

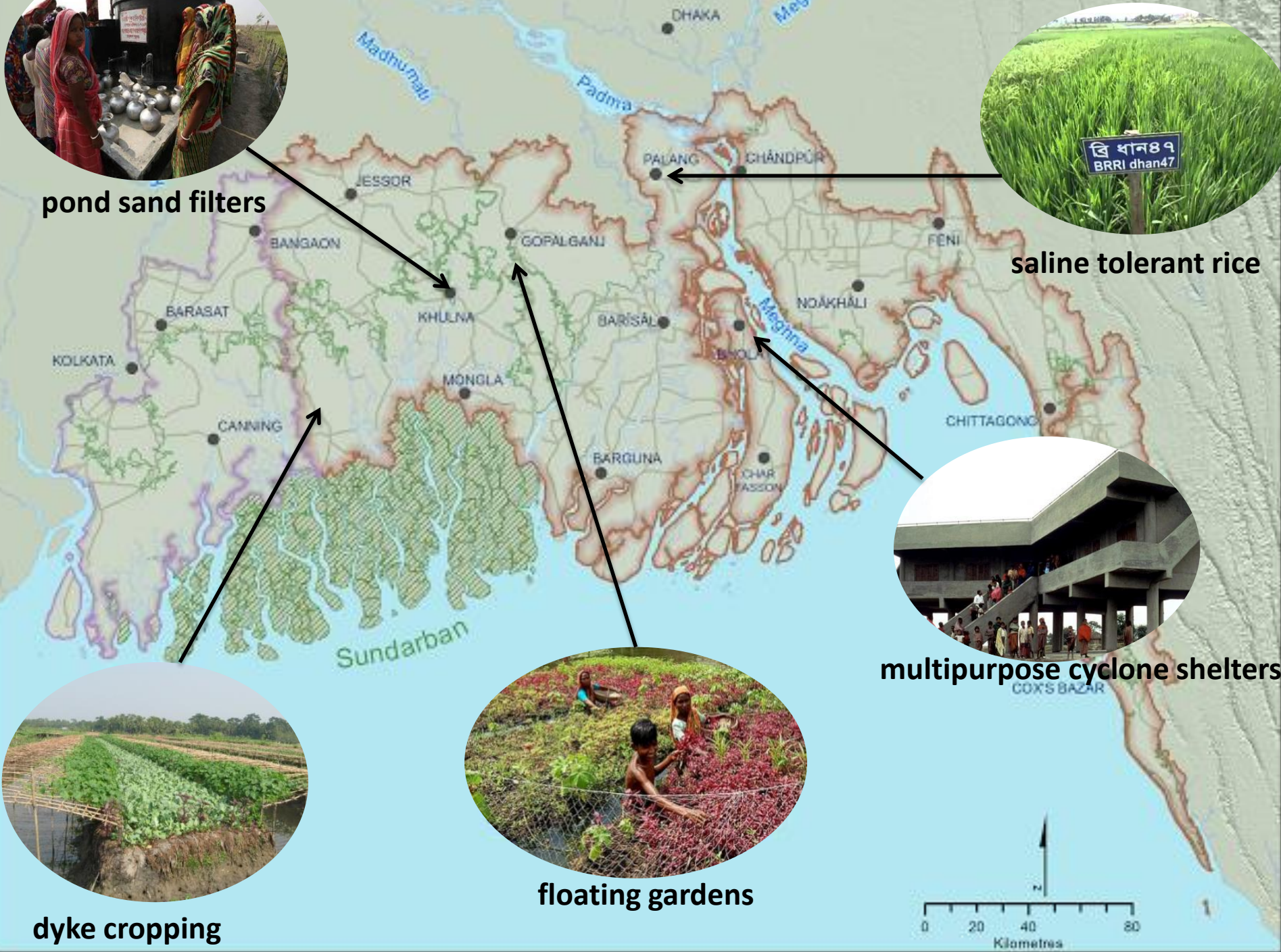
Examples of Adaptation in the GBM Delta, Bangladesh



pond sand filters



saline tolerant rice



multipurpose cyclone shelters

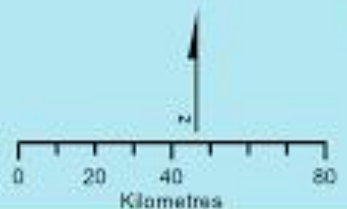
COX'S BAZAR



dyke cropping



floating gardens



Pond sand filters

Introduced by UNICEF and the Department of Public Health Engineering (DPHE) **pond sand filters (PSFs)** are a simple and effective way of providing clean water for cooking and cleaning in areas of high salinity. During the monsoon season, rainwater collects in specially build ponds. This water is hand pumped through a filter packed with coconut fibres and then through a sand bed. In addition to providing a clean water supply, women no longer have to walk miles to fetch water from distant sources. Potential issues with PSFs include a lack of community involvement in maintenance, including washing the filter beds. This could be addressed through further community training in participatory natural resource management

For more information:

- Abedin, M. A., Habiba, U., & Shaw, R. (2014). Community Perception and Adaptation to Safe Drinking Water Scarcity: Salinity, Arsenic, and Drought Risks in Coastal Bangladesh. *International Journal of Disaster Risk Science*, 5: 110-124
- Alauddin, S. M. and Rahman, K. F. (2013). Vulnerability to Climate Change and Adaptation Practices in Bangladesh, *Journal of SUB* 4(2): 25-42
- Sutradhar, L. C., Bala, S. K., Islam, A. K. M. S., Hasan, M. A., Paul, S., Rhaman, M. M., Pavel, M. A. A. and Billah, M. (2015). A Review of Good Adaptation Practices on Climate Change in Bangladesh, 5th International Conference on Water & Flood Management (ICWFM-2015), pp. 607-614

Multipurpose cyclone shelters

Especially prominent in the Bhola district, **multipurpose cyclone shelters** are designed to serve the local community both during and outside of cyclone events. Each shelter is designed to protect approximately 2000 people during a cyclone and also to function as a school , or other public building, during normal times. Because the shelters also function as schools, they are more likely to be maintained in between extreme events. Shelters have been largely successful and have greatly reduced deaths from cyclones and flooding. However, barriers to their use include distance to the shelter, a lack of facilities for women and a reluctance to leave behind animals. These barriers may be over come by developing a more participatory approach to shelter management that takes into account community needs.

Further reading:

- Rahman, A. and Islam, R. (2015). Shelters and Schools Adapting to Cyclonic Storm Surges: Bangladesh, Bangladesh Centre of Advanced Studies, Dhaka, Manly Council, Australia, III-3-3-4: 165-171
- Ahamad, S., Rahman, M.M. and Faisal, M.A. (2012). Reducing Cyclone Impacts in the coastal areas of Bangladesh: A Case Study of Kalapara Upazila, Journal of Bangladesh Institute of Planners, Dhaka, 5: 185-197.
- Dhakal, S. P. and Mahmood, M. N. (2014). International aid and cyclone shelters in Bangladesh: adaptation or maladaptation?, Contemporary South Asia, 22:3, 290-304

Dyke cropping

In Satkhira district, **dyke cropping** has been introduced to deal with water logging. A raised mound of earth is built alongside a ditch. Water in the ditch is used as a reservoir for cultivating prawns and fresh fish. Water can also be used for small scale irrigation including irrigating nearby rice fields when traditional water sources are scarce. On the raised mounds, vegetables are grown, including okra, pumpkin, and gourds. The combined fish-vegetable cropping system works well for local farmers and can be achieved with little investment and little additional space. This practice reduces the risk of crop failure due to water logging and provides further income opportunities through crop diversification.

Further reading:

- Rashid, M. H. and Islam, M. S. (2007). Adaptation to Climate Change for Sustainable Development of Bangladesh Agriculture, Bangladesh Country Paper, Bangladesh Agricultural Research Institute, Gazipur. Paper presented in Technical Committee of Asian and Pacific Center for Agriculture Engineering and Machinery(APCAEM) on November 20-21, 2007, Beijing, China.
- Alauddin, S. M. and Rahman, K. F. (2013). Vulnerability to Climate Change and Adaptation Practices in Bangladesh, Journal of SUB 4(2): 25-42
- Azad , A. K., Lin C. K. and Jensen K. R. (2008). Coastal Aquaculture Development in Bangladesh: Un-Sustainable And Sustainable Experiences. IIFET 2008 Vietnam Proceedings, pp. 1-12

Saline tolerant rice

In coastal areas, particularly in Shariatpur district, the Bangladesh Rice Research Institute (BRRI) has developed various **saline tolerant rice crop** varieties that can tolerate high salinity during the seedling and other growth stages. The development of saline tolerant rice is an important part of feeding the increasing population of Bangladesh under increasing salinity. But lack of awareness amongst local farmers and non-availability of seeds act as barriers to take up. The productivity of these type of crops is also threatened by the severe salinity expected to be encountered in future. Although saline tolerant rice makes a promising contribution to addressing climate impacts, continued research, including at the community level, is needed.

Further reading:

- Rahman, M.M. (2011). Country report: Bangladesh, ADBI-APO Workshop on Climate Change and its Impact on Agriculture, Ministry of Agriculture.
- Alauddin, S. M. and Rahman, K. F. (2013). Vulnerability to Climate Change and Adaptation Practices in Bangladesh, Journal of SUB 4(2): 25-42
- Alam, M., Ahammad, R., Nandy, P. and Rahman, S. (2013). Coastal Livelihood Adaptation in Changing Climate: Bangladesh Experience of NAPA Priority Project Implementation. R. Shaw et al. (eds.), Climate Change Adaptation Actions in Bangladesh, pp.253-276. Springer Japan 2013.
- Sutradhar, L. C., Bala, S. K., Islam, A. K. M. S., Hasan, M. A., Paul. S., Rhaman, M. M., Pavel, M. A. A. and Billah, M. (2015). A Review of Good Adaptation Practices on Climate Change in Bangladesh, 5th International Conference on Water & Flood Management (ICWFM-2015), pp. 607-614
- Master Plan for Agricultural Development in the Southern Region of Bangladesh, Ministry of Agriculture, Government of People's Republic of Bangladesh and Food and Agriculture Organization of the United Nations, June 2012

Floating gardens

In the flood prone areas of the districts of Khulna, Jessore, Gopalganj, Madaripur, Pirojpur and Jhalokathi where flooding and waterlogging are major problems, traditional **floating gardens** have been promoted by NGOs. Floating beds are prepared on water hyacinth covered with compost. This acts as a raft for vegetable cultivation. The rafts can be moved into sunny or shady areas as needed. However, floating bed cultivation is threatened due to the increase of salinity, particularly in Gopalganj as raising salinity hampers growth of water hyacinth. When successful, floating beds increase food security and generate income.

Further reading:

- CCC, (2009). Adaptive Crop Agriculture Including Innovative Farming Practices in the Coastal Zone of Bangladesh, Climate Change Cell, DoE, MoEF; Component 4b, CDMP, MoFDM, Dhaka.
- Alauddin, S. M. and Rahman, K. F. (2013). Vulnerability to Climate Change and Adaptation Practices in Bangladesh, Journal of SUB 4(2): 25-42, 2013