Culture of *Pangassius suchti*

1 Introduction:

Pangassius sp is commonly called as river or silver stripped catfish, Siamese shark, sutchi catfish, or swai catfish. This fish species live in freshwater and endemic to the Mekong basin. It is a riverine catfish belonging to the members of the family *Pangassidae*. It exhibits fast growth when cultured given a good environment.

It is cultured due to its good market demand, fast grower, few countries dominate the culture production, and being the third most important freshwater fish group within aquaculture sector. *Pangassius* is now cultured in several countries in the world like Thailand, Nepal, Pakistan, India, Bangladesh, Vietnam, Laos, Maynmar, Indonesia, and Cambodia.

Pangassius is an air-breathing fish that can tolerate low Dissolved Oxygen (DO) content in the water and can be cultured in ponds, concrete tanks, fish cages or pens.

2 Culture of *Pangassius sutchi* in India

The exotic freshwater catfish *P. sutchi* was first introduced into India in the year 1995-96 in the state of West Bengal from Thailand through Bangladesh. Initially farming was carried in limited area in the states of West Bengal and Andhra Pradesh. But since 2004 the farming of *Pangassius* has spread due to the commercial importance and by 2008 it is estimated that *Pangassius* is being farmed in about 40,000 ha with an expected production of 1.80 to 2.20 lakh tons. There is a growing interest among the farming community in other states as well to take up *Pangassius* culture in a larger extent, thus paving way for demand for its seed and for establishment of commercial scale hatcheries. *Pangassius* is farmed under monoculture or polyculture with carps.

3. Technical Parameters : Technical parameters of *Pangassius* fish culture includes site selection, items of pond development, pre and post stocking operations, stocking, fertilisation, feeding etc. Annexure I

4. Margin:

The margin money may be considered @ 5, 10 & 15% for small, medium and large farmer respectively and 25% for companies and partnership firms.

5. Subsidy

Subsidy is available for various items like Pond Development, construction of New Ponds, first year inputs etc. under a centrally sponsored subsidy scheme implemented by majority of the State Governments through Fish Farmers Development Agency (FFDA) for different categories of farmers, details of which may be obtained from concerned Fisheries Departments/National Fisheries Development Board (NFDB).

6. Eligible Borrowers

The following categories of borrowers are eligible to avail credit.

a) An Individual.

b) A company.

c) A Partnership firm.

d) A co-operative society.

e) A group of fish farmers/SHG/ JLG

f) Producers organisations / companies.

Training in fish farming is being provided by the FFDAs to the eligible borrowers and it is prudent to have prior knowledge of fish farming before availment of bank loan for the purpose.

7. Financial Outlay :

The details of Capital Cost and Recurring Cost is indicated in Annexure II . As per the annexure, the capital cost for excavation of one hectare pond works out to be Rs 1.57 lakh and the recurring cost as Rs 5.57 lakh . However, the cost given is indicative and actual assessment of the cost parameters based on the specific region/area will have to be done while submitting the project proposal to the bank.

8. Repayment

Repayment of bank loan is possible in 8-10 years in annual instalments with moratorium on repayment of principal for the first year.

9. Financial Analysis:

As per financial analysis shown in Annexure III the scheme is financially viable. The financial parameters are as follows

i) NPW @ 15% Rs: 10.11 lakh

ii) BCR @ 15% 1.30 : 1

iii) IRR > 50%

10. Rate of Refinance

NABARD provides refinance assistance for fish culture to commercial banks, cooperative banks and Regional Rural Banks. The rate of refinance is fixed by NABARD from time to time.

11. Rate of interest

Interest rate to be charged to the ultimate borrowers would be as indicated by the bank/RBI/NABARD from time to time depending on quantum of loan amount and the agency providing the loan.

12. Security

Security from the ultimate beneficiaries may be obtained as per the guidelines of RBI issued from time to time.

13. Registration

Farmers who intend to take up *Pangassius sutchi* culture shall apply to the State Fisheries Department for permission and registration (in case required).

Annexure I

Technical parameter of *Pangassius sutchi* culture

Commonly Cultured *Pangassius*:

- Scientific name: *Pangassius sutchi*. English name: Sutchi river catfish.
- Scientific name: *Pangassius bocourti*. English name: Bocourts catfish

Potential of *P. sutchi*

P. sutchi has tremendous potential in India for its culture due to following advantages:

Fast growth

The fish has rapid growth rate and attains 1.0 to 1.5 kg in 8 - 10 months culture period in ponds.

Adaptability

• *P sutchi* depends mostly on supplementary feeding and is amicable for culture

with least animal husbandry practices.

• The fish being compatible can be cultured along with carps in poly culture.

• The fish under monoculture can be farmed at high densities.

• The fish can even be cultured in areas of low salinity (brackish water and abandoned

shrimp farms).

• The fish being non competitor for food with other cultured fishes it is considered to

be environment friendly in culture condition.

Culture area

P sutchi can be cultured in ponds, seasonal tanks, abandoned shrimp ponds, fish pens / cages, canals, reservoirs and other deep landlocked water bodies. Suitable water bodies namely ponds, seasonal tanks,

canals, lagoons and reservoirs, brackish water areas especially low saline waters. Abandoned shrimp ponds having potential for fish culture can also be utilized. Besides canals, lagoons and reservoirs may also be utilized once the cage culture technology for *P.sutchi* in India under biosecurity is developed and standardized.

Diseases

P sutchi is prone to diseases such as haemorraegic septicemia, bacillary diseases,*Flavobacterium columnarae, Trichodine* which can impact farmed and wild stocks. However, there are no reports on occurrence of serious diseases during culture.

Marketability

• Since the fish doesn't have intramuscular bones, the flesh can be easily filleted.

• The fish has tremendous potential for domestic market

• India with its large infrastructure of fish processing unit and vast experience in shrimp processing & exports can exploit the international market.

Site Selection: Location

The farm should not be located adjacent to rivers and areas prone to floods. Seepage channel around the culture pond is suggested to avoid infiltration of pond water into adjacent paddy/other crops. Inlets and outlets of culture ponds should be provided with screens to prevent escape of fishes from the pond into the natural environment. The other vital parameters to be borne in mind are ;

- Efficient source of water
- Free from pollution
- Free from any disturbance
- Free from poachers
- Availability of uninterrupted power supply

Size of Culture Pond & Depth of water

- The ideal pond size 1 ha area
- The ideal water depth is 1.5 -2 meter.

Pond Preparation and Management

Pond preparation is the same as general preparation for fish ponds.

Draining and sun drying

Sun dry the pond until the pond bottom cracks to eliminate unwanted fish species and condition the pond.

Repairing of dykes and gates.

Dykes and gates should be repaired to avoid entry of other fishes and escape of stocks.

Eliminating predators

Predatory fish species should be eliminated to promote better yield and harvest.

Liming

Liming is done primarily to the condition pond soil, since *Pangassius spp*. can tolerate pH ranging from 5 - 7.5.

Filling of water

Fill the pond with water to about 1.5 to 2m, to provide a wide aquatic environment for the stocks.

Type of culture intensity and stocking density

P.sutchi could be cultured both under mono and poly culture systems. Monoculture could be restricted up to semi intensive with a stocking density of less than 20,000 advanced fingerlings (15-20 gm/ha aiming at a production target of 20-25 tons/crop. Under poly culture the stocking density of *Pangassius sutchi* should not be more than 10,000/ha with a target production of 12-14 tons/ha. *Pangassius sp*. can be stocked at a rate of 12500 per ha depending on the culture environment. Stocking should be done early morning or late afternoon. Survival rate of *Pangassius sp*. is estimated to be 80-90%.

Feed management

Pangassius sp can be fed with kitchen waste, rice bran or pelleted feeds (recommended for faster growth and better flesh quality) at a rate of 2.5 - 3% of the Average Body Weight (ABW) and will be monitored and adjusted bi-weekly. Feed Conversion Ratio (FCR) averages to 2.35:1, which makes it a suitable for culture. *Pangassius* is omnivorous (eat both plants and animals) during their first year and become herbivorous for the following years. Wet feeds should be totally discouraged in the culture. Use of floating pellets is desirable for better growth, better meat quality, better health and better pond water and soil management in order to achieve the FCR of less than 2.35 : 1. In case of poly culture mashed feeds of good quality may also be used through bag feeding in addition to floating pellets

Feed storage

Proper feed storage facility should be provided at the farm site with proper, ventilation and fumigation. The feed should be stacked on raised wooden platforms without touching the walls to avoid moulding. The feed should be used within three months from the date of production .

Water Management

Quality water is important for all fish culture . Water quality parameters like pH (6.5 - 7.5), Dissolve Oxygen (DO) (0.1 mg/l), Temperature (25-30° C), Salinity (< 2 ppt) and water depth (1.5 - 2m). Efforts should be made to maintain these parameters to get a better yield levels. *Pangassius* spp. is an air breathing fish thus, they don't need to have a much higher Dissolved Oxygen in the water.

Sampling

Sampling is done to monitor the growth of stocks and to monitor feed usage to the stocks. This is also done to see and decide the marketable/harvestable size and time. Since *Pangassius spp*. is fast growing fish, sampling is mandatory.

Each pond should not be **more than 1 hectare in area** and an average depth of 1.5 - 2 m for better monitoring and management. Grow out culture period for ponds could be 8 to 12 months depending upon stocking density and the targeted size of harvest. Cage culture could be done in about 6 months. Generally the marketable size is 1-1.5 kg.

Harvesting

Harvesting can be partial (selective harvesting) or total harvesting. *Pangassius* spp. can be harvested for about 8 - 10 months of culture period. It can reach the weight of 1-1.5 kilogram in 8-12 months of culture given the proper pond management.

Post harvest and transport

Harvested fish should be immediately iced and transported for domestic markets/processing plants in reefer / refrigerated vans.

	Estimated Cost - Pangassius sutchi culture in 1 ha area			**Annexure II**	
A	**Capital Cost**				**Amount Rs**
S.No	**Particulars**	**Units**	**Quantum**	**Rate (Rs.)**	**Total**
1	Site clearance		LS	4000	4000
2	Construction of pond including digging, bund construction and compaction and consolidation	Hr	50 hr	1500/hr	75000
3	Diesel Pump Set	5HP	1	60000	60000
4	Inlet/outlet sluices			LS	7000
5	Nets and other implements			LS	6500
6	Miscellaneous			LS	4500
	Total "A"				**157000**
B	**Operational cost for one crop**				
1	Drying,desilting and ploughing	LS		4500	4500
2	Lime	Kgs	500	5	2500
3	Pangassius Fish Seed	Nos	13000	1	13000
4	Fish Feed (FCR 2:1) Oil cake & Rice bran (6.0tonnes of GN Oil cake & 24 tons of Rice bran @ Rs 25000 per ton/- and Rs 12000 per ton respectively)	Kgs	30000	14.6/kg	438000
	Pumping charges (electricity / diesel)	months	12	5000/ month	60000
5	Watch and ward	Mandays	12	2000/ month	24000
6	Miscellaneous incl harvesting charges				15000
	Total "B"				**557000**
	Total A +B				**714000**
C	**Production Norms:**				
1	Survival(%)	90	11700 nos		

2	Average weight at harvest (gms)	1500	15210		
3	Total production (Kg)	15210			
4	Farm gate price (Rs.)	50			
5	Number of Crops per annum	1			
6	Income during 1st year (Rs)	760500			
	Financial analysis - *Pangassius sutchi* culture - 1 ha Model				
	Year	**1**	**2-8 years**	**9**	**10**
	Capital Cost	1.57	0	0.6	0
	Recur ring Cost	5.57	5.57	5.57	5.57
	Total Cost	7.14	5.57	6.17	5.57
	Gross Benefit	7.61	7.61	7.61	7.61
	Net Benefit (B-C)	0.47	2.04	1.44	2.04
	Present Worth of Costs at 15% DF		33.42		
	Present Worth of Benefit at 15% DF		43.53		
	Net Present Worth (PW Benefit - PW Cost)		10.11		
	Benefit Cost Ratio (PW of Benefit / PW of Costs)		1.30 :1		
	Internal Rate of Return		> 50		

Repayment Schedule Pangassius sutchi culture – 1 ha model

Total Financial out lay	7.14
Margin @ 15%	1.07
Bank loan	6.07
Rate of Interest	12%

Year	Net Income	Interest	Principal	Total outgo	Bank loan o/s	Net surplus	DSCR
1	2.04	0.73	0.00	0.73	6.07	1.31	2.79
2	2.04	0.73	0.67	1.40	5.39	0.63	1.45
3	2.04	0.65	0.67	1.32	4.72	0.71	1.54
4	2.04	0.57	0.67	1.24	4.05	0.79	1.64
5	2.04	0.49	0.67	1.16	3.37	0.88	1.75
6	2.04	0.40	0.67	1.08	2.70	0.96	1.89
7	2.04	0.32	0.67	1.00	2.02	1.04	2.04
8	2.04	0.24	0.67	0.92	1.35	1.12	2.22
9	2.04	0.16	0.67	0.84	0.67	1.20	2.43
10	2.04	0.08	0.67	0.76	0.00	1.28	2.69

Repayment 10 years with one year grace