

# **SMALL IDEAS TRANSFORMING RURAL LIVES AND LIVELIHOODS IN RIVER ERODED AREAS OF BANGLADESH**

**Case Study of Ryutaro Hashimoto APFED  
Award for Good Practices, 2007**



**2009**

**Institute for Global Environmental Strategies**

**Hayama, Japan**

**&**

**Bangladesh Center for Advanced Studies**

**Dhaka, Bangladesh**



Small ideas transforming rural lives and livelihoods in river  
eroded areas of Bangladesh: Case Study of Ryutaro Hashimoto  
APFED Award for Good Practices, 2007

July 2009

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## FOREWORD AND ACKNOWLEDGEMENTS

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Bangladesh is one of the most vulnerable countries in the world with a range of natural disasters hindering its development. Decades of developmental efforts were repeatedly undermined by the repeating natural disasters which took the communities back to the beginning stages of development indicating that there is a need for a paradigm shift in the way the development is approached in the country. Development in Bangladesh requires an integrated approach that promotes small ideas with high potential without reliance on high-end technologies that often fail in the context of developing countries like Bangladesh. Such a development should also take into consideration different risks and vulnerabilities that the country is facing.

The project on 'disappearing lands' has rightly been awarded The *Ryutaro Hashimoto APFED Awards for Good Practices* as the project is aimed at bringing in small ideas that have potential to change the lives of millions of rural people challenged by natural vagaries. Implemented under the name of River Erosion Project, the project has made a progress in people's living standards, helped build their confidence to take on the challenge and emerge as winners. This was made possible by creating new livelihood options that are viable and effective.

Our sincere thanks goes to Ms. Veena Khaleque, Country Director, Practical Action, Bangladesh; Mr A.Z.M. Nazmul Islam Chowdhury, Program Manager, Practical Action; and Md Miznur Rahman, ANM Kaiser Zillany, Utpal Kumar Dutta, Abdur Rahim, Nirmal Chnadra Bepari, Md. Misbahuzzaman, Subhash Chandra Barman, Omar Faruque, Iqbal Hussain, Samsad Najnin, Humayun Kabir, SNM Moniruzzaman, Md. Ahsan Habib, and Mollah Mohammad Nuruzzaman all belonging to the Disappearing Lands Project for providing full support during the study visit by IGES and BCAS staff. This report is an outcome of a collaborated effort between IGES and BCAS where BCAS provided needed local support and expertise in organizing the field visits and in successfully finishing the case study. We also thank numerous local government administration and other local partners who provided needed support throughout the process of reviewing and writing this report. Feedbacks are welcome from readers in order to improve the future APFED Award case studies.

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## TABLE OF CONTENTS

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Foreword and Acknowledgements .....	III
Table of Tables.....	5
Table of Figures.....	5
Introduction.....	6
The Project.....	9
Objectives.....	11
Description of Project Sites .....	11
Problem Analysis.....	14
Key Activities .....	14
Project Implementation Mechanisms .....	15
Simple Solutions for Big Challenges.....	17
Rehabilitation: Cluster Villages .....	18
Alternative Livelihoods.....	19
Floating Vegetable Garden .....	20
Sandbar Cultivation .....	21
Animal Husbandry and Fisheries .....	23
Pottery.....	27
Light Engineering .....	29
Handicrafts.....	30
MultiPurpose Refugee Shelters and Disaster Management .....	31
Outputs and Outcomes.....	33
Key Outputs.....	33
Direct Impacts.....	35
Employment Generation.....	36
Innovations .....	38
Policy Influence and Advocacy .....	39
Lessons Learned .....	41
Recommendations and Conclusions .....	43
References Cited .....	48
Annexure I: The Case Study Methodology in Brief.....	49

## TABLE OF TABLES

---

Table 1. Impact of river erosion on Bangladesh.....	6
Table 2. Length of riverbank erosion in various rivers of Bangladesh.....	6
Table 3. Internal and external migration of people in Bangladesh (migration per 1000 people).....	7
Table 4. Percent of migrants by push factors at the place of origin.....	7
Table 5. Divisions and districts affected by river erosion in Bangladesh.....	9
Table 6. Objectives of the project and pertinent activities taken up.....	10
Table 7: Name of upazilas and unions under the project.....	11
Table 8. Length of embankment (km), number of people living on embankment in Gaibandha district compared to other districts. ....	14
Table 9. List of activities and number of beneficiaries. ....	15
Table 10. Technology adoption rate in different sectors.....	33
Table 11. Cost-benefits of different initiatives under the project. ....	34
Table 12. Reduction in migration among the cluster village dwellers and those living on embankment. ....	37
Table 13. Beneficiaries of alternative livelihoods and awareness campaigns. ....	37

## TABLE OF FIGURES

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Figure 1: Map of Disappearing lands project sites (Prepared by GIS Lab, BCAS).	13
Figure 2. Cause and effect relations between shifting river course and vulnerability to other stresses.	17
Figure 3. Houses in one of the cluster villages built by the Practical Action.	19
Figure 4. Floating vegetable garden in full growth.	20
Figure 5. On the left, the pumpkins are being grown on char land. On the right, the pumpkins stored under room conditions.	23
Figure 6. Cage fisheries: Open cages for growing large fish. Observe the floating cages in the background.	24
Figure 7. Cage fisheries provide flood proof solution to capture fisheries in flood prone areas of Bangladesh.	24
Figure 8. The community pond dug in the cluster village (picture during dry season).	25
Figure 9. Beef fattening: Feeding bull a special diet for faster growth.	26
Figure 10. Duckery being practiced by the beneficiaries.	26
Figure 11. Improved pottery wheel provided by the Practical Action.	28
Figure 12. Mr. Shahidul Islam, a beneficiary, sharing his experiences.	29
Figure 13. Training on Handicrafts WAS imparted to adolescent girls, school dropouts and women on embroidery and weaving winter cloths.	30
Figure 14. One of the multipurpose refugee shelters constructed by Practical Action.	31
Figure 15. The dispensary in a multipurpose refugee shelter.	32
Figure 16. The cluster village saved lives and assets during 2007 floods.	36
Figure 17. A national level workshop organized by the Practical Action to disseminate the outputs of the project.	39
Figure 18. The APFED evaluation team discussing with the local government official.	41

## INTRODUCTION

Bangladesh is largely a delta formed by different rivers merging with Bay of Bengal. About 230 small and big rivers, which are considered to be the most unstable river systems in the world, intersect the country. The rivers keep changing their course in certain time intervals leading to destruction of land and property. This has become a root cause for at least two immediate major problems i.e. riverbank erosion and forced migration of people. The frequently changing rivers erode the lands situated along the riverbanks that are inhabited by millions of people all over the country. The available data shows that the impacts of riverbank erosion are increasing over the years in terms of area and number of people impacted (Table 1). Riverbank erosion is severe along the Brahmaputra-Jamuna River with erosion along a length of 160 km at 38 locations (Table 2). It is to be noted that the rural outmigration in Bangladesh is a complex problem with driving forces varying in different parts of the country. Riverbank erosion is undoubtedly the important reason along the course of major rivers in Bangladesh. Statistics reveal that nearly 7 million people have been displaced by river erosion over the past two decades, and current trends shows that more than a million are affected and nearly 100 thousand people are displaced every year.

Table 1. Impact of river erosion on Bangladesh.

Year	Financial Loss (million USD)	Affected areas (hectares)	Affected population
1996	5809	11734	10103635
1997	33012	1270	173090
1998	2201	6797	321000
1999	10535	37284	899275
2000	3286	35901	415870

(Salim, 2007)

Table 2. Length of riverbank erosion in various rivers of Bangladesh.

River	No. of locations of riverbank erosion	Length of erosion in kilometers
Brahmaputra-Jamuna	38	160.0
Ganges-Padma	30	94.4
Meghan	6	12.8
Teesta	8	35.2
Minor rivers	18	31.2
Flashy and other rivers	165	77.6
Tidal rivers	18	83.2

(Dey, 2008)

In the process, people loose not only their farming land and homestead, but find themselves completely uprooted from their community, social networks and livelihoods. In a way, the impact of riverbank erosion is far more devastating than other natural disasters, as it permanently washes away the land on which their livelihood and structures depend. The affected communities have no other means of shelter and means of living, and are forced to take refuge in unauthorized river embankments and marginal lands, living under most deprived and in-human conditions. Those who have no other alternative migrate to cities in search of jobs. They are among the poorest of the poor in Bangladesh.

Migration, both in-migration and out-migration, is a serious social issue in Bangladesh (Table 3) due to the reasons listed in Table 4. The available statistics suggest that nearly 41 people out of 1000 people migrated from rural areas to urban areas in 2007 (Bangladesh Bureau of Statistics, 2009). Migration is seasonal and the rate of migration is much higher during natural disasters such as floods. In absence of national level studies on the reasons behind migration, we can derive some inferences from a micro-level study carried out in Comilla district of Bangladesh which revealed that 39% of those migrated did so in search of job and 30% due to poverty (Table 4, Hossain, 2001). Hence, poverty and unemployment are the major reasons behind the migration which are in turn caused by the resource degradation by riverbank erosion and floods. The migration was highest among those involved in agriculture and among illiterates which suggests that targeting these communities could potentially reduce the migration.

Table 3. Internal and external migration of people in Bangladesh (migration per 1000 people).

S No	Category	2007	2006
<b>I</b>	<b>Migration (Internal) per 1000 population</b>		
1	In-migration Rate	37.1	33.6
1.1	Rural In-migration	20.7	17.5
1.1.1	Rural to Rural	15.6	13.9
1.1.2	Urban to Rural	5.1	3.6
1.2	Urban In migration	64.8	60.1
1.2.1	Rural to Urban	23.7	23.0
1.2.2	Urban to Urban	41.1	37.1
2	Out migration Rate	37.0	28.9
2.1	Rural out migration	23.4	19.5
2.2	Urban out migration	61.4	46.2
<b>II</b>	<b>Migration (External) Per 1000 population</b>		
1	In migration	0.96	0.88
2	Out migration	1.81	1.78

(Source: Bangladesh Bureau of Statistics, 2009)

Table 4. Percent of migrants by push factors at the place of origin.

Push factor	% of total migrants
<b>Poverty</b>	39
In search of job	30
Influence of village	4
Family influences	19
Study	6
Others	3

(Source: Hossain, 2001)

The government of Bangladesh has been implementing several developmental programs to help rural poor. An indicative list of agriculture, animal husbandry, and rural development programs is given below (Government of Bangladesh, 2009).

1. Agriculture and water sectors
  - a. Expanding irrigation facilities in Southern Bangladesh, addressing water logging in South-Western Bangladesh, and by creating opportunities for multiple cropping.
  - b. Subsidies on fertilizer and other inputs

- c. Developing high yielding varieties and improved agronomical practices
  - d. Agricultural loans
  - e. Provide vaccines for poultry and cattle
  - f. Releasing fish fry in open water bodies for improved fish catch
  - g. Formation and implementation of Water Use Act and amendments in Water Resource Planning Act, 1992
  - h. Construction and repair of irrigation canals
  - i. Automation of flood, salinity and cyclone forecasting systems
2. Rural development
- a. Extending credit by strengthening micro-credit programs
  - b. Expansion of Information Communication Technologies in rural areas
  - c. Improve socio-economic conditions and empower rural women
  - d. One house one farm initiative to turn every rural household into an economic unit
  - e. Training on social and skill development
  - f. Providing better sanitation and safe drinking water facilities
  - g. Improving rural infrastructure such as roads and bridges
  - h. Rural electrification
  - i. Implementing national food policy capacity strengthening program through fair price system and subsidies, food for work, and establishing food storage facilities
  - j. Housing for lower and middle income groups
  - k. Rural healthcare through community clinics, maternal health voucher program, national nutritional program, patient welfare fund and digital pass card for patients
  - l. Social security for unemployed, old age allowance, allowances for destitute women, allowances for poor lactating mothers, capitation grants.
  - m. Returning home program to bring back rural people to villages and distribution of public lands for reducing migration
  - n. Stipend for people affected by '*monga*' (short-term food and employment crisis created by floods) in river erosion affected areas.

While several developmental programs are being implemented, it can be noted that there are very few programs aimed at riverbank erosion or communities affected by riverbank erosion. Only the recent budget for 2009-10 talked about formulating and implementing Water Use Act that is aimed at reducing the riverbank erosion. Programs such as stipend for people affected by *monga* are only expanded to all the affected people only from the year 2009-10. We are unable to get our hands on studies that dwell into why government programs failed to address this important problem head on (or there is absolute lack of such studies). However, from our interviews with the local administration in Gaibandha district revealed that the problem is so huge that it is simply impossible for the government to address it to any extent. Part of the problem also seems to lie with how government identifies the program beneficiaries (please look at the recommendation section of this report). We were told by some governmental and non-governmental interviewees that since migrants who settle on riverbanks are considered as 'illegal settlers', they are not eligible to get benefit from many of the programs listed above.



## THE PROJECT

Being aware of the issues discussed in the previous section and gaps in government policies, the Practical Action Bangladesh has implemented a project in the river-bank erosion prone areas of Gaibandha district with an aim to rehabilitate and to provide alternative livelihood options.

The Gaibandha district is located in the north-eastern Bangladesh at the confluence of the two major rivers; namely, Tista and Brammaputra. This geographical location makes the area vulnerable to disasters, especially floods and riverbank erosion (Table 5). Frequent disasters make the life in this area much more difficult than the rest of country, by depriving people of land, employment opportunities and basic service facilities (refer to Table 5 and Table 8). The width of River Jamuna varies between 3-18 km along its length. The river flow varies depending on the volume of the water in a given season and hence one can find dry patches, or elevated char lands created due to continuous siltation, in the river course at any given point of the year less so during the peak monsoon season. Due to lack of available land to live, many poor people live on the char lands, lands created within the course of the river due to continuous siltation (the white areas in the blue river course depicted in Figure 1), created along the breadth and length of the river. Hence, these char lands are one of the most isolated and highly vulnerable place of the country to varying flood levels and related migration.

People from these flood prone areas often migrate and take shelter in very marginal areas, where basic services such as safe water, sanitation, health and education are minimal or non-existent. Communities are mostly excluded from basic services and infrastructure facilities such as communication and transportation. Ill health, malnourishment, and mortality rates for women and children are also significantly high. The remoteness of the district and the complexity of the problems result in a high degree of social marginalisation, migration, child labour, exploitation, child marriage, early pregnancies and violation of human rights. Women and children are the most vulnerable due to the absence of alternative livelihood options, basic services, lack of institutional support, men and even women migrate in search of employment to other parts of the country. The area suffers from regular seasonal famine every year often invisible to outsiders.

Table 5. Divisions and districts affected by river erosion in Bangladesh.

Divisions	Districts
<b>Rajshahi</b>	Sirajganj, Rajshahi, Pabna, Bogra, Kurigram, Lalmonirhat, Gaibandha, Nilphamari and Rangpur
<b>Dhaka</b>	Mankiganj, Tangail, Jamalpur, Faridpur, Shariatpur
<b>Chittagong</b>	Chandpur, Noakhali, Bhola, Laxmipur

(Source: Assessments of Bangladesh Center for Advanced Studies)

The project ‘Disappearing Lands: Supporting Communities Affected by River Erosion’ was formally launched in April 2004 financed by the Big Lottery Fund (BLF) and Practical Action for the period of April 2004 to April 2009. The project covers two major thematic areas such as a) rehabilitation of the river eroded community and b) alternative livelihoods through mainstreaming disaster risk management issues into development practices. The project has innovated a number of pro-poor technologies listed in Table 6. The project has successfully built the capacity of over 13000 direct household beneficiaries, above 65% are female beneficiaries, and 65000 in-direct beneficiaries on alternative livelihood skills through its diversified and innovative approaches listed in the Table below.<sup>1</sup>

Table 6. Objectives of the project and pertinent activities taken up.

Objective category	Activities
Promoting food security and additional livelihoods	<ul style="list-style-type: none"> <li>• Sandbar cropping (agriculture on sand deposited on the river bed)</li> <li>• Floating vegetable gardens;</li> <li>• Fisheries and livestock technologies innovation, adoption and promotion;</li> <li>• Light engineering training to diversify skills from traditional agro based skills to alternative livelihood opportunities;</li> <li>• Food-processing for value addition;</li> <li>• Small enterprise development for alternative earning and community managed extension system development to reinforce and continue project interventions on a sustainable basis;</li> </ul>
Disaster risk reduction	<ul style="list-style-type: none"> <li>• Infrastructure development through establishment of multipurpose refugee shelters and model cluster villages</li> <li>• Community based early warning and rapid evacuation system;</li> <li>• Volunteer group development;</li> <li>• Integrated cluster village development to resettle the homeless;</li> </ul>
Education, awareness generation and capacity building	<ul style="list-style-type: none"> <li>• Non formal education centres (schools) for the socially marginalised children;</li> <li>• Community hospitals aim to decentralise basic services;</li> <li>• A series of campaigns on basic health, WatSan and livestock disease management.</li> </ul>

Additionally, the project has emphasised the right based training, particularly for women groups on legal rights, child rights and reproductive health and strengthening right based issues of the target communities to articulate their civil, social and political rights.

In summary, the project is highly focused on food security and employment issues for the erosion affected and displaced resource poor communities, initiating alternative strategies for community based disaster risk management & vulnerability reduction, and building awareness on social, civil and political rights of the displaced communities for greater access to facilities, opportunities and basic rights in the region. The beneficiaries of the project are mostly landless community who were frequently affected by flood and riverbank erosion. The project has built four cluster villages in the char lands of Jamuna

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<sup>1</sup> Direct beneficiaries are those who received direct benefits from the project in the form of skills, assets etc. Indirect beneficiaries are those benefited by adapting those practices by informally learning from the direct beneficiaries.

River and introduced a number of livelihood options considering local needs and potential skills of the community. The project has provided trainings on agriculture technology like floating bed vegetable cultivation, fish culture in cage, sandbar cultivation, livestock and poultry rearing; agro-food processing, light engineering, tailoring, handicrafts etc. to the community for building their capacity. Transfer of simple, replicable, and practical technologies among the community is an integral part of the project.

## OBJECTIVES

The project has aimed to address the needs of the community based on the following four major objectives:

- Poor women, men and children living on vulnerable riverbanks are better prepared to withstand the impact of recurrent (annual) natural disasters.
- People displaced by riverbank erosion have access to basic services (Food, shelter, water, health and education through cluster village development and multipurpose refugee shelters, the beneficiaries will have access to basic services).
- People displaced, or at risk of being displaced by riverbank erosion, have alternative livelihood options (new income earning opportunities).
- Improved social, civil, and political rights of disadvantaged men, women and children affected by riverbank erosion and regular flooding.

## DESCRIPTION OF PROJECT SITES

The project was operated in 23 unions of four upazilas<sup>2</sup> of Gaibandha. The Table 7 presents the list of project sites:

Table 7: Name of upazilas and unions under the project.

Name of Upazila	Name of Union	Name of Upazila	Name of Union
Gaibandha Sadar	Ghagoa	Fulchari	Kunchipara
	Malibari		Uria
	Kuptola		Udakhali
	Badiakhali		Badiakhali
Sundarganj	Chandipur	Shaghata	Gidari
	Kanchibari		Mollaher Char
	Sreepur		Gazaria
	Haripur		Bharatkali
	Tarapur		Guridaho
	Dahobond		Holdia

<sup>2</sup> Bangladesh is divided into six divisions, each division is divided into number of districts (or zila) and each district is in turn divided into number of upzilas. Each upzila may be divided into what are called unions depending on how big the upzila is. Hence, unions represent the lowest level of governance in Bangladesh.

Name of Upazila	Name of Union	Name of Upazila	Name of Union
	Tarapur		Jumarbari
	Belka		Muktinagar
			Shaghata

**Gaibandha Sadar Upazila** has an area of 306.53 sq km. It is bounded by SUNDARGANJ and CHAR RAJIBPUR upazilas on the north, PALASHBARI, SUGHATTA and FULCHHARI upazilas on the south, DEWANGANJ and Fulchhari upazilas and BRAHMAPUTRA river on the east, SADULLAPUR and Palashbari upazilas on the west. Main rivers are JAMUNA, Brahmaputra and GHAGHAT. The upazila consists of one municipality, 9 wards, 138 mouzas and 127 villages. Total population 359226; male 50.60%, female 49.40%. Average literacy rate is 28.2%; male 35.2% and female 21.1%. Main occupations are agriculture 33.91%, agricultural labour 26.22%, wage labour 3.81%, transport 3.72%, commerce 13.05%, service 7.11% and others 11.55%. Total cultivable land 21521.65 hectares; fallow land 1783.49 hectares; single crop 18.20%, double crop 55.56% and triple crop 26.24%; land under irrigation 75.18%. Main crops Paddy, wheat, potato, brinjal, *patal*, *kakrol*, onion, and garlic.

**Fulchhari Upazila** has an area of 306.53 sq km. It is bounded by GAIBANDHA SADAR upazila on the north, SUGHATTA and ISLAMPUR upazilas on the south, DEWANGANJ upazila on the east, Gaibandha Sadar and Sughatta upazilas on the west. Vast area of the upazila is *char* land. Main rivers are BRAHMAPUTRA, JAMUNA, GHAGHAT, OLD BRAHMAPUTRA. Population 168772; male 51.6%, female 48.4%. Average literacy 16.5%; male 22.9% and female 10%. Main occupations are agriculture 51.5%, agricultural labourer 26.27%, wage labourer 3.01%, fishery 1.65%, commerce 6.47%, service 2.84% and others 8.26%. Total cultivable land 18772.50 hectares, fallow land 83 hectares; temporarily uncultivable land 488 hectares; single crop 23%, double crop 67% and treble crop land 10%; land under irrigation 27.93%. Main crops *paddy*, wheat, *kaun*, *maskalai*, onion, chilli, peanut, mustard seed and katechu.

**Sughatta Upazila** with an area of 255.67 sq km, is bounded by GAIBANDHA SADAR upazila on the north, SONATOLA upazila on the south, FULCHHARI upazila on the east, GOBINDAGANJ and PALASHBARI upazilas on the west. Population 237062; male 52%, female 48%. Average literacy 22.1%; male 29.8% and female 14.3%. Main occupations agriculture 43.96%, agricultural labourer 27.61%, wage labourer 1.58%, commerce 9.37%, service 6.05% and others 11.43%. Total cultivable land 23108.64 hectares, fallow land 301.17 hectares; single crop land 38%, double crop 40% and treble crop land 22%; cultivable land under irrigation 70%. Main crops *paddy*, jute, wheat, potato, brinjal, *patal*, onion and garlic.

**Sundarganj Upazila** has an area of 426.52 sq km, is bounded by PIRGACHHA, ULIPUR and CHILMARI upazilas on the north, GAIBANDHA SADAR and SADULLAPUR upazilas on the south, Chilmari and CHAR RAJIBPUR upazilas on the east, Pirgachha, MITHAPUKUR and Sadullapur upazilas on the west. It has a population of 360676; male 51.17%, female 49.83%. Average literacy is 24.1%; male 31.9% and female 16.5%. Main occupations are agriculture 48.57%, agricultural labor 29.64%, wage labor 2.06%, commerce 6.63%, service 2.59%, fishing 1.25%, others 9.26%. Total cultivable land 33234.09 hectares, fallow land 404.69 hectares; single crop 12.29%, double crop 74.29% and treble crop land 13.42%; cultivable land under irrigation 70%. Main crops are *paddy*, jute, wheat, ground nut, tobacco, sugarcane, mustard seed, onion and garlic.

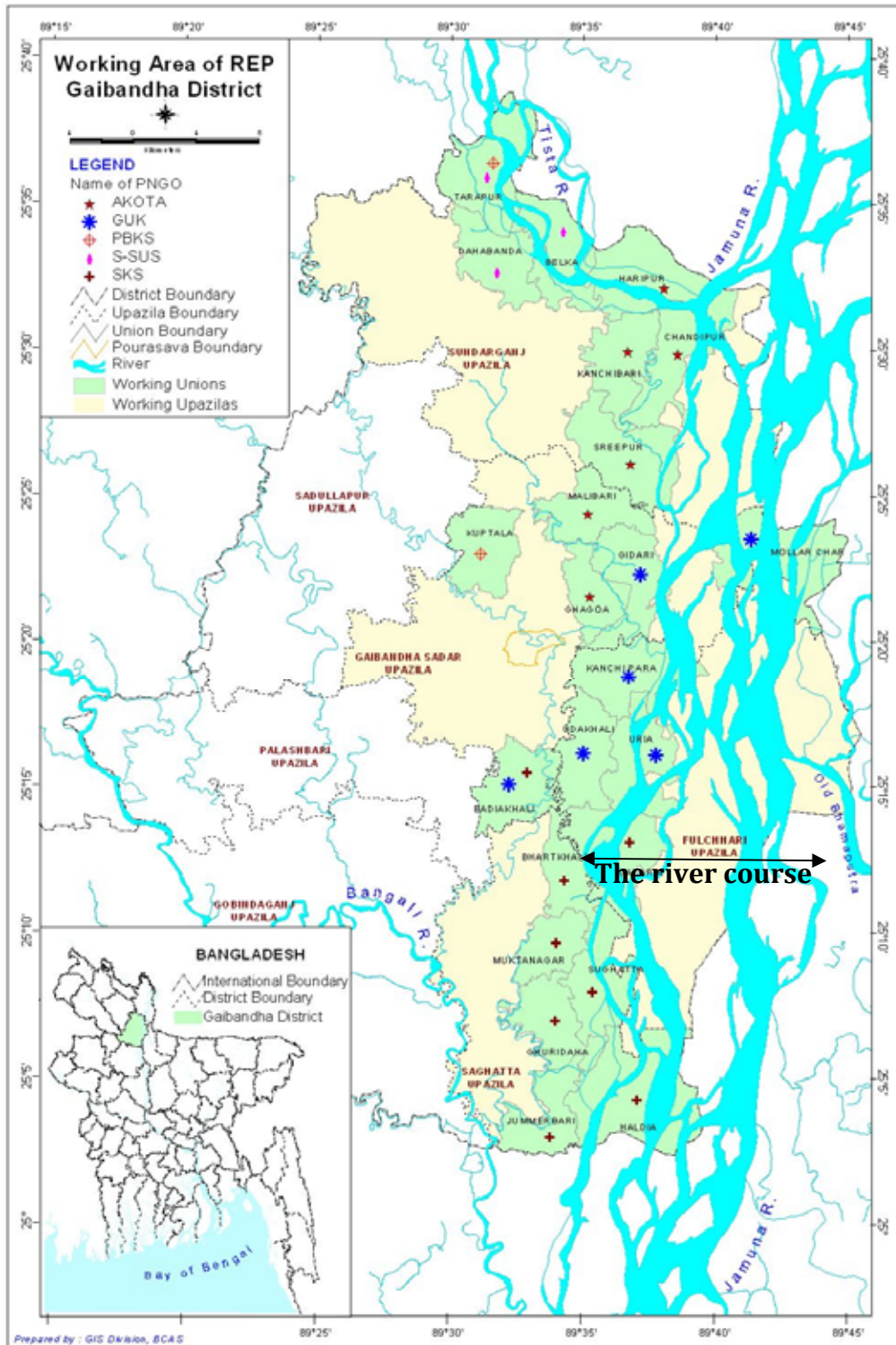


Figure 1: Map of Disappearing lands project sites (Prepared by GIS Lab, BCAS).<sup>3</sup>

<sup>3</sup> The arrow represents the width of the river course which can vary from season to season. The white areas in the river course are char lands created by siltation.

## PROBLEM ANALYSIS

As mentioned earlier, the Gaibandha district is one of the most vulnerable districts to riverbank erosion as the river Jamuna flows through it (refer to Table 8 for details on the length of river embankment in the district and number of people living on the embankment when compared to other districts). This region has experienced devastating floods in 1954, 1970, 1988, 1994, 1998, 2004 and 2007. The local people informed us that normal floods occur almost every year and severe floods once in 3-4 years. It has been noted that most of the severe floods have occurred fifteen to twenty days earlier than regular flood. For example, the flood of 2007 has occurred in the last week of June. The people also informed us that in the year of early flood, there would be repeated floods in the same year. They also indicated that the frequency and intensity of floods have been increasing over the time, which could be one of the indications of climate change.

Table 8. Length of embankment (km), number of people living on embankment in Gaibandha district compared to other districts.

Name of District	Length of embankment (kilometers)	Number of households living on the embankment	Total Population in the district	% of total population living on embankment	Number of disabled persons living on the embankment
Gaibandha	111	20018	103733	19	507
Rangpur	55	6887	27700	25	1197
Lalmoharhat	38	4092	15500	26	359
Nilphamari	138	10551	45205	23	999

(Source: Practical Actions obtained from Water Development Board, Information Office, local NGOs, field surveys, Social Service Department)

The elderly respondents informed that according to the land record of 1940 the char lands were mainland before 1962. The river has extended more than three to four kilometers towards East. The mainland has started to erode since 1962 by the river Brahmaputra as the river shifted towards West. The erosion still continuous, they informed. The inhabitants of char lands informed us that the people living along the river on the mainland are more vulnerable to riverbank erosion than the char dwellers since they are frequently affected by both flood and riverbank erosion.

## KEY ACTIVITIES

One of the thrusts of the project was to shift emphasis from relief based attitude towards long term climate risk reduction. To achieve this objective, the project has tested and implemented various activities (Table 9) that include alternative disaster risk management strategies, created alternative employment opportunities, innovating a number of appropriate technologies for utilising natural resources to address the needs of the communities on a sustainable way. The project has given highest emphasis on capacity building and awareness generation of the target communities (men, women and children), and has trained over 13,000 families (each family has an average of 5 members. In some cases husband, wife and children were benefited and in other cases only one of them) to date, on different on- and off-farm skills. This resulted in higher

income and regular cash flow in the family, employment opportunity, improved consumption & nutritional status in the region. Additionally, the project has reached to over 46,000 individuals through different campaigns and awareness building initiatives (i.e. on basic health, safe water & sanitation, livestock disease management etc.). Simultaneously the project has developed infrastructure facilities and services (i.e. model cluster villages, multipurpose refugee shelters, community clinics, primary schools, early warning system and rapid evacuation) for the communities in the suitable locations in the project areas.

Table 9. List of activities and number of beneficiaries.

Sector	Total Project period		
	Male	Female	Total
Agriculture	1376	5399	6775
Fisheries	1788	2425	4213
Livestock	514	4102	4616
Small enterprises	322	757	1079
Light engineering	803	4	807
Agro processing	311	392	703
Gender and technology	94	1292	1386
Volunteer group development	232	57	289
Community extension agents	240	403	643
CBO mobilization	16	8	24
Total	5696	14839	20535

(Source: Practical Action, 2009)

## PROJECT IMPLEMENTATION MECHANISMS

Please refer to Annexure I for details on the process implemented for drafting this evaluation report. The rest of the section deals with the project implementation mechanism of the River Erosion Project (REP). The REP was submitted under the title Disappearing Lands Project for APFED Award and hence the name Disappearing Lands is used in the entire report.

The Disappearing Lands Project was implemented by Practical Action with the help of five local partner non-governmental organizations (NGOs) Gana Unnayan Kendra (GUK), Shamaj Kalyan Sangstha (SKS), Pallibadhu Kallayan Sangstha (PBKS), Samakal Shamaj Unnayan Sangstha (SSUS), and AKOTA. At the national level, the project was managed by a project Steering Committee consisting of heads of all the collaborating partner NGOs, Country Director of Practical Action-Bangladesh, Team Leaders, Program Manager, and Head of Finance and Admin who will meet at regular intervals to monitor the progress of the project. While Practical Action has provided the technical and financial support, the ground level support was rendered by the partner NGOs supported by Practical Action Bangladesh expert panel based in the field.

Overall management of the project was carried out by a project manager recruited by the Practical Action. At the project site level, the project has set up a regional office at Gaibandha district. The office was managed by a Regional Manager. Five sectoral coordinators, under supervision of a Regional Manager, have managed the individual components. In addition, a monitoring and evaluation (M&E) officer was appointed to

monitor the project on regular basis. Evaluation of the project impacts was carried out by the M&E officer assisted by sector specialists.

The partner NGOs have played a vital role in contacting the local communities, in identifying the beneficiaries, and actual on the ground implementation of the project including construction of the infrastructure. The beneficiaries were identified through participatory rural appraisal techniques, baseline socio-economic surveys, and priority ranking by the communities who ranked among themselves on who should get what benefit from the project. The infrastructure designs were made by the area coordinators of Practical Action in consultation with the partner NGOs and beneficiaries in a participatory manner.

There were no subsidies from the government and funds were obtained from the donor agency i.e. Big Lottery Fund. The reason for choosing the location was that the Gaibandha district was identified as one of the most vulnerable locations for river erosion with river eroded communities living on the riverbanks for long time (refer to Table 5 and Table 8). In addition, the Practical Action has better linkages with the local NGOs in the district.

Practical Action has put in place an elaborate and effective M&E framework consisting of baseline study, individual livelihood information collection, and tracking the progress through different tools such as training intervention tracking format, participatory monitoring and evaluation procedures, secondary adoption tracking etc. As a part of the M&E, the project has instituted issue-based thematic studies that focused on the impact of the project on specific aspects such as migration. Other tools used were impact assessment studies, case studies, and observation and follow-up on regular basis. The participatory M&E consisted of regular meetings with the project staff and beneficiaries where group discussions consisting of 12-15 members are carried out with members tracking their progress along the set targets and evaluate the progress and identify pitfalls if any.



## SIMPLE SOLUTIONS FOR BIG CHALLENGES

Different issues were identified by the project that needs immediate attention for development of communities affected by the riverbank erosion. We have arranged these key issues and vulnerability factors in the form of Figure 2 linking the causes and effects. The overall impact of shifting rivers and riverbank erosion lead to a condition called 'Monga' which translates into 'poverty'. It is clear that the shifting course of river is the primary causal factor that has led to various other vulnerabilities in the affected human lives and ecosystems.

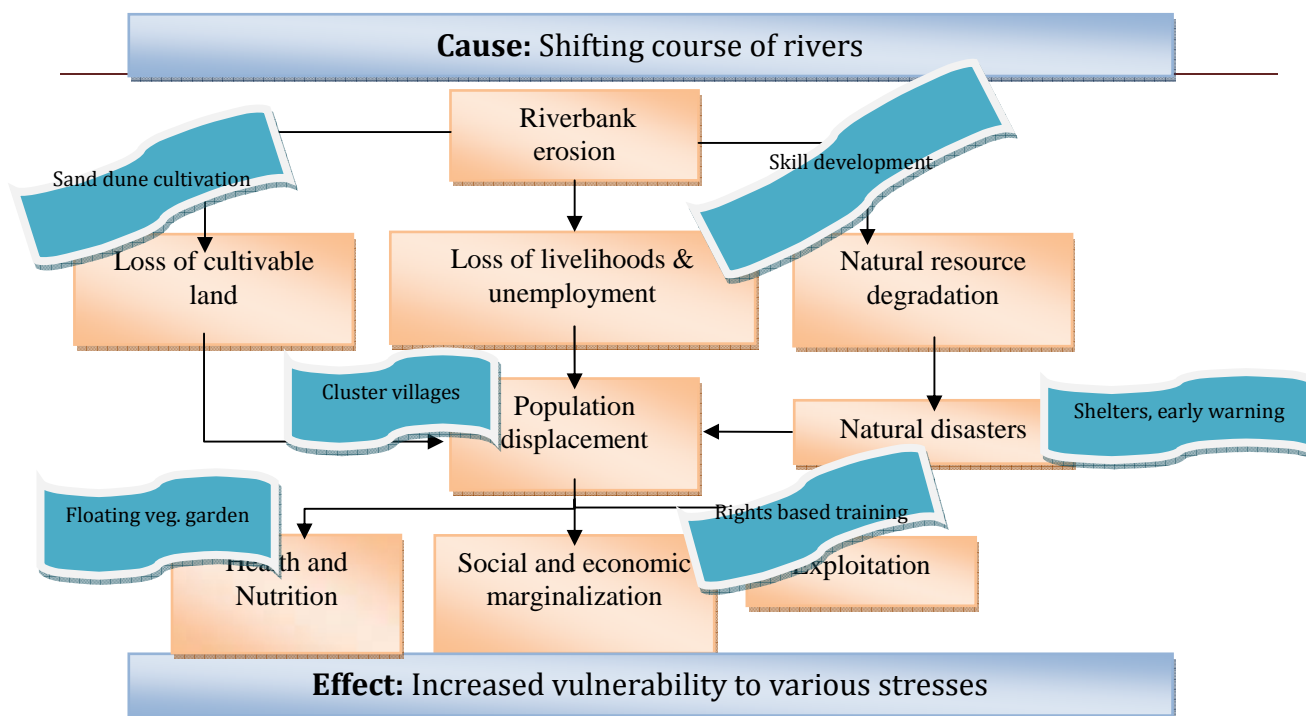


Figure 2. Cause and effect relations between shifting river course and vulnerability to other stresses.

The project has addressed the above issues and vulnerabilities in a comprehensive manner. The cause-effect relationships addressed by the project interventions is depicted in the Figure 2 (Flags represent the interventions while the flow diagram shows the cause-effect relationships). While majority of areas are covered, some of them received higher emphasis (skill diversification and provision of shelter) over other aspects (such as degradation of natural resources and physically restricting the riverbank erosion).

The project activities can be grouped into four main categories: a) rehabilitation of riverbank erosion affected communities by providing shelters using a 'cluster village' concept; b) development of alternative livelihoods; c) disaster risk reduction through multipurpose refugee shelters; and d) awareness generation in public health and hygiene, and civic rights with each one addressing the one or many issues identified in Figure 2. The activities implemented include the following:

### 1. Rehabilitation

- a. Cluster villages
2. Alternative livelihoods
    - a. Agriculture and food
      - i. Floating bed vegetable cultivation
      - ii. Floating cage fish culture
      - iii. Smalls scale food processing
      - iv. Sandbar cropping
    - b. Handicrafts
      - i. Weaving, embroidery, stitching and related skills
      - ii. Pottery
    - c. Animal husbandry and fisheries
      - i. Floating cage fisheries or cage aquaculture
      - ii. Community based fishery management
      - iii. Beef/cow fattening
      - iv. Poultry/integrated duck farming
    - d. Other skills
      - i. Light engineering skill training
      - ii. Community based vaccinator development
  3. Social infrastructure and disaster risk reduction
    - a. Multipurpose refugee shelters with clinics and schools
    - b. Training in early warning and evacuation
  4. Awareness generation
    - a. Rights based training
    - b. Personal health and hygiene
    - c. Livestock disease management

In the following part of the section, an effort was made to describe the major components.

### REHABILITATION: CLUSTER VILLAGES

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Floods and shifting river courses displace thousands of people in Bangladesh annually. In addition, climate change related sea level rise is expected displace nearly 34 million of coastal population (estimates by UNEP-GRID Geneva, IPCC). As a result, available land for safe housing has dwindled drastically. This calls for an innovative idea to rehabilitate thousands of people displaced by floods and shifting rivers. One idea that the project came up was the establishment of cluster villages.

Cluster village concept involves identifying a location that is relatively less vulnerable to floods and riverbank erosion, by raising the level of the field, and construction of housing and other amenities on the top of the raised land (refer Figure 3). The project has finished constructing 4 cluster villages at different locations. Due to the high cost of the land outside the flood prone area, the land for cluster village was identified in what is called 'char land' (land created with silt and sand deposits by the shifting course of the river). The location was chosen by taking into consideration the flood level in the past 30 years such a way that the change in river course and flood levels would not adversely

impact the cluster village. Commutation during normal time is possible by foot and during floods by a boat provided by the Practical Action.

The housing was designed by taking into consideration the local weather conditions. The houses were constructed using brick and galvanized iron sheets which are locally available. Significant to mention is the design of the cluster village. Each cluster village is divided into 'sub-clusters' where each house faces other house, as opposed to a row housing, providing good interaction among the residents. The design also allows the residents to grow kitchen garden in their backyards.

In addition to residential houses, each cluster village has a shelter for community activities, petty shops run by the residents, water and sanitation facilities, a pond for community fishery, and a boat for commutation during flood season. As of writing this report, nearly 342 families have moved into the cluster villages. Some cluster villages have biogas plants and solar power panels to provide cooking and lighting facilities. Two cluster villages have schools within the cluster village.



Figure 3. Houses in one of the cluster villages built by the Practical Action.

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### ALTERNATIVE LIVELIHOODS

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One of the important problems caused by recurring floods and changing course of the river is loss of cultivable land. In the year 2000 alone, about 35,909 ha of fertile land was lost due to river erosion in Bangladesh (Salim, 2007). The problems of floods and riverbank erosion are plenty including heavy siltation making fields unfit for regular cultivation, loss of field boundaries that create problems related to ownership, and displacement of population. Since much of the country remains under water during monsoon season, the fields cannot be cultivated. As a result, the people living in flood prone areas face food scarcity and malnutrition. The livelihood component of the project catered to the creation of additional livelihoods those can be used during and after the flood season with impacts such as generating income throughout the year, providing food and nutrition, and restricting migration. This project has introduced a set of practices to the community through training, providing mechanical hand tools and financial support.

The project has introduced the following livelihood technologies and skills:

1. Floating bed vegetable cultivation
2. Floating cage fish culture/cage

- |  |  |
|--|--|
| aquaculture  | 9. Poultry rearing                         |
| 3. Sandbar cultivation                             | 10. Light engineering                      |
| 4. Beef/cow fattening                              | 11. Integrated duck farming                |
| 5. Weaving and related skills                      | 12. Community fisheries management         |
| 6. Embroidery and related skills                   | 13. Community based vaccinator development |
| 7. Stitching and related skills                    | 14. Smalls scale food processing           |
| 8. Pottery with improved pottery wheel and furnace |  |

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### FLOATING VEGETABLE GARDEN

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Floating vegetable garden involves growing vegetables on a floating medium during the flood season. The motivation for this idea came from the fact that Bangladesh is affected by floods of various kinds. The idea found its roots in the coastal Bangladesh where rivers meet the Bay of Bengal. In addition, the practice could also be found in Pirojpur where the farmers have been using the practice for growing rice seedlings during flood season.

The floating bed can be made by fresh water hyacinth that keeps the bed afloat while providing nutrients to the plants grown on it. The process involves preparation of a raft with dimensions of 8 m long and 1 m width with the help of water hyacinth. The soil is spread on the top and seeds are sown. Depending on the decomposition rate of water hyacinth, the bed needs to be replaced once in a year. The replaced bed could be used as compost elsewhere such as rice fields. Different vegetables, including okra, guards, onions, and pumpkins, were tried with good success.



Figure 4. Floating vegetable garden in full growth.

The main impact of the floating vegetable garden was in terms of providing additional food and nutrition during the flood season when availability of vegetables is scarce. Additionally, it also provided new income opportunities at the household level.

The following advantages were reported by the interviewed beneficiaries on floating vegetable garden:

1. Additional income was possible from the excess vegetables after home consumption
2. Improved nutrition and health for the entire family
3. Empowerment of women
4. Reduction in migration
5. Availability of compost for the dry season crops
6. Some farmers have also reported that they helped others in constructing the raft, acting as resource persons in the community, and received some additional economic benefits

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### SANDBAR CULTIVATION

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The loss of fertile cultivated land has been a debilitating problem leading to unemployment and poverty in the river erosion affected areas of Bangladesh. The shifting river would not only erode fertile lands but also deposit sand and silt on one of its side as the river changes its course. Often, the sand deposits are deep enough that it is impractical to remove the sand making them uncultivable.

This debilitating problem required equally innovative idea to solve. One of the ideas that Practical Action team has come up was to dig circular holes on the char land until the underneath fertile soil is exposed and sowing the seeds of pumpkins. Four pumpkin seeds are sown and the pumpkins will come to fruiting within 2-4 months. The impact was tremendous. In the year 2005-2006, about 177 farmers have harvested 67000 pumpkins and the number grew to 460 farmers in 25 locations producing 0.438 million pumpkins (Source: Practical Action project documents and interviews).

One obvious question is why pumpkins. Our interviews with farmers revealed several advantages they obtained which included income and nutrition security during the

difficult times of the year when nothing else could be grown on char lands. Additionally, pumpkins could be stored under room conditions for duration of 4-6 months or more (even up to one year) which covers the peak flood season providing nutrition and income during floods. The income generated was so significant that some farmers reported us that they have accumulated the assets such as diesel pump sets and resources to repair and or construct a house after starting pumpkin cultivation.

Looking at the success, Practical Action is trying to identify better management practices to grow other vegetables including spinach, radish, tomatoes etc on char lands. The success of pumpkin cultivation has clearly demonstrated how small ideas can dramatically change peoples' lives and livelihoods.

The char land cultivation brings out another issue of access to resources such as land (land ownership). No official data is available on the land ownership of char lands in Bangladesh.<sup>4</sup> However, our interviews suggested a range of possibilities of char land ownership which include previously owned by farmers but abandoned due to siltation and loss of boundary demarcations, owned by government (not distributed to people at any point in the past), and owned by other entities such as businesses and trusts. Since majority of char lands are not owned by communities, or they owned but lost due to siltation and loss of land demarcations, the Practical Action has been calling, however with least success, the government to either redistribute or give legal access to these lands so that the river erosion communities can use it for cultivation. There is a need to evolve a mechanism where the local communities can access the land for their benefit without raising the issue of ownership.

Sandbar cultivation has provided the following advantages:

- Provided access to land and hence the additional income.
- Pumpkins could be preserved for near about an year or more under room temperature which helped in wading through the 'Monga' conditions.
- They provide nutrition during flood season when no other vegetables can be cultivated and when vegetables are costly in the market.

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<sup>4</sup> If it is of any indication, another study conducted on Khas lands (land owned by government), indicated that about 56.5% of Khas land remained undistributed to the people (about 8.98% of total land in Bangladesh is Khas land) (CARE, 2003. Land policy and administration in Bangladesh: A literature review. CARE rural livelihood program. CARE, Dhaka, Bangladesh).

- Pumpkins are also known to have anti-oxidants such as beta carotene which also gets converted to vitamin A in the body, provides good amount of potassium, fiber and carbohydrates.
- Overall, the practice has opened up new avenues to improve the quality of life.



Figure 5. On the left, the pumpkins are being grown on char land. On the right, the pumpkins stored under room conditions.

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## ANIMAL HUSBANDRY AND FISHERIES

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### FLOATING CAGE FISHERIES OR CAGE AQUACULTURE

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Under fisheries and animal husbandry, a range of capacity building activities were implemented. They include floating cage fisheries, poultry, beef fattening, integrated duck farming, and community fisheries management.

Fish are an important source of protein in Bangladesh. Floods often interfere with the capture or inland fisheries leading to loss of livelihoods during flood season. An innovative idea was required to continue to enjoy the convenience of inland capture fisheries even during the flood season. This was made possible by adapting the floating cage fisheries. The floating fish cages are constructed by bamboo and nylon net tied to floating material such as long bamboo poles or PET bottles tied all over the cage. Called '*hapa*' in local language, these cages are left in either a floating river or a pond and inoculated with fingerlings and left to grow about 4-5 months.

Different fish species could be grown successfully. Currently, fish such as tilapia have been tried due to the local demand. Tilapia is also resistant to different kinds of diseases. Rice bran, oil cake, molasses, fish meet, snail meet, dry fish, duck weed are fed to the fish.



Figure 6. Cage fisheries: Open cages for growing large fish. Observe the floating cages in the background.



Figure 7. Cage fisheries provide flood proof solution to capture fisheries in flood prone areas of Bangladesh.

Practical Action (PA) has provided necessary training to 20 farmers in the first year of the project and by the end of the project the number of interested farmers has grown multiple folds who adapted the cage fisheries on their own.

Our interviews indicated that some farmers could produce as many as 300 fish, weighing 35 kg, per cage in 6 months providing an additional income of 34000 taka (~500 USD) using the technique of cage fisheries. There are some farmers who started with one cage and expanded the number to 17-20 in three years making cage fisheries as main source of income.



## COMMUNITY FISHERIES

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The cluster villages constructed by Practical Action have ponds included in design. The idea was to promote community based fisheries so that the people living in the cluster village manage the pond and share the benefits equally.

The community based fisheries essentially involve making a pond management committee with representation from each household. A roster is prepared indicating the responsibilities of each household on what to do when. Efforts would be made to spread the burden and benefits equally across all the households involved in community fisheries. About 96 families in a cluster village involved in community based fishery management.



Figure 8. The community pond dug in the cluster village (picture during dry season).

## BEEF OR COW FATTENING

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The traditional form of rearing beef is slow, inefficient, and uneconomical. To solve the problem, the Practical Action has trained communities on beef fattening which involves feeding the calves in such a manner that they gain required weight in short time. A 2-day training was given on the beef fattening.

Beef fattening involves feeding a 2-year old bull straw, molasses, and urea in a right combination. This enables the bull to reach weight that is suitable for selling in the market within 6 months. In contrast, the traditional feed management takes 1.5 years.



Figure 9. Beef fattening: Feeding bull a special diet for faster growth.

### POULTRY

Ducks are better adapted to flood conditions than the chicken. Keeping this in view, the Practical Action has promoted the duckery in the Disappearing Lands Project. Under poultry component, 5 ducklings were given to each beneficiary. The benefits obtained by the beneficiaries are listed at the end of the section.



Figure 10. Duckery being practiced by the beneficiaries.

### BENEFITS FROM ANIMAL HUSBANDRY INITIATIVES

The beneficiaries of animal husbandry related initiatives have reported us the following benefits they obtained from the project initiatives:

1. Community based fisheries have helped the residents of cluster village to earn up to 1200-1500 USD in a year after domestic consumption. The fish has provided additional protein for the families.
2. Some families could send children to school with the additional income generated from the community fisheries.
3. The cage fishery has provided an assured income for people who depended on seasonal income from occupations such as repairing diesel engines.
4. Cage fisheries provided stable income throughout the year since they can be managed throughout the year.
5. Some successful farmers have become resource persons for training and educating the fellow community members on cage fish farming.
6. There is little or no risk to investment in cage fish farming since the fish are reared in an enclosure and it is easy to manage the fish free from predators and diseases.
7. A family rearing 5 ducks could earn as much as 7-10 USD per month from the eggs. An additional income is possible from selling the ducklings. Some have also reported that they could sell as many as 8 ducks in a year earning 2 USD per duck.

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## POTTERY

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The Practical Action group has identified that the current pottery practices such as making big size utensils and pots are not aligned with the changing tastes and needs of the society. They also identified that the decoration and gift items will fetch premium price in the market. However, the local artisans are either not skilful enough or do not have needed tools to meet the market demand.

Practical Action has provided needed training and tools to the local artisans transforming their lives. The training included making molds, using tools like design paper, mixing and applying colors, operating and maintaining improved pottery wheel using videos and hands-on training. Artisans are now making different colorful decoration items that are small in size but fetch better price than the large articles that they used to make. A group of artisans were provided with improved pottery wheels and

a furnace/kiln that will help them fire the clay uniformly and even during rainy season when drying and firing clay becomes difficult.



Figure 11. Improved pottery wheel provided by the Practical Action.

The artisans have articulated the following benefits they got from the pottery related capacity building:

1. Improved quality in the pottery.
2. Income has improved from 2000-3000 taka (USD 30-40) to 7000-8000 taka (USD 100-120) per month.
3. Diversified product portfolio: From traditional utensils to urban oriented decoration items.
4. Better market spread: Export to outside markets such as distant cities in Bangladesh.

5. Additional employment generation: The potters are able to employ additional help due to improved income and expansion of the business.

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## LIGHT ENGINEERING

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Light engineering constitutes skills that are enough to repair certain machines employed in rural areas such as boat engines, diesel power engines, and pump sets those require regular maintenance and repair. In certain cases, the same engine is often employed for multiple purposes such as running a boat or tractor or to pump water (shown in the figure below).

Practical Action has provided 15-day training on light engineering comprising of diesel engines, power tillers, and pump sets to rural artisans. The trainees were also provided with basic tools worth 30 USD per head.



Figure 12. Mr. Shahidul Islam, a beneficiary, sharing his experiences.

*Mr Shahidul Islam obtained light engineering training from Practical Action: Small skill based training helped communities diversify their livelihoods during flood time hence maintaining their purchasing power.*

The interviewed beneficiary has reported the following benefits accrued to them from the light engineering training:

1. An additional income of 60-70 USD per month is possible during flood season.
2. The additional income goes up to even 120-150 USD during irrigation season when farmers use diesel engines for irrigation.
3. Some farmers have plans to shift to light engineering due to the assured income it offers.

4. The new skills have opened up new avenues to farmers to explore opportunities such as welding and lathe machines which have higher income earning potential than light engineering.

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## HANDICRAFTS

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Practical Action has provided different kinds of handicrafts training to rural adolescent girls, weavers, and others with an aim to raise their income levels. The training included hands-on training on embroidery (250 adolescent girls), master tailor training (185 persons), gift-wrapping, and weaving. Some beneficiaries are rural adolescent girls who are also school dropouts due to poor economic conditions.



Figure 13. Training on Handicrafts WAS imparted to adolescent girls, school dropouts and women on embroidery and weaving winter cloths.

The interviewed beneficiaries have reported the following benefits they got from the training:

1. Income levels have gone from zero to anywhere between 30-100 USD per month depending on the work involved.
2. Increased income levels have helped some of the school dropouts to continue studies through distance education programs.
3. Some adolescent girls have informed that more and more girls are getting married due to the new skills gained since they can earn additional income for the family, and others have reported that they have better social status than before as people started looking at them doing useful work.

4. Empowerment of rural women.
5. Winter clothes are available at cheaper price and locally.
6. Training on garment industry helped many to think better and make decisions in line with the market needs.
7. Some have reported increase in assets such as purchasing a rice de-husker.

### MULTIPURPOSE REFUGEE SHELTERS AND DISASTER MANAGEMENT

Practical Action has realized that the current disaster management in Gaibandha District in specific and in Bangladesh in general is relief and response oriented and that it has been ineffective in saving the lives and assets during devastating floods and cyclones. It also has realized that there is a need for enhanced preparedness. Keeping this in view and the multiple developmental needs of the local communities, the Practical Action has come up with the idea of installing multipurpose refugee shelters linked with the community based disaster early warning and evacuation teams.

The multipurpose refugee shelters consist of a dispensary, a school, facilities for vocational training, sheds for stalling cattle, storage facilities for storing valuable items and food during floods and cyclones, designated area for cooking, safe drinking water, and separate rest rooms for men and women. The multipurpose refugee shelters are constructed at such a location that they can be easily accessed by road. Practical Actions has constructed three such multipurpose shelters which are implemented by three different collaborating local NGOs SKS Foundation, AKOTA, and GUK.



Figure 14. One of the multipurpose refugee shelters constructed by Practical Action.

The multipurpose refugee shelters are linked with the community based early warning, rescue and evacuation teams. A group of young village members are trained on disaster risk management including early warning, rescue and evacuation, and relief. The early warning is obtained from the partner NGOs or from the government and members of the village disaster management initiate rescue and evacuation before the danger level reaches a critical level as suggested by the obtained early warning information. The local NGOs and Practical Action provide a coordinated response by pooling their resources

which include boats, fodder, food and medicines. Our interviews with a early warning team member indicated that they are well aware about where vulnerable people live in their village, how to handle the victims, and what kind of priorities to be made in the wake of a disaster.



Figure 15. The dispensary in a multipurpose refugee shelter.

The clinics in multipurpose shelter can be used by any members of the community with the differential access system made possible by issuing three kinds of cards to different community members depending on their economic status (refer to the inset in Figure 15). The red card was issued to the project beneficiaries who doesn't require to pay for medical services; the green card was issued to marginal sections of the society who needs to pay 40% of the medical expenses; and the white card was issued to the richer sections of the community who can pay all the expenses for the medical services offered at the dispensary.

Advantages and impact:

- During 2007 floods, about 325 households, 869 cattle and 512 poultry birds took shelter in two refugee shelters.
- During 2007 foods, a total of 218 families, 1264 cattle and 663 poultry birds were evacuated by the trained volunteers and boats provided by the project.
- Communities get benefit from stable dispensary services and schools run during normal time.



## OUTPUTS AND OUTCOMES

### KEY OUTPUTS

- All the community groups consisting of 13,000 trained beneficiaries (72% women) working with the project have explored opportunity for alternative income and has already improved household level consumption, sale and distribution, and have got access to improved nutrition by adopting a variety of on and off farm technology options i.e. fisheries, livestock rearing, vegetable cultivation and agro-processing, small enterprise development etc. This is also indirectly benefitting the family members (65,000) of the trained beneficiaries as mentioned earlier.
- A total of 46,000 individuals benefitted through different campaigns (Basic health, safe water and sanitation and livestock disease management) at their door steps.
- The project has reached to very highly vulnerable locations prone to flood and river erosion in 4 Upazila, 23- Unions, 77- Villages, 152- vulnerable communities and 932- beneficiaries groups to date.
- The technology adoption rate in the project was stellar. The following Table provides a glimpse of technology adoption rate in the project areas.

Table 10. Technology adoption rate in different sectors.

Technology area	Adoption rate (% of project beneficiaries)
Agriculture	68
Fisheries	64
Livestock	65
Small enterprises	47
Agro-processing	73
Light engineering	40

(Source: Practical Action, Gaibandha, Bangladesh)

- The project has produced more than it spent in many of the components. The following table from the Project Evaluation Report provided by Practical Action more than provies how effective the technologies were in generating the benefits more than the costs. The floating garden has provided the maximum cost benefit ratio (CBR) of 46 followed by sandbar cropping with a CBR of 36.

Table 11. Cost-benefits of different initiatives under the project.

Activity	Year 1			Year 2			Year 3			Year 4			Year 5		
	Cost (USD)	NR (USD)	CBR	Cost (USD)	NR (USD)	CBR	Cost (USD)	NR (USD)	CBR	Cost (USD)	NR (USD)	CBR	Cost (USD)	NR (USD)	CBR
Sandbar cropping				177	7259	5	460	25167	7	1283	59974	15	1353	116561	36
Floating Garden				15	721	14	116	1237	24	102	1577	16	190	2225	46
Homestead gardening	2625	568	5	1650	1244	3	2950	1233	12	2517	3194	13	1200	3940	12
CBFM	45	511	2	320	915	2	538	1284	3	874	774	3	970	8281	5
Cage aqua				234	1102	3	375	1042	2	816	1180	3	1190	3937	7
Beef Fattening				120	6310	2	767	10327	2	995	9334	2	1029	17171	2
Duck Rearing				100	162	2	200	835	2	240	234	1	320	8363	3
Weaving				70	5776	3	90	5244	2	50	8203	3	210	29556	2
Tailoring				125	5313	6	125	-528	1	60	11014	5	185	70460	5
Packaging							154	1643	3	154	806	2	154	24707	2
Agro-processing	22	1462	2	95	30987	2	139	18331	2	289	33224	2	308	86944	2
Light Engineering				125	1366	2	272	2020	2	409	6992	3	567	59990	8
Total	2692			3031			6186			7789			7676		

(Source: Project evaluation report, Practical Action, 2009; Empty cells: Data is not available)

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## DIRECT IMPACTS

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- 460 sandbar farmers have successfully produced 438,146 pumpkins (2244 MT) in 2008 and have earned a gross income of US \$ 165,784 with an average net income of US \$ 359 in 180 days (Source: Practical Actions).
- The stored pumpkins helped the communities to face lean season with secured food supply and income by selling the product to the market.
- 2950 homestead vegetable producer groups have produced 495.6 ton green vegetables (for both consumption and sale) and have generated an income of US \$ 48,796.
- 116 floating vegetable producers have produced 17.1 ton leafy vegetables and earned US \$ 2,137 in 2008.
- 379 floating fish cage operators produced 9.4 ton fish in six months (July 06 to January 07) and generated an income of US \$ 9825.
- A total of 18 community based fishery groups of 538 men and women have produced 18.2 ton of fish in 43 acres of common water bodies and have generated an income of US \$ 14,637 and have consumed 2.4 ton of fish over the period.
- A total of 767 beneficiaries (male-147 and female-620) were benefited with an income of US \$ 169,574. Where the average net profit was estimated to be US \$ 160.
- The project agro-processor group (191 processors) has produced 116.1 ton of locally processed food and has earned US \$ 85,211 in a single season. The average income calculated was US \$ 193.
- 190 trained beneficiaries on light engineering have diversified their income on completely new skills and have generated an additional income of US \$ 9,156 particularly in off season during flooding.
- During 2007 floods, about 325 households, 869 cattle and 512 poultry birds took shelter in two refugee shelters.
- During 2007 foods, a total of 218 families, 1264 cattle and 663 poultry birds were evacuated by the trained volunteers and boats provided by the project.



Figure 16. The cluster village saved lives and assets during 2007 floods.

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### EMPLOYMENT GENERATION

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- A total of 69,000 person-day work was generated in the region to date for day laborers, masons, carpenters, through infrastructure support service works (i.e. earth works, cluster village, multipurpose refugee shelter, schools and community clinic construction).
- Four volunteer groups (100 individuals male- 83 and female-17) have been trained at community level and equipped with rapid evacuation materials i.e. mechanised boats and other relevant logistics and linked with the early warning system established by the network of local NGOs and the government. This is helping communities to reduce risks and save assets from floods.
- 342 households have been re-settled in cluster villages.
- The cluster village model has already attracted a number of policy makers who have recommended to incorporate in the national policy for greater interest of the vulnerable communities living in other similar locations in the country.
- Access to primary education of the vulnerable non school going children has increased through the establishment of non formal schools in the area. Five schools were established in time educating 245 students with a potential to enroll 525 boys and girls.
- Three community clinics are in operation serving the community members at their door steps with quality medical services in collaboration with Govt. MBBS

doctors. To date, the service has reached to 4,470 individuals (men-1888, women- 1818, and children-764).

- Migration to urban areas has reduced significantly due to job opportunities and cluster village shelters created (Table 12). The impact study conducted by Practical Action indicated a 64% reduction in migration among those living in the cluster villages. When compared with those living on the river embankment, the cluster villages provided a marginal advantage of 14% reduction in migration in the same year.

Table 12. Reduction in migration among the cluster village dwellers and those living on embankment.

	% reduction in migration		
	Male	Female	Total
Cluster Village dwellers	30	34	64
Embankment dwellers	20	30	50

- The project has trained number of rural communities on diverse practices. The type and number of trainings conducted is given in Table 13.

Table 13. Beneficiaries of alternative livelihoods and awareness campaigns.

S No	Component	Beneficiaries		
		Women	Men	Children
1	Training on year-round vegetable cultivation (sandbar cultivation, floating garden etc)	1375	460	-
2	Training on fishery resource management (floating cage culture, community fisheries, improved traditional gear, fingerling production etc)	618	481	-
3	Training on livestock management (beef fattening, duck farming, community vaccinator, disease management campaign)	1344	2226	-
4	Weaving, pottery, stitching etc	161	130	-
5	Handicrafts (knitting etc) training for adolescent girls	-	-	140
5	Small scale food processing	71	88	-
6	Light engineering <sup>5</sup>	4	229	-
7	Training on community extension skills (agriculture, animal husbandry, and fisheries)	62	66	-
8	Basic health awareness campaign	2071	1008	985
9	Disaster management	17	83	-

(Source: Practical Action)

<sup>5</sup> 2 vocational training centres were established in one of the multi-purpose shelters constructed for providing regular training programs.

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## INNOVATIONS

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- The project has successfully innovated a number of pro-poor technologies i.e. sandbar cropping, floating garden, and floating cages to ensure food security, additional income and disaster risk reduction. The innovation in cage aquaculture is in terms of linking the cage aquaculture with the hapas for the first time in Bangladesh.
- Additionally, the technologies have been replicated to the communities outside of the project in the region and outside of the district by other interested NGOs.
- Some of the best practices are in the process of getting recommended by the policy makers to incorporate it in the national policy for wider dissemination in the other parts of the country to help millions.
- Access to common property resources i.e. char islands and water bodies has ensured the access of vulnerable and non resource base communities to the resources.
- Community based weaving has greatly helped the communities to reduce vulnerability from cold and reduced external dependencies and relief.
- International donors, local, and national NGOs and development agencies (i.e. ADB, World Bank, Oxfam, Friendship, SDC, Intercooperation, etc.) have shown interest to share the project learnings nationally and internationally.
- A good number of women and adolescent girls have become aware on women and child right issues.
- To date, the project has produced a variety of knowledge products and published a number of articles both at home and abroad in leading newspapers and journals (please refer to Practical Action Bangladesh website: [http://practicalaction.org/?id=region\\_bangladesh\\_publications](http://practicalaction.org/?id=region_bangladesh_publications)).
- The project has developed a detailed monitoring and evaluation system (please refer to the section on Project Implementation Mechanisms).

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## POLICY INFLUENCE AND ADVOCAY

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- The project has made good efforts to influence the national and international policy makers/ forums (e.g. The House of Lords, The Westminster UK, where the findings were shared).



Figure 17. A national level workshop organized by the Practical Action to disseminate the outputs of the project.

- The project has conducted a national level workshop showcasing the project outputs to the policy makers and local developmental practitioners such as NGOs, (Figure 17).

### Box 1: Significant spillover effects in the project

Our interviews have indicated the following spillover effects of the project:

- Some of the adolescent girls who were trained on handcrafts and sewing could continue going to schools and renew education.
- Some farmers who adapted sandbar cropping of pumpkins could start saving, lending money, purchasing materials for constructing a house, and installing pump sets for irrigation purposes.
- Housewives who adapted floating garden felt empowered to take certain decisions related to what they should cook at home and how they take care of children since they have some additional income at hand.
- Several non-project beneficiaries have adopted technologies promoted in the project. Some popular technologies were floating vegetable garden and floating cage fish farming.
- The community vaccinators we interacted with expressed the confidence of moving to higher level of skill and competency levels in their new occupation. As of now, they are only eligible to administer the vaccines suggested by the veterinary department. They thought that they can now prescribe and administer drugs and are willing to take required education and training to do so.



## LESSONS LEARNED

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The Disappearing Lands Project provides us a good example of how small ideas can transform the lives of rural people living under stress. The project could generate significant benefits those will last longer. Much of the success of the project could be attributed to the effectiveness with which ideas were identified and implemented. The practices were timely, location and problem specific, targeted to the affected communities, and produced significant benefits, as demonstrated by the additional income generated, assets such as cluster villages and multipurpose shelters constructed, and improved capacities and awareness achieved. The project was successful in instilling sufficient interest and ownership among the beneficiaries.



Figure 18. The APFED evaluation team discussing with the local government official. The project provides several lessons useful for taking up similar activities or even to scale up.

- Highly vulnerable groups and extreme poor needs a very comprehensive support from external sources to recover from natural and social shocks to resume their normal livelihood. However, the practices should soon shift from relief to long-term capacity building measures that will help affected communities to spring back to the normal, and even improved, lives.
- A holistic risk reduction model supported with alternative livelihood options, infrastructure support, access to basic services etc, as designed in the project, have the potential for long term sustainable impacts in reducing poverty and uplifting the poor.

- Participatory design, planning, and development of project secures best results, impact, and highest satisfaction of the beneficiaries and other relevant stakeholders for sustainable development. The design of the cluster villages and houses was done by keeping in mind the local weather and socio-economic conditions of the people. The communities were consulted before finalizing the designs of the cluster village. Group discussions were organized to obtain the feedback on the proposed designs from the communities.
- Programmes that bring practical technologies can bring real, long term, and sustainable change. It builds peoples skills, knowledge, and capacity and promotes self reliant development rather than externally driven development.
- Partnership process of project implementation has helped to scale up operations within a limited timeframe in a cost effective manner.
- Involvement of local influential members of the community can contribute to project success.
- Involvement of local governments can make the project outputs be integrated with the local government initiatives.
- Direct assistance by the relevant technical experts in the field (full time presence of technical persons in the field and direct communication with farmers) adds value in providing quality support to the partners and project beneficiaries.
- Networking with Government and local service providers always reinforce project implementation on a sustainable basis.
- Flexibility and cordial cooperation of donor is needed to bring positive result in implementing projects.
- Effective monitoring and evaluatoin mechanism is important to see the project reaching its targets. Such M&E mechanism should include all the stakeholders invovled in the proejct and help in guiding the future course of action for meeting the targets.
- Linking with markets is essential. The project has effectively linked the trained community members with the market so that the outputs can be easily marketed. The training included aspects related to understanding the trends in markets, linking with the buyers, etc.

## RECOMMENDATIONS AND CONCLUSIONS

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The project was successful in demonstrating the effectiveness of the identified interventions at a division and district level. This cannot be said as pilot project. This is a project whose experiences can be directly translated to the entire country or to those locations that have similar issues to be addressed. This is so since the project was successful in adapting some of the practices from other locations in Bangladesh. For e.g. floating cage fisheries and floating vegetable gardens were brought from the coastal Bangladesh.

However, in order that the practices benefit larger communities and geographical locations, there is a need for broader policy support from the government with a coordinated effort involving all governmental developmental agencies, non-governmental organizations, donor agencies, and private sector. The following are the areas where broader policy support could help in up-scaling the benefits of the project.

1. **Understanding the causal factor:** There are little or no studies that link the changing river course and climate change, though there are studies that showed the impact of climate change on the river flow. There is a greater need for studies that answer the following questions:
  - a. What is the link between climate change and change in river course?
  - b. What is the frequency of river course?
  - c. Why structural mitigation measures have failed in controlling the change of river course and erosion related problems?
2. **A comprehensive study on river-erosion induced migration:** While there are studies and statistics on rural-urban migration in Bangladesh, there is a need for a comprehensive national level study that looks into the river erosion. The Disappearing Lands Project has identified some of the real challenges and how to tackle them in the project areas and could be a very good beginning point for a national level comprehensive study that identifies the extent of riverbank erosion induced migration, the socio-economic profiles of those migrate, and the challenges they face during migration. The study should also look into why this issue has received such a low emphasis in government policies and measures when the problem appears to be reaching a debilitating proportion.
3. **Recognition and inclusion:** The project has successfully demonstrated that there is a need for identifying and addressing the socio-economic problems posed by the changing river course and riverbank erosion. Such a focus is still lacking at the larger

national level planning. Our talks with local administration have revealed that there are not many government programs focusing on the people displaced by the river erosion since the problem is 'huge'. Part of the problem also lies with the way the government defines flood affected communities. The river eroded communities don't fit into such a definition and hence attract little or no attention by the government. Since the settlements on river embankments are considered illegal, these communities are not eligible to have access to many social programs and services that are applicable to others. A change is needed in the way the government defines certain sections of the vulnerable population for targeting them with appropriate social development programs. This change requires either considering these people as "people in special needs" or not defining them as "illegal settlements" so that they can get benefit from the ongoing developmental programs. Efforts are also required by the international, national and local NGOs so that the limited strength of the government doesn't hinder in helping these needy people.

4. **Scaling up:** The project success can be scaled up in other areas of Bangladesh and elsewhere. Such a scaling up is possible only with the policy level support from the government. APFED suggests that there is a great potential for designing and implementing a national program based on the success achieved from the project. The national program can effectively involve national and local NGOs in transferring some of the technologies tried and tested in this project.
5. **Uptake of technologies into formal research and training:** The project has demonstrated that the support from local and national government is paramount for the success of any intervention. Though there was certain amount of cooperation from the local government, there is a greater need for policy level support of the government at the national level. Technologies such as floating bed vegetable cultivation, sandbar cropping, and floating fish culture could be effectively promoted if these technologies are taken up by the research institutions, standardized, and transferred to the needy. Similarly, these technologies could be effectively transferred through government aided capacity building programs.
6. **Access to natural resources:** There is a need for the government to reconsider how the access to different natural resources is governed. The project has successfully demonstrated on how to relook at certain resources that have been considered useless before. For example, the cultivation of char lands (sandy river beds) using innovative techniques such as sandbar cultivation. Such a benefit cannot be obtained outside the project location since char lands are not allocated to communities or communities doesn't have legal access to these lands. The government should consider allocating legal rights to people to use these lands without transferring the

ownership. Practical Action has been advocating the ear-marking policy of land distribution to rural poor where a certain amount of land is ear-marked to be used by landless poor without transferring the ownership to the beneficiaries.

7. **Land for safe housing:** A certain amount of problem, and probably significant while alleviating the flood related vulnerabilities in Bangladesh, is due to lack of suitable land for rehabilitating those living on the embankments. The project had to create cluster villages by raising the elevation of the land and virtually creating an 'island' on a char land, land where the river flew earlier and there still is a chance to get flooded during a severe flood, entirely due to lack of sufficient land in safer areas or the procurement price of the land is very high. As of now, many of the char lands belong to the government or are not assigned to any communities. There is a big question on how much of the char land belongs to whom. APFED suggests that the government should institute a comprehensive study on the ownership of the char lands and provide access to some of these lands to dislocated communities so that the landless people living on embankments could have access to land for cultivation using sandbar cultivation techniques or establish cluster villages using the technique perfected by the project.
8. **Redesigning the flood mitigation infrastructure:** APFED has identified that there are millions of people living on the embankments along the river courses in Bangladesh (there are no official or unofficial estimates on this). These embankments are not designed to accommodate settlements but rather to protect from seasonal floods. Every year, thousands more moves to these embankments due to recurring floods which is considered illegal. Such an illegal settlement on embankments is leading to damage of the embankments putting rest of the people living outside the embankment at flood risk. This situation can be avoided if the embankments are designed to accommodate settlements. For example, embankments were often not lined with masonry, without staircases, and are narrow. Broadening these embankments and lining them with masonry and erecting stone platforms along the inside of the embankment would help establishing safe settlements without damaging the embankment.
9. **Better penetration of vocational training:** Many vocational training programs run by the government require certain minimum qualifications such as ability to read and write. However, many of the migrant communities living on embankment are uneducated and hence cannot utilize these vocational training programs. There is a need that the government establishes special training programs for these sections of the community or relaxes the rules such that they can also take advantage of the ongoing developmental and capacity building programs. These training programs

should also provide mechanical hand tools such that the beneficiaries can utilize the gained skills after the training.

10. **Transfer of project assets to local communities:** the assets such as multipurpose shelters, schools and dispensaries are still in the hands of the local NGOs after the title deeds are transferred from Practical Actions to local partners. The cluster villages were however handed over to the communities. This necessitates that the local NGOs should stay in the project areas to manage some of these assets. This raises the question of complete ownership of communities in some of the project products. Efforts are needed to create capacity among communities so that they can manage the assets created for a long time. This is possible by creating asset management committees in project areas.
11. **Mainstreaming with the society:** The cluster villages are often isolated from rest of the villages and have poor access. Often, villagers faced problems to commute especially during medical emergencies. It is important that the government provide helping hand by establishing a connecting road or a bridge between cluster villages and the nearest embankment. Emergency telephone and postal services are not located on the cluster village and post often doesn't reach these villagers. These essential services need to be provided to the residents of the cluster villages so that they can integrate with the rest of the society.
12. **Coordinated efforts at the national level:** the project has effectively demonstrated the need for coordinated efforts for the success of any project. The same holds true at the national level as well. Since the problem of river erosion is too gigantic that can be solved by any single initiative, it requires well coordinated efforts by government, non-governmental organizations and donor agencies.
13. **Bringing private sector to rural areas:** We are impressed by the fact that the problem of river eroded communities is huge and even bigger than the capacity of the government to solve it. We see a greater role of private sector in alleviating their problems. Private sector penetration in rural Bangladesh is non-existent (except for the purpose of mobile phones). The government of Bangladesh should provide incentives for private sector to invest in rural development and especially in skill development and linking the rural products to the mainstream markets. Some successful models are already available in Bangladesh (e.g. the Grameen Phone revolution in Bangladesh, the World Bank funded program on solar house systems (SHS) in a public-private sector partnership model etc. Refer to The World Bank, 2002; Grameenphone, 2009) which can be adapted and replicated by the government.

**14. Sustainability:** Sustainability of project initiatives is an important issue in any intervention and it holds true for this project as well. There is no doubt that some of the initiatives such as capacity building and skill development will last longer without any external intervention since communities have seen advantage in adopting them. However, the assets created such as multipurpose refugee shelters, dispensaries, and schools would require larger integration with government programs or made self sustainable such that they can last longer. The school teachers were hired as a project staff and they may continue for some time with support from the ongoing programs of the partner NGOs. However, such a mechanism cannot support the schools and dispensaries established for longer time without integrating them with the ongoing government programs in respective sectors or making them financially independent through generating income from the services they provide.

## REFERENCES CITED

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- Bangladesh Bureau of Statistics. 2009. Key indicators on report of sample vital registration system 2006 & 2007. Available at [http://www.bbs.gov.bd/dataindex/Key\\_svrs\\_2007.pdf](http://www.bbs.gov.bd/dataindex/Key_svrs_2007.pdf).
- Dey, S.K. (2008) riverbank erosion and environment of Bangladesh, Environmental Science, Khulna University, Bangladesh.
- Government of Bangladesh. 2009. Budget for 200-10. Government of Bangladesh, Dhaka, Bangladesh. Available at <http://www.bangladesh.gov.bd/>.
- Grameenphone. 2009. About Grameenphone. Available at <http://www.grameenphone.com/index.php?id=64>.
- Hossain, M.Z. 2001. Rural-urban migration in Bangladesh: A micro-level study. Presented at IUSSP Conference on Internal Migration, 20-24 August 2001, Salvador, Brazil.
- Salim, M. B. (2007) Climate change: River erosion in Bangladesh. Dhaka, Bangladesh: COAST Position Paper 5, COAST Trust.
- The World Bank. 2002. Rural Electrification and Renewable Energy Development. The World Bank, Washington D.C. Available at <http://web.worldbank.org/external/projects/main?Projectid=P071794&theSitePK=40941&pagePK=64283627&menuPK=228424&piPK=73230>.



## ANNEXURE I: THE CASE STUDY METHODOLOGY IN BRIEF

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The selected case study of the APFED Golden Prize awarded project on Disappearing Lands was carried out in a consultative manner under the collaboration of the Institute for Global Environmental Strategies (IGES), Japan and Bangladesh Center for Advanced Studies (BCAS), Bangladesh with field level support from Practical Action, Bangladesh (PAB).



Figure Annexure I. Interviews with different stakeholders.

The drafting of this award case study involved the following steps.

- **Step I:** Memorandum of Understanding between IGES and BCAS on collaborative assessment of the APFED Awarded project.

- **STEP II:** BCAS helps IGES Staff in planning and conducting case study visits in Dhaka and Gaibandha district in consultation with Practical Action, Bangladesh.
- **STEP III:** IGES staff visits the national offices of BCAS and PAB and plans detailed field visits.
- **STEP IV:** IGES and BCAS staff visits project fields with an aim of
  - Interviewing the PAB staff in Dhaka
  - Interviewing the PAB Disappearing Lands project staff in Gaibandha
  - Interviewing the project beneficiaries
  - Interviewing the government officials of Gaibandha District
- **STEP V:** Collection of relevant data from field office of Gaibandha office of PAB from its Monitoring and Evaluation reports and debriefing the PAB staff about further steps towards finalization of the report.
- **STEP VI:** Drafting the detailed report in a collaborative manner by IGES staff with inputs from BCAS.
- **STEP VII:** APFED Secretariat and PAB reviews and comments the draft for finalization.
- **STEP VIII:** The draft is finalized.