

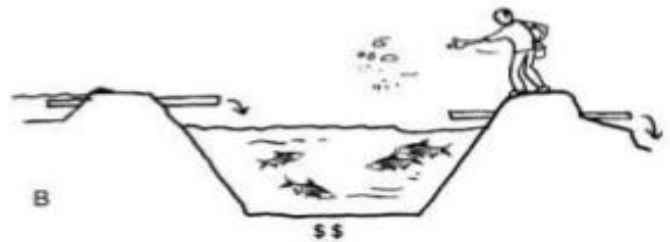
### Extensive:

Fish farming, economic and labor inputs are usually low. Natural food production plays a very important role, and the system's productivity is relatively low. Fertilizer may be used to increase fertility and thus fish production.



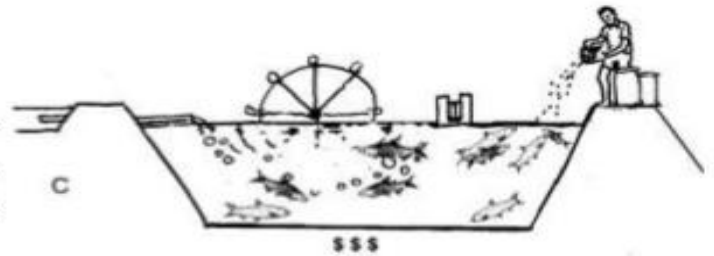
### Semi-intensive:

Fish farming requires a moderate level of inputs and fish production is increased by the use of fertilizer and/or supplementary feeding. This means higher labor and feed costs, but higher fish yields usually more than compensate for this.



### Intensive:

Fish farming involves a high level of inputs and stocking the ponds with as many fish as possible. The fish are fed supplementary feed, while natural food production plays a minor role. In this system, difficult management problems can arise caused by high fish stocking densities (increased susceptibility to diseases and dissolved oxygen shortage). The high production costs force one to fetch a high market price in order to make the fish farm economically feasible.



## Extensive, Semi-intensive and Intensive culture of fish:

Depending upon the motive of farming, based on economic and commercial considerations, fish culture practices may be classified as under:

### (i) Extensive Fish Culture:

1. Large ponds, beels, etc. are brought under this culture (Table1) where **little care** is taken with regard to its improvement.
2. So it is the least managed fish farming. Here, the **yield is modest and the expenditure is less as it is raised on natural food.**
3. In extensive fish farming, economic and labour inputs are usually low.
4. Natural food production plays a very important role, and the system's productivity is relatively low.
5. Fertiliser may be used to increase fertility and thus fish production.
6. The extensive fish farming system is the least managed form of fish farming, in which little care is taken.
7. This system involves **large ponds measuring 1 to 5 ha in area with stocking density limited to only less than 5000 fishes/ha.**
8. No supplemental feeding or fertilisation is provided. Fish depends only on natural foods.
9. **Yield is poor (500 to 2 ton/ha), and survival is low.**

10. The labour and investment costs are low, and this system results in minimum income.

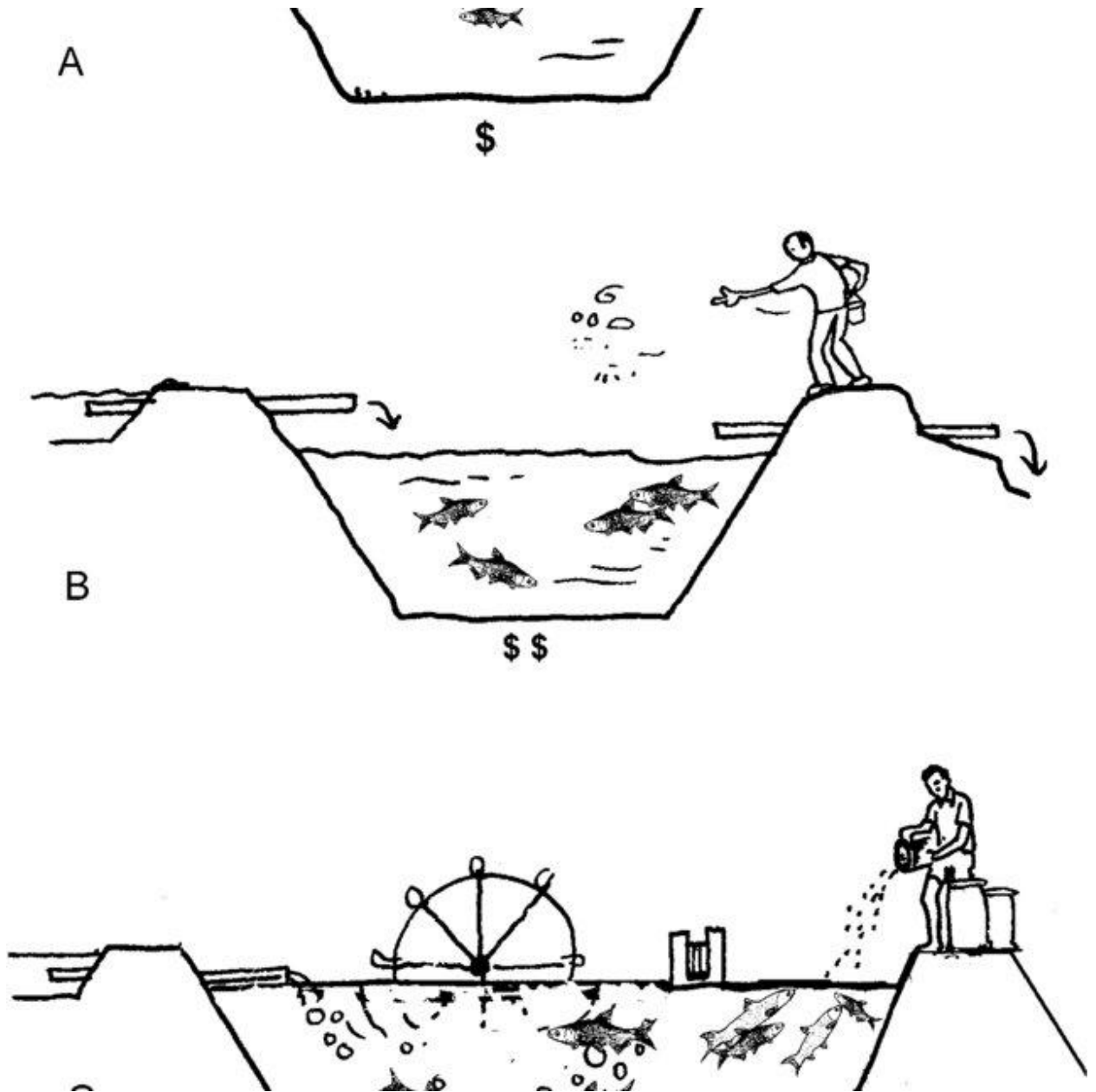
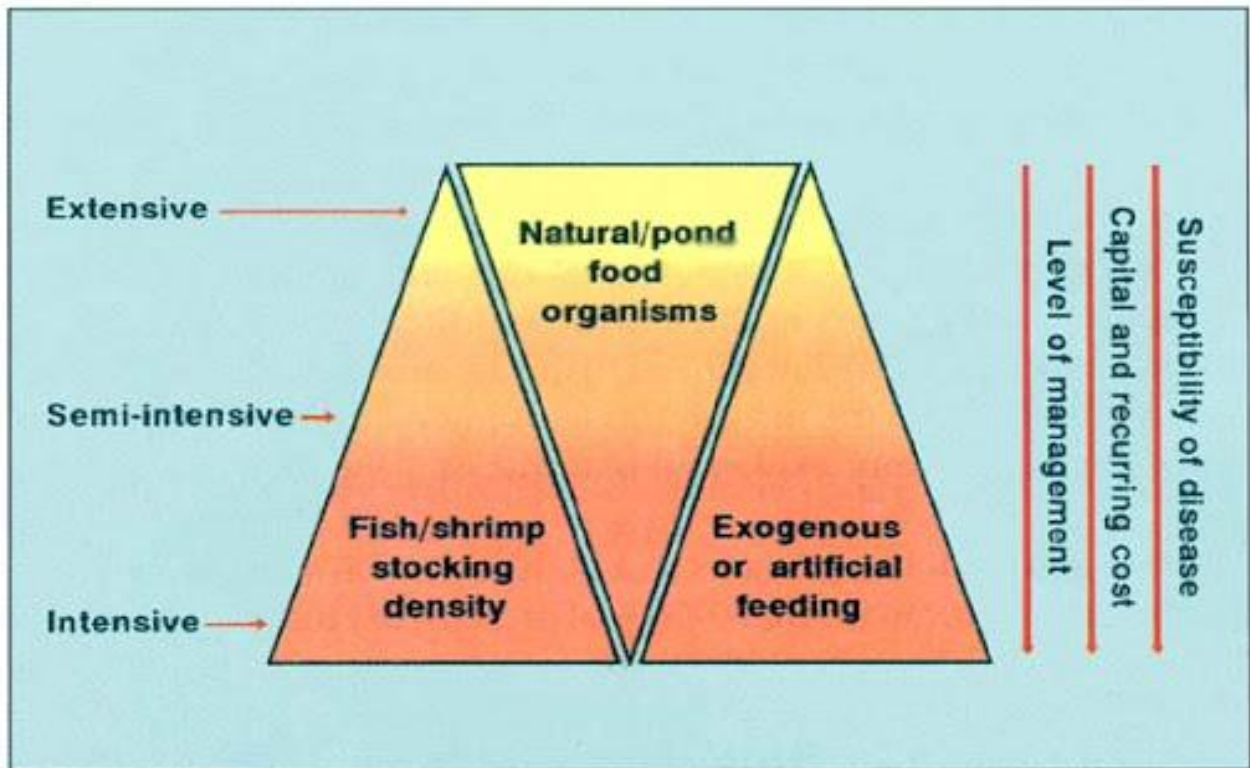


Fig1. A=Extensive B=Semi-intensive C=Intensive.

	Extensive/Traditional	Modified Extensive	Semi-intensive	Intensive	Super-intensive
Pound size	5 hectares	1 – 2 hectares	1 hectare	0.2 – 0.4 hectare	0.05 – 0.1 ha
Shape	Any	Any	Rectangular	Square	Circular
Stocking density	Mixed culture uncontrolled	3/m <sup>2</sup> Mixed culture	8-15/m <sup>2</sup> Monoculture	50-100/m <sup>2</sup> Monoculture	100/m <sup>2</sup> Monoculture
Water exchange	Sometimes with the help of pump	5%/day	5-10% per day	20-50% per day	100% flow through
Water depth	1.2-5.0 m	1.0 – 3.0 m	0.8 – 1.5 m	0.6 – 1.5 m	
Aeration	Not needed	Very less, if needed	2 HP	8-12 HP	Continuous
Production	500 kg/hectares	1000-3000 kg/ha	3000-6000 kg/ha	15000 kg/ha	25000 kg/ha
Feed used	Natural feed	Natural and formulated feed	Natural and formulated feed	Pellet feed	Pellet feed
Rate of feeding	—	1-4 times daily	3-6 times daily	—	—
Crops/year	1	2	2	Batch-wise	Batch-wise
Engineering	Not needed	Very less needed	Essential	Essential of high quality	Essential of high quality
Investment	Very less	Less	High	Very high	Very high
Care	Not much needed	Needed	Essential	Essential	Essential
Generator and current	Not needed	If needed	Necessary	Compulsory	Compulsory
Prawn/shrimp larva source	Wild	Wild	Hatchery	Hatchery	Hatchery

**Table: 1 Comparative study of types of farming.**



## (ii) Intensive Fish Culture:

1. In this fish culture (Table 1) an all-out attempt is made to achieve maximum production of fish from a minimum quantity of water.
2. It is the best managed form of fish farming and the fishes are fed on artificial food in addition to the natural feed.
3. Here the yield is very high (over 6000 kg/ha/year).
4. Although the cost of investment is high, the earnings from this culture far exceed the cost, so as to ensure high profit.

5. Intensive fish farming involves a high level of inputs and stocking the ponds with as many fish as possible.
6. The fish are fed supplementary feed, while natural food production plays a minor role.
7. In this system, difficult management problems can arise caused by high fish stocking densities (increased susceptibility to diseases and dissolved oxygen shortage).
8. The high production costs force one to fetch a high market price in order to make the fish farm economically feasible.
9. An intensive fish farming system is the well-managed form of fish farming, in which all attempts are made to achieve maximum production of fish from a minimum quantity of water.
10. This system involves small ponds/tanks/raceways with very high stocking density (10-50 fish/m<sup>3</sup> of water).
11. Fish are fed wholly formulated feed.
12. Proper management is undertaken to control water quality by use of aerators and nutrition by use of highly nutritious feed.
13. The yield obtained ranges from 15 to 100 ton/ha or more.

14. Although the cost of investment is high, the return from the yield of fish exceeds to ensure the profit.



**(iii) Semi-Intensive Fish Culture:**

1. Intensive culture possesses certain hazards, for which a culture between the first two, called semi-intensive culture (Table 1), is generally practised.
2. Here certain amount of management is required and the net profit is in between the above two.
3. Semi-intensive fish farming requires a moderate level of inputs and fish production is increased by the use of fertiliser and/or supplementary feeding.

4. This means higher labour and feed costs, but higher fish yields usually more than compensate for this.
5. Semi-intensive fish culture system is more prevalent and involves rather small ponds (0.5 to 1 hectare in an area) with higher stocking density (10000 to 15000 fish/ha).
6. In this system, care is taken to develop natural foods by fertilisation with/without supplemental feeding.
7. However, the major food source is natural food. Yield is moderate(3 to 10 ton/ha), and survival is high.

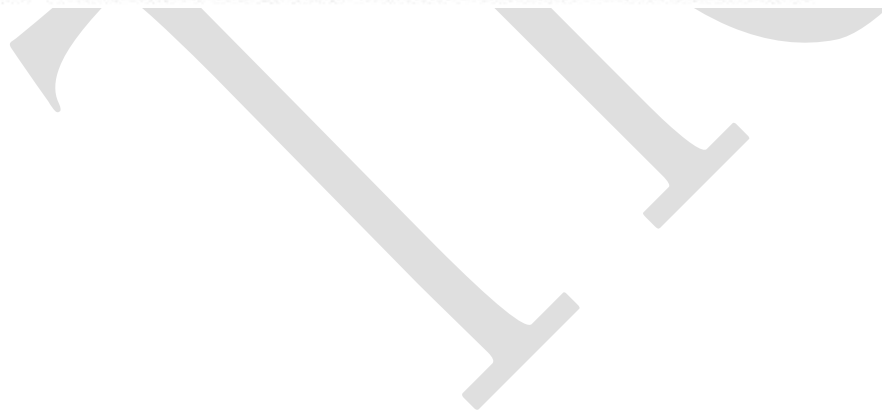
## Semi intensive Aquaculture





## Advantage of semi-insensitive culture:

- **Reduced water requirements** as compared to raceway or pond aquaculture systems.
- **Reduced land needs due to the high stocking density.**
- **Site selection flexibility** and independence from a large, clean water source.
- **Reduction in wastewater effluent volume.**
- Ability to closely monitor and control environmental conditions to maximize production efficiency. Similarly, independence from weather and variable environmental conditions



# Difference

## Intensive or extensive ?

<i>Characteristics</i>	<i>Extensive Aquaculture</i>	<i>Intensive Aquaculture</i>
<b>Inputs</b>	<b>Low</b>	<b>High</b>
<b>Self-sufficiency</b>	<b>Closed system</b>	<b>Open system</b>
<b>Waste</b>	<b>Useful - recycled</b>	<b>Hazardous</b>
<b>No. of Spp.</b>	<b>Several</b>	<b>One</b>
<b>Energy input</b>	<b>Low</b>	<b>High</b>
<b>Market</b>	<b>Near to farm</b>	<b>Far away from farm</b>
<b>Economy</b>	<b>Subsistence</b>	<b>Capital intensive</b>
<b>Diversification</b>	<b>Considerable scope</b>	<b>Limited scope</b>