

Floating Beds for Vegetable Cultivation in Waterlogged Areas

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A vast coastal area of Andaman Islands and coastal lowlands of mainland India are situated below high tide level and also vulnerable to high tides occurring during cyclonic storm. The projected change in the climate is expected to aggravate this problem. Consequently flooding and water logging has become a common problem in the coastal lowlands in several countries in the tropical Asia. There is evidence already of these adverse impacts, which affect the livelihood of people by reducing crop production and increasing food insecurity. Many communities have developed different form of floating (*baira*) cultivation as an adaptive strategy to reduce their vulnerability.

Adaptive option against climate change

ICAR-CIARI experimented floating vegetable beds at Ograbraj, S.Andaman during post rainy season, which grow in water logged and salinity prone areas so as to promote it for similar areas in Andaman Island. This provides employment, income, food and nutrition for the farming families and local communities. Furthermore, it helps the coastal flood prone population adapt to the changing environment, which is increasingly influenced by global climate change. Floating vegetable bed cultivation has been a local practice in some villages for many years but in very small scale. It involves planting crops such as water hyacinths and other aquatic plants on soilless rafts on water and is called a 'floating garden', locally known as *baira*. The platform provides a base to raise seedlings, vegetables and crops on it. The plants grown on the floating beds get nutrition and food either from composted organics or from the water. During periods of flood and water logging field crops often perish, but short duration vegetables and greens on the floating beds can survive. The local practice was improved with scientific and technological input in close cooperation with local communities as an adaptation option against climate change. This resulted in longer and stronger beds, cultivation of diversified vegetable and crop rotation.

This can be up scaled in waterlogged areas for producing vegetables on a small scale to meet family requirements of tribal population and on a commercial scale for landless farm labourers in a public space.

Material needed for making floating beds

In addition to water hyacinth, deep water rice straw and different types of aquatic vegetation (*e.g., Kochuripara-Eichhornia crassipes, Khudipara-Lemna trisulca, kuti pana-Azolla pinnata, Shayala - Bluxa japonica*) and pieces of bamboo are required to make a *baira*. Initially, the farmer lays a bamboo pole on dense water hyacinth to stand on and then piles more water hyacinth to make it compact. The thickness depends on the duration of water logging, as it needs to float for the whole time of inundation. Beds can be prepared over bamboo placed on motor vehicle tubes. The bed is movable so the farmer can choose suitable locations for better management. After selecting a good location, the floating beds are usually fixed with bamboo poles. After 10-15 days, the farmers may transplant seedlings or broadcast vegetable seeds. They usually also plant additional crops between the main cultivation and can harvest crops 2-3 times a year. There is no need to use chemical fertilisers for growing crops and should be treated as low input agriculture to avoid pollution of water bodies.

Suitable crops and vegetables

Crop cultivation varies in seasons. However, more than 20 varieties on vegetables like red amaranth, Indian spinach, coriander leaves, cauliflower, cabbage, tomato, lady's finger, cucumber, bitter, gourd, bottle gourd, snake gourd, ash gourd, sweet pumpkin, bean, radish, brinjal (eggplant), and leafy spices can be grown on raised beds in different locations. The formation of a floating beds and cultivation starts in the month of June and continues until November in lowlands. However, these floating beds can be used for round the year vegetable cultivation on permanent water bodies or coastal waterlogged area.

. *Dhania* (*Coriandrum sativum*) and *Amaranthus* leafy vegetables were grown successfully during post rainy season. In this method, biomass yield of 460 g/m² of coriander and 720 g/m² of amaranthus were recorded. Further, the other leafy vegetables like palak and mint (*Pudina*) can also be grown successfully.

Multiple benefits

During flooding and water logging, many people suffer from shortage of food and lack of nutrition in the

island due to loss of standing crops and of income. Further, import of vegetables from mainland India is becoming difficult and costly. In the dry season, composted material from the floating beds can used as organic manure for field crops. Usually, there is no employment available during flood periods and life of the poor is becoming increasingly difficult. However, by cultivating short during vegetables it is possible for people to meet their household food requirements and earn an additional income.



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