

## Floating agricultural systems

**Challenge:** Sea level rise

**Adaptation response:** Accommodation and management

### Description

Floating agriculture is a way of producing food in areas that are waterlogged for long periods of time. It is mainly aimed at adapting to increased or prolonged flooding.

The system employs beds of rotting vegetation that act as compost for crop growth. The beds are able to float on the surface of the water, thus creating areas agricultural land in a waterlogged area. Scientifically, floating agriculture can be referred to as hydroponics.

Floating agriculture is reasonably widespread in Bangladesh, where agricultural land is inundated for extended periods during the monsoon season (APEIS & RIPSO 2004).

### Implementation

A typical application of floating agriculture in Bangladesh involves a floating layer of water hyacinth, straw or rice stubble, to which is added upper layers of small and quick-rotting waterworts, which make for good manure (APEIS & RIPSO 2004). The floating raft structure is strengthened with bamboo, and bamboo poles are used to fix it in position to avoid damage caused by wave action or drifting (Saha 2010). The floating raft can then be transferred to any submerged location for agricultural purposes (APEIS & RIPSO 2004).

### Environmental Benefits

- Uses water hyacinth, a highly invasive weed with prolific growth rates, in a highly beneficial way. By harvesting water hyacinth, areas covered by it are cleared, with the beneficial side-effect of reducing breeding grounds for mosquitoes and improving conditions for open-water fishing (Saha 2010).
- Provides a source of organic fertiliser when crops are harvested and the floating rafts are no longer required. The fertiliser can be used in fields or used in the following year's floating beds (APEIS & RIPSO 2004; Saha 2010).

### Socioeconomic Benefits

- Serves as an alternative growing area to land lost through flooding.
- Is highly productive – up to 10 times more productive than traditionally farmed land (Haq et al. 2004), and requires no additional chemical fertilisers or manure.

### Opportunities and Barriers

#### Opportunities:

- When cultivating crops in water it is also possible to simultaneously harvest fish populations that reside in the beds (APEIS & RIPSO 2004)
- It helps supplement the income of local communities and contributes to poverty alleviation (Saha 2010) and improving food security
- Because the system is fairly labour intensive, it can provide employment opportunities within communities (Haq et al. 2004)

## Barriers:

- The technology currently works well in certain areas, but it is unclear how it may be affected by sea level rise and salinity increases, which are likely to occur due to climate change
- It encourages insect and rodent infestation, which may cause health problems and damage to crops (Saha 2010)
- While it is applicable in several mega-deltas such as the Ganges-Brahmaputra, more general application is untested. Success seems unlikely and caution is recommended for wider application.

## **Implementation considerations\***

Technological maturity:	2-4
Initial investment:	1-2
Operational costs:	1-2
Implementation timeframe:	1-2

\* This adaptation technology brief includes a general assessment of four dimensions relating to implementation of the technology. It represents an indicative assessment scale of 1-5 as follows:

*Technological maturity:* 1 - in early stages of research and development, to 5 – fully mature and widely used

*Initial investment:* 1 – very low cost, to 5 – very high cost investment needed to implement technology

*Operational costs:* 1 – very low/no cost, to 5 – very high costs of operation and maintenance

*Implementation timeframe:* 1 – very quick to implement and reach desired capacity, to 5 – significant time investments needed to establish and/or reach full capacity

This assessment is to be used as an indication only and is to be seen as relative to the other technologies included in this guide. More specific costs and timelines are to be identified as relevant for the specific technology and geography.

### Sources and further information

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