

INTEGRATED APPROACH TO COASTAL WATER MANAGEMENT BY THE POOR IN BANGLADESH

Coastal floodplains in Bangladesh experienced increasing problems of salinity, water logging, drought, and over-exploitation of natural resources in the last two decades. This has increased the vulnerability of the extreme poor. Extension targeted at individual farmers will not be sufficient under this situation. Instead, what is needed is a well co-ordinated approach to improve water management based on participatory planning involving farmers and landless. In this Good Practice Note, Dr Parvin Sultana reflects on the experience of promoting technical and institutional innovations to bring about livelihood improvements among the extreme poor.

SYNOPSIS

In Barguna district in southwest Bangladesh salinity and drought in the dry season constrain agriculture, and the poor lacked access to land. An integrated approach to land and water management has dramatically improved livelihoods of the extreme poor, it was introduced through a project “Adapting Natural Resource Management to Climate Change and Increasing Salinity” undertaken by Shushilan and Flood Hazard Research Centre, with support from the Shiree programme (EEP – Economic Empowerment of Poor) funded by UKaid (Department for International Development). The approach is based on:

- facilitating group and individual leases to farm land for the extreme poor (landless),

- excavating silted up canals to hold freshwater in the dry season,
- training participants in cultivating low water demand but high return crops,
- provision of quality seed and inputs for crops in the first year, and
- restoration of native fish as an added incentive for poor and landowners.

CONTEXT

Over 30% of the net available cultivable land of Bangladesh is located in the coastal floodplains that have experienced increasing problems of salinity, water logging, drought, and over-exploitation of natural resources in the last two decades. This has created acute problems for the extreme poor to continue their traditional livelihoods pattern in the face of declining fish catches, reduced land for grazing, and erosion of share-cropping due to expansion of shrimp farming in cultivable land. At the same time, the agriculture labour market has been almost eroded causing a serious threat to daily income of the extreme poor, with a combined result of increased rural to urban migration. Moreover all the coastal cultivable lands are not being used. Declining winter rainfall, decreased moisture content of topsoil, poor recharge of ground water and higher temperatures and evaporation intensify drought-like conditions for half of the year. In addition increased soil salinity is a major constraint on agriculture – it limits growth and production of crops, and also makes the soil unsuitable for many potential crops.

Fallow crop land in dry season in Barguna

In Barguna District, like others in the coastal zone, waterbodies and natural channels or canals (khals) increasingly dry up, and demand for fresh water to irrigate dry season paddy is high, while availability of fresh water has declined. As a result native fish are unable to survive the dry season, and farmers and fishers are in conflict. Seasonal drought and surface water salinity are some of the trends that have been predicted to worsen with climate change according to the Bangladesh Climate Change Strategy and Action Plan. Moreover, as the district is disaster prone people avoid any risky investment, and the poor have become dependent on relief for immediate necessities.

The two main agricultural problems - drought and salinity – are compounded by a shortage of surface fresh water sources due to siltation and encroachment of canals. Irrigation from surface water is expensive, while the fresh water table for irrigation is deep underground. Soils also have poor moisture holding capacity and contain little organic matter. Early monsoon rice is also vulnerable to drought and salinity at the sowing stage. Consequently most land is single cropped with rain fed Aman rice in the monsoon season. Therefore Aman planting depends on rainfall, and harvest is later than in other districts, which means the potential dry season (rabi) crops cannot be planted in time. Access to land for the landless is more problematic than in other parts of Bangladesh. For the single Aman crop landowners demand two-thirds share of the crop so there is no incentive for tenants to invest in good cultivation practices such as improving soil fertility. Instead landowners lease out their land or more often cultivate Aman rice themselves using very little inputs. The only dry season crop in many fields is low yielding grasspea (khesari) which needs minimal inputs.

The poor who worked as agricultural labourers often migrate from this area to the nearest towns or big cities in search of work either permanently or temporarily. Poor people are the worst sufferers from climate vulnerability, but medium farmers here also live hand to mouth. The target group are the extreme poor who consume under 1,805 kcal/person/day, live in vulnerable housing conditions, and lack access to the safety nets of government and NGO programmes. These households are trapped in a web of poor health and nutrition, do not possess productive assets (no cultivable land and may not even own a homestead), and are unable to obtain or retain work that offers sufficient income to meet their basic needs.

The challenge is to find ways of helping the extreme poor lift themselves out of poverty using the resource base within this region. One opportunity is to innovate ways to enhance the productivity of land-water resources that are accessible for the extreme poor.

Excavation of a canal for water storage

GOOD PRACTICES

The set of good practices generated under this approach form a package and comprise:

- **Inclusive participatory planning** to analyse problems, identify scope to restore surface water, linkages with other institutions managing sluices and waterbodies, establish demand for re-excavation in order to obtain government

permission, link the poor with local champions and service providers, and reach a critical mass of participating landowners and poor people.

- **Collective action to re-excavate silted up channels and manage water for irrigation and fisheries** – communities can make some contribution, and can link with other institutions managing sluice gates where necessary, but need external support for the costs of re-excavation and buying pumps.
- **Leasing agreements so that poor people can farm land that was fallow** – to target poorer people and overcome the constraint of absentee and larger landowners who have low motivation to try new dry season crops, longer term sharecropping or lease agreements need to be negotiated so that poor people can access this land within the catchments of the re-excavated channels.
- **Cultivation of low water demand dry season crops that offer good returns** – rice is a water hungry crop, 5-6 times more land can be cultivated with crops such as sunflower and maize which require less irrigation yet give at least as much profit. These crops are not known to most farmers and landless so intensive extension support in the first year is needed along with facilitating access to quality seeds.
- **Fishery conservation and restoration** – as part of the collective action, communities have scope to restore a common resource in the form of capture fisheries once canals are re-excavated – this requires agreement on setting

aside parts of the canal as fish sanctuaries so that fish can survive there in the dry season and then repopulate the floodplain in the monsoon.

CHALLENGES

Two hundred extreme poor households meeting the target criteria were selected from five different sites, but 19 beneficiaries had to be replaced due to death, marriage, unwillingness to take innovations, and migration to Dhaka. The beneficiaries were organized into 20 groups. Each group operates as a saving group for their safety net. All the groups from each site were linked with an existing Community Based Organisation (CBO) managing natural resources in the area and were linked to a local champion oriented by the team, these champions help them with space for meetings, suggestions and negotiating with other landowners to get long term land lease.

In the beginning these extreme poor people had no confidence in themselves, had little or no skills, had no person or organization to help them, and had no institutional base of their own. The process of organising into groups, making links to existing CBOs in the area, getting help from local champions, and having their safety net account has increased their social capital and self respect.

During participatory planning the beneficiaries were introduced to local service providers, and the local service providers gave their commitments to help these poor people whenever necessary. Accordingly participants now have access to local

officers of the Department for Agricultural Extension, Department of Fisheries, Department of Livestock, Upazila administration for example AC(land), and local seed and fertilizer dealers.

The main constraint encountered has been getting permission from the authorities to re-excavate dead canals for irrigation water to grow crops, which took a longer time to process than expected. Administrative complications made this a lengthy and slow process, which delayed some excavations.

Sunflowers grown by participants

BENEFITS and IMPACT

Participants heard from the initial pilot participants that cultivation was potentially profitable, so from 2010-11, 95% of participants cultivated a total of 80 acres of leased in land in the five sites, with 111 participants in areas served by the re-excavated canals, and the others using water from existing canals or waterbodies. All of this land was fallow in the dry season before this initiative

The crops grown are local varieties of rice in aus and aman season; and in the rabi season sunflower, maize, vegetables (bitter gourd, red amaranth, Indian spinach, okra, etc.), mung and shorter duration HYV rice (BR-28) and saline tolerant rice (BR-47). Reduced irrigation is being adopted for the dry season rice, and the other crops need much less irrigation water –

in trials sunflower used about 150 mm of irrigation water and maize about 220 mm compared with more than 900 mm for rice. Moreover the non-rice crops give higher returns than rice as shown in the table. The participants usually eat more of the rice and sell the other produce in local markets. Besides, using money saved from their crop incomes 80 participants extended their areas of leased-in lands.

Income and expenditure from the main crops grown by beneficiaries in 2010 monsoon and 2010-11 rabi season

Season	Crop	Land (acre)	Labour* (days/ac)	# of irrigation	Cost (Tk/ac)	Net return (Tk/ac)	Own consumption (%)	Sold (%)
<u>Aus</u>	Rice (<u>Goda Irri</u> , <u>Mala-china</u> , <u>Haitta</u>)	15.28	24	1	16,014	6,036	50	50
<u>Aman</u>	Rice (<u>Sadamota</u> , BR-11, <u>Kajalshail</u>)	15.28	18	0	11,550	9,450	100	0
<u>Rabi</u>	Rice (BR-28, BR-47, <u>Chaita Boro</u>)	84.00	36	21	25,044	15,456	20	80
	Sunflower**		12	2	14,670	20,970	20	80
	Maize		15	3	14,670	24,930	2	98
	Mung		9	2	2,820	18,780	10	90
	<u>Grasspea</u>		9	0	2,760	6,000	10	90
	Bitter gourd		27	as needed	20,000	40,000	2	98

* excludes land preparation which is by contract/hiring draft power

** If they could sell oil they would get a three times higher return

A total of six fish sanctuaries were established in three re-excavated canals for conservation of indigenous fish species which were threatened. These were mostly aimed at community benefits and the participants who were fishing in the adjacent canals and beels. Nobody is allowed to catch fish in the sanctuaries. The benefit the participants reported is a 40% increase in their catch. Moreover, during the monsoon subsistence fishers also caught fish from their rice fields.

Fish sanctuary in re-excavated canal

Where there is available water (in Choto Lobongola, near the river) other complementary enterprises have also been tried. Seven participants received ducks and geese. Each goose laid 5-7 eggs and each gosling could be sold for Tk. 100-150, while an adult goose can be sold for Tk. 600. Each of these beneficiaries increased their flock on average from 17 to 50 and earned Tk. 7,000 from this enterprise against an initial investment per participant of Tk.3000.

The poor participants now have their own self-help groups, and the participants have built up individual savings in the range from Tk.550 to Tk.1,250. None of them could imagine having savings before. All of the participants plan to gradually save

more with increased income from different micro-enterprises. All of them believe that their savings will help them to cope with any risks and challenges in future.

Socially these formerly destitute people are now more accepted in their local community as they no longer go to people for alms or help and they can contribute a little towards community gifts in social events in the village. The participant households are also closer to each other and more supportive to each other, rather than before feeling isolated and helpless. These changes came from regular meetings, group savings and working together in water management and cultivation. Self confidence is high and beggars are no more beggars, instead they can introduced themselves as self employed petty traders. All the supports they received were given in kind. They learned to do new things and use their own skills. In total 196 participants have taken up new occupations: five changed completely from begging to petty trade and 191 have adopted cultivation of new crops on leased land, while continuing their other livelihood strategies such as agricultural labouring. Only eight women participants who are old and physically disabled could not take up cultivation themselves but are still involved in farming by hiring labourers.

Beneficiaries harvesting rice crop

In general all of the beneficiaries can at least have six months food from their own leased in lands. Instead of eating 1 or 2 meals a day before they all now can eat three meals a day, can send their children back to school and can afford to get health care. They are not migrating in search of money to big cities rather they are busy farming.

SUSTAINABILITY and SCALING UP

The evidence so far is that cooperation among the beneficiaries is sustaining and re-excavated channels do not silt up again quickly. Cultivation of low water demand crops has expanded in these catchments to the extent that water is available. The central coastal region of Bangladesh has large areas of dry season fallow, and many dried up channels suitable for re-excavation, but scaling up will require a coordinated approach that links extension with funding for communities to re-excavate and with local planning that explicitly links the poor with landowners.

LESSONS LEARNED

For wider uptake of this approach extension targeted at individual farmers will not be sufficient. It depends on local participatory planning involving farmers and landless so that a coordinated approach is adopted that combines collective action to improve water management, with individual adoption of new crops and practices. Moreover, this group based approach to transforming dry season fallows is possible for the landless provided agreements on leasing land can be reached with a critical mass of landowners. The following lessons were drawn:

- The poorest of the poor have low self confidence in taking decisions because of poverty and their vulnerable condition, but the scenario can be changed with access to own controlled land without any personal financial risk.
- At the beginning of the project they should be supported in enterprise choices which they are comfortable with, and later helped to switch to more profitable enterprises.
- Participants were given choices and in-kind help, which decreased the chance they would spend support for non-profitable purposes. They have now the ownership of their enterprises.
- Economic empowerment can provide community acceptance and capacity to demand services from the public service providers.
- Even poor people can cope with climate change and variability if proper technologies and small grants are provided.
- Social cohesion can be increased through institution building and regular discussion on personal and enterprise-based issues.
- In the rabi season, even in a climate challenged area, land can be productively used to cultivate high value but low water demanding crops.
- Excavation of canals can be beneficial to the poor as well as for the community on whom these poor people are dependent.
- With secure access to land, the poor invested in cultivation, and with increased cultivation and recycling of plant material the land productivity and soil organic matter increased.

- For coping with climate variability poor farmers should be trained and made aware of the new technologies, seasonal variation and cost-effectiveness of alternative crops and fishery.
- Stronger coordination and links are needed between the poor beneficiaries leasing land and sluice committees.
- The process for government approving plans to re-excavate silted up canals for the benefit of local communities and their environment should be made easier, quicker and more responsive to local needs.

Additional links/References

Sultana, P., and P. Thompson. 2004. Methods of Consensus Building for Community Based Fisheries Management in Bangladesh and the Mekong Delta. *Agricultural Systems*82(3): 327-353.

Sultana, P., and P.M. Thompson. 2008. Gender and Local Floodplain Management Institutions -- A Case Study from Bangladesh. *Journal of International Development* 20: 53-68.

Sultana, P., and P.M. Thompson. 2012. Community adjustment to climate stresses in coastal Bangladesh. Paper presented at the CAPRI/CCAFS Workshop on Institutions for Inclusive Climate-Smart Agriculture, September 10-13, 2012, Nairobi, Kenya.

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