

**Challenges in Adopting Floating Bed Cultivation in  
Waterlogged Areas: A Case Study from Southwest  
Bangladesh**

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**Shantanu Kumar Saha**

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## Summary of the Dissertation

There is an increase in the frequency of extreme weather events since the late twentieth century, mostly in low lying coastal zones already beset by poverty and underdevelopment (IFRC, 1999, IPCC, 2001 as cited in Uyigue & Agho, 2007; Pender, 2008). This is causing instability in the agricultural sector, and thereby, jeopardizing economies that depend on farming. The marginal and small-holder farmers who make up the majority of the rural population in most developing countries have been adjusting to both short-term and long-term climate change consequences. Besides, different technological innovations and research related to agricultural improvement have been supportive for the farmers. Furthermore, various types of programs and projects are implemented by different developmental organizations in areas affected by extreme climatic events in developing countries in order to support farmers. Considering the prospects as well as problems of those multidimensional programs, a more critical perspective has arisen questioning the effectiveness of those initiatives (Grenier & Wismer, 2000). The intention of this research is to explore the consequences of introducing an indigenous adaptation cultivation practice by NGOs for poor farmers as an alternative livelihood in an area of Bangladesh affected by waterlogging.

Bangladesh is one of the most climate vulnerable countries in the world (Dasgupta, Huq and Wheeler, 2015). In some areas of south and southwest coastal Bangladesh, flood has noticeable impacts on agriculture both in a positive and negative ways (MoEF, 2008). In those coastal areas of Bangladesh, agricultural modification has shown success with the local people exhibiting remarkable

ability to withstand nature's destructive powers whereas in other areas some non-government organizations have provided assistance.

While reviewing the literature, it has been noted that the local farmers from the southern part of Bangladesh have invented an indigenous cultivation practice (i.e. floating bed cultivation practice) to produce seedlings and vegetable on their waterlogged land. In this practice, farmers use their submerged lands for crop production. Crop can be grown on the water in floating bed of water-hyacinth, algae and other plant residues with no additional water, nutrients, or chemical fertilizers being needed. Moreover, the cultivation bed can be recycled as organic fertilizer for the next season in the crop field (Haq *et al.*, 2002; Haq *et al.*, 2004; APEIS, 2004; Irfanullah *et al.* 2007; Islam & Atkins, 2007).

However, in the last decade, this floating bed cultivation has become a popular policy recommendation for coping with adverse ecological condition in waterlogged farm land (Irfanullah, 2013). Both local and international developmental organizations have started incorporating this cultivation practice into their developmental and adaptation projects for other areas in Bangladesh. While developing an in depth understanding regarding the spread of floating-bed cultivation, the findings from previous research illustrate that the practice has been introduced in the southwest part of Bangladesh as part of development initiatives for the poor people. Large sections of the region suffers from stagnant water bodies resulting from disruption of river flow due to coastal damming against tidal surges (Haq, et al., 2004; Dev, 2013). The construction of embankments under the Coastal Embankment Project (CEP) initiated in the 1960s,

has gradually created waterlogging, which has become worse with frequent floods. Consequently, marginal poor farmers have become landless and jobless during the waterlogged period.

This research has explored the consequences of the introducing the floating bed cultivation in southwest region of Bangladesh and to understand the dynamics of adoption of the floating bed cultivation among poor farmers. This research focused on the floating bed cultivation in the southwest region as it an innovation for the farmers of this area. To achieve the research objectives, the research used a case study approach to study an area from south-western Bangladesh.

The researcher traveled to the multiple sites (Monirampur, Keshobpur upazila of *Jessore* district) during his field trips in southwest region in order to identify the case. The research finds that the poor farmers joined those projects, got training and practiced floating bed cultivation during the project running time. However, most of the farmers do not continue this practice after the project finish. Based on the observation of all the sites from field trips, *Chandra* village was determined as the primary case. The researcher decided to explore this case (*Chandra* village) more in detail, considering the opportunity to observe a running project on floating bed cultivation in the south-west region where he will get the chance to observe the different phases of the project over time as well as interview respondents to know their perceptions during different phases.

This research chose to use qualitative evidence for writing this dissertation, as the research found it difficult to manage reliable information about the population of the research area as well as the actual number of people

practicing floating bed cultivation. The data was primarily collected by undertaking interviews with five groups related with floating cultivation as well as diffusion of innovation for agricultural adoption in waterlogged areas. The five groups of people included poor farmers of ongoing projects, poor farmers from previous projects, poor farmers without experience of floating cultivation, agricultural landowners, and experts and organizers of projects related to floating cultivation. All together 27 research participants were selected, considering on an average of 5 participants from each classified group.

This research has used purposeful sampling strategy to select specific cases that best met the purpose of the study. Here, by sampling the researcher refers to the initial selection of the case and within case sampling in terms of informants (Mills et al., 2009: 837). More specifically, among the different forms of purposeful sampling strategies, this research has used the snowballing strategy to identify the informants (Mills et al., 2009: 761). Open-ended questions were used to gather stakeholders' opinions as well as a more detailed account of facts (Yin, 2003). All the interviews were conducted in Bengali and the interviews were digitally recorded with the consent of the respondents. Besides, the researcher took field notes, made observations as well as photos of the areas.

While addressing the first research objective (*the dynamics of adoption of the floating bed cultivation among poor farmers given their limited access to resources in waterlogged southwest coastal Bangladesh*), the research found that the waterlogging problem in south-western part of Bangladesh has restricted the land based agriculture practice. This situation has mainly reduced the income opportunities of the poor farmers. On the other hand, this adverse condition

expresses the need of an alternative solution. Consequently, the poor farmers are becoming interested to practice floating bed cultivation, especially when supported by non-government organizations in order to enhance their income opportunities and access to resources.

The research found that local NGOs are working in collaboration with international aid organizations and farming experts are playing an active role in the diffusion of floating cultivation practice, which has been especially beneficial for poor and unemployed women. All the floating cultivation practitioners were ultra-poor (according to NGOs evaluation) and all of them are beneficiaries of the local NGOs. During the project time, the research did not find any case of individual initiative of doing floating cultivation. During the project time all the practitioners were given cash money as daily labor costs for working in their own bed by the NGO. Besides, the NGO also distributed seeds, so no initial investment by the farmers were made while they received wages on a daily basis. It was an attractive offer for the marginal farmers and the poor.

In order to address the second research objective (*the perception of the different stakeholders about the relative advantage, compatibility, complexity, triability, and observability of floating bed cultivation*), the research explored the different perceptions of farmers towards floating bed cultivation. Since, the poor farmers of the study area do not continue the floating bed cultivation after the project comes to an end. To explore the challenges of adopting the floating bed cultivation in the study area, the researcher considers it as an innovation as it is a new cultivation practice for the farmers in this area. The innovation is being introduced (diffusion) by NGOs. This research by using the innovation

perspective mainly explores the relative advantage, compatibility, complexity attributes of the floating bed cultivation, because in this decision making process, individuals mostly consider the relative advantage, compatibility, complexity aspects of an innovation (Rogers, 2003).

From the perception of the farmers about the relative advantage of floating bed cultivation, this research found that floating bed cultivation is beneficial when farmers do not have any other income opportunities. The farmers who did not join the project advanced the view that floating bed cultivation is not a better option for them in terms of economic efficiency. Besides, the landowners think that floating bed cultivation is only for the extreme poor, and it is a project for NGOs. The farmers who practiced floating bed cultivation think that floating bed cultivation is beneficial for them if they are given initial input costs support by NGOs. On the other hand, about the complexity dimension of floating bed cultivation this research has found that there are some technical aspects of the floating bed cultivation, which is not so easy. To get the best output from a floating bed, one needs to understand the science of it. For making the bed properly, the farmers need to understand the technique, otherwise bed preparation becomes harder for them. While exploring the compatibility dimension of the floating bed cultivation, this research has found that floating bed is not compatible with the current cultivation practice (rice farming and fish farming).

While discussing the third research objective - *underlying challenges of floating bed cultivation*, the research found numerous challenges in adoption floating bed cultivation. The challenges ranged from risk and uncertainty, hardship, complexities, incompatibility with the existing farming system to

limited access to resources. This research has reported that the underlying challenges of adopting floating bed cultivation is not only related with geophysical phenomena such as climate variability but also with social dimensions of access to resources by the poor farmers. This research has also explained that emphasis on incentives rather than the agricultural practice, incompatibility with the context, limited NGOs efforts are also acting as crucial impediments for adopting floating bed cultivation.

In essence, the research findings indicate the presence of NGOs as the key element for the success of floating bed cultivation in the study area. Floating bed cultivation becomes viable for the marginal farmers only in cases where monetary and training assistance are present. Most importantly, it is costly for the poor farmers (day-laborers) to start practicing floating cultivation as it requires initial investments (i.e. employing daily-labor, buying seeds etc.) and returns are delayed. Most of them were unable to invest money for any duration. Besides, there are risk factors like breaking of bed, or being washed away due to high tides or floods. Since, poor people always remain at poverty's edge, they try to avoid risk. Moreover, lack and access to resources has made their adoption harder. But the training giving to the poor farmers will help them in extreme adverse situation, as they are already familiar with the cultivation practice and know how to do it.

The study's findings conclusively support the view that the adverse situation created by waterlogging problem has reduced the income opportunities of the poor farmers as well as their access to resources. This situation has made them more vulnerable. Due to limited income opportunities, poor farmers need to go through different occupational transition. And here the diffusion of floating

bed projects also worked as a transition phase. But none of these worked as a sustainable solution for the poor farmers. On balance, the NGOs as well as the poor people received aid or assistance for overcoming poverty but different challenges hinder the process of sustainability.

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