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An Insight to Loach Fish Culture

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Introduction

The species *Lepidocephalus thermalis* is commonly called as Indian spiny loach and locally called as Ayirai meen. It is widespread in peninsular India and Sri Lanka. Loach is edible freshwater fish and its preferred food fish in southern part of Tamil Nadu. It consists of nutraceutical potential with good taste and flavor and it's rich in calcium, irons and other nutrients. In many places, this species is being used and consider as ornament value but, in this state, it is considered as better taste inland fish so it has to fetch good price all-around in the local market. Loach has inhabitant in ponds, lake, streams and adjacent creeks of paddy fields. A species diversification is takes place important role in inland fish culture at India.

The loach fish population is getting a decrease in some regions due to subsistence fisheries, aquatic pollution, climate change, deforestation, construction of a dam across the river etc. thus species stock or population could be rehabilitated possibly by culture propagation. Since farming, carp species is alone contributing more fish production to the country, even though after reporting, much indigenous food fish availing in the nation. Therefore, the cultural practice or various farming methods of new species can emerge upon in species diversification and providing varied fish protein for as consumer preference. And spiny loach is potential species for inland cultivation in close to future and it’s the optional fish species for carp culture.

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Site selection

The Indian spiny loach can be cultured in earthen pond. A selection of appropriate site for fish culture is the important factor to determine the success of fish farm and before construction of fish farm water retention and soil fertility has to be taken care. Ecological factor to be considered (soil, water, topography and climate). A need pond criterion such as even earth surface, without rocks and big trees etc. are suitable area for culturing of loach in earthen pond. Selected site should have easy to access transport, electricity and low land cost. For culturing loach fish mixture of Clay: Sandy (85:15) soil is essential. In many places, the availability of sandy soil is less; in this case riverine sand can be mixed with clay and that can used for culture.

Pond preparation

Based on water retention capacity ponds are categorized into perennial and temporary or seasonal ponds. Seasonal pond can hold the water for five to six-month duration. With the availability of water duration fish culture are also differing. Therefore, choosing of pond should be depends on species or duration of culture. The following criteria are needed for loach fish culture.

- The small size of 18 m^2 to 40 m^2 ponds are ideal for loach fish culture.
- Pond should be in rectangular shape.
- A dike entirely built of good soil and dike thickness is 30-40 cm (it should be able to resist the water pressure). It should be compact, solid and leak free.
- Pond total height is required for up to 1m
- The depth of water volume has to be maintained up to the level of 0.6m – 0.7m.
- As Should leave the free board is 0.3m is always.

- The pond bottom slope is required for complete harvesting of loach fishes. While constructing pond as dry slope deeper than wet slope (1cm (WS) :3cm (DS) is preferable).

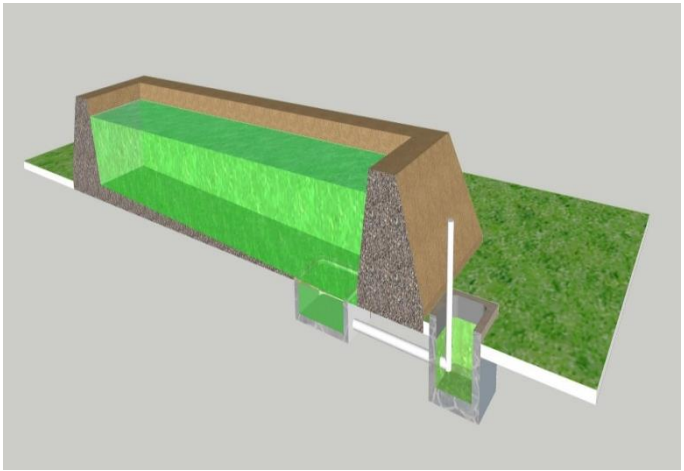

Figure. 1: A schematic diagram of pond bottom slope construction

By naturally this species has concealing behavior. So that the fined sand can be filled over the pond bottom as a layer up to 5 cm height of thickness for favorable fish growth. Bottom of pond should be constructed with slope towards to the outlet for Easy to dewatering the water. Outlet need to set up at bottom and its construct prior to dyke construction. Inlet are fixed top of pond and it should not take more than hours to fill the pond water. In addition

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to that the predatory or unwanted fishes should not entered into the pond for that inlet and outlet shall be properly knotted with fined mesh.

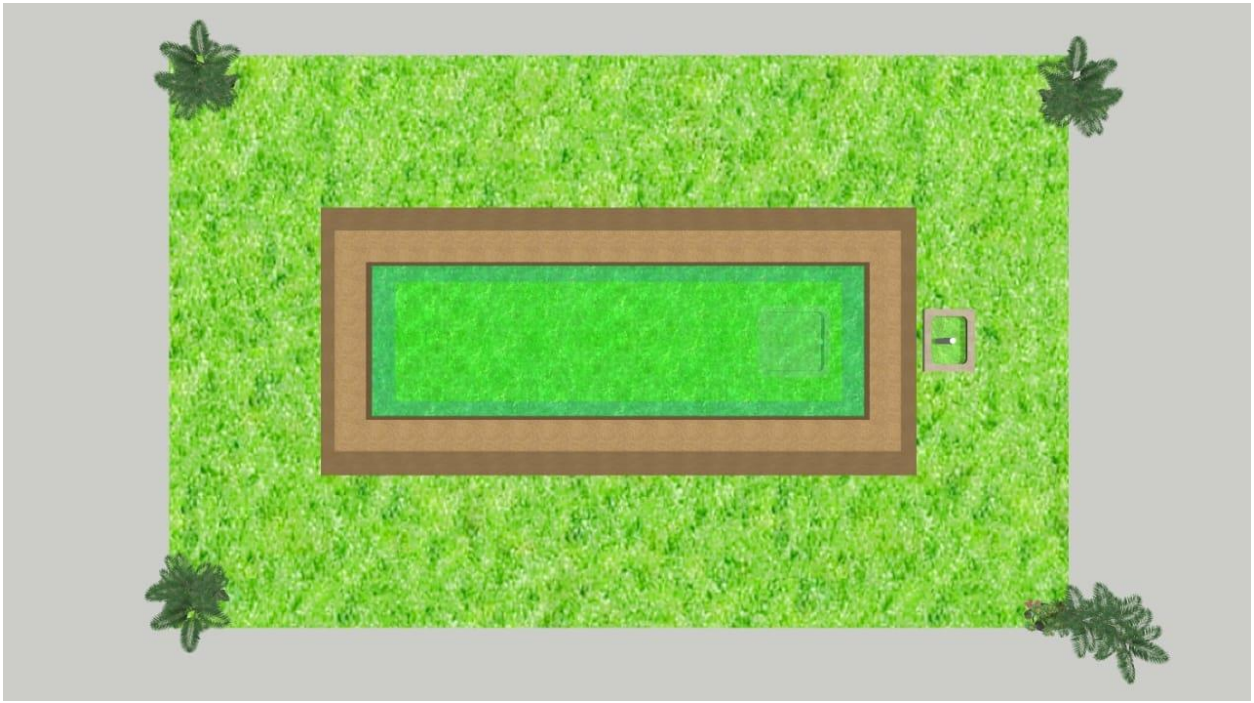

Figure 2. An aerial of view of loach pond

Figure 3. A side view of Loach fish pond.

In case used pond, before stocking fish, the following measurement needs to be taken care;

- Removal of unwanted fishes
- Dyke Maintenance

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- Inlet and outlet of pond shall be maintained properly
- Correction of pH
- Prior application of fertilization for enhancing plankton production
- If required, use recirculatory system.

Pre – Post stocking management:

Application of fertilizer

A Fertilizer application in fish pond is used to stimulate the growth of plankton and fish production. These are used as two form natural (organic) or synthetic substance (inorganic). The quality of water is very much essential for any fish culture. The application of fertilizer depends on certain water quality characteristics.

(I) Organic fertilizer

Once filled the pond water, the water quality is need to be assessed, based on these result, application & usage of lime quantity can be calculated. Lime application is used to correct the water pH level in pond. In addition, it's releasing the nutrient into soil and water and balancing the pH. Lime is help to fastening the decaying process in the pond bottom due to this soil nutrients become enriched. After 15 days of lime application, organic fertilizer has to be applied in pond. Organic fertilizer contains mixture of organic matter and mineral nutrient they produce locally from farm animal. Cow dung manure are mainly used in fish culture pond. It's the best manure in among the animal manure. Raw cow dung (wet) is the best manure for application. Small scale fish farm are mostly rely on these fertilizer because of low cost and local availability.

(ii) Inorganic fertilizer

The application strategies of fertilization are depending on pond substratum and their optimum level are different from region to region, moreover it's based on soil chemistry. Application of inorganic fertilization is enhancing the primary production in pond. These fertilizers are containing fixed nutrient composition and it possess high solubility in water and after application it cause rapid reaction with pond water. It should be used alternative with organic manure. Inorganic fertilizer is categorized into three that is nitrogen, phosphorus and potassium. As ammonium sulphate, calcium ammonium nitrate and urea these fertilizers are used in pond to enhancing the nutrient of nitrogen and it is application should be adhere based on soil pH. A freshwater limiting nutrient is phosphorus therefore very low level occur in pond; to enhancing these nutrient super phosphates is added, these fertilize is leaching the nutrient slowly into the water and providing phosphorus along calcium nutrients. An application of inorganic fertilizer should be based on the water quality and fish behavior and its application dosage level is given below table as example.

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S. No	Area	Nitrogen (urea) / kg	Phosphorus (super phosphate) /kg	Potassium (potassium chloride) / kg	Cow dung (kg)
1.	0.25 acre	5. 06	5.06	2.55	1012.1

Water quality

The success of fish culture is dependent on water quality. A poor water quality can affect the fish health, reproduction and growth in any culture system. So fish farmer should have knowledge in management of pond water quality. Loach fish can able to tolerate and grow in slight acidic, neutral and slight alkaline condition. Particularly these species lives under plants and detritus matter; pH and hard water are does not affect much. Pond water level should be maintained minimum 2 feet for loach culture. Aquatic weeds like Azolla can be cultured in loach fish pond, it's provided favorable environment condition to the fish and also help to reduce excess available nutrients in pond. Favorable water quality parameter is depicted in below table.

S. No.	Parameters	Favorable Level
1.	Temperature	27 – 29 degrees Celsius
2.	Dissolved oxygen	> 4 ppm
3.	pH	6.5 – 8.5
4.	Hardness	165 ppm
5.	Ammonia	0.01 ppm
6.	Nitrate	< 5 ppm
7.	Nitrite	< 0.05 ppm

Stocking

Based on the preliminary study and farmers trail studies the following stocking densities were determined for loach culture in earthen ponds. Despite, it can breed naturally, there is a possibility for variation in final biomass harvest from pond to pond. The preferable stocking rate is 70-72 gm (0.4 - 0.5g/fish wt.) of loach in 1 square meter. At the end of three-month culture duration able to harvest approx. 225 – 230 gm/ square meter. While harvesting partial harvest methods is

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recommended to avoid animal shortage for stocking.

Feeding

Loach fish is an omnivorous. In natural system, it is mainly feeding on detritus, plankton, insects etc. if it is adopted under captivity can also feeding supplementary diet as well. If fishes are cultured with more stocking density then supplementary feeding is necessary to meet out the feed demands by the animal. In any culture system, supplementary feed should provide twice in day with 6-7 % of fish body weight. If fish weight is reached beyond 1.5 gm, then 2-3% of fish body weight is preferable. A significant fish growth can be achieved through best feed management practices. Supplementary feed should contain mixture of all macro and micro nutrient composition for better growth of fish, especially for loach fish 35% of protein is recommended and it provide significant contribution to fish growth. Farmer trials recommending Ground nut oil cake (GNOC) and Cotton seed cake (CSOC) with 60:40 ratio, this feed composition is help to attained quick maturity of fish and breed naturally in culture system. And also, half grained rice particles can also use as supplement diet in culture system.

Harvesting

After 3-5 months these species is ready to harvest from culture pond. The suitable size for harvest is above 5 cm. A getting loach young one are very difficult. Therefore, the partial harvest has to be done in culture pond, otherwise it is, better to maintain additional fish pond is required for stocking. So that the seed crisis could be manageable. Harvest can be done after complete dewatering of culture pond.

Conclusion

Indian spiny Loach is suitable candidate species for scarcity of water and land prevailing area. And almost considered as hardy. Also suitable for poly-culture with carp fry. It has more

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consumer preference and fetch high market price. It is an alternative species for carp and other inland fish cultures. it might be contributing to the species diversification and future candidate in aquaculture industries.

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