

Post harvest recycling:

After cultivation, the floating beds are carried to higher grounds and broken up. The huge amount of compost material generated is mixed with the soil in land-based agricultural fields as organic fertilizer. Compost selling could be a good additional income generation opportunity.

Cost and benefit:

The capital and infrastructure requirements are minimal as raw materials for the construction of floating beds are readily available from local waterways. Hence, it is a generally profitable venture for farmers. Cultivating vegetables in 7 beds incurs a cost of Rs750(approx), generates an income of Rs 2940 (approx) and a profit of Rs 2190 (approx).

Maintenance of floating beds:

Farmers use boats or rafts to look after their floating beds.

- Weeding to be done as required.
- The bed should be adequately fenced or covered by net to protect against ducks and rodents.
- Crops which are infected by diseases and pests should be uprooted. Insects like Aphids, Leaf hoppers, White flies etc. can harm crops. Leaf spot, mosaic etc. are major diseases that affect floating vegetable bed crops. Organic pest and disease control measures should be adopted. No chemical pesticides should be used
- Neem juice mixed with water in a 1:3 ratio can be used to control ants.

Disadvantages of the practice :

- o The method encourages insect and rodent infestation, causing health problems and damage to crops.
- o Accessibility to markets is difficult from the waterlogged areas.

Challenges:

- o The uptake of this technology may be limited in wetlands with limited supply of fast growing organic material like water hyacinth.
- o Awareness raising of the local communities is needed in areas where floating agriculture is not a traditional practice.

Opportunities for implementation :

o Floating agriculture is an environmentally friendly way of increasing arable land. It is an environmentally sustainable way for supplementing incomes and increasing food in the developing nations.

o Aquatic invasive species used in floating agriculture are considered to be the second largest reason for biodiversity loss worldwide. Clearing waterways of this weed congestion is beneficial in maintaining high biodiversity of wetland ecosystems. For e.g. it can have a positive impact on open water fisheries. The reduction in the carrying capacity of the water body that occurs when the weed breaks down the drainage system, is also done away with.



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Floating Vegetable Bed Cultivation

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Floating vegetable bed cultivation is an environmentally sustainable agricultural practice whereby low-lying areas which are waterlogged or face prolonged flooding can be used in the production of food. With a regular increase in the Earth's temperature due to climate change, there is a consequent rise in sea levels. Floating agriculture can be a good and popular practice in the inundated coastal areas of the world. It is a widespread indigenous practice in Bangladesh where agricultural land is submerged for extended periods during the monsoon season.

A bio-land or floating bed is prepared with the biomass using aquatic invasive species like water hyacinth.

Scientifically, floating agriculture may be referred to as hydroponics as plants are grown in water and they derive their nutrients from water, instead of from the soil.

Benefits of floating agriculture:

- o The fallow waterlogged areas can be cultivated, increasing the total cultivable area. It helps supplement the income of local communities and provides greater food security by increasing the land output and supporting capacity for poor and landless people.
- o Productivity of area under floating cultivation is 10 times more compared to land-based farming.
- o No additional chemical fertilizers and manures are required. As vegetables and crops produced on the floating beds are fully organic, the produce is popular amongst buyers.
- o The fishermen can cultivate crops in water and also simultaneously harvest fish populations which reside in the beds.
- o Water hyacinth is a highly invasive weed with prolific growth rates. By harvesting water hyacinth, the choking of the water bodies is reduced. It improves conditions for open water fishing by reducing weed congestion.
- o Crops on floating bed can survive periods of flood and waterlogging when field crops often perish.
- o In hydroponics the chance of soil-borne diseases is greatly reduced as it is a soilless practice.

Season for preparation of floating bed:

In perennial wetlands, cultivation on floating beds is possible the whole year round. In seasonally flooded areas, floating beds are created at the onset of monsoons.

Cropping pattern:

All kinds of vegetables and spices as well as paddy can be grown in floating beds. In perennial wetlands additional crops are planted in between the main cultivation and it is possible to harvest crops 2-3 times a year from one such bed.

Water bodies where floating agriculture can be done:

It can be practiced in still water bodies where there is no tidal activity and there is abundant suitable organic material like water hyacinth to construct floating beds.

Construction of floating beds:

1. Raw materials:

A bio-land or floating bed is prepared with the biomass using water hyacinths, aquatic algae, waterworts and other waterborne creepers, straws, herbs, plant residues, paddy stubs and also coconut husk. The elements used for preparing the floating bed differ according to the needs in different regions.

2. Dimensions of a floating bed :

The size and shape of the bed is not fixed. The dimensions mainly depend on the submerged land size and shape and on the farmer's choice, demand and economic capability. Generally, the villagers construct beds that are 15 feet in length, 6 feet wide and 4.5 feet in height.

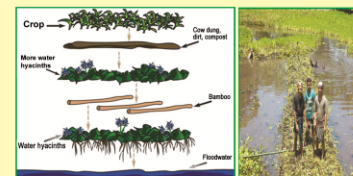
3. Method:

- Initially, the farmer collects dense, mature and long sized water hyacinths and lays an optimum sized bamboo pole on it.
- A man then stands on the bamboo pole and starts to pull the water hyacinths together from both sides of the bamboo and then compacts the accumulated water hyacinths under his feet. The process continues until the desired size of the bed is obtained. As the bed needs to float for the entire period of inundation, its thickness depends on the duration of waterlogging. The durability and buoyancy of the floating bed depends on the first bottom layer, which becomes more stable and durable if made of mature water hyacinth.

- After 7 - 10 days, a second round of water hyacinths are added on the bed and then the bed is left to decompose before being planted.

• The beds are movable and after selecting a good location, the floating beds are usually fixed with bamboo poles. The upper layer can be comprised of deposits of small and quick rotting immature water hyacinths and waterworts, which decompose quickly and make for good organic manure. There is no need to use chemical fertilizers for growing crops on the floating bed.

- It requires 15-20 days for the bed to decompose fully before cultivation can begin.



Sowing and seedling transplantation technique:

Seedling transplantation:

- Sometimes balls are made of compost, manure and decomposed water hyacinths and aquatic creepers.
- The balls are pressed lightly by hand to remove the excess water.
- The seeds are placed inside these balls which further enriches the growing condition of the seedlings. At least two seeds have to be put inside the ball.
- The balls are placed in the shade and water is sprinkled from time to time.
- Once the seeds germinate, the saplings are planted on the floating bed.

Direct sowing:

Seeds which are too small (like that of spinach, coriander etc.) can be sown directly on the bed.

