza*	Sonapana	Leaves are flat or oval, 6-10.5 mm in length, 5-10 mm wide and 0.6-1.5 mm thick. Deep green above but with deep brown/reddish ventral. It contains 10-15 roots which are 10-40 mm long.
3	*Lemna minor*	Khudipana	Leaves are flat and elongated, like tamarind tree leaves, 3-4.5 mm in length, 2-2 mm wide and 0.2-0.3 mm thick. Deep green or green in color. It contains single root which is 10-15 mm long.
4	*Wolffia arrhiza*	Sujipana, Dimpana	Leaves are minute and rounded, 0.6-1.2 mm in length and 0.5-1 mm wide. Deep green in color and without roots.