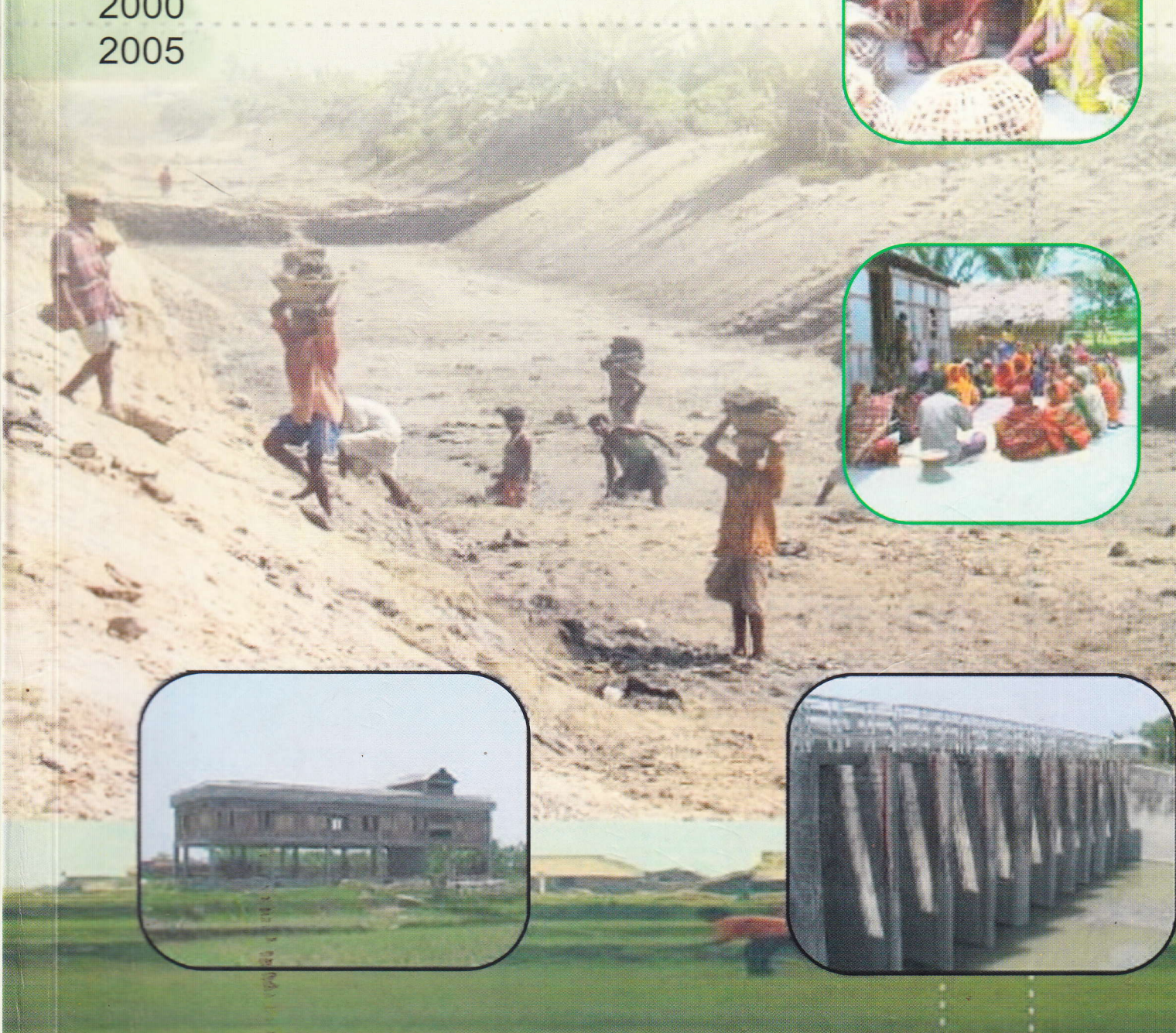


Experiences of the Char Development and Settlement Project II



A PROJECT IN THE COASTAL CHARS OF SOUTH-EASTERN BANGLADESH

2000
2005





**The work of CDSP and this report
are dedicated to
The People of the Coastal Chars of Bangladesh.**

Photographs by Judi Pitchford Pearson ARPS

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Abbreviations.

AA	: Administrative Arrangement	PC	: Polder Committee
AC (L)	: Assistant Commissioner (Land)	PCo	: Project Coordinator
ADC (R)	: Additional Deputy Commissioner (Revenue)	PD	: Project Director
ADP	: Annual Development Plan	PDO	: Project Development Office
AWP	: Annual Work Program	PDZ	: Productive Development Zone
BARI	: Bangladesh Agricultural Research Institute	PMC	: Project Management Committee
BBS	: Bangladesh Bureau of Statistics	PMU-ESPP	: Project Man. Unit Estuary Study Pilot Project
BDT	: Bangladeshi Taka	PP	: Project Proforma
BRAC	: Bangladesh Rural Advancement Committee	PPD	: Pilot Polder Division
BRRRI	: Bangladesh Rice Research Institute	PTPS	: Plot-to-Plot Survey
BWDB	: Bangladesh Water Development Board	SC	: Steering Committee
CBD	: Char Baggar Dona	SPC	: Sub Polder Committee
CBT	: Char Bhatirtek	SRDI	: Soil Resource Development Institute
CM	: Char Majid	TA	: Technical Assistance
CDSP	: Char Development and Settlement Project	TC-ICZM	: Technical Committee - Integrated Coastal Zone Management
CEP	: Coastal Embankment Project.	ToR	: Terms of Reference
CERP	: Coastal Embankment Rehabilitation Project	TR	: Technical Report
DAE	: Department of Agricultural Extension	TUGs	: Tubewell User Groups
DC	: Deputy Commissioner	UNDP	: United Nations Development Programme
DESPP	: Directorate of Estuary Studies Pilot Project	UP	: Union Parishad
DFID	: Department For International Development	WARPO	: Water Resources Planning Organisation
DPHE	: Department of Public Health Engineering	WFP	: World Food Programme
ERD	: External Resource Division	WM	: Water Management
FA	: Financial Assistance	WMA	: Water management Association
FD	: Forestry Department	WMC	: Water Management Committee
FM	: Formulation Mission	WMF	: Water Management Federation
FY	: Financial Year	WMG	: Water Management Group
GoB	: Government of Bangladesh	WMO	: Water Management Organization
GoN	: Government of the Netherlands		
GNAEP	: Greater Noakhali Aquaculture Extension Project		
GPWM	: Guidelines for Participatory Water Management		
HH	: House Hold		
HYV	: High Yielding Variety		
IA	: Implementing Agency		
ICC	: Inter Agency Coordination Committee		
ICZM	: Integrated Coastal Zone Management		
IPSWAM	: Integrated Planning for Sustainable Water Management Project		
IWM	: Institute of Water Modelling		
LADC	: Local Area Development Committee		
LGED	: Local Government Engineering Department		
LRP	: Land Reclamation Project		
LRMS	: Land Record Management System		
MAA	: Muhuri Accreted Area		
MCC	: Mennonite Central Committee		
MES	: Meghna Estuary Study		
MoL	: Ministry of Land		
MTR	: Mid Term Review		
MOWR	: Ministry of Water Resources		
NGO	: Non Governmental Organization		
N-RAS	: Noakhali Rural Action Society		
NSC	: National Steering Committee		
O&M	: Operation & Maintenance		
OFRD	: On Farm Research & Development		

Introduction

This report presents an overview of the experiences of the Char Development and Settlement Project II (CDSP II) in the period 2000 – 2005. The project is located in the south eastern delta of Bangladesh and has as main objective “To bring about an improvement in the economic situation and in the living conditions of the coastal *chars*.”

CDSP II is a joint undertaking of the Governments of Bangladesh, The Netherlands and World Food Programme.

CDSP II is a multi agency project under the Ministry of Water Resources. The Bangladesh Water Development Board (BWDB) is the lead agency, while the Ministry of Lands MOL), the Local Government Engineering Department (LGED), the Department of Public Health Engineering (DPHE) and the Department of Agricultural Extension (DAE) are the other participating government agencies. Five local NGOs participate in the project supervised and coordinated by BRAC under a special contract with the Royal Netherlands Embassy.

Technical Assistance was provided by a consortium consisting of Consultants for Development Programmes (CDP), The Netherlands; Royal Haskoning, The Netherlands and Sheltech Consultants Pvt. Ltd (SCPL), Bangladesh.

CDSP II is the successor of earlier projects: the Land Reclamation Project (1977 – 1990) and CDSP I (1994-2000). The positive results of CDSP II have led to an extension of the *char* development activities into a new project: CDSP III (2005 – 2009).

The objective of this report is to present an overview of the experiences, the results and the challenges in *char* development in the five year project period. More in-depth information can be found in the Technical Reports 10 to 21 and other project publications, as attached to this report in the CD-ROM. Other TRs and similar are published and available.

The other two CD-ROMs at the end of this report contain a video presentation of CDSP II: one in English and one in Bangla.

The report starts with a description of the physical and socio-economic conditions of the coastal *chars* (chapter1), followed by an overview of the history of char development activities since the 1970s (chapter 2).

Chapter 3 gives an outline of CDSP II, while the experiences of the main components are elaborated in the following chapters: Land Settlement (chapter 4,) Habitat Development (chapter 5), Agricultural Development (chapter 6). The benefits and costs of char development are discussed in chapter 7. The report finishes with some concluding remarks with special reference to the challenges for future *char* development.

1. COASTAL CHARS

The Physical Environment

Formation process

The bulk of the sediment carried by the Padma, the Brahmaputra and the Meghna from the Himalayas on their journey to the Bay of Bengal is deposited in their meandering courses and in the estuary raising the riverbeds and forming *chars*. In the process of erosion and accretion, the sandbars either form a landmass in the riverbeds and in the estuary, as an island or attached to the existing land. Such newly accreted lands are commonly called *chars*. It is estimated that more than 2,000 square kilometres new land has been formed in the last two centuries with an average annual net increase of around 10 square kilometres.

The hydro-morphological processes in the rivers and the delta are complex and difficult to predict. Sen Bahadur, a government officer responsible for settlement operations in the Noakhali District reported in 1939:

Where there was a rich village brimming over with life and prosperity a few years ago, there is a deep channel today and vice versa. Where there was a deep channel a year ago through which steamers could easily pass, there is a mud bank today.

The hydro-morphological processes have been subject to study by the BWDB since the 1970's. The Meghna Estuary Study (MES) of the BWDB resulted in predictions of areas which are most likely to erode and areas where accretion will take place in the short and medium term.

Land development

Coastal *chars* pass several stages before reaching a stage of stability. The sequence of development is presented in Table 1.1

Table 1.1: Development of a Char

Stage	Land level	Level of development	Land use
Mudflat	Higher than MLWL	Dry during low tide	Sometimes used as fishing ground and grazing land during low tide
Grassland	Between MLWL and MHWL	Accretion continues and land remains dry for a longer spell. Daily tides inundate.	Grass such as <i>Uri</i> and other vegetations grow well. Used as grazing land and suitable for mangrove forest.
Mono-crop	Higher than MHWL	High spring tide inundates occasionally	<i>Rajashail</i> (monsoon rice crop) grows. People start living by building houses on raised earthen platforms. Homesteads often suffer from spring tides. Embanking of the char is possible.
Consolidation	Close to HHWL	Relatively old chars and lands are consolidated	Annual cropping and limited possibilities for Kharif-1 and Rabi Crops. Permanent homesteads develop. Lands remain vulnerable to saline intrusion, cyclone and tidal surges.

MLWL: Mean Low Water Level
 MHWL: Mean High Water Level
 HHWL: High High Water Level

Land Reclamation

The earliest coastal embankments date from the seventeenth century. Under the *Zamindar* System, people constructed embankments, known as *Berri Bundhs* with fixed sluice gates to prevent saline water intrusion and to wash out the accumulated salts.

Large scale human interventions to accelerate land accretion started in the 1950's with the construction of two cross-dams in Southern Noakhali by the Bangladesh Water Development Board , resulting in an area of 90,000 ha of new land.



Disasters

The coastal chars are prone to several types of disasters including cyclones, tidal surges and tidal flooding. Incidence of cyclones and land erosion significantly affect lives and properties of the coastal households. Cyclones accompanied by tidal surges are the most damaging natural disaster, which take a heavy toll on life and property. Seventy major cyclones hit the coastal belt of Bangladesh in the period 1795-1998 (BBS, 2002). Cyclones mostly occur in the pre-monsoon and post-monsoon months. An increasing trend of cyclone occurrence is reported.

Seasonality

There are two main seasons. The monsoon season is from June through October accompanied by warm weather, when 80 per cent of annual rainfall occurs. Annual rainfall usually exceeds 3000 mm. The dry season is from November to March with a brief spell of cool weather between December and February. April-May is an intermittent pre-monsoon period with occasional rains and thunderstorms.

1. Then called the WAPDA (Water and Power Development Authority)

Soils

The soils are young without differentiated horizons and are mostly heavy textured varying from silty clay loam to silty clay, almost devoid of sand with high moisture retention capacity and low permeability.

Salinity

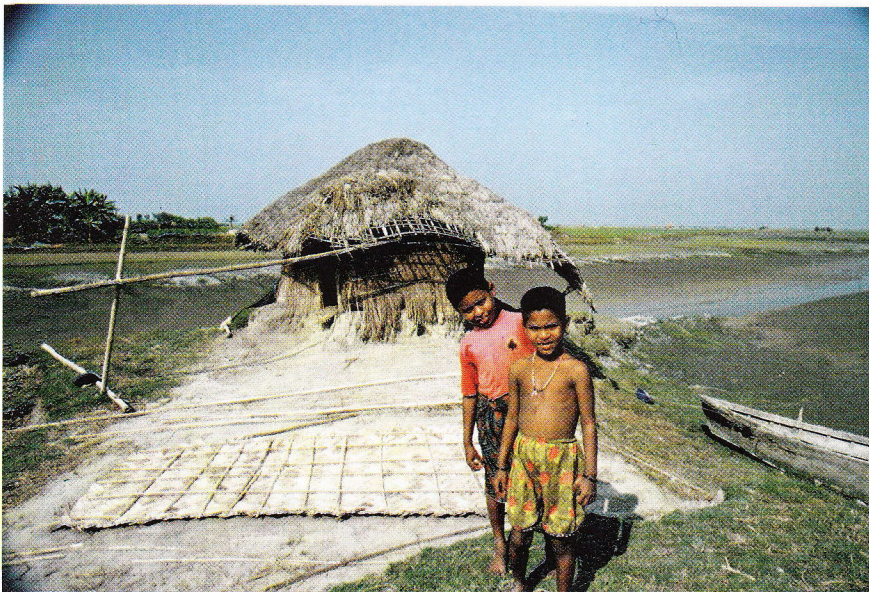
A determining factor for agricultural development is salinity. In the process of land formation, the water of the estuary regularly inundates the chars. In the monsoon period, the estuary water is fresh because of the high river discharges, while before and after the monsoon, the estuary water has the salt content of seawater.

When the chars have reached a level where agriculture is possible during the monsoon, the excessive rainfall (over 3,000mm) washes the salts from the upper soil layers, making it fresh enough for paddy cultivation. After the monsoon, re-salinisation of the topsoil occurs due to capillary rise of saline groundwater and saline water intrusion. When the char is embanked and not prone anymore to saline water intrusions, the soil salinity gradually decreases, but a seasonal cycle remains. With the decreasing soil salinity, the chars become gradually suitable for Rabi and *Karhif-1* cropping.

The Socio-economic Setting

People migrating into the char areas are confronted with a harsh environment, prone to the dangers of saline water intrusion and cyclones, where physical infrastructure is weakly developed, easily damaged and difficult to maintain. Moreover, where there is a lack of fresh drinking water, especially in the dry season, where institutional structures are weak and the level of government services low. On the other hand, the coastal zone, offers new land for settlement, potential for agriculture, great fish resources (culture, river, coastal and marine), important forest resources and access to the sea with all its opportunities for shipping and trade.

Autonomous settlement



The socio-economic setting is highly conditioned by the process of human settlement. When a new *char* becomes fit for cultivation, people start to migrate into the area. The settlers are mostly from the other coastal *chars* and offshore islands that have lost their land due to erosion or due to natural process of pauperisation.

The early (autonomous) settlement takes place before the government is represented in the areas. Local powerful people, known as *jotdars*², claim the lands and regulate the settlement. Prospective settlers have to undergo a process of scrutiny at the outset. Kinship, factional bondage, political disposition and neighbourhood relationship determine preference. If accepted, they are assured of shelter and protection and, of course, a piece of land. In return, the patron receives loyalty.

Economic activities

Single crop paddy cultivation in the monsoon period (*Aman*) is the main source of income for the initial settlers. Another important source of income is fisheries. The estuary and the extended *Khal* system are endowed with rich fishery resources. Some work independently (fry collector), some work as lessee or on share basis and others are contractual labourer. Other sources of income are wood extraction from the mangrove forests and cattle rearing.

In the agricultural off-season, men tend to migrate to other parts of the country to work as labourers in construction or agriculture.

Landownership and tenancy conditions

Land is cultivated under different tenure systems. Besides farming on their own or occupied land, farmers hire land from others for a particular season or a particular year. Dominant systems are described in Box 1.1.

Box 1.1: Land Tenure Systems

(a) *Baga*: The most dominant tenancy system other than own land farming is locally termed as *baga* (sharecropping). Under this system, the *chasha* (sharecropper) supplies all inputs. The *malik* (landowner) provides land only and gets one-half of the produce as rent after the harvest. In some cases, the *malik* shares the cost of fertilisers. Payment of *haolat* (security deposit) by the sharecropper to the landowner is a common practice. This deposit is returned after expiry of the contract. Contracts are negotiated verbally with one or more witnesses.

Sharecropping arrangements mentioned above are for *Aman* (monsoon rice) crops. For *Rabi* (dry season) crops, the sharecropper provides all the inputs and gets two-thirds of the produce. If the *malik* shares the cost of seeds and fertilisers (50%), he gets half of the produce.

(b) *Kodi baga*: Under this system, a fixed quantity of rice is paid as rent by the sharecropper to the landowner irrespective of production. If there is a crop failure, the sharecropper has to compensate by buying rice from the market or to pay equivalent amount of money. This system is applicable only for *aman* crops.

(c) *Ren*: *Ren* (*rehan*) stands for mortgage. One can borrow money by mortgaging land to a lender. The lender retains the right to cultivate or even rent out the land for sharecropping until he gets back the money. The minimum period of contract is one year, from *Baishakh* to *Chaitra* (mid-April to mid-March).

² *Jotdar*- persons forcefully occupy the *Khas* land in the *char* area.

Housing, Water and Sanitation

Poor people live in impoverished neighbourhoods with no or little access to basic amenities of life. The majority of them live in shanties made of bamboo and straw. Those who have not been able to occupy any land usually crowd along the slopes and berms of the dykes.

In remote and unprotected chars, few people have access to portable water. A 2-3 km evening walk by the women to collect water on the mainland is common practice. Access to electricity and sanitation is negligible.

Conflict and law and order

The crime and violence which occurs in southern districts including Noakhali and Lakshmipur is mostly related with *char* land; grabbing crops, land grabbing, looting and robbery are the main types of crime. In land disputes and conflicts, many people are harassed, kidnapped, evicted and killed. The reasons are unsettled district boundary conflicts, isolation and vested interests of the power brokers. Violence against women is a common phenomenon that includes domestic violence and sexual abuse.

Services

It takes considerable time before government services enter into the *chars*. Lack of services is most apparent in the areas of law and order, water supply, education, health and credit.

Mortality rates are high where health care depends on self-medication and unqualified advice of scarcely available drugstore keepers. Literacy rate is low in general. Local communities initiate sometimes schools and *moktab* (religious schools)

Vulnerability

The foregoing sections show that the physical and socio-economic conditions in the char areas are highly vulnerable for the char population. In summary, the vulnerability is characterised by:

- The threat of cyclones and storm surges affecting life and property;
- The threat of land erosion;
- A limited agricultural potential of the char lands with mainly saline and low fertile soils and exposure to tidal flooding;
- A highly unequal social structure, with a small powerful elite dominating the majority of the settlers;
- Unfavourable tenancy conditions for the majority of the people.
- Poor levels of service provision, resulting in an unfavourable law and order situation, lack of potable water and a deprived health and education situation.

2. EVOLUTION OF THE CHAR DEVELOPMENT AND SETTLEMENT PROJECT (CDSP)

Setting the Tune

Following the positive experience of the two cross-dams on the coast of the Noakhali District, the Government of Bangladesh (GoB) requested the Government of the Netherlands (GoN) for technical assistance in land reclamation. Based on an Identification Mission in 1976, two projects were formulated: the Land Reclamation Project (LRP) in the eastern part of the delta and the Delta Development Project for the western part. Both projects were brought under the Bangladesh Water Development Board (BWDB). The BWDB established a separate directorate for the planning and implementation of the projects: the Directorate of Estuarine Survey (DES). Two Field Divisions, residing under the DES, were created for the LRP: the Survey & Study Division (SSD) with its office in Chittagong, and the Pilot Polder Division (PPD) with its office at Noakhali. The SSD was involved in hydrographic surveys and studies in the sea and the estuary, while the PPD was involved in the development of accreted land.

Land Reclamation Project

The Land Reclamation Project started in late 1977. The objectives of the project were formulated as follows:

- (i) To set up an organization within the BWDB to carry out surveys and studies in order to develop a long-term policy for land accretion works in the southeastern delta of Bangladesh.
- (ii) To try out various methods to accelerate the accretion of land in order to define those methods that are possible.
- (iii) To implement experimental schemes with the purpose of promoting a faster and more effective use of newly gained lands, so that food production can be increased and conditions made viable for poor farmers.

To develop a suitable approach for the development of new land, a Pilot Polder was established at Char Baggar Dona, including a 40 ha agricultural research plot. In the period 1986-1989, 895 households were settled in the polder, grouped in 30 cooperatives. Each household received 1.0 ha of land: 0.8 ha for field crops and 0.2 ha for a homestead. They were housed in 30 cluster village communities, one for each cooperative.

The PPD engaged a team of consultants to carry out research and extension work in various fields including agriculture (field crops and home gardening), aquaculture, livestock, health, education and credit. Nijera Kori, a National NGO was engaged under a separate contract for social mobilization, group development and training of the new settlers.

After several project extensions, LRP terminated in 1991. The appraisal mission in 1990 concluded that:-

- (i) *Char* development would be better served if the LRP were split into two separate projects: one project for surveys and studies (water-based) and one for land development (land-based).
- (ii) The development activities as executed in the pilot polder should be brought under the appropriate government agencies.
- (iii) After more than 10 years testing of land development approaches, the new land based project should

evolve from its pilot stage to a project directed at developing new areas. Consequently, the LRP was concluded and two separate projects were formulated: the Char Development and Settlement Project (land-based) and the Meghna Estuary Survey (water-based). Both projects started in 1994.

Char Development and Settlement Project I

CDSP I was initially formulated for a period of three years ending in 1997 but lasted until 1999. CDSP I embarked on the construction of three new polders with a total area of 5,000 ha: Char Baggar Dona (CBD II), Char Majid (CM) and Char Bhatirtek (CBT). The single agency (BWDB) institutional arrangement changed into a multi-agency integrated set-up with the BWDB as the lead agency and the Ministry of Land (MoL), the Local Government Engineering Department (LGED), the Department of Agriculture Extension (DAE), Department of Fisheries (DoF), Department of Health and the Department of Education. The BWDB, MoL and the LGED had their own Project Proforma (PP), while the other agencies were the non-PP partners. Three local NGOs were engaged under a separate contract for social mobilization, extension and training: UPOMA (CBD II), Sagarika (CM) and N-RAS (CBT).

To bring about a suitable involvement of the char population in the planning and implementation of project activities, Sub-Polder and Polder Committees were created.

The institutional arrangement included an inter-ministerial Steering Committee (SC) at National Level headed by the Secretary of the MoWR and represented by all relevant Ministries and Departments. At the project level, a Project Management Committee (PMC) was functioning with the Project Director (BWDB) as the chair and representatives of all partner agencies in the field (District level), including three NGOs.

CDSP concentrated activities on land settlement and land development in three polders. One of the core programmes was to settle 5,000 landless households on *Khas* land. Each household received an area of land, not exceeding two acres. Several clustered villages were constructed, where one thousand houses were constructed for the most destitute settlers. Other activities included construction of protective and water management infrastructures including embankments, regulators, drainage channels, cyclone shelters, roads, tubewells, water-sealed latrines and clustered villages. There were regular 'software' activities on health and nutrition education, training of traditional birth attendants (TBA), support to community-initiated and registered primary schools, demonstration and extension on improved farm and aquaculture practices, support to livestock vaccination and development of water management institutions.

The CDSP experience resulted in a number of 'lessons learned' which were important for the formulation of the follow-up CDSP II project. The most important ones were:

- The multi-agency setting of CDSP appeared to be successful, which was rather unique in Bangladesh in the early nineties, but it appeared that the agency commitment could be enhanced if each had their own Project Proforma. Mainstreaming of char development in the national agencies at the various levels was considered a next step. A future project should therefore focus on the creation of a favourable institutional environment for char development rather than on project implementation.
- In LRP and CDSP I, many sectors were included in the projects. The experience of CDSP was that this type of project could better focus on a few core sectors, rather than try to cover all. Core sectors were considered to be: land settlement, physical infrastructure including water & sanitation and the

productive sector. Although not of lesser importance, it was considered that the sectors of health and education would be better served through separate (national) programmes.

- Char development under LRP and CDSP I was identical with polder development; while chars are already inhabited long before polder development can take place. Attention to these unprotected char areas should therefore be considered as an integrated part of char development.
- Any physical intervention in char areas has influence upon the upstream and downstream areas; a more regional (catchments area) approach for future development of char areas is therefore considered important.

Char Development and Settlement Project II

The formulation of CDSP II project took place in 1999. The 'lessons learned' from CDSP formed the basis for the project design. Another important factor that shaped CDSP II was the Integrated Coastal Zone Management (ICZM) concept that started to gain impetus in the late nineties (see Box 1.2).

Box 1.2 The ICZM Concept

The specific coastal ecosystems, the vulnerability of the coastal zone due to natural disasters and the land use conflicts justify a specific development approach for the coastal zone. The need for such a specific approach was already recognized in the early eighties. Initiatives from the GoB and some donor agencies (UNDP, FAO) did not get the proper follow-up at that time because of the lack of political support.

In the late nineties, the ICZM concept gained again momentum through initiatives of the Government and the donor community led by the World Bank. In 1999, the GoB produced an ICZM Concept Paper (*Integrated Coastal Zone Management: Concepts and Issues; 1999*) and a large-scale ICZM programme was planned to be launched in 2002; ongoing programs and projects in the coastal zone, like CDSP, would become part of this ICZM programme. With the withdrawal of the World Bank from ICZM, the implementation of the ICZM concept lost part of its thrust. The GoN and later on DFID continued with ICZM and funded the first step in the development of the ICZM concept: the elaboration of an ICZM policy framework. For this purpose a Project Development Office (PDO-ICZM), resorting under the Water Resources Planning Organization (WARPO) was established in 2002. At national level, the ICZM National Steering Committee was established including a Technical Committee (ICZM-TC).

Important outputs of the PDO-ICZM are the Coastal Zone Policy (approved in January 2005) and the Coastal Development Strategy (in preparation).

In the formulation of CDSP II, the project was strongly linked to the ICZM: CDSP II would contribute to the development of the ICZM concept through participating in the ICZM-TC, sharing its experiences with the PDO-ICZM through providing data and conducting a number of studies and pilots. The ICZM context in CDSP II is reflected in the first two project objectives and in the incorporation of the so-called 'ICZM building blocks': (i) study on fresh water storage, (ii) study on coastal agriculture, (iii) the local level planning pilot.

The long-term development objective was defined as: 'To bring about an improvement in the economic situation and in the living conditions of the coastal chars' and the project objectives as:

- Promotion of an institutional environment that sustains CDSP II and similar interventions.
- Accumulation and dissemination of data and knowledge on the coastal areas.
- Direct improvement of the economic and social situation of people in a number of coastal chars areas in a sustainable way.

The mandate of CDSP II was wider as compared to CDSP I. CDSP II took a more regionally based approach and dealt with both protected and unprotected areas. In 1999, two new sites were added for empoldering, South Hatiya (SA) and Muhuri Accreted Area (MAA). Feasibility studies were completed and construction works began. A host of interventions was made in unprotected chars that were not yet suitably mature or appropriate for empoldering. Among these were Char Torabali-Gangchil, Nijhum Dwip-Bandartila, Char Mora Dona., Char Osman and Char Lakshmi.

A feasibility study was conducted in the Baggar Dona Catchment Area. The study resulted in a project proposal to improve the drainage situation in the upstream Baggar Dona Area and to develop a polder in Boyer Char. The proposal formed the basis for the extension of CDSP II. Due to financial constraints, only the Boyer Char polder will be developed in the extension phase (CDSP III) in the period 2005-2009.

In addition, CDSP II resulted in a number of 'lessons learned'; there are two 'lessons' are of particular relevance: (i) the sustainability of CDSP interventions and closely related to this (ii) the internalisation of char development concepts as developed during CDSP I and II into the government agencies.

In the following table the chronology of the main events since 1975 is shown, while table 2.2 provides some key data of char development activities in the period 1981 – 2009 and Map 2 the location of the project areas.

Table 2.1 Chronology of main events

1975	Identification Mission commissioned by the Government of the Netherlands
May 1977	An Agreement arranging the technical cooperation between the Bangladesh Government and The Netherlands Government was signed
December 1977	LRP started formally
1981	Construction of a pilot polder at Char Baggar Dona started
1986	Settlement of landless in Char Baggar Dona started
November 1990	Appraisal Mission recommended for the termination of LRP by mid 1991
September 1994	Char Development and Settlement Project (CDSP) started
September 1999	CDSP-II started
February 2002	ICZM-P initiative launched
July 2002	Mid Term Review Mission recommended for continuation of CDSP-II and extension of activities in Boyer char
February 2004	Governments of Bangladesh and the Netherlands agreed extension of CDSP-II from September 2005 to September 2009
September 2005	CDSP II terminates
October 2005	CDSP III starts for a period of 4 years.

Map 1.

Map of CDSP-II Areas

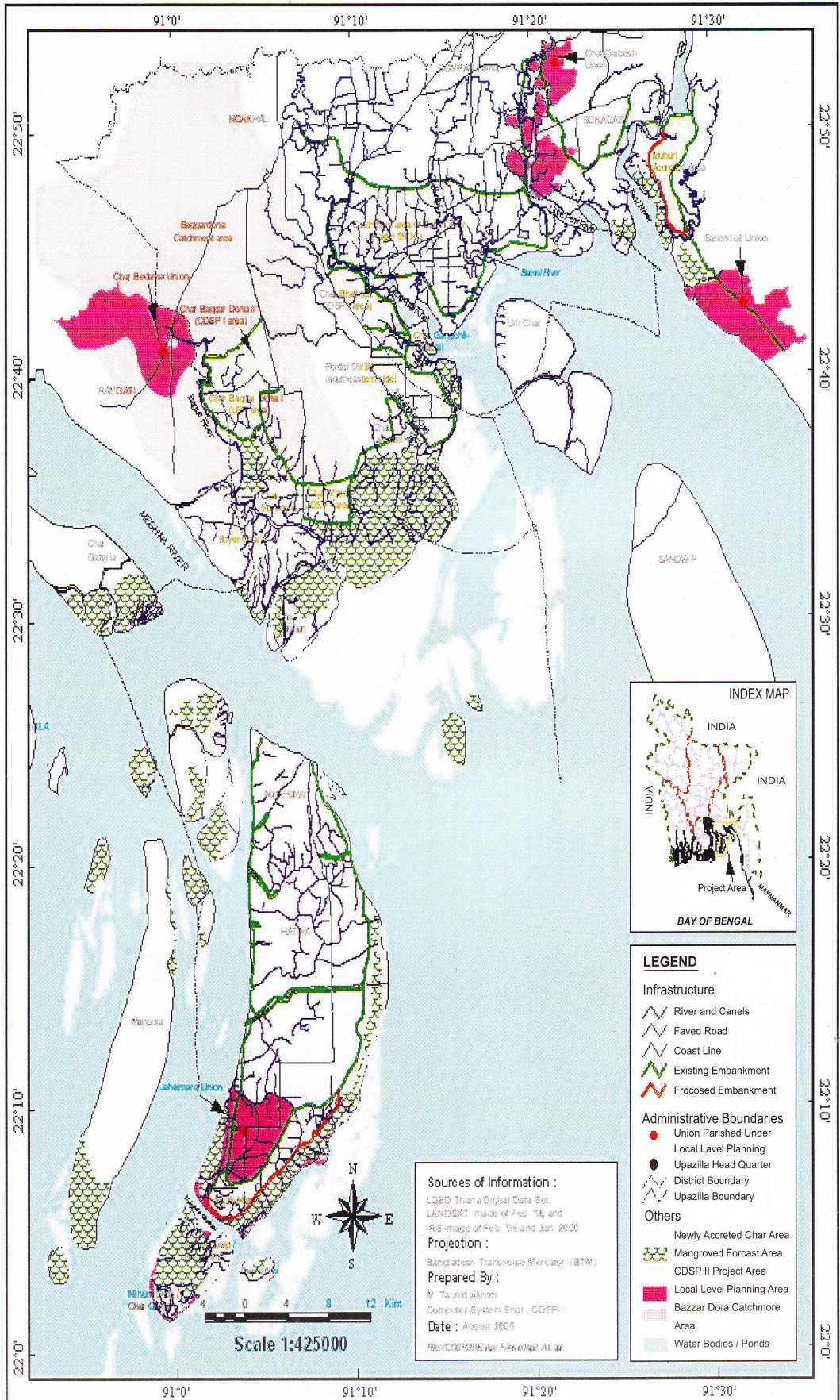


Table 2.2 Char Development Activities under LRP and CDSP 1987-2009

Char	Location (Upazila)	Area (ha)	Population (number)	LRP			CDSP I			CDSP II			CDSP III												
				81-89	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	
A.																									
1	Polder Development																								
	Char Baggard Dona I	1,688	8,328																						
	Char Baggard Dona II	2,065	15,077																						
	Char Majid	1,320	15,541																						
	Char Bathirtek	1,748	16,451																						
	Muhuri Accreted Area	1,981	3,478																						
	South Hatiya	2,759	21,223																						
	Sub-totals	11,561	80,098																						
B.	Unprotected Area Development																								
	Boyer Char	6,500	65,000																						
	Char Mora Dona	1,793	19,043																						
	Char Lakshmi	944	6,600																						
	Char Ganchil Torabali	743	2,123																						
	Nijum Dwip, Char Osman	519	5,236																						
	Nijum Dwip, Bandartila	650	6,916																						
	Sub-totals	11,149	104,918																						
C.	Water Management																								
	Polder 59 3B	3,486	24,662																						
	Polder 59 3C (Bamni)	12,825	94,189																						
	Baggard Dona Catchment	59,921	592,158																						
	Sub-totals	76,232	711,009																						
D.	Strengthening Union Level Planning																								
	Jahajmara	11,942	59,800																						
	Shaherkhali	3,980	20,182																						
	Char Badam	5,429	37,818																						
	Char Darbesh	3,942	37,338																						
	Sub-totals	25,293	155,138																						
	TOTALS	124,235	1,051,163																						

CLUSTERS OF ACTIVITIES

Studies	Monitoring & Institutional Dev.
Polder development	Water Management
Unprotected Area Dev.	Local Level Planning

3. OUTLINE OF CDSP II

The purpose of this chapter is to present a brief outline of the project. It discusses the scope of the project, the applied planning approach, and the activities divided over the three components of (i) *char* development: direct improvement of the socio-economic conditions of the *char* population, (ii) strengthening of institutions, (iii) building, and spreading the knowledge base. The chapter is concluded with the institutional setting of the project.

Scope

In the predecessor projects the focus was on those *chars* that were suitable for empolderment; in other words *char* development was identical with polder development.

In CDSP II, the scope of the project became much wider:

- Areas that were not (yet) suitable for empolderment were also addressed: the unprotected areas,
- Whereas in LRP and CDSP-I, the activities were concentrated on the development of the polder area only, in CDSP II the upstream and downstream areas were also included in the planning of project activities;
- Institutional issues received a much greater attention: a few key areas for institutional strengthening have been identified, and the links with other (coastal) projects and programmes were intensified.
- The accumulation and dissemination of knowledge on *char* development was addressed much more systematically;
- Through the established relationship with ICZM, the project addressed a few key issues related to coastal development: (i) study on fresh water, (ii) study on the potential of coastal agriculture, and (iii) improvement of local level planning.

In CDSP II, the project area was not limited to a few polder areas, but covered, with either higher or lower intensity, the entire coastal belt between the Meghna and the Feni Rivers.

Char Development

Type of Interventions and Project Areas

The selection of project areas was based on the *char* pre-feasibility study conducted at the end of CDSP I and on feasibility studies carried out by CDSP I and the Meghna Estuary Survey. The *char* study covered the entire eastern coastal zone between the Meghna and the Muhuri Area.

Table 3.1 Clusters of CDSP II Interventions

	Type of Intervention	Land Settlement	heral Infrastructure	Internal Infrastructure	Water Management	Productive Development
A.	Polders					
B.	Unprotected Areas					
C.	Water Management in existing polders					

The project interventions in the selected areas can be divided over three clusters (see table 3.1) of (A) Polders, (B) Unprotected Areas (C) Water Management in existing polders.

- Land settlement is executed both in polders and in unprotected areas and entails the issue of *Khatians* (title deeds) to the landless population of the *char* within the available *Khas* land.
- Construction of peripheral infrastructure like embankments, drainage regulators and major drainage canals is executed in polders. In the cluster of water management the infrastructural activities are limited to rehabilitation and some new construction;
- Construction of Internal Infrastructure is done in polders as well as in unprotected areas and to a lesser extent to the Water Management Areas. It includes rural roads, bridges and culverts, cyclone shelters, deep wells and latrines;
- Water management entails mainly the creation and strengthening of the water management organisations.
- Productive development involves agricultural extension in polders and unprotected areas.

Development of new polders was executed in two areas: Muhuri Accreted Area (1,981 ha) and South Hatiya (2,759 ha). Unprotected Area Development was implemented in 6 *chars* with a total area of 11,149 ha. Improvement of Water Management was implemented in two existing CERP polders (Polders 59/3B & 3C) covering an area of 16,311 ha; and in the LRP and CDSP I polders (6,821 ha).

In total, *char* development activities covered an area of 40,000 ha with an estimated population of 300,000.

Planning

The planning in *char* development differs slightly for each cluster, but roughly, the following planning steps can be distinguished: (i) preparation, (ii) creation of field level planning committees, (iii) implementation and (iv) continued institutional strengthening & monitoring.

Preparation

Once the *char* areas have been selected a number of preparatory activities start, which may vary from a full-fledged feasibility study to a few rapid appraisals. In all cases, the preparatory activities start with communication with the *char* population in formal and informal institutions.

Planning

One of the first steps in the planning process is the creation of people centred planning committees. In polder areas these are called Polder Committees and in unprotected areas Local Area Development Committees. These committees are in place for the time of the project and form the interface between the project and the *char* population. All kind of project related issues are discussed and decided here like physical planning of the area (roads, deep-wells, and cyclone shelters), progress and quality in implementation and land settlement.

Implementation

When the planning structure is in place a wide range of activities start simultaneously:

- Land settlement: the process of land settlement starts with a plot-to-plot survey in order to assess the existing land-rights of each household and to assess the area of *Khas* land and finishes with the issue of *Khatians* (title deeds) to the *char* population;

- In case of empolderment: construction of the peripheral infrastructure like embankments, regulators and main drainage structure;
- Construction of internal infrastructure: rural roads, cyclone shelters, water supply and sanitation, cluster villages;
- Agricultural extension through the DAE and through local NGOs.

Creation and strengthening of field level institutions for the operation and maintenance of the infrastructure (water management committees, tubewell user groups) and for agricultural extension form an integral part of the implementation phase.

Monitoring & support to O & M institutions.

Once the implementation phase is concluded, project support to the field level organisations continues. This is mainly because the creation of sustainable O&M groups is a long-term process. Simultaneously, the project monitors the effect and impact of its interventions following a pre-defined monitoring method.

The planning steps are schematically shown in Table 3.1a the timeframe is indicative and depends on the range of activities undertaken in a *char* and the progress made by the implementing agencies.

Experience has taught that the timeframe for the planning and implementation phase for polder development is around 5 to 6 years.

Table 3.1a Planning Phases in Char Development

PLANNING PHASE		YEAR									
		1	2	3	4	5	6	7	8	9	10
1.	Preparation: Studies, RRAs	■									
2.	Participatory Planning Creation of PCs and LADCs			■	■	■	■	■			
3.	Implementation Land Settlement, infrastructure, agricultural extension				■	■	■	■	■		
4.	Support to O&M Institutions					■	■	■	■	■	
5.	Monitoring									■	■

Strengthening the Institutions

The parties involved in CDSP II consist of a large number of government and non-government agencies. Strengthening of these agencies in order to improve their capacity in *char* development is one of the major areas of attention in CDSP II. Based on the experiences of CDSP I, a few key areas were identified where institutional strengthening is considered crucial. These are:

- The establishment of a water management organisation at field level and creation of functional relationships between these organisations and the government agencies: the BWDB, the LGED and the Local Government
- Improvement of the bureaucracy of the Ministry of Lands at District and Upazila levels through staff training and introduction of a computerised system for handling the land-settlement procedures.
- Strengthening of the local NGOs through a separate training and support programme coordinated by BRAC.

Furthermore, CDSP II contributed to the development of the ICZM institutional framework through collaboration with the PDO-ICZM and participation in the ICZM forums.

A special ICZM related activity was the pilot on Local Level Planning. Assistance was provided to four Unions (25,292 ha, 155,138 people) in four Districts in participatory planning as well as in building the Union database. The resulting Union Development Plans were supported by partly financing the identified priority projects. Four hundred and fifty, {450} *lac* Taka was invested in these Unions.

Building and spreading the knowledge base

The experiences with *char* development in LRP and CDSP I had accumulated considerable knowledge on the physical and socio-economic characteristics of the *char* areas as well as the potentials and constraints in *char* development.

With the establishment of the ICZM framework, the demand for the gained experiences in the coastal areas increased. During CDSP II, there was room to pay proper attention to increasing the knowledge base in *char* development as well as to the dissemination of this knowledge.

Main activities in this respect have been:

- Systematic monitoring of the effect and impact of the LRP and CDSP I interventions;
- Feasibility studies of potentially new intervention areas: the catchments of the Baggar Dona and Noakhali Khal;
- Studies on specific topics in *char* development: the fresh water situation and the potential for agriculture;
- Regular data collection on water and soil characteristics; and
- Pilot activities in the area of land and water engineering.

Dissemination of the acquired knowledge occurred through various channels: (i) results have been published in project reports and (ii) thematic workshops have been conducted on certain topics (land settlement, water management, agriculture); (iii) survey results were shared with the appropriate institutions and (iv) efforts have been made to make the CDSP II database compatible with the PDO-ICZM data base for easy and uniform access.

Parties Involved

The thrust of CDSP I was to mainstream *char* development activities into the regular mandated government and non-government agencies. CDSP I had proved that – after a difficult start – this institutional setting was feasible. CDSP II built on this experience and further refined the institutional embedding of the project. The major changes as compared to CDSP I were as follows:

- Each government agency had its own Project Proforma (PP) ; which enhanced the commitment of the agency towards the project;
- The local NGOs were brought under the umbrella of one national NGO (BRAC) who became responsible for training of the local NGOs and coordination of the NGO activities;

- In order to bring *char* development closer to the local government, CDSP II was represented in the District Development Coordination Committee.

The parties involved are listed in Box 3.1. The large number of parties requires appropriate coordination mechanisms at the national and local levels. CDSP II has sought to bring this coordination within the existing structures. At district level, CDSP II was represented in the District Development Coordination Committee chaired by the Minister of Law Justice and Parliamentary Affairs Deputy Commissioner. The Project Management Committee at the project level is held under the Chairmanship of the lead body PD. At national level CDSP II was represented in the (newly created) Inter Ministerial Technical Committee of the ICZM (ICZM-TC) chaired by the Secretary of the MWR. The main aim of this forum is to discuss ICZM related policy issues. The more technical project issues were dealt with in the Inter Agency Coordination Committee (ICC), chaired by the Chief Planning of the BWDB, where all agencies including BRAC and the RNE were represented.

Box 3.1 Parties Involved in CDSP II

	Agency	Responsibility
A.	Government Agencies	
1.	Ministry of Water Resources	Lead Agency (delegated to BWDB)
2.	Bangladesh Water Development Board (BWDB)	Lead agency by delegation and responsible for main protective & water management infrastructure; Land settlement
3.	Ministry of Land	Internal infrastructure (roads, cyclone shelters)
4.	Local Government Engineering Bureau (LGED)	Water & Sanitation
5.	Department for Health & Education (DPHE)	Agricultural Extension
6.	Department of Agricultural Extension (DAE)	Forestation (foreshore, roads & embankments, homestead)
7.	Forestry Department (FD) (since 2005)	
B.	NGOs	
8.	BRAC	Coordination and training of local NGOs Implementation of NGO-programme in:
9.	Young Power in Social Action (YPSA)	▪ Muhuri
10.	Saghorika	▪ Char Mara Dona (part) & Char Lakshmi
11.	Upoma	▪ Char Baggar Dona and Char Bhatirtek
12.	Noakhali Rural Action Society (N-RAS)	▪ Char Bhatirtek
13.	Dwip Unnayan Sangstha (DUS)	▪ South Hatiya and Nijhum Dwip
C.	Donor Agencies	
14.	The Royal Netherlands Embassy	Financing, monitoring
15.	World Food Programme	Financing, monitoring
D.	Technical Assistance	
16.	Consortium of <ul style="list-style-type: none"> ▪ Consultants for Development Programmes, ▪ Royal Haskoning and ▪ Sheltech 	Advisory and monitoring
17.	Consultants for studies & surveys	Studies & Surveys

Investments

The total investment in the period 2000 – 2005 amounted to Taka 1,239.9 million (around Euro 20.6 million)³. The sources for funding were the Government of Bangladesh, The Government of The Netherlands and World Food Programme.

The figures in table 3.2 refer to the final budgets; the exact expenditure was not known at the time of writing.

Table 3.2 Investments in CDSP II

	Source	Taka (million)	(%)
1.	Government of Bangladesh	274.6	22.1%
2.	Government of The Netherlands		
	a. <i>Financial Assistance</i>	612.2	49.4%
	b. <i>Technical Assistance</i>	300.5	24.2%
3.	World Food Programme	52.6	4.2%
	Total	1,239.9	100%

³ With average exchange rate of Euro 1 = Tk 60.

4. LAND TO THE LANDLESS

Land settlement: the heart of coastal char development

In a country such as Bangladesh where agriculture is the main source of income and the pressure on land extremely high, to own a piece of land is highly advantageous. For this reason, people start to occupy *char* land long before the most vital living conditions are met.

At this early stage, the government is rarely present in the new chars. Several, often competing, factions led by powerful people, locally known as *jotdars*⁴ determine life in these new lands. Prospective settlers have to undergo a process of scrutiny at the outset. Kinship, factional bondage, political disposition and neighbourhood relationship determine preference. If accepted, they are assured of shelter and protection and, of course, a piece of land. In return, the patron receives loyalty. The stories described in boxes 4.1 and 4.2 illustrate this process of autonomous settlement.

According to Government policy, usually the coastal *khas* lands are firstly handed over to the Forestry Department for a period of 20 years. In this period, mangrove forests are planted as part of the coastal protection system. With the proceeding accretion, the lands having a substantial foreshore mangrove belt can be converted into agricultural lands after this period.

However, before the *khas* lands can be handed over to the Forestry Department, settlers have often already occupied the lands, and even encroached onto forest lands, cut the young plantations and started agriculture.

The government land settlement policy can be characterised as pro-poor. Landless families who are victims of river erosion elsewhere in the delta have priority in the issue of land. The implementation of this policy appears to be cumbersome, with lengthy procedures, an ineffective land bureaucracy with high influence of the local power brokers.

In this environment, CDSP implements its land settlement programme. The major thrust is to assist the Government of Bangladesh and specifically the Ministry of Lands to implement its own land settlement policy.

Land settlement is considered as the projects core programme as it provides a major asset to the settlers from which they can obtain some security for their survival. At the same time it is the most complicated programme; its implementation is a long story of foreseeable and unforeseeable obstacles, varying from manipulation of the local powerful people, land use conflicts between agriculture and shrimp or fish farming, to political influence and bureaucratic inefficiency.

Land settlement is the most discussed issue in the local forums, like polder committees and local area development committees. Problems had often to be solved by intervention of the Project Director and the Consultants Team at District and National level. In one case the donor has put successful completion of the land settlement conditional for further funding.

In the next sessions, first the land settlement policy and procedures will be discussed followed by a description of the CDSP involvement. The problems met during implementation will be discussed in the following section, while the concluding paragraph deals with the effects and impact of the land settlement programme.

⁴ *Jotdar*: literally (big) landowner; in Noakhali, it is associated with land grabbers: people who forcefully occupy *khas* land in the *char* areas.

Box 4.1: The Story of Jalil Commander

"I was born in 1944 (B.S) in South Hatiya. We are Bhuiyan by lineage and once we had a huge tract of land in Bamni during my grandfather's days. He lost all his land into the Bamni River. Then we settled in Char Bata from where my father migrated to Char Tamuruddin in South Hatiya about 75 years ago buying 22 *kani* of land at a cheap rate and started his life anew there.

Unfortunately, we faced the same fate of my grandfather and gradually lost all our land into the Meghna and became landless. Having no other alternatives, I settled here in Boyer char cleaning jungles in 1997. I occupied four plots of land each consisted of 1.5 acres. It was forest's land yet I occupied it for my survival. In 1997 with the blessing of a chairman and one of his deputy, I knew both of them before, I occupied the land through Soleman Commander, a forest robber in the eastern part of Boyer char.

I was the Commander of the Ansar bahini of Tamuruddin Union after liberation till 1995 and for this people call me 'Jalil commander'. I am also a freedom fighter. I have a good relationship with an ex-parliamentarian from Hatiya. When I was in Hatiya I was a ward level Group Leader of the Red Crescent Society and carried out relief operations after the cyclones of 1960, 1970 and 1991. It gave me the credibility among the local people.

"In Boyer char we are in a community of 300 families that have come here from the same place of origin and most of us are relatives. Here I have my siblings, offspring and lineage group members. Those who are not relatives we knew them from Hatiya. We are all the victims of river erosion; some before; some later. Many were squatting on the embankment foot huddling in the congested space".

"They all got 1.50 acres of land each and I helped them in getting land. I led them in building the commune here. Soleman commander settled us and protected us from other armed groups. We have a *samaj* (socio-religious unit) and a bazaar both after my name in my community. I (We) have founded a mosque and a community school. I am the president of the mosque committee and the donor of school's land. People elected me as their representative of the sub-polder committee and the members of the SPC elected me as the president of the SPC."

"We faced the trouble from the armed groups who oppressed us ruthlessly and exploited us too. Our people fought against the armed group led by Soleman commander through whom we got settlement here. He wanted to deprive us of our occupied land to sell to others with high price. We the landless people stood firmly against them. I led the people and in the fighting I lost my brother-in-law and many of our people were wounded seriously by gunshot."

"In Boyer char power changes with change in leadership that is determined by arms. We settled here through Soleman commander who is not in the area after the cleansing of the *bahini*. Still my leadership has not faced any challenges from any quarters. I hope I will keep my leadership in my community whoever takes over the power of Boyer char because I have my relatives in my community as well in other communities. People who got settlement through me I hope they would remain attached with me in future. Moreover, I have good reputation as a good doer (school, mosque, etc.). People also respect me as I have come from a respected Bhuiyan family and for my past leadership as the Group Leader of Red-crescent Society, Ansar commander, etc. Moreover, people of my community faced less oppression and exploitation by the arms cadre during the jungles' days as I could protect them from the cadres."

Box 4.2: The Story of Faruque

Faruque, a rickshaw puller, is 18 years old. His father settled here four year back buying 1.50 acres of land from Soleman commander, a forest robber, at Taka 1000 but later Soleman snatched away 0.50 acres of land and sold it to another for Taka 5000. "We cleared the jungles by felling trees and weeds and when land became good he took away it forcible from us. We could not pay him Taka 5000 to keep the land". Faruque's family was in Hatiya and they had a bullock cart but after river erosion they left Hatiya and settled here. "We did not have any way to live in Hatiya. Who would give us land for a homestead? What could we do there?"

His two younger brothers are working with his father in the field. "I pull the rickshaw because we do not have enough jobs to do in he chars. We cultivate one plot of 0.60 acres under sharecropping conditions, but it is too little for us. We cannot get more land, because all people here are too poor to lease out lands. We have two bullocks and my father sells draft power to others' field. When we came here we had seven cows but thieves lifted them at night. People suspected that the *bahini* (armed gang) had done it. We contacted them and they wanted Taka 5000 as ransom. We gave them accordingly but they did neither return the cows nor the money." Later his father bought two bullocks and now he sells draft power to others and sharecropping in land. They got financial assistance from Faruques's maternal uncle to buy the bullocks.

Land settlement policy

The Ministry of Land (MoL) is the government agency responsible for the maintenance and issue of *khas* land. *Khas* land information is gathered through cadastral surveys and the information is kept in an official register called 'Register VIII'.

The settlement of *khas* land has a long history and settlement policies have changed over time. Before 1972 land settlement, policies were mainly aimed at raising government taxes; with the Agricultural *Khas* Land Settlement Policy of 1972, the emphasis shifted towards the rehabilitation of landless people, especially those affected by river erosion. The latest policy called the 'Agricultural *Khas* Land Management and Settlement Policy', dates from 1997.

The 1997 agricultural *khas* land management and settlement policy

The 1997 policy substantially simplified the procedures in the issue of title deeds as compared to the former policies. Priority in land settlement is given to landless peasants, defined as: landless families, depending on agriculture and without a homestead or a homestead of less than 0.1 acres.

Within the group of landless peasants further priority is given to: (i) destitute freedom fighters, (ii) families who lost their land in river erosion, (iii) widows and abandoned women with an adult son, (iv) families without a homestead and (v) families who have become landless due to land acquisition.

Implementation of the policy is the mandate of the Ministry of Lands (MoL), which is represented at the various government levels (national, district, *Upazila* and Union). Table 4.1 shows the key MoL staffs.

Table 4.1 Key MoL staffs in Land Settlement

Level	Main Government Officers	Responsibilities
1. National	<ul style="list-style-type: none"> ▪ Minister ▪ Secretary ▪ CDSP II Project Coordinator 	<ul style="list-style-type: none"> ▪ Settlement Policy Coordination ▪ Land Settlement Progress Monitoring ▪ Solution of various land settlement problems
2. District	<ul style="list-style-type: none"> ▪ Deputy Commissioner ▪ Additional Deputy Commissioner (Revenue) ▪ Revenue Deputy Collector (RDC) 	<ul style="list-style-type: none"> ▪ Approval of Settlement Cases proposed by <i>Upazila</i> Committee ▪ Supervision of <i>Upazila</i> Committee activities ▪ Disposal of petitions regarding settlement irregularities ▪ Dissemination of settlement policies
3. <i>Upazila</i>	<ul style="list-style-type: none"> ▪ <i>Upazila Nirbahi</i> Officer (UNO) ▪ Assistant Commissioner (Land) 	<ul style="list-style-type: none"> ▪ Identification and procurement of <i>khas</i> land ▪ Receive applications from landless people ▪ Landless selection ▪ Preparation of allotment sheets ▪ <i>Kabuliyat</i> Execution (AC-L) ▪ <i>Khatian</i> Preparation ▪ Hand-over of lands
4. Union	<ul style="list-style-type: none"> ▪ Union Land Assistant Officer (<i>Tahsildar</i>) 	<ul style="list-style-type: none"> ▪ Assist UNO and AC-L ▪ Collection of <i>salami</i>

There are three committees involved in the land settlement process:

1. The National Executive Committee on Agricultural *Khas* Land Management,
2. The District Agricultural *Khas* Land Management and Settlement Committee, and
3. The Upazila Agricultural *Khas* Land Management and Settlement Committee

The National committee is mainly concerned with policy formulation and acts as an appeal body against decisions of the District Committee. The implementation of the land settlement policy lies with the District and *Upazila* committees

Settlement activities can be divided into three categories: (i) policy formulation, (ii) *khas* land identification and (iii) land allocation to eligible settlers. The main task of identification of *khas* land lies with the Upazila Committee, where the District Committee acts as an appeal body against decisions of the former.

The identification of *khas* land comprises seven steps (table 4.2) and starts from the surveys and the information recorded in Register VIII. Before 1997 the identification had to be based on an official cadastral survey (*Diara*), after 1997 this can also be based on a survey done and approved at District level: the *charcha* map. Approved *charcha* or *diara* maps are conditional for the initiation of the land settlement process. In the absence thereof, only annual lease permits (*Eksona*) can be issued by the AC (Lands).

Against the identified *khas* land, people can appeal at the three subsequent levels of the Upazila, the District and at national level. The total period after the publication of the identified *khas* lands amounts to 165 days.

Table 4.2: Identification of *Khas* land

Step	Activity	Time (days)	Responsible land management Committee	Key person
1.	Identification by land use and occupancy based on <i>Diara</i> record and Register VIII	30	<i>Upazila</i>	AC Land/ Tahsildar
2.	Publication and receiving objection against identified <i>khas</i> land	30	<i>Upazila</i>	AC Land
3.	Settlement of objections <i>Upazila</i> level	15	<i>Upazila</i>	UNO, AC Land
4.	Receiving objections before District Committee	15	District	DC
5.	Settlement of objections District level	15	District	DC
6.	Receiving objections before National Committee	30	National	Joint Secretary {Admin}
7.	Settlement of objections National level	60	National	Joint Secretary {Admin}
	Total Period	195		

Once the area of *khas* land is identified, the actual settlement procedure can start. The procedure can be divided in nine subsequent steps, taking a maximum official period of 162 days {Table 4.3}.

Table 4.3: The Land Settlement Process

Steps	Activity	Time (days)	Com- mittee	Key person
1 Application	Application by landless in a prescribed format	30	Upazila	ACL/ UNO
2 Selection	Selection of applicants and allotment of amount of land	30	Upazila	UNO
3 <i>Jamabandi</i>	Preparation of formal allotment proposal	21	Upazila	ACL/Surveyor
4 Approval <i>Jamabandi Upazila level</i>	Approval at <i>Upazila</i> level by UNO and Land Management Committee and submission to the DC	21	Upazila	UNO
5 Approval <i>Jamabandi District level</i>	Approval at District level by District Land Management Committee and forwarding cases to AC Land for further processing	30	District	DC
6 <i>Kabuliyat execution</i>	Signing of the document by the settler (husband and wife) and the AC Lands Collection of Tk 1 fee (<i>salami</i>) from the settler and <i>Kabuliyat execution</i> :	15	National	ACL/ <i>Tahsildar</i>
7 Registration	Registration of <i>Kabuliyat</i>			Sub-register
8 <i>Khatian</i>	Title deed (<i>khatian</i>) preparation and issue			ACL
9 Handing-over	Handing-over of land to <i>khatian</i> -holder.	15	Upazila	ACL
	Total Period	162		

Implementation of the settlement policy

According to the policy of 1997, the total timeframe for the implementation of the land settlement procedure takes a little more than one year. The reality is that it takes several years before the entire procedure has been successfully concluded. There are several constraints in the implementation process. The major ones will be discussed below.

The policy and procedures are in general not known to the *char* population and often not to the local government officers, including the MoL officials. This lack of transparency is a source of conflicts and gives rise to misuse of the settlement policy.

Preparation of the documents appears to be a time-consuming process; the records are not properly kept; payment of one Taka *salami* is often made as an additional income by increasing this fee with a factor 500 – 1000. In addition established registration fee amounting to approximately 400 Taka are required to be paid.

Major conflicts originate from the very start of the whole process: the identification of *khas* land through *diara* and *charcha* mapping and subsequent registration of the records in Register VIII. The accuracy of the surveys can be questioned and so is the recording in Register VIII. Often people are given a piece of land, which in reality is already occupied.

Local influential people (*jotdars*) use their links with the local government to maintain the *status quo*. The land settlement procedures give ample opportunities for delaying or frustrating the progress. As long as there is no approved *charcha* map, the settlement process cannot start and yet the District Administration can issue annual lease permits (*Eksona*) and as such continue the actual situation of land possession by *jotdars*. At the initial phase (*khas* land identification), there is room for objecting to the identified *Khas* lands at *Upazila*, district and national level. Through appealing at the relevant committees, or even courts, the identification process is often delayed by months or years. Also the landless selection process gives room for manipulation and in many cases the selected settlers do not belong to the eligible group of landless. The approval of the *Jamabandi* by the *Upazila* and District Land Management Committees can – in practice – be delayed by several months.

The Role of CDSP in Land Settlement.

Strategy

As stated before, the major thrust of CDSP is to assist the Government of Bangladesh and particularly the Ministry of Lands, to effectively implement the government land settlement policy.

CDSP I was the first project where the MoL distributed *khas* lands of the *chars* through a project. The land settlement experience of LRP made it clear that the MoL should be an implementing partner in the project with its own Project Proforma.

The strategy as has been developed during CDSP I and further refined in CDSP II is characterised by

- (i) Enhancing the transparency of the settlement process;
- (ii) Improving the efficiency of the land bureaucracy;
- (iii) Special attention to women in land settlement; and
- (iv) Monitoring the entire process from identification of *khas* land to the handing-over of land to the selected eligible landless.

This strategy is shown in the support to the MoL in the subsequent stages of the settlement process as will be described in the next sections.

CDSP support to the land settlement process

Information Dissemination

To enhance the transparency of the land settlement process, CDSP support starts with information dissemination meetings where the rights and procedures on the land settlement process are explained to the char population. In addition, separate meetings are held with the women of the char population to ensure that the information is also reaching them. Several meetings are held; the most important meeting is held just before the plot-to-plot survey to explain the aim and the justification of this survey

Plot-to-Plot Survey



As stated before the official *charcha or diara* maps are often not updated or inaccurate. The plot-to-plot survey assesses the actual occupancy situation in the *char* lands: who occupies how much land with what rights.

The plot-to-plot survey results are analysed, processed, and then publicized at the walls of public buildings in the concerned area, giving the people the opportunity to check the results and to raise objections. A separate list is prepared of the women headed households in the area and handed over to the local NGO and the Polder Committee or Local Area Development Committee; their support is sought in giving these families priority in the selection

Hearings

The plot-to-plot survey results are discussed in public hearings and corrections are made if necessary. In these hearings, the candidates for settlement are selected in the presence of the *Upazila Khas* Land Settlement and Management Committee. The eligibility of the candidates is discussed in front of the community and consensus is reached on the candidates for the available *khas* lands.

Jamabandi

When consensus is reached on the selected candidates, formal allotment proposals (*Jamabandi*) are prepared and forwarded to the *Upazila Khas* Land Settlement and Management Committee for approval. After approval at *Upazila* level, the *Jamabandi* is submitted to the Deputy Commissioner who puts the settlement cases before the District *Khas* Land Settlement and Management Committee. Once this Committee has given its approval, the land possession is secured. The following steps of *Kabuliyat* and *Khatian* are the final formal procedures for acquiring the title deed.

Kabuliyat & Salami

The *Kabuliyat* is a document that indicates that the settler has been selected for the issuance of a certain amount of land at a certain location. The document has to be signed by both husband and wife. From the Government side, the Assistant Commissioner Lands signs the document. After the signing of the *Kabuliyat*, the *Salami* will be collected: a token fee of one Taka.

CDSP II facilitated the process of *Kabuliyat* execution in two ways: (i) the signing of the *Kabuliyat* is done in the field instead of the settlers going to the government office and (ii) CDSP II pays the *Salami* from a revolving fund, which is later recovered from the settler when the *Khatian* is issued.

Registration of Kabuliyat:

Usually the registration of *Kabuliyat* carried out at the Sub Registrar's office located in the Upazila Head Quarters, but in a project situation, *Kabuliyat* Registration generally arranged in the field so poor landless families do not need to travel several kilometres from their homesteads to Sub Registrar's office for registration which also saves their money and time.

Khatian and Possession Handing-over

Once both parties sign the *Kabuliyat*, the official title deed (*Khatian*) is prepared by the AC Land and handed over to the settler.



For the majority of the settlers the *Khatian* means the official possession of the *Khas* land they already were occupying. From settlers who occupied more than the permissible 1.5 acres, the surplus land will be acquired and handed-over to other settlers who had no or less than 1.5 acres of land. The handing -over of surplus land to the new *Khatian*-holders is often cumbersome, giving rise to conflicts. The Assistant Commissioner Lands is responsible for the handing-over. The role of the project is limited to the monitoring of the handing-over process.

Clustered Villages

There is a special form of land settlement in clustered villages. Clustered villages consist of 30 tin-shed houses around a central pond of 1.2 acres. Each household receives 0.16 acres for the homestead including 0.04 acres pond area. When available, the settlers also receive *khas* land for farming. The poorest landless people opt for settlement in these clustered villages; as they were living in other homesteads or living along

the embankments. The clustered villages give some physical protection against the *jotdars*, while it gave the project the opportunity to target these people with special activities (homestead agriculture, fisheries) through the NGO programme.

CDSP I built 30 clustered villages accommodating six thousand people (990 households); in CDSP II four thousand two hundred people (674 households) were accommodated.



Support to the Land Administration

The Agricultural *Khas* Land Management and Settlement Committees at *Upazila* and District level are the main players in the settlement process. The members of these committees are often not fully aware of the settlement policy and procedures and leave the decision-making to their chairmen: the UNO at *Upazila* level and the Deputy Commissioner at District level. CDSP II carried out orientation courses to the committee members to make them aware of the policies and procedures and their envisaged roles and responsibilities in the process.

Similarly, the MoL officials at District, *Upazila* and Union levels are often not fully acknowledged with the settlement policies and procedures. Special training courses have been organised for these MoL officials.

The inefficient way the MoL keeps and maintains the land records is one of the causes of the slow and un-transparent land settlement process. To enhance the efficiency, a special computer software system has been developed: the Land Records Management Software; and introduced in the five *Upazila* Land Offices. The software has the following capacity: (i) documentation of *Khas* land identification, (ii) data-base for eligible landless applicants, (iii) documentation of the settlement process (iv) updating of Registers, (v) production of various reports such as progress reports on land settlement and mutations in the Registers.

Review of Land Settlement.

Results

In CDSP I (1994 – 1999) 5785 acres were distributed to 4,450 families (around 35,000 people); each family received a maximum of 2.0 acres (0.81 ha). Furthermore, 990 families were settled in 30 clustered villages.

In CDSP II, the total identified khas land amounted to 10,118 acres and a target was set for 6,848 families (see table 4.4). By the end of August 2005 some 5890 families had the *Jamabandi* approved, 4544 families had signed *Kabuliyats* and 2454 families received the *Khatian*, while 674 families are settled in clustered villages.

The gender focus in land settlement resulted in (i) land being registered in the name of both husband and wife; (ii) around 12% of the settlers were women headed households, while the average percentage of these households amounts to 6% in the *char* areas. One of the reasons for the relatively high proportion of women headed households was the fact that the condition of having an adult son was abolished in the selection.

Table 4.4: Identified khas Land and number of targeted and selected landless families in CDSPII.

Upazila	Polder/ Area	Khas land (acres)	Families	
			Target	Selected
Noakhali Sadar	Moradona	1,813	1,200	1490
	Char Baggar Dona I	2,265	918	945
Companiganj	Gangchil/South Elahi	1,234	800	805
Hatiya	South Hatiya	2,364	2,300	2252
	Nijhum Dwip	392	260	174
	Bandartila	550	370	499
Mirsharai & Sonagazi	Muhuri Accreted Area	1,500	1,000	1051
TOTAL		10,118	6,848	7216

Impediment

According to the 1997 policy, the entire settlement process should take a little more than one year. In CDSP-I it took 5 years to complete settlement for the 4,450 families. With the lessons learned in CDSP-II and the improvements made to the process of settlement during CDSP II, it would be expected that the efficiency of the process would improve. There have been however many constraints which had to be, and were, solved in the course of the project period. These problems can be divided in three main categories: (i) bureaucratic/political, (ii) local vested interests and (iii) boundary disputes.

At the start of CDSP II, the project was confronted with a number of problems of bureaucratic/political nature: (i) the MoL Project Proforma for CDSP II was only approved 1.5 years after the start of the project, implying that no land settlement activities could be initiated before that date. (ii) The first Project

Coordinator for Land Settlement nominated by the Ministry had, due to his rank, no authority over the MoL officials at District Level, especially the DC. (iii) After the national elections in 2001, the Land Management Committees were suspended until January 2003, implying that the process of landless selection and *Khatian* preparation could not start before that date.

Vested interest groups who would lose their control over the *khas* lands, have many ways to frustrate the settlement process, varying from physically threatening the surveyors of the plot-to-plot survey, to initiating court cases and influencing government officials at *Upazila*, District and higher levels. By the end of CDSP II, there were 73 court cases with a number of courts.

A relatively new interest group in the Eastern Delta is the group of fish/shrimp cultivators. Conflicts between *char* population and the shrimp cultivators have become apparent in the CDSP II project areas: Mora Dona, Muhuri Accreted Area and Gangchil.

The shrimp cultivators have a strong lobby within the government. In Noakhali, this lobby led to a proposal by the District Development Coordinating Committee to use part of coastal areas for shrimp cultivation. The proposal resulted in an Inter-Ministerial Decision⁵ which entailed that “coastal areas in the Noakhali District that were handed over to the Forestry Department, but presently have no forest cover will be used as follows: (i) one third for land settlement, (ii) one third for afforestation; and (iii) one third for shrimp/fish cultivation. The total area comprises 23,846 acres (9,500 ha). The Inter-Ministerial Decision has however not (yet) come into force.

The resistance against settlement became most visible by the end of 2003. After the completion of the stages of plot-to-plot survey, the hearings and the *Jamabandi* preparation, the *Jamabandi* approval by the *Upazila* and District was kept pending for a long time. The District and *Upazila* officials were told “to go slow” and only after interference from higher levels, a breakthrough was achieved in the course of 2004 when the Joint Bangladesh-Netherlands Formulation Mission for CDSP III recommended making successful completion of the land settlement process in CDSP II conditional for further donor funding for CDSP III.

Shrimp cultivation has led to severe social unrest, land grabbing, and loss of land for small farmers, environmental degradation (re-salinisation) and impoverishment in the Western Delta and in Cox’s Bazaar.

A special issue in the CDSP II areas was the boundary disputes in two areas: Muhuri Accreted Area and Boyer Char. Both boundary disputes concern eroded and re-accreted lands on which ancestral claims were made.

In Muhuri, the Feni River was considered the boundary between two districts: Chittagong at the eastern side and Feni at the western side. After the construction of the Muhuri Closure, the Feni River shifted westwards and large tracts of land accreted at the eastern side of the river. The people at the eastern side as well as the western side claimed these newly accreted lands as their ancestral lands.⁶

⁵ the Inter-Ministerial Meeting of 12 February 2004 between the Minister of Law, Justice & Parliamentary Affairs, the Minister of Lands and the Minister of Environment and Forest

⁶ The Feni People (west side) claim the land based on the Revision Survey of 1926-1930, while the Chittagong people (east side) refer to the Diluvium and Alluvium Rule of 1972, which declared the lands as *khas* land

In order to solve the problem the MoL declared the district boundary of 1927 as the official boundary. However, the boundary was never physically demarcated and also not accepted by the Feni people.

Over time the boundary dispute was used as a 'cover-up' for other interests: The MoL allotted land for shrimp cultivation without demarcating the shrimp zone, resulting in an uncontrolled expansion of the shrimp and fish pond areas, while a group of freedom fighters filed a case in the High Court claiming the ownership of the total accreted area.

It was only by early 2005, that the majority of the problems were solved and 5890 households {35340 people} received lands extending to a total area of 7657 acres.

As the preceding account shows: even in a project situation, such as CDSP II, where support is provided to the MoL and where a strong monitoring component is existent, the land settlement process is complex and time consuming and a lot of constraints need to be solved before the landless eventually receive their title deeds and possession.

Effect and Impact

During CDSP II, the effect and impact of the CDSP I land settlement programme in the three polders has been monitored. In two surveys in 2000 and 2003 the following topics were – amongst others - subject for investigation: (i) land possession (ii) land distribution, (iii) land retention and (iv) land management.

Land Possession

The surveys revealed that 93% of the settlers got possession of their allotted lands. Of the allotted lands, 89% were already occupied by the settlers before the settlement process and only 11% of the lands was redistributed.

The main effect of the land settlement process is that people get property security over their lands giving them a base for their livelihood and enabling them to invest in their lands and homesteads.

Land distribution

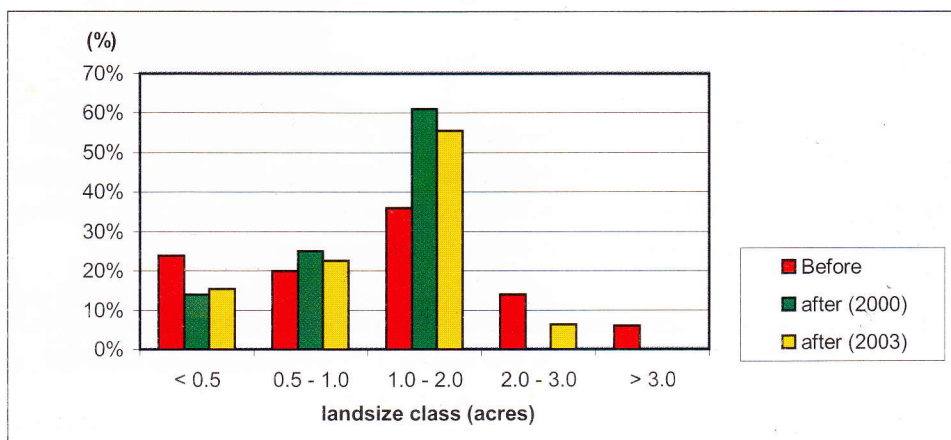
People who occupied more than 2.0 acres (later 1.5 acres) lost their 'surplus land'. This surplus land was added to the "land reserve" and redistributed. The land distribution in size classes before and after (2000 and 2003) the land settlement programme is shown in graph 4.1.

From the graph the following conclusions can be drawn.

- Just after the land settlement programme (in 2000) the size classes of 2.0 – 3.0 acres and larger than 3 acres disappeared.
- The land size class smaller than 0.5 acres decreased, while the land size class of 1.0 – 2.0 acres increased considerably.
- In the 2003 survey, the > 3.0 acre size class increased at the cost of the 1.0 – 2.0 acres and the 0.5 – 1.0 classes.

The move towards the bigger land size class can be explained through land transfer to the bigger landowners, or by the fact that during the redistribution of lands, the lands were written in the name of relatives and as such remained within the same holding.

Graph 4.1: Land Distribution according to size classes before and after (2000 & 2003) the Land Settlement Programme in the three CDSP I Polders



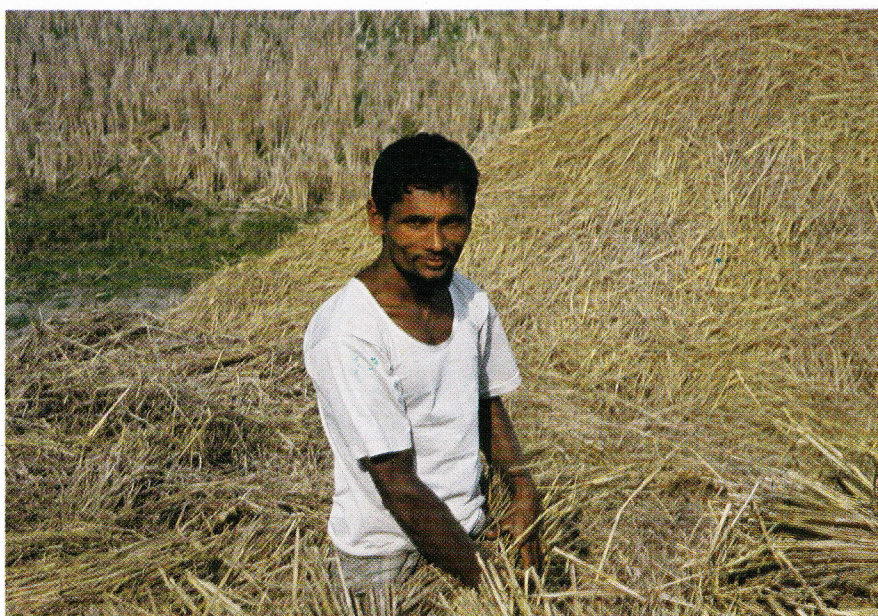
Land Retention

An interesting and telling outcome of the monitoring study in 2003 is that still in 2003 93% of the land issued in the settlement process in the period 1994-1999 remains with the *Khatian* holder. This retention rate is considered very high in contemporary Bangladesh. Impoverishment in rural Bangladesh is closely related to the land loss process: poor people when having debts will mortgage out their lands and in case of continuous default, finally lose their ownership.

The high retention rate is considered to be due to the joint effect of the CDSP activities: land settlement, improved farming conditions (protective embankments and drainage) and improved agricultural extension.

Land Management

As per Agricultural Khas Land Management Policy, the lands recipients are supposed to cultivate the allotted land under own management and prohibit any kind of sub-letting. The survey showed that 76% of the *Khatian* holders actually cultivate their own lands; however 11.3% was sharecropped out and 12.2 % mortgaged out.



5. HABITAT DEVELOPMENT

Context

The Starting Position

People begin to settle in the *char* areas, when the land has reached a level that cultivation becomes possible. In the monsoon period, a single rice crop (*Aman*) can be grown and people start building houses on raised earthen platforms to protect them from the flooding during the springtide. This is before the final formation stage of the *chars*: accretion continues during occasional floods.

Living in the *chars* at this early stage is very risky, as the raised houses do not protect against storm surges and cyclones, which mainly occur during spring and autumn. Communication to the mainland is difficult and fresh drinking water is only obtainable from considerable distances.

Coastal Embankments

People used to construct coastal embankments as early as the seventeenth century, known as *beri bundhs* with sluice gates to flush the accumulated salts and to prevent the intrusion of saline water.

These early embankments had mainly a protective function for the crops.

With the aim to promote agricultural production and to provide a better protection, Bangladesh embarked on the large-scale Coastal Embankment Project (CEP)⁷ in the 1960's. The provision of flood protection work required the construction of new embankments or repairs to and strengthening of existing embankments along coastlines, banks of rivers and tidal estuaries to form individual maintenance units. The Dutch term 'polder' was adopted to designate these reclaimed bodies of land. In the first phase, it was decided to build 92 polders with 2500 miles of embankments and 780 sluices covering an area of more than 3 million acres. By June 1968, the construction of 46 polders was completed.

Internal Infrastructure

The embankment system, as constructed by the CEP provides protection against the 'normal' floods and storm surges within a statistical return period of 50 years. The embankments are not able to cope with the tidal waves that are accompanied with the large cyclones. For that reason, cyclone shelters are built along the coastal belt to give the people protection in case of emergency.

The *char* population always mentions drinking water as one of the first requirements; therefore the construction of tube-wells is an infrastructure priority in the *char* areas.

Improved physical communication through the construction of rural roads including bridges and culverts is another priority.

Other infrastructure includes the construction of clustered villages, office buildings for government agencies and field-level organisations.

⁷ Later followed by the Coastal Embankment Rehabilitation Projects: CERP I and CERP II

Infrastructure in CDSP II

The type of infrastructure as constructed in CDSP II includes peripheral infrastructure (embankments and main drainage network) as well as internal infrastructure. Table 5.1 presents schematically the types of infrastructure for the different types of *char* interventions, while table 5.2 provides the details.

In polder areas, all types of infrastructure are implemented, while in unprotected areas only the internal infrastructure is executed. In the improvement of water management in existing polders, the interventions mainly concern rehabilitation and some new construction.

Infrastructure has been implemented in a total area of 39021ha: (i) 4740ha in polders, (ii) 11,149ha in unprotected areas and (iii) 23,132 ha in existing polders where water management improvements were implemented.

The total investment amounts to 6313 *lakh* Taka. Investments per category varied largely. The investments per ha for polders is on average Tk 71150/ha (Euro 1192/ha)⁸ ; for unprotected areas Tk 11940/ha (Euro 199/ha) and for water management activities Tk 6884/ha (Euro 115/ha).

Table 5.1 Infrastructure in CDSP II

Type of Infrastructure	Agency	Polders	Unprotected Areas	Water Management
A. Peripheral Embankments Drainage network: channels and regulators	BWDB			
B. Internal Roads, Bridges & Culverts Cyclone Shelters Clustered Villages <i>community ponds</i> <i>houses</i>	LGED			
Water & Sanitation <i>Tubewells</i> <i>Latrines</i>	MOL			
	DPHE			

The infrastructural activities are implemented by the mandated government organisations: BWDB for the peripheral infrastructure: embankments and drainage network, the LGED for the internal road network, cyclone shelters and community ponds for clustered villages, while the houses are built by the MOL. The Water & Sanitation Programme (tubewells and latrines) is implemented by the DPHE.

The works are implemented following the agency's design standards and construction procedures. Contractors, who are selected following the standard tender procedures, execute the actual construction, while the implementing agencies are responsible for quality control.

8. Based on average exchange rate in the period 2000 - 2005 of Euro = Tk 60



Table 5.2: Details and magnitude of Infrastructure in CDSP II

Infrastructure	Agency	Unit	Polders		Unprotected Areas						Water management in existing polder areas			Totals
			Muhuri Accreted Area	South Hatiya	Char Gangchil-Torabali	Char Lakhsmi	Char Mora Dona	Boyer Char	Nijhum Dwip/Char osman	Nijhum Dwip/Bandaritel	Polder 59/3B	Polder 59 3C	LRP & CDSP I Polders	
1. <u>Peripheral Infrastructure</u>		ha	1,981	2,759	743	944	1,793	6,500	519	650	3,486	12,825	6,821	39,021
Sea Dykes		km	11.6	2.1										13.7
Interior Dykes		km		18.7										18.7
Low Embankment		km			4.6									4.6
Repair old embankments		km	9.0											9.0
Drainage Canals		km	16.5	22.0							54.0	58.6	13.3	164.4
Drainage Sluice		nos	2	3							2			7.0
Pipe Sluice		nos		6.0										10.0
Repair Sluices		nos	1	1.0							7.0			9.0
Irrigation Inlet		nos	2											2.0
Foreshore Plantations (partly DAE)		km	15.0	14.0									15.0	44.0
2. <u>Internal Infrastructure</u>														
Rural Roads		km	15.0	39.3	6.0	7.0	7.0	8.2	12.0	10.0	5.0	31.2		140.7
Bridges		nos						1	1			4		6.0
Culverts		nos	19	20	5	3	5	1	5	4	15	7	8	92.0
Cyclone Shelters		nos	4	7	1	3	2	2	1	4		1		25.0
Community Ponds		nos	4	6										10.0
Cluster Villages (constr. & Repair)	MOL	nos	4	3										23.0
Tubewells (Constr.&Repair)	DPHE	nos	7	107	11	50	95	6	34	10			16	540.0
Latrines		nos		500	130	390	620		200	200			220	2,040.0
Offices (Land, BWDB, WM)		nos		2	1			1			1	1	6	12.0
TOTAL COSTS	Lakh Taka		1,267.0	2,122.6	126.9	229.1	208.7	386.8	137.9	241.9	449.3	924.3	218.8	6,313.1
Cost/ha	Taka/ha		63,958	76,934	17,078	24,265	11,637	5,951	26,566	37,208	12,888	7,207	3,208	16,179
	Euro/ha		984	1,184	263	373	179	92	409	572	198	111	49	249

The Role of CDSP II

As shown in the preceding section, the infrastructure is implemented by the mandated government agencies following the national standard designs and implementation procedures. CDSP II as a project has as such no 'added value' to the construction of infrastructure.

However, the involvement of four agencies in the same project areas requires a high degree of coordination between the implementation activities. Proper planning and tuning between the agencies is a prerequisite for a smooth implementation. A main role for the project was therefore the coordination and monitoring (progress and quality), which time-wise was one of the major activities of the PMU-ESPP assisted by the TA-Team.

Specific roles of CDSP II have been (i) the attention to participatory planning in infrastructure, (ii) emphasis on sustainable Operation & Maintenance and (iii) investigations into a few key water engineering aspects of char development.

Coordination & Monitoring

Coordination of infrastructural activities is required in area planning, especially where an appropriate sequence and tuning is necessary for peripheral and internal infrastructure. Coordination takes place in the established coordination forums, like the PMC and the ICC and in bi-lateral meetings between the partner organisations and the PMU-ESPP assisted by the TA-Team.

In the last project years, the project assisted the implementing agencies in improving their planning, by introducing specialised planning software.

Monitoring includes the progress monitoring as well as quality control. The implementing agencies have their own progress and quality control mechanisms. The role of CDSP II is to monitor the progress and quality control of the implementing organisations. For this purpose, a quality monitoring section was included in the TA-Team. The CDSP II quality mechanism is shown in Box 5.1.



Box 5.1 Quality Control under CDSP II

- The agency staff is responsible for the supervision of the execution of work and quality control; the consultant monitors the agency's progress and quality.
- Field Engineers of the consultant do regular field checks; they submit a structured monitoring report after the site visit to a construction work, which is forwarded to the concerned implementing agency for necessary action. The monitoring report contains two parameters: observation and comment
- If case tests are required, agencies inform the consultant three days in advance of any test. Consultants can decide to be present during the test. The agency submits test results to the consultant.
- Consultants have the right to reject reimbursement claims for works which do not pass a test or for which test results are not finalized.
- Agencies submit post-work measurements to the consultant within seven days of taking measurements.
- Consultants have the right to check the measurements taken by the agency.
- After scrutinizing the request for reimbursement, the consultant recommends payment if the quality of the works is acceptable and the quantities as claimed are in conformity with the actual situation.
- If the work is defective to a degree that the objective of the structure will not be met, agency is requested to replace the whole work
- If construction can be proven to be not defective, but not all procedures have been followed in a proper manner, the consultant deducts a certain safety margin from the reimbursement claim.

Participatory Planning

Recognizing the involvement of the local population in the planning of project activities enhances the ownership and therefore the probability for sustainable O&M, the *char* population has been involved in the planning from the onset.

Whereas for the peripheral infrastructure, the planning is mainly determined by physical factors⁹, the planning for internal infrastructure still leaves a certain degree of liberty in terms of location of rural road network, place and use of the multi-purpose cyclone shelters and location of the tubewells. The earlier mentioned Polder Committees and Sub-Polder Committees as well as the Local Area Development Committees have been primarily established for this purpose.

The physical planning is intensively discussed and agreed upon with these committees including their role in operation and maintenance. The committees are intensively involved in the planning and implementation of the construction activities and – to a certain extent – in the quality control.

⁹ For example, the existing land levels determine the trench for the embankments and the existing *khal* system determines the design for the drainage system.

Sustainable O&M

Appropriate operation and maintenance of infrastructure is one of the main problem areas in Bangladesh as it is in many other countries. National as well as international efforts to address sustainable O&M have not led to satisfactory solutions until date. On one hand, this is due to a lack of financial resources for maintenance; on the other hand, there is a lack of sufficient legislation towards maintenance.

In the 1990's a start was made with the establishment of rules & regulations of O&M in water management. Based on the experiments in water management projects, the Guidelines for Participatory Water Management (GPWM) were drafted and circulated as an official document in 2001. These guidelines have been regularly updated following new experiences and insights in participatory water management.

Maintenance of the infrastructure is the shared responsibility of the implementing agencies, the local government and the beneficiaries. The present legislation however does not delineate the maintenance responsibilities. In CDSP I, maintenance was addressed in two ways: (i) firstly by organising the users in operation & maintenance committees: Water management Committees (WMC) in water management and Tubewell User Groups (TUG) in drinking water supply; and (ii) secondly by preparing maintenance plans where the maintenance responsibility for each type of infrastructure was defined for the implementing agencies (BWDB and LGED), the local government (Union) and the beneficiaries organised in O&M committees. The Maintenance Plans were drawn up with all parties involved and eventually signed by them.

Water Management

Organisation of water users in Water Management Committees (WMC) started in CDSP I. The GPWM formed the basis for their structure, functions and tasks. The unit of organisation was the drainage area of one sluice. In case a larger area with more drainage outlets was covered, an apex organisation of the WMCs was formed, called the Water Management Federation. The project provided intensive training to the WMCs on tasks and responsibilities, internal organisation, assistance in the drafting of the WMC constitution and byelaws; and in drafting of maintenance plans.

The main tasks of the WMC were (i) regulation of the water level in the polder through sluice operation, and (ii) infrastructure maintenance as agreed upon in the joint Maintenance Plan.

The maintenance responsibilities of the WMCs were still quite limited: mobilisation of water users in removing cross-bundhs, removing debris before structures, etc. The contribution was in labour; collection of a fee was not practised yet among the members.



In CDSP II, the organisation of water users in WMCs was extended to the new areas, but also new activities to further develop the existing organisations were undertaken:

- (i) Functional links between the WMC and the implementing agencies were established. Regular meetings were held between the WMCs and the BWDB O&M Division, LGED and the UPs to discuss and agree water management issues in the WMC areas: priorities were indicated for maintenance and at the end of CDSP II joint annual maintenance plans were drawn up.
- (ii) Initiatives were taken to enhance the WMCs role in structure maintenance: WMCs started fund raising among their members, opened bank accounts and handled the funds for maintenance activities.
- (iii) With the finalisation of the GPWM in 2001, the WMCs were restructured in accordance with the Guidelines. Water Management Committees (WMCs) were renamed as Water Management Groups (WMGs); Water Management Associations (WMA) and Water Management Federations (WMFs)
- (iv) A start was made with the official registration of the WMGs and WMAs.

Realizing that the responsibility for establishment of a sustainable water management organisation lies with the government agencies, CDSP II played a role in the further elaboration of the rules and regulations in water management. In particular, CDSP II assisted in the elaboration of the GPWM into an Implementation Manual.

A break-through in the legislation occurred in the beginning of 2005, when the BWDB took the initiative for official registration of WMGs and WMAs under the BWDB. In the latter part of CDSP II, the existing WMGs and WMAs were registered in accordance with this legislation.

Drinking Water Supply

As part of the Water & Sanitation Programme of the DPHE, the prospective users of the tubewells are organised in Tubewell User Groups (TUGs). Organisation of the TUGs is the responsibility of the participating NGOs. The TUGs are trained in the use and maintenance of the tubewell and a contribution to the construction costs is collected from the future tubewell users. Within the TUG a caretaker family is nominated, who live close to the location of the tubewell.



Experiments in area of land and water engineering

There is a number of engineering issues specific to *char* development which received attention in CDSP II: (i) the appropriate land level for empolderment, (ii) the problem of siltation at the outfall channels of sluices, (iii) the required crest level of embankments for agricultural protection and (iv) the operation of sluices.

It would be beyond the purpose of this report to discuss these experiments in detail, but a successful experiment, which has a wider application, is the pilot on the improved operation of sluices.

Pilot on Improved Sluice Operation

The poor quality of the mechanical parts of sluices is considered a persistent problem all over the country. In the latter part of CDSP II, a pilot started with an improved design in terms of quality of materials, quality of installation, length of expected operational life and easy operation of the sluices. Apart from the technical aspects, the pilot addresses the institutional aspects in the chain of design - construction - quality control. The BWDB Design Department as well as the BWDB mechanical workshop, who fabricated the units were fully involved in the pilot.

Two 'Technical Reports' 15a and 15b have been drafted by CDSP-II the latter being the more important as it reviews not only the pilot activities of CDSP-II but presents the current situation as found within Bangladesh, a situation which should be granted a very high priority if the needs of the people are to be addressed.

It should be understood that the high failure rate of the mechanical parts of the sluices creates a condition in which the whole of the sluice unit fails and on a cost basis, the mechanical parts usually represent a minor part of sluice construction, perhaps on average 12%.

The development of Water Management Groups will only be the success that it needs to be, involving the peoples of an area with the ownership and maintenance of sluices and similar, if the units they are required to take over are in good and effective working condition. The pilot activity has demonstrated the simplicity of fabrication and installation on both renovated and new sluices and the 'lessons learned' are hoped to be put into use with minimal delay throughout the flood affected areas.



Review

Progress and Quality

Most of the planned infrastructure (table 5.2) has been implemented successfully although with a one-year project extension. The qualities of the works are reasonable to good, but this is mainly because of the strict quality monitoring mechanisms of the project. Although all implementing agencies are capable of monitoring the quality of work, the reality is that the quality is often far from what is desired. However, the poor quality is more related to governance than to capability and capacity of the agencies.

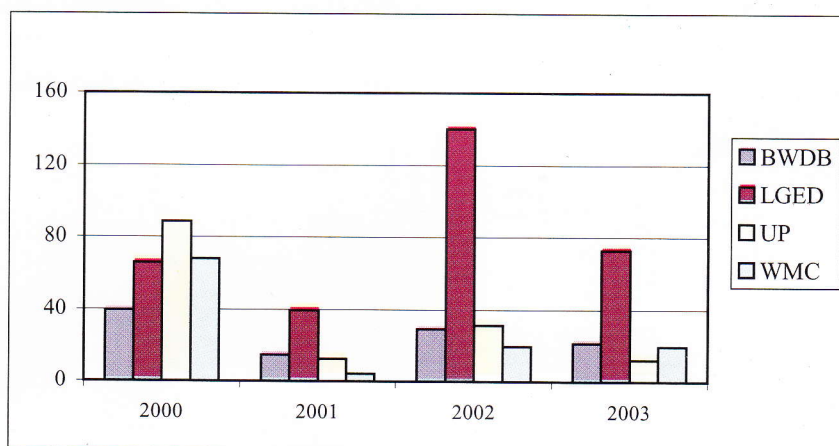
Participatory Planning

The participatory planning process as initiated by the project has been successful. The planning committees (Sub-Polder Committees, Polder Committees, and Local Area Development Committees) have played their envisaged roles and the implementing agencies accepted the planning procedures.

Sustainable O&M

During CDSP II, the implementation of the Maintenance Plans in the CDSP I polders has been monitored. The results are summarized in figure 5.3. The overall average investment as compared to the planned investment is 41% over the period 2000 - 2003. For the different parties these figures are BWDB: 27%; LGED: 87%; UP: 36% and WMC 28%. The relatively high LGED figure is attributed the one-time investment for rural roads in 2002.

Table 5.3: Actual percentage implemented of required investments according to the CDSP I Maintenance Plans by party involved



The results show that no high expectations should be made as regards the commitment of the parties involved, especially the government agencies. Although the government agencies at Noakhali level show the willingness to take up their maintenance responsibilities, the budgets provided from national level do not allow implementing these. Achieving sustainability in infrastructure lies therefore largely beyond the project level.

6. AGRICULTURAL DEVELOPMENT

The first economic activity on an emergent *char* is cattle rearing on the emerging grasslands. With further accretion, the lands become suitable for rice cultivation in the wet season (*Aman*); this is the time at which people start to settle in the *char* areas. When the *char* formation advances, homestead gardening becomes possible on the more elevated areas. Also a second crop in the pre-monsoon (*Kharif 1*) and/or in the dry season (*Rabi*) becomes possible to a limited extent.

When the *char* becomes protected, saline water intrusions will be terminated and the potential for agricultural development should increase. The soil and water salinity will gradually decrease giving scope to higher crop intensities. Homesteads can be developed all over the protected *char* with opportunities for homestead gardening, small livestock and fishponds.

This chapter describes the opportunities and limitations in coastal agriculture, the role of CDSP in agricultural development, the results and recommendations for the future.

Agro-ecological Environment

Climate

Bangladesh is characterised by cool winters and hot summers. The average minimum and maximum temperatures in the winter season range from 12 – 18 °C and 25 – 28 °C, while in the summer season these values are 18 – 26 °C and 28 - 33 °C. The advantage of the coastal areas is that, unlike in the mainland, the winter minimum temperatures remain above 10 °C, being the critical level for plant growth.

Annual rainfall usually exceeds 3000 mm. The rainfall pattern is uni-modal: 80% of the rainfall occurs in the monsoon period: June to October with a peak in July. The dry season is from November to March, while April-May is an intermittent pre-monsoon period with occasional rains and thunderstorms.

The climatologic conditions determine the cropping seasons in the country (Table 6.1): *Kharif 1*, the pre-monsoon, *Kharif 2*: the monsoon and *Rabi*: in the dry season.

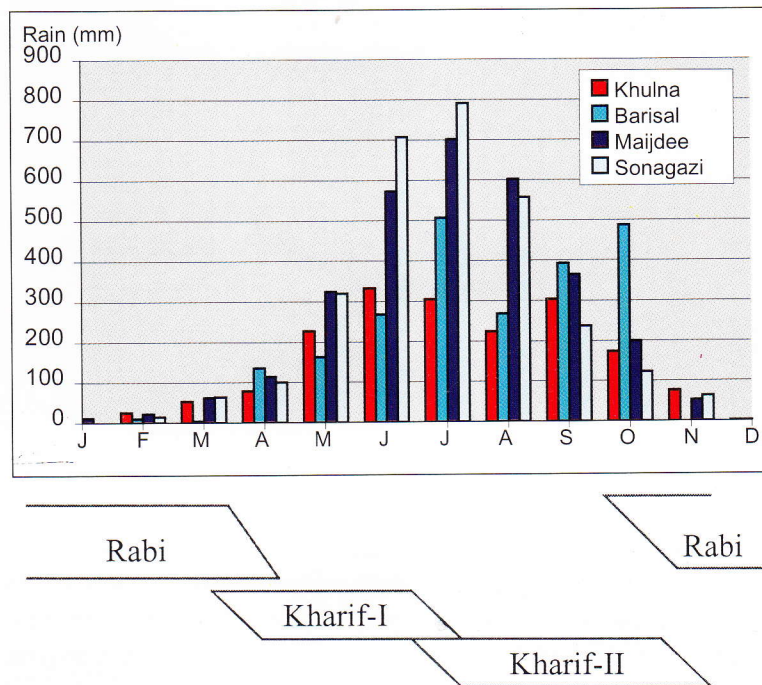


Table 6.1 Monthly total rainfall at four locations in the coastal region and its relation with the cropping seasons.

Soils

The soils are young without differentiated horizons and are mostly heavy textured varying from silty clay loam to silty clay, almost devoid of sand with high moisture retention capacity and low permeability.

The soils have widespread deficiency of nitrogen and phosphorus and localised zinc deficiency. The organic matter content is low (0.9 - 2.4%)

Soil Salinity

Soil salinity is one of the major factors determining land use and land productivity in the coastal areas. In the process of land formation, the water of the estuary regularly inundates the chars. In the monsoon period, the estuary water is fresh because of the high river discharges, while before and after the monsoon, the estuary water has the salt content of seawater.

When the chars have reached a level where agriculture is possible during the monsoon, the excessive rainfall (over 3,000mm) washes the salts from the upper soil layers, making it fresh enough for paddy cultivation. After the monsoon, re-salinisation of the topsoil occurs due to capillary rise of saline groundwater and saline water intrusion. When the char is embanked and not prone anymore to saline water intrusions, the soil salinity gradually decreases, but a seasonal cycle remains (see table 6.2)

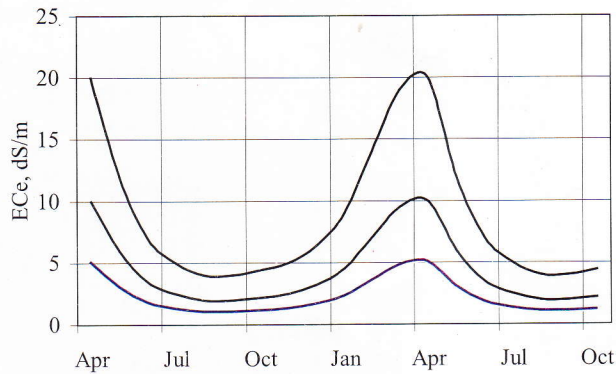


Table. 6.2 Approximate seasonal trends of soil salinity at three levels of soil depth.

Soil and water salinity measurements during LRP and CDSP I suggested that in protected areas the soil salinity would decrease in a period of 10 - 15 years to levels where year-round cultivation would be possible. During CDSP II it appeared that the de-salinisation process is much more complicated. There is a high variation in soil salinity depending on ground water levels, groundwater flow, land levels and distance to the drainage base: major *khal* or the estuary. An example of spatial differentiation in salinity is shown in photograph below.



Spatial variation of soil salinity in the field at Char Majid.

Water Availability and Quality

Other than rainfall, the fresh sources are extremely limited in the *char* areas. The shallow groundwater is often too saline to use for irrigation water, while deep fresh groundwater is found in pockets at various depth levels. The limited groundwater surveys done in the coastal areas have not indicated aquifers with sufficient capacity for exploitation for irrigation.

Storage of fresh water in the monsoon is difficult due to the topography and the scarcity of land. Fresh water can be stored in the *khal* system, but the capacity is limited: Calculations indicated that a maximum of 1 - 8% could be irrigated, provided that no outside water enters through the sluices, either because of poor sluice management or through poor construction.

The lack of fresh water sources implies that agriculture in the *char* area is basically rain-fed.

Flooding Characteristics

Two types of flooding occur in the coastal areas: floods caused by the accumulation of monsoon rains and tidal flooding.

The heavy monsoon rains cause floods, which vary in depth and duration depending on the topography and the drainage conditions of the land. The topography in the coastal areas is characterised by flat lands with local depressions and a very small gradient towards the estuary. The drainage canals are prone to siltation causing drainage congestion.

The flooding depths vary from 10 – 180 cm depending on the land type. The flooding duration may last up till a maximum of December depending on the drainage conditions.

In the monsoon period, the high water tides are in general one meter higher than in the dry season. Low and medium land along the coast are flooded daily, because during this period the water of the estuary is fresh, this is considered beneficial for rice cultivation; however when tidal flooding occurs from October onwards, the water becomes saline and has harmful effects.

Harmful flooding related to storm surges occur in the pre- and post monsoon, causing heavy damage to crops and lands because of the force of the water flow, the salinity of the water and burial of the lands by sediments.

Crop Production

Cropping Patterns and Cropping Intensity

The three cropping seasons (*Kharif-1*, *Kharif-2* and *Rabi*) are determined by rainfall and temperature. In the coastal zone there are two more important factors that determine the agro-ecological conditions: salinity and flooding.

The first crop grown in an emerging *char* is Aman during the Kharif II season; when the flooding intensity diminishes and soil salinity decreases, gradually Rabi and Aus crops are grown.

Major cropping patterns in protected and unprotected chars of CDSP II project area are shown in table 6.3

Cropping pattern	Chars	
	MD	SH
Aus	0.0	0.0
Aman	57.4	40.1
Rabi	0.2	0.4
Total	57.6	40.5
Aus-aman	3.0	4.6
Aus-rabi	0.1	0.1
Aman-rabi	30.6	32.2
Total	33.7	36.9
Aus-aman-rabi	8.7	22.2
Cropping intensity	151.1	180.9

Table 6.3 Percentage of land under each cropping pattern in two chars of CDSP-II.

The majority of the areas (40-57%) are single cropped with predominantly an *Aman* rice crop, followed by double cropping: around 35% mainly *Aman-Rabi*; and only 8 – 20% is triple cropped.

The cropping intensity ranges from 150% to 180%.

The cropping pattern may vary year by year, depending on the time of the start of the rains (*Aus*), the soil moisture conditions of the lands after the *Aman* season as determined by the duration of the monsoon rains and the flooding conditions. A late drying of the soils will reduce the extent of *Rabi* crops.

***Kharif-I* Season**

The *Kharif-I* season starts in March-April. The main crop in this season is *Aus* rice. The success of a good yield is dependant on the early onset of the rains to guarantee sufficient soil moisture, and to reduce the soil salinity, which is at the maximum after the dry season; furthermore, the heavy rains during June and July may cause crop damage. This altogether makes the cultivation of an *Aus* crop quite risky. On the other hand, especially the poor farmers cannot avoid growing *Aus* because food scarcity is highest just after the dry season.

Yields vary depending on the conditions under which the crop is grown and the varieties; and range between 1.3 – 1.8 ton/ha for local varieties and 2.5 – 3.1 ton/ha for HYVs.

***Kharif-II* Season**

The season covers the full monsoon period from June to December where more than 2,000 mm rain can be expected and the soil salinity levels are at the lowest. Only dry spells at the start or at the end of the growing season may influence yield levels. Rice is grown in all areas, except where the flooding depth does not allow. Traditionally *Kajalsail* and *Rajasail* are the main varieties grown; nevertheless, the extent of HYVs¹⁰ has increased in the past 10 years. Yields vary from 1.5 – 3.5 ton/ha (average 2.0) for local varieties and 2.5 – 5.5 ton/ha (average 4.0) for HYVs.

¹⁰ BR22, BR23, BRRIDhan31, BRRIDhan39, BRRIDhan40 and BRRIDhan41

Rabi Season

The *Rabi* season in Bangladesh starts when the rains stop in October and lasts till mid-May. The start of the *Rabi* season in coastal areas depends on the moisture conditions of the soil, which in turn depends on the extent of the late rains and the drainage conditions and is, in general, much later: December or January. Furthermore, in this dry season, the salinity levels are highest and rainfall is low. Therefore, the opportunities for *Rabi* crops are more restricted in the coastal areas than in other parts of the country.

Greengram (*Khesari*), mungbean, chilli and sweet potato are the most common crops grown. All these crops have a certain tolerance to soil salinity. Linseed, garlic, groundnut and vegetables are other crops, which are grown to a lesser extent.

The Concept of Productive Development Zoning

Experience with agricultural extension during LRP, CDSP-I (and CDSP II) has led to the identification of a large number of improved technologies for coastal agriculture (Examples: HYVs, *rabi* crops: water melon, bean varieties, etc.). At the same time, it was realized that the technologies are suitable under specific conditions only. Dissemination of these technologies should therefore only be targeted to the areas where those specific conditions prevail.

As has been mentioned earlier, the determining factors in coastal agriculture are flooding depth and salinity; based on these main factors {Table 6.4a} four Productive Development Zones have been identified according to the table {table 6.4b} below.

Table No. 6.4a

	peak soil salinity, EC _e dS/m			Legend
	0 - 8	8 - 16	> 16	
0 - 20	1	1	2	<div style="display: flex; flex-direction: column; align-items: flex-start;"> <div style="margin-bottom: 5px;"> PDZ 1</div> <div style="margin-bottom: 5px;"> PDZ 2</div> <div style="margin-bottom: 5px;"> PDZ 3</div> <div style="margin-bottom: 5px;"> PDZ 4</div> </div>
20 - 45	1	2	2	
45 - 100	3	4	4	
> 100	4	4	4	

Table 6.4b = The characteristics of each PDZ:

Productivity Zone (PDZ)	Characteristics
PDZ 1	<p>"Shallow flooding, low to medium salinity". Favourable conditions in all seasons</p> <ul style="list-style-type: none"> - High ('Uchu') to medium high ('Majori') land that may get temporarily inundated to a maximum depth of 45 cm; after rain the highlands drain fast, within a few hours to 3 days. The land starts drying during mid-October to mid-November, sometimes later. The Zone is relatively risk-free where all types of crops can be grown. - Direct-seeded dibbled aus rice can be grown successfully. - HYV Aman varieties have potential, but late transplanted Aman may suffer from drought during the reproductive stage in the high land, unless there is late rain. - Different Aman varieties may be needed for high and medium land - In highland Rabi crops can be planted early, which allows them to escape salinity in soils with April salinity up to 6 dS/m. They may suffer from water scarcity during establishment, particularly in years with a minimum of late rain.

Productivity Zone (PDZ)	Characteristics
PDZ 2	<p>"Shallow flooding, medium to high salinity". Favourable Aman season conditions, limitations for Aus and rabi due to salinity</p> <ul style="list-style-type: none"> - High land flooded up to 20 cm depth with high soil salinity and medium land flooded of between 20 to 45 cm with medium salinity. Shallow flooded areas drain fast, usually within a few hours to 3 days after each rain and the medium flooded areas become dry in mid-November. - Transplanted aus rice can be grown in the medium land in this zone. - HYV Aman varieties have potential, but late transplanted Aman may suffer from drought during the reproductive stage in the high land, unless there is late rain. - Different Aman varieties may be needed for high and medium land - Rabi crops tolerant to moderate soil salinity can be grown early in the high lands and less tolerant ones adapted to late planting in the medium lands.
PDZ 3	<p>"Medium to deep flooding, low salinity". Flooding depth limits options in all seasons, suitable for short season rabi crops</p> <ul style="list-style-type: none"> - Medium-low to low areas ('Nichu') with low salinity. Fields do not drain out until late November or early December. In the lowest fields water logging may extend to January when there is late rain, which is a common in the south-eastern coastal belt - Transplanted aus rice is suitable if monsoon flooding is not too deep, otherwise Aman transplanting will be hampered. - Currently available Aman HYV are not suitable - Late planted Rabi crops can be grown but there is risk of water congestion at maturation - High and low beds ('Sarjan') can be tried with crops like summer and winter vegetables.
PDZ 4	<p>"Deep to very deep flooding". Only suitable for long straw Aman varieties, boro if water is available</p> <ul style="list-style-type: none"> - Low to very low lying areas; similar hydrological conditions as PDZ 3, but longer period of water logging after the monsoon - Long straw varieties of transplanted Aman rice are the only crop suited for this zone. In very deeply flooded areas even that may not be possible. Boro can be grown if surface water is available

The main characteristics, the agricultural potential & limitations and the average mean proportion in CDSP II areas of the four PDZ's are shown in table 6.5

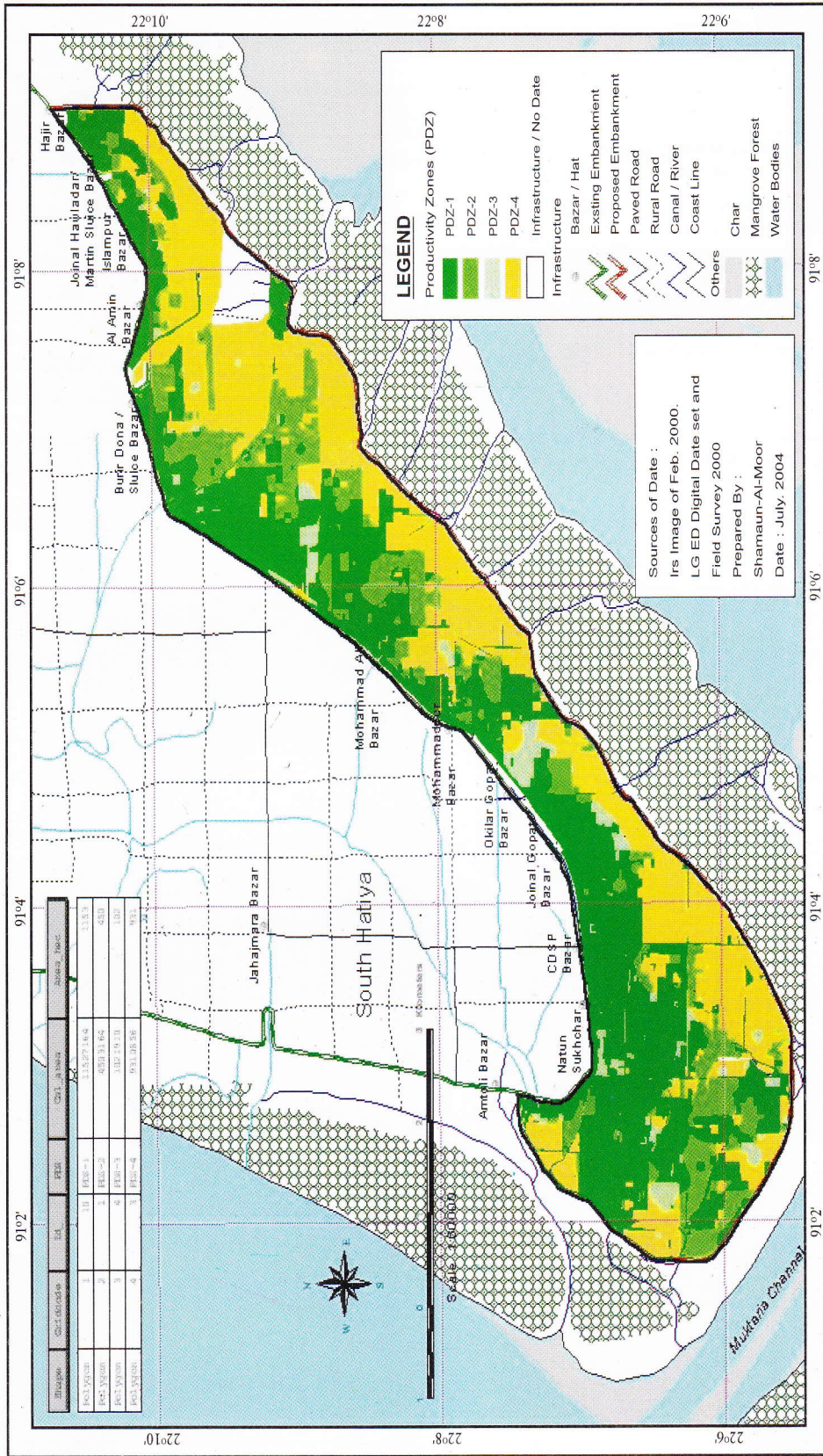
Table 6.5 Characteristics and extent of the four Productive Development Zones

PDZ	Main Characteristics	Potential/Limitations	Average Proportion in CDSP II Areas (%)
1	Shallow flooding, low to medium salinity.	Favourable conditions in all seasons	18%
2	Shallow flooding, medium to high salinity.	Favourable Aman season conditions, limitations for Aus and Rabi due to salinity	12%
3	Medium to deep flooding, low salinity.	Flooding depth limits options in all seasons, suitable for short rabi crops	6%
4	Deep to very deep flooding	Only suitable for long straw Aman varieties and boro, if water is available.	64%

The char areas have been surveyed and subsequently mapped by PDZ category. An example is shown in the map of South Hatiya {Table/map 6.7}.

Productivity Zones - South Hatiya 2004

Map No. 2. Productive Development Zones South Hatiya.



The next step was to define the appropriate technologies for each of the PDZs. An inventory has been made of existing technologies as developed in the research institutes, DAE, LRP and CDSP and other coastal projects. The inventory resulted in the Technology Source Book targeted at DAE extension workers and others involved in coastal agriculture.

In the last part of CDSP II, the PDZ concept has been intensively discussed with DAE officials at all levels. In principle, the concept has been accepted; the challenge for the future is that it will be actually utilised in the extension service.

Changes in Land Use

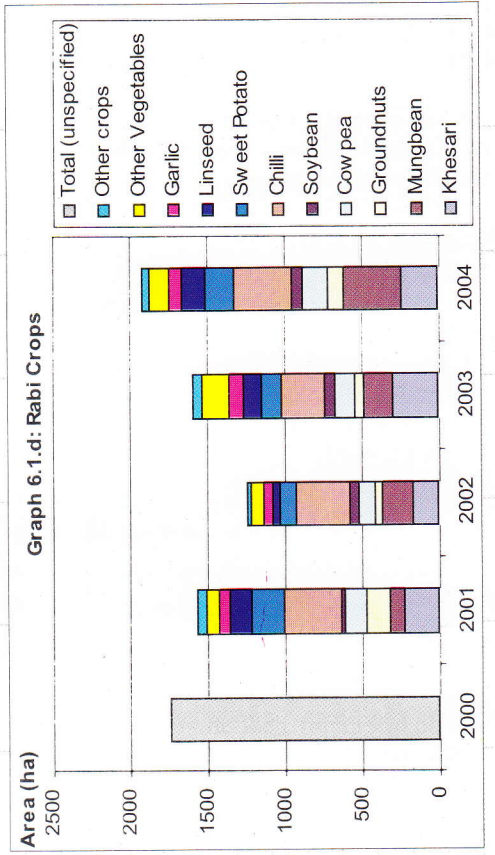
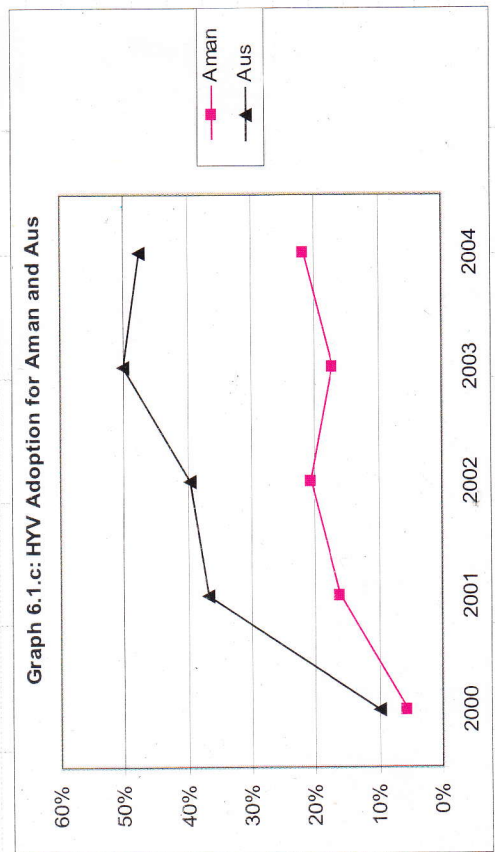
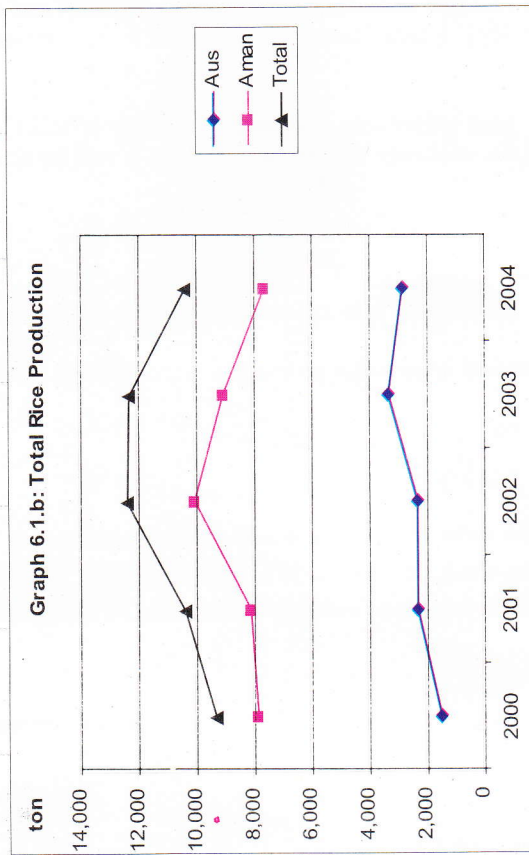
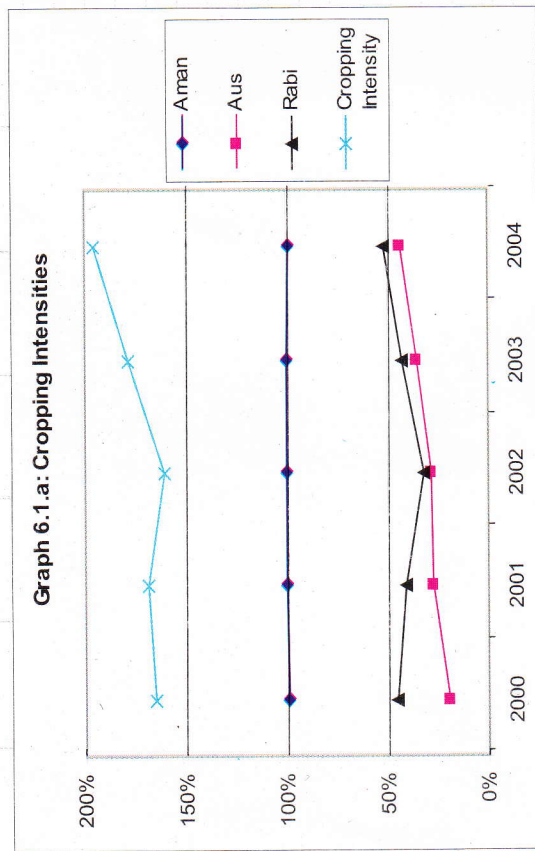
The joint effect of the CDSP interventions is expected to result into an increased agricultural production through

- A more intensified land use mainly through increased areas under production in the *Kharif-I* and Rabi seasons and
- A shift from local rice varieties towards HYVs and
- A shift towards higher value crops in *rabi*.

By the end of CDSP-I it was assumed that (i) the area under HYV *Aman* would gradually increase to 75% of the total cropped area, (ii) that the *Aus* cultivation would increase to 50% of the area with 75% HYV, and that. (iii) *Rabi* crops would increase to 80% of the total area and that there would be a shift to the higher value crops.

In the period 2000 – 2004, the changes in land use as well as the crop production have been monitored in the 'old CDSP-I polders' and the CDSP II areas.

Graphs 6.1



The monitoring results in the CDSP-I areas over the period 2000 – 2004 are summarized in graphs 6.1.a,b,c&d.:

- The total cropping intensity (graph 6.1.a) showed a small increase from 165 to 195; which is mainly due to the gradual increase in *Aus* from 20% to 44%, while the cropping intensity in *Rabi* shows a fluctuating trend, due to the earlier mentioned changing soil moisture conditions at the end of the Kharif-II season.
- The shift towards HYVs in *Aman* and *Aus* (fig 6.1.c) seems to converge around the figures of respectively 20% and 50%, being much lower than the expected 75%.
- The total rice production (fig 6.1b) shows an increase in the period 2000 to 2003, which is mainly caused by the higher *Aus* production. The decline in 2004 is due to flooding as caused by a 550 mm rainfall in September of that year.
- The area on *Rabi* Crops shows a fluctuating trend with a cropping intensity varying from 32% to 52%, considerably lower than the expected 80%, while the shift towards higher value crops is not noticeable.

The limited adoption to HYVs has been subject to investigation in CDSP II (See TR 12). Main identified reasons are:

- (i) The water management conditions often do not allow the cultivation of HYV: some lands are too low and are too deeply flooded during the monsoon, while other (higher) lands suffer from drought for a longer or shorter period.
- (ii) Tenancy conditions: In most sharecropping arrangements, the landowner does not contribute to the costs, while the harvest is divided (often 50-50%) between the landowner and the tenant, making the cultivation of HYV unattractive to the tenant.
- (iii) Labour: HYV cultivation requires higher labour inputs than the local varieties. Absentee landowners and people who migrate temporarily during the season therefore prefer to grow the local varieties.

The de-salinisation process, which appears to be much slower than expected by the end of CDSP-I, can explain cropping intensities in *Aus* and *Rabi*.

The monitoring of the agricultural data in the CDSP-II areas, being mainly unprotected areas, showed a gradual increase in the adoption of HYVs in *Aman* and to a lesser extent in *Aus*, while the cropping intensity showed a gradual increase as well. As the infrastructural interventions have only been realised in the course of the monitoring period, these changes can be mainly ascribed to improved agricultural extension in these areas.

Prospects

The foregoing monitoring results raise the question whether the full agricultural potential has been utilised and whether additional interventions are required to further increase the production and productivity. The following remarks should be made in this respect:

- Different performance between the polders: The figures as presented above are the averages of the three polders. The figures for each of the polders deviate substantially from the average. Char Baggar Dona II suffered from drainage congestion because of the silting of the main drainage outlet: the Baggar Dona River. The de-salinisation process in Char Majid has been much slower than expected affecting the performance in *Rabi* and *Aus*; furthermore, it has the most disadvantageous land tenure conditions with a high degree of sharecropping and absentee landowners. Char Batir Tek has the most favourable conditions in terms of drainage and land tenure.

- The existing unfavourable water management conditions in some areas can only partly be withdrawn. A more intensive drainage network together with land levelling would create more favourable conditions, but is probably too costly; moreover, – with the pressure on land – a more intensive canal network is not favoured by the population. There is scope for better water management through improved maintenance of the canal network and through improved sluice management (water level regulation).
- Storage of fresh water during the dry season in the drainage system has only limited potential for irrigation (some 8%). Up to now, this has not been possible due to the poor functioning of the mechanical parts of the sluices, which hampered proper sealing of the sluices. With the improved design as experimented in CDSP II, this may give scope for a more – but limited - intensified land use in the *Rabi* season.
- As has been discussed elsewhere, the storage of fresh water in the char areas is quite limited. Bringing in water from the main rivers upstream of the *char* areas would give a boost to agricultural production in the *Kharif-I* and *Rabi* seasons. This would require large-scale interventions at regional level.
- Agricultural research for the specific agro-ecological conditions of the coast has been quite limited. More research on – for example - long-straw rice varieties would certainly benefit the rice production; identification of salt tolerant crops for *Aus* and *Rabi* is another area for research.
- The higher value crops in the *Rabi* season were expected to be grown because of better access to the *char* areas. Only in the latter part of CDSP II did this appear to be realized: crops like okra, watermelon and sweet gourd were grown and marketed to a limited extent. There are certainly perspectives to further improve the marketing conditions in the *char* areas;
- Finally, a better technology targeting using the PDZ concept will certainly have its impact on the agricultural performance in the *chars*.

The Institutional Environment

There is a host of governmental and non-governmental organisations involved in agricultural extension, research, input supply and marketing. In the government sector the most important ones are:

- The Department of Agriculture (DAE) of the Ministry of Agriculture is primarily vested with imparting extension services in the country. DAE has offices up to the Upazila level and the field extension officers, called Block Supervisors, are the vital actors in extension.
- The Bangladesh Agricultural Research Institute (BARI) has the mandate for the generation of technologies for crops, other than rice, jute, sugarcane and tea. BARI's On-Farm Research Division (OFRD) has the mandate for on-farm testing at different sites in the country for the formulation of appropriate technology packages for a particular location. OFRD has a farming systems research site at Atkapalia, Noakhali Sadar Upazila.
- The Bangladesh Rice Research Institute (BRRI) is the source for new paddy varieties in the country; BRRI also imparts training to DAE staff and others involved in extension of paddy cultivation.
- The Soil Resource Development Institute (SRDI) responsible for soil surveys including soil and water salinity.
- The Bangladesh Agriculture Development Corporation (BADC) formerly a large institution with many commercial roles is now involved in the production and distribution of certified seeds.
- The Bangladesh Rural Development Board (BRDB) is involved in a wide range of rural development programmes; including poverty alleviation programmes through cooperative societies and promotion of marketing.

Although the public institutions are in place, the following observations can be made regarding their functioning:

- DAE is underrepresented in the *char* areas, especially in the beginning of settlement;
- The extension is mainly routine demonstration of improved varieties and cropping practices which are mostly defined at central level and often not adapted to the specific coastal agro-ecological conditions;
- Agricultural research for the coastal zone (BARI and BRAC) is rather underrepresented as compared to the rest of the country.
- There is a lack of coordination between the vertically organised public organisations.

Most NGOs in the region have an agricultural component in their programmes predominantly directed at homestead development including vegetable gardening, poultry, and pond fisheries, and to some extent livestock. The cooperating six NGOs in CDSP II, coordinated by BRAC, implemented the homestead improvement programmes in the CDSP II project areas. Other significant actors in the project area are CARE and Mennonite Central Committee (MCC). MCC has successfully promoted the soybean cultivation in the Noakhali area.

The private sector is poorly developed in the coastal zone, especially in the recently settled chars. Basic agricultural inputs like seeds, fertilizers and tools are often not available in the local markets. Traders from the centres like Noakhali will only purchase the produce if a sufficient volume is assured.

Group Approach in Extension

The T&V extension methodology has been officially replaced by a group approach since the mid nineties following the acceptance of the National Agricultural Extension Policy. Implementation of this group approach has been limited until date.

The group approach entails a bottom-up planning which starts with farmers' information need assessment (FINA). Experience in the Noakhali District so far has led to the conclusion that the formed groups lack coherence and thus cannot emerge as a self-sustaining group because the groups have farmers with varying needs, mental attitude, social status, education, skill, hope and aspiration. Such a heterogeneous group often brings up a variety of complexities and cannot give results as per se.

CDSP assisted the DAE through the creation of Farmer Forums, which is in essence not essentially different from the extension groups of DAE. They are informal groups of producers, linked with DAE and local NGOs and provide a mechanism for dialogue and cooperation among the farmers and the service providers, especially with DAE. Generally, a Farmer's Forum has 25 to 30 members with at least 20 decimal of cultivable land, either of their own or rented in, resides in or around the area and are socially accepted in the locality, and are willing to participate in all group activities.

In a training session the forum farmers analyse their situation, and come up with major constraints relate to agricultural production to be addressed. The training session follows a participatory method. The NGO or the extension personnel assisted them in this exercise mostly through facilitation.

DAE bring in their specific knowledge about the potential of the area, using the zone maps (PDZ) and present ideas they have about possible technologies and other innovations (e.g. new variety, new crops, farmer seed production, marketing, processing, etc.).

Members of the Forum volunteered to locate demonstration plots in the fields, storing seeds of improved varieties for later sale among other members. DAE/CDSP assists them in identifying possibilities for marketing, processing, procurement of equipment, etc.

The forum members meet bi-monthly. At the beginning of a season a review and planning meeting is held and a post-season review and planning meeting is held to analyse constraints of the preceding season and to make new proposals for new activities. Meetings are also held during the crop seasons to review the on-going activities and problems.

The Role of CDSP

The main thrust of CDSP in agriculture is to increase the agricultural production in the char areas through improved agricultural extension.

From the predecessor project (LRP) a wealth of information was available from the agricultural research plot. The results have been used during the extension programme in the three polders in CDSP I. Because of the understaffing in DAE Block Supervisors, CDSP had its own agricultural extension staff consisting of an agronomist and field extension workers. Although there was a close collaboration with DAE, especially with the Block Supervisors, the extension activity during CDSP I was principally implemented by the CDSP staff.

The approach in CDSP II was much more directed to providing support to DAE. DAE had its own Project Performa for CDSP II, based on an agreed extension programme. CDSP consultants and fieldworkers had a more advisory function in the implementation of the extension programme.

During CDSP II the project worked in more (and more dispersed) areas with varying agro-ecological conditions: Noakhali Coast, Muhuri Accreted Area and the Islands, which gave the opportunity to get a better insight in coastal agriculture in the entire eastern delta.

The TOR for CDSP II included the production of a document on Coastal Agriculture, being one of the “ICZM building blocks”

CDSP II assisted the DAE in two issues, which were considered key in the present extension practices of the department:

- A. Improving the extension message by disseminating technologies which are suitable for the different specific agro-ecological conditions in the coastal area, and
- B. Improving the extension methodology from the former top-down T&V system to a group approach based on dialogue between the extension workers and the farmers.

At the beginning of CDSP II this was formulated in the four “Big Issues” as shown in box 6.1

Box 6.1: The four “Big Issues” in agriculture

1. Characterisation and agricultural zoning of the coastal area, across the full range of variation from unprotected, exposed and highly saline areas to protected polders with good water control, based on water conditions and salinity.
2. Identification and dissemination of improved technologies targeted to each zone;
3. Effective group approaches in extension, replacing the traditional top-down approach by one based on dialogue with farmers, to enhance the chances of identification and adoption of suitable technologies, which can improve people’s lives.
4. Improved availability and use of fresh water for agriculture.



7. BENEFITS AND COSTS

The benefits of *char* development because of project interventions and strategy have been mentioned in the subsequent chapters.

In this chapter, the benefits and costs will be brought together and a comparison between the benefits and costs will be made.

The Benefits

The benefits of the project can be subdivided into those, which directly result from the project interventions, and those, which result from the project strategy.

The *char* development interventions in CDSP consist of the following main components (i) land settlement, (ii) peripheral infrastructure: embankments and main drainage system, (iii) internal infrastructure: roads, cyclone shelters, clustered villages, water & sanitation, (iv) agricultural extension.

CDSP's strategy has a pro-poor focus which is visible in (i) targeting the landless people in the land settlement programme, (ii) the opportunity given to the poorest *char* dwellers to settle in clustered villages which provides them with housing, a communal pond, water and sanitation; additionally NGOs focus these clustered villages in their homestead programme.

Involvement of the *char* population in all phases of construction including operation and maintenance as well as a gender focus in all activities is characteristics of the project. Institutional strengthening of all parties involved has been another important feature of the project.

The joint benefits accruing from these activities can be summarized as follows:

1. The land settlement activities providing land titles (*kathians*) to the hitherto landless people give the *char* population security over one of the main assets (land). Secured landownership in turn enhances the investments in land resulting in increased agricultural productivity.
2. The constructed embankments and main drainage system provide (i) security to the lives and property of the *char* population, (ii) protection to the crops against (saline) water intrusions, (iii) improved soil conditions through gradual de-salinisation allowing for the cultivation of higher value crops and higher cropping intensities, (iv) protection of homesteads allowing investment in homestead gardening, fish culture and small livestock.
3. Construction of cyclone shelters will provide protection to the *char* population in case of emergency, while the buildings can be (and are) used for all kinds of other purposes: including schools, community centres and government office buildings.
4. Construction of the internal road structure will increase the accessibility of the *char* areas, resulting in lower prices for agricultural inputs, higher farm gate prices and stimulation of all kind of other economic activities¹¹.
5. Improved agricultural extension will contribute to higher crop production.

¹¹ See Latif, M.A. Impact of CDSP Infrastructure on Private Sector Activities; Internal Resource Report, 1999.

The pro-poor and gender focus of the project resulted in the following benefits intended for these target groups:

6. The landless, being the poorest segment of the *char* population, acquired landownership through the land settlement programme;
7. Women acquired title deeds through registration of the land on both the name of the wife and husband and through priority given to women headed households in land settlement
8. Women were exposed to agricultural extension through targeting women as farmers and not as farmers' wives
9. Women participated in decision making through active participation in the planning and O&M institutions.

The project's emphasis on institutional strengthening will result in

10. A more cost effective planning and implementation of *char* development,

The importance given to sustainable O&M of the infrastructure will result in

11. A better maintenance of the infrastructure and
12. A more cost effective way of O&M.

The benefits can be divided into economic and social benefits. To the economic benefits belong: (i) the expected higher agricultural production and (ii) the lower O&M costs, (iii) increased employment and (iv) other economic activities because of the project interventions.

The other benefits related to protection of life and property, secured landownership, pro-poor and gender focus are considered social benefits.

The Costs

Costs in *char* development can be subdivided into:

- Construction and maintenance costs in infrastructure
- Costs for agricultural extension and land settlement
- Costs for institutional development: training, equipment, group formation etc.
- Costs for Technical Assistance

Comparing Benefits and Costs

Over the years, there have been many economic assessments of polder (*char*) development in Bangladesh, usually in feasibility studies in order to justify investments. Usually these were based on assumptions; often quite optimistic ones, as actual measurements of productive changes rarely took place. An overview of the cost benefit analysis results is presented in table 7.1.

Table 7.1 Results of various C-B Analysis Studies

	Study	Year	FIRR ¹²	EIRR ¹³
1.	CDSP I Polders	1991		5.5-7.0%
2.	Muhuri Pre-Feasibility Study	1996	7.0%	12.0%
3.	Muhuri Feasibility Study	1998	16.9%	20.2%
4.	South Hatiya Polder	2001	14.7%	15.9%
5.	Baggar Dona Catchment Area	2001	26.0%	28.0%
6.	CDSP I Polders	1999	12.5%	15.5%

In 1999, after the completion of the CDSP-I Polders: Char Bagga Dona II, Char Majid and Char Batir Tek, a cost benefit analysis has been conducted, based on the data then available. The costs for construction were known at that time, but the benefits in terms of agricultural production increase still had to be estimated. The conclusion was that char development, at least in these three polders, was financially (FIRR-12.5%) as well as economically (EIRR=15.5%) feasible.

At the end of CDSP II the financial and economic analysis for the CDSP I polders was repeated, but now based on the agricultural monitoring data as collected in the period 2000 – 2005.

As has been discussed in the preceding chapter, the expectations at the end of CDSP-I were much higher than the monitoring results showed.

Based on that data the Cost-Benefit analysis resulted in a FIRR of 8.8% and an EIRR of 11.9%. This means that the interventions are not feasible in financial terms and only marginally feasible in economic terms.

In comparison with other feasibility studies, these results are also more modest (see table 7. 1). Although studies in the early 90s were quite pessimistic, confirming the marginal nature of polder development in economic terms, the later feasibility studies seem over optimistic.

These results are also in line with a number of relevant studies done under FAP (FAP 1 and 98), confirming the general conclusion that at the present stage of socio-economic development in Bangladesh, work to protect agricultural land are barely feasible from an economic point of view. Only if urban centres also benefit from such work, or if there are other related benefits, could the necessary investments be justified.

As long as there is (almost) a break-even point, as seems to be the case in CDSP-I, the present investments are certainly justified from a social point of view, as there are clear social benefits resulting from polder development.

¹² Financial Internal Rate of Return

¹³ Economic Internal Rate of Return

Concluding Remarks

It was quite some time before the CDSP concepts were accepted by the government agencies, the local government and the NGOs: the multi-agency setting was relatively new in Bangladesh and CDSP was the first project where land settlement was implemented through a project. Now the concepts are now well accepted and appreciated by all parties involved having demonstrated

- Success in Land Settlement where 63,000 people are living in, almost, 10,500 households around which they own land legally;
- In Water Management CDSP was instrumental in the drafting of Guidelines and 'The Water Management Manual'; the latter in Bangla.
- The infrastructure which CDSP constructed is obvious to see:-
 - 42 Cyclone Shelters;
 - 66 km embankments;
 - 15 sluices.
 - 265 km excavation of drainage Khals.
 - 329 km of roads
 - 40 cluster villages where people thrive and prosper;
 - Improved water availability 561 tube wells.
 - 178 Bridge and culverts
 - Better sanitation facilities 7379 single pit latrines.
 - A demonstration of how the mechanical parts of sluice, when correctly fabricated can enable the sluice to work
- 53 Water Management Groups formed with the concepts now appreciated.
- Improvements in agriculture in that High Yielding Varieties of rice are adopted and there is a greater diversification in the marketable crops grown
- Genuine adoption of Gender Mainstreaming.
- The changes which these have made have contributed greatly towards the main objective of the project Poverty Reduction!

CDSP is considered a pathfinder project for Integrated Coastal Zone Management¹⁴ and the Formulation Mission for CDSP III mentioned that the developed concepts, particularly in land settlement, water management and agricultural extension should be applied more widely. This same Formulation Mission recommended a scaling-up of these proven *char* development interventions. The period for CDSP III (2005 – 2009) should be the final preparatory phase for major investments in *char* development post 2009 when CDSP would end as a bi-lateral project and continue as a multi-donor programme.

There are a number of challenges for CDSP III to prepare for the major *char* development investments post 2009. The first one refers to the internalisation of the CDSP concepts into the government agencies, the local government structure and the NGOs. The second challenge is closely allied to the first one and refers to the institutional setting for larger scale investments.

¹⁴ Quoted from BWDB Chief Planning (former Project Director CDSP II) Mr Habibur Rahman in Video Production "A New Frontier in Bangladesh"

A major comment of the TA-Team and subsequent review and formulation missions has been that the TA-Team is still the 'driving force' in planning and coordination of the CDSP concepts. This especially refers to coordination of activities, the participatory planning approaches, the gender mainstreaming, the land settlement programme and the water management organisation. Although major efforts were made during CDSP II to integrate the CDSP concepts into the regular government institutions and programmes, there remains much to be done to achieve this. CDSP III has a four year window of opportunity to achieve the 'internalisation' of the CDSP concepts.

Coordination of CDSP activities lies with the BWDB Directorate: Project Management Unit - Estuary Studies and Pilot Projects (PMU-ESPP) headed by the Project Director. The PMU-ESPP has a limited planning and coordination capacity. Although the PMU-ESPP has functioned very well during the last four years, especially in view of its limited capacity, this institution has not sufficient capacity and capability to coordinate the envisaged large scale investments. During CDSP III, the institutional setting needs to be reviewed and an appropriate organisation needs to be established to cope with the conceived future investments in *char* development.



15. See for example 'Position Paper for Formulation Mission CDSP III' April 2004.



বাংলার মাটি, বাংলার জল, বাংলার বায়ু, বাংলার ফল -
পুণ্য হউক, পুণ্য হউক, পুণ্য হউক হে ভগবান ॥
বাংলার ঘর, বাংলার হাট, বাংলার বন, বাংলার মাঠ -
পূর্ণ হউক, পূর্ণ হউক, পূর্ণ হউক হে ভগবান ॥
বাংলার পণ, বাঙালির আশা, বাঙালির কাজ, বাঙালির ভাষা -
সত্য হউক, সত্য হউক, সত্য হউক হে ভগবান ॥
বাঙালির প্রাণ, বাঙালির মন, বাঙালির ঘরে যত ভাই বোন -
এক হউক, এক হউক, এক হউক হে ভগবান ॥

- রবীন্দ্রনাথ ঠাকুর

Let the earth and the water, the air and
the fruits of my country be sweet,
my God.
Let the homes and marts, the forests
and fields of my country be full,
my God.
Let the promises and hopes, the deeds
and words of my country be true,
my God.
Let the lives and hearts of the sons and
daughters of my country be one,
my God.

- Rabindranath Tagore



**CDSP is a joint undertaking by The Governments of
The Netherlands and Bangladesh.
The Technical Assistance being provided by
Consultants for Development Programmes
The Netherlands,
Royal Dutch Consulting Engineers and Architects
The Netherlands
and
Sheltech Consultants Pv. Ltd. Bangladesh**

