



CHAR DEVELOPMENT AND SETTLEMENT PROJECT-IV DEPARTMENT OF AGRICULTURAL EXTENSION

Periodic Agriculture Survey Report 2014



July 2014





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Contents

Major findings.....	1
Chapter 1: Introduction and background of the project	2
1.1 Introduction and background	2
1.2 Objective of the project	3
Chapter 3: Approach and Methodology of Sampling Procedure.....	6
3.1 Preparation of survey questionnaire	6
3.2 Sampling procedure and method of data collection	6
3.3 Quality control and data analysis	7
Chapter 4: Survey Findings	8
4.1 Land possession per HH	8
4.2 Distribution of land (ha) and cropping intensity.....	8
4.2.1 Distribution of land (ha) in PAS.....	8
4.3 Land topography.....	10
4.3.1 High land.....	10
4.3.2 Medium high land	10
4.3.3 Medium low land	10
4.3.4 Low land	10
4.4 Cropping pattern.....	11
4.5 Cropping season and production practices	11
4.5.1 Kharif-I: Aus Crop in ABS	12
4.5.2 Kharif-I in PAS	12
Sorjan method of summer vegetables	13
4.5.3 Kharif II T.aman	14
4.5.6 Rabi crop.....	16
4.6 Use of fertilizer in PAS.....	18
4.7 Source of seed	18
4.8 Crop yield	19
5.0 Adoption of modern technology	20
6.0 Gender participation in post harvest activities/operation as per ABS	21
6.1 Harvesting	22
6.2 Carrying	22
6.3 Threshing	22
6.4 Winnowing.....	23
6.5 Drying	23
6.6 Grading	23
Chapter 10: Salinity Effect on crop production	29
Graphical re-presentation of average salinity for project chars	29
Chapter 11: Potential technologies for the project.....	30
11.2 Proven and practiced technologies.....	32
11.3.1 Land zoning of agriculture (General concept of PDZ)	34
Chapter 12: Conclusion.....	36
.....	36
Annex-1.....	37
Annex-2: List of shomaj	41
.....	45

List of Tables

Table 1: Area, population and households (HH) of chars under CDSP IV	2
Table 2: Field Officer and SAAO wise sample survey.....	7
Table 3: Distribution of sample shomaj and households for periodic survey.....	7
Table 4: Distribution of land into cropped area (PAS 2014).....	9
Table 5: Land distribution as per topography (%)	10
Table 6: Major cropping patterns of CDSP IV chars.....	11
Table 7: Area covered by Kharif-I (Variety wise).....	13
Table 8: Percentage of HH adoption in T. aman rice varieties (PAS 2014).....	15
Table 9: Percentage of HH with major rabi field crops (PAS 2014)	17
Table 10: Use of inputs in T. aman (PAS 2014).....	18
Table 11: Percentage of HH for Seed Source (PAS 2014)	19
Table 12: Average yield (mt/ha) of major crops.....	19
Table 13: Practice of modern technology (%) in PAS (HH)	20
Table 14: Comparison with FF and Non FF adoption of variety and technology	18
Table 15: Gender participation in harvesting (%).....	22
Table 16: Gender participation in carrying (%).....	22
Table 17: Gender participation in threshing (%)	23
Table 18: Gender participation in winnowing (%)	23
Table 19: Gender participation in drying (%).....	23
Table 20: Gender participation in grading (%)	24
Table 21: Use of agricultural equipment (%)PAS (HH).....	24
Table 22: Percentage of HHs holding various species of trees.....	25
Table 23: Number of Fruit tree per HH @PAS	25
Table 24: Number of Medicinal plant per HH.....	25
Table 25: Effect of salinity on crop production	29
Table 26: Salinity trend from ABS to PAS (Top soil readings)	29
Table 27: Potential technologies suitable for the project chars	30
Table 28: Sowing time management of various crops to avoid salinity	33

ABBREVIATION

ABS	Agricultures Benchmark Survey
BADC	Bangladesh Agricultural Development Corporation
BARI	Bangladesh Agricultural Research Institute
BINA	Bangladesh Institute of Nuclear Agriculture
BRRI	Bangladesh Rice Research Institute
CDSP	Char Development and Settlement Project
DAE	Directorate of Agricultural Extension
FF	Farmers Forum
FO	Field Officer
HH	House Hold
Ha	Hectare
HYV	High Yielding Variety
ICZM	Integrated Coastal Zone Management
Kg	Kilogram
LCC	Leaf Color Chart
MoP	Muriate of Potash
MoL	Ministry of Land
PAS	Periodic Agriculture Survey
PA	Project Agriculturist
PNGO	Partner Non Government Organization
PTO	Project Technical Officer
SAAO	Sub Assistant Agriculture Officer
TA team	Technical Assistance team
TSP	Tripple Super Phosphate
USG	Urea Super Granules

Major findings

Char Development and Settlement project- IV has been working in Char Ziauddin, Char Nangulia, Noler Char, Caring Char and Urir Char area since March, 2011(actual intervention started in March, 2012). At the initial year; 2012 of the project DAE conducted an Agriculture Benchmark Survey (ABS) to oversee the overall status on agriculture situation, constraints and formulation of strategic plan on intervention of the project chars. The status of the survey result was reported in project Technical Report-2.

After two years, Periodic Agriculture Survey (PAS), 2014 was conducted to assess the status of technology implementation after two cropping season. Survey data revealed that in benchmark survey the single cropped area 11226 ha has been decreased in average 37% where as double cropped area 10212 ha has been increased by 29% to 44% but triple cropped area remains almost same as it was found in ABS.

The average cropping intensity in all chars has been increased in PAS by 35% from 127% to 162%. The maximum cropping intensity was found in PAS is 206% in Char Ziauddin (increased 58%) followed by 172% (49%) in Noler char and 164% (53%) in Caring char. But very little improvement was observed in char Nangulia (5%) and Urir char (7%), where the cropping intensity stands at 135% and 132% respectively.

In ABS the cropping intensity was 148 % in Char Ziauddin, 132% in Char Nangulia, 123% in Noler char, 111% in caring char and 125% in Urir char.

Average 72% HH are using their own seed (unknown quality) and the rest 28% are collecting from seed dealers (quality seed). In Char Ziauddin and Caring char the maximum 40% HH have been collected HYV quality seeds through BADC appointed seed dealers followed by 26% HH in Char Nangulia, 20% HH in caring char and 14 % HH in Noler char.

In Kharif-I, Shaita a local rice variety is covering major area 36% followed by a HYV BRRIdhan 27 with 20% of cropped area. Among the Aus HYV rice, the maximum average yield 3.5 ton/ha was found in BRRIdhan 27 followed by BR-14 at 3.3 t/ha in place Shaita 1.8 t/ha . Among the adapted varieties BRRIdhan 27 was found highest adoption rate by HH because of its yield and salinity tolerance character was observed during its growing period.

In Kharif-II, local varieties are covered maximum HH 71% in all chars but significant changes was observed by covering 29% HH in practicing HYV. Among T. Aman HYV rice, the maximum average yield is 4.2 ton/ha was found in BRRI dhan 52 followed by BRRIdhan 40 is 4.0 t/ha and the minimum 2.4 ton/ha in BRRI dhan 41. Hence, BRRIdhan 40 and BRRIdhan 52 were found highest acceptability by the HH in all the chars.

Among the Rabi crops, some HYV are being introducing of which significant better yield adaptable was found in Cucumber (Alavi, Green line), Tomato (Roma VF &Tripti-2), Bitter gourd (Papiya, Tia), Bottle gourd (BARI Lau 4), and Sweet potato (Tripti & kamala sundari). In general, FF members were found more responsive in adoption of all the intervention in compared to 4 days trainees and non FF farmers.

Chapter 1: Introduction and background of the project

1.1 Introduction and background

Char Development and Settlement Project (CDSP)-IV, started in March 2011, with the mobilization of TA team. The focus of the activities is the development of five new chars namely:

1. Char Nangulia
2. Noler Char
3. Caring Char
4. Char Ziauddin and
5. Urir Char

The total land area of these five chars is around 30,000 ha, with an estimated population of 155,000 in 28,000 households (Table-1).

The chars are located under Noakhali and part of Chittagong district. See the map of the CDSP IV area. The geographical/ administrative distribution is as under:

- Char Ziauddin: under Subarnachar Upazilla of Noakhali
- Char Nangulia: part of Hatiya and part of Subarnachar Upazilla of Noakhali
- Noler Char: under Hatiya Upazilla of Noakhali
- Caring Char: under Hatiya Upazilla of Noakhali
- Urir Char: part of Sandwip Upazilla of Chittagong district and part of Companiganj Upazilla of Noakhali district.

These chars were accreted during 20-40 years and settlement started from 11-15 years ago, except Urir Char. In Urir Char, people were settled before the 1970s. The settlers were mainly river eroded from adjacent areas like Hatiya, Bhola, Ramgati, Companiganj and Sandwip.

Table 1: Area, population and households (HH) of chars under CDSP IV

Sl. No.	Name of the Char	Area		Population	Households
		Hectare	Acre		
1	Char Nangulia	8,990	22,000	67,000	12,000
2	Noler Char	2,690	6,650	33,000	6,000
3	Caring Char	6,850	16,920	33,000	6,000
4	Urir Char	10,300	25,441	11,000	2,000
5	Char Ziauddin	1,943	4,799	11,000	2,000
Total		30,773	75,810	155,000	28,000

In 2013 the government has decided to hand over Caring mouza under Caring char to the Bangladesh Army consisting around 2750 HH of 11 shomaj (village) are excluded from the planned project area. However with the increasing of HH after feasibility study the total number of HH is remain same.

1.2 Objective of the project

The overall objective of the project is to reduce poverty and hunger for the poor people living on newly accreted chars. This is expected to be achieved through the process of improved and more secured livelihood. The purpose of the project, therefore, is to improve and enhance the security of livelihood of the settlers in these char areas.

This is applied in particular for the targeted 28,000 households of the CDSP IV project area. Objective and purpose will be achieved through six outputs:

- Effective management of water resources, protection against tidal and storm surges, improved drainage system;
- Climate resilient internal infrastructure of communication, markets, cyclone shelters, provision for potable water and hygienic sanitation;
- Provision of legal title to land for the landless settlers;
- Improved livelihood and household resilience;
- Institutional development in order to creating an enabling institutional environment;
- Knowledge management through undertaking and disseminating surveys and studies and by learning from contribution to ICZM efforts.

Chapter 2: Objective of DAE

The unprotected coastal chars are vulnerable to regular flooding and have saline soils. In most of the unprotected lands along the coast only one rice crop is possible in the aman season, when heavy rains temporarily decrease the salinity of the higher layers of the soil. In the winter season, at some places an additional crop is harvested. The overall cropping intensity is very low 111 to 148% compared to other areas of the country 191%.

The agricultural component of the project has the following specific objectives:

- Strengthening of agricultural extension services
- Support to homestead agriculture and agro forestry by contracted NGOs
- Surveys and monitoring

2.1 Objective of the Periodic Agriculture Survey (PAS)

At the starting of the project agricultural benchmark survey was conducted to find out the pre-project situation of agricultural status as regards to area under cultivation, cropping pattern, cropping practices, use of HYV and modern technology, etc. As a follow up activities after two years of project period, a subsequent periodic agriculture survey will indicate changes status as a consequence of project interventions.

In addition, the survey will help to identify the further scope of potential modern technologies, suitable for the area in the light of the existing crop production practices and the prevailing environmental circumstances.

Since about 19 years of project periods CDSP has been completed 3 phases in different coastal areas as a model of development. The earlier phases of CDSP and CDSP-IV areas are shown in map:

[illegible]

Fig-1: CDSP-I, II, III and IV areas

Area under CDSP-IV

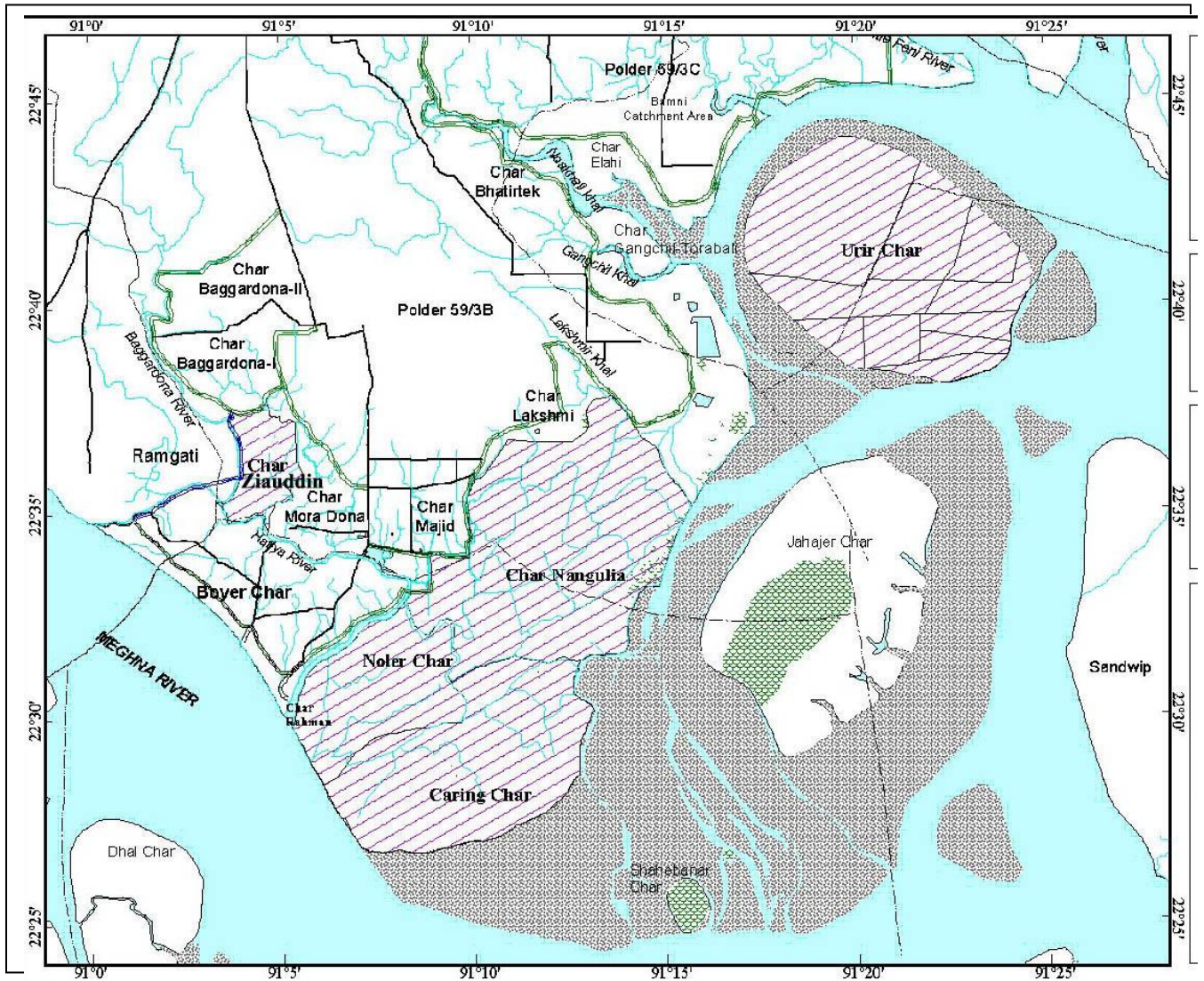


Fig-2: Area under CDSP-IV

CHAPTER 3: APPROACH AND METHODOLOGY OF SAMPLING PROCEDURE

3.1 Preparation of survey questionnaire

A pre-designed survey questionnaire was prepared for the interviews, to collect the required data carefully. Before finalizing, the questionnaire was distributed to the Field Investigators (FI) it was discussed with PD DAE, concerned DAE officials and TA team members. A one day orientation was organized, where project Director, CDSP-IV, DAE along with other concerned officers such as Crop Production Specialist, Project Agriculturist, Project Technical Officers, Field Officers and TA team members were present and gave their valuable suggestion to develop the questionnaire. After getting feedback the questionnaire and the draft was tested in the field for two days with 20 samples and then finalized (Annex-1).

3.2 Sampling procedure and method of data collection

Six Field Officers and five Sub Assistant Agricultural Officers (SAAO) were engaged for the periodic survey in all five chars. Out of 28,000 HH, a total of 1200 HH were surveyed which covered 5% of the total HH by the stratified sampling procedure. It was planned to cover a minimum of 14 samples from each of the existing 134 shomaj (see Annex-2 for the list of shomaj) of the project area. All shomaj were covered category wise such as from each shomaj 7 sample (4 from FF committee members +3 from 4 days trainee) and 7 from non FF at the time of the survey. Non FF samples were surveyed from different locations at random by system walk through and transact FGD method to see the implementation status of agricultural technology in the area.

Detail sampling procedure of the survey

Total HH of CDSP IV	: 28000
Total sample of HH	: 1200
Number of enumerators	: 11 officers (6FO& 5 SAAO)
Survey period	: 6 th to 16 th January 2014.
Sampling procedure	: 50% FF groups and 50% non FF at random
From Farmers 'forum	: For each FF select 7HH (4 Committee members + 3 from 4 days trainee)
Non FF farmers	: Select 7(seven) farmers randomly from each Shamaj

Table 2: Field Officer and SAAO wise sample survey

Sl. no	Name of FO/SAAO	Name of Char	No. of FF	Total sample survey	From FF	From non FF	Remarks
1	Md. Rakibul Islam	Urir char	06	84	42	42	- From each FF select 7(seven), 4 Committee members + 3 from 4 days trainee
2	Tanjida Islam	Char Ziauddin	07	98	49	49	
3	Md. Mokbul Hossain	Caring char	08	112	56	56	
4	Md. Mahidul Islam	Char Nangulia(S)	25	150	75	75	
5	Abdul Aziz			100	50	50	
6	Md. Shabuddin			100	50	50	
7	Md.Mahedi Hasan	Char Nangulia(H)	12	100	50	50	- For non FF select 7(seven)farmers randomly from different location of each Farmers' forum area
8	Md.Abul Kalam			68	34	34	
9	Md.Khabiruddin	Noler char	25	150	75	75	
10	Md.Abdur Rahman			100	50	50	
11	Subir Charaborty.			100	50	50	

Supervisor enumerator: Min 20 sample by each PTO (10 from FF& 10 from non FF) and each PTO check at least 5% survey form which are filled-in by FO/SAAO

Table 3: Distribution of sample shomaj and households for periodic survey

Name of Char	Total area (ha)	Total Population	Total Shomaj	Sample surveyed	Total HH	Sample FF & Non FF(each)
Char Ziauddin	1,943	11,000	13	98	2,000	49+49
Char Nangulia	8,990	67,000	69	518	12,000	259+259
Noler Char	2,690	33,000	29	350	6,000	175+175
Caring Char	6,850	33,000	15	112	6,000	56+56
Urir Char	10,300	11,000	08	84	2,000	42+42
Total	30,773	155,000	134	1162+40	28,000	1202

3.3 Quality control and data analysis

To ensure quality of the survey, the collected information was checked so that information on each of the items was correctly recorded. If it was found that any of the items was overlooked, misunderstood or/and found contradictory, it was corrected through re-interview on-the-spot basis. The TA Team and DAE officials gave feedback after reviewing the filled in questionnaire on a sample basis and shared their experience with all the members of the survey team. As a follow-up work, the Field Investigators (FI) checked the questionnaire with each other when felt necessary. HHs in question was re-interviewed for obtaining correct data. In addition two Project Technical Officers were engaged for sampling of 40 HH (20 each) to get better additional output of the survey.

CHAPTER 4: SURVEY FINDINGS

4.1 Land possession per HH

In CDSP-IV area, most of the HH having no ownership of land and land titling but they possess some land including their homestead area. Land possession was spitted into homestead area, self (with /without land titling) and rental cultivated area per HH.

It is revealed that Caring char possesses the lowest 12% homestead area of total farm size per HH and Urir Char is the highest 31% where other chars shows around 20%. In case of cultivable area, farmers of Char Ziauddin have the highest 63% self possession with 18% rental and farmers of char Nangulia have 60% self and 14% (the lowest) rental area which is very close to Char Ziauddin. In contrary it was observed that the farmers of Caring char covered the highest 52% rental land it indicates may be due to more absentee land owner of the area.

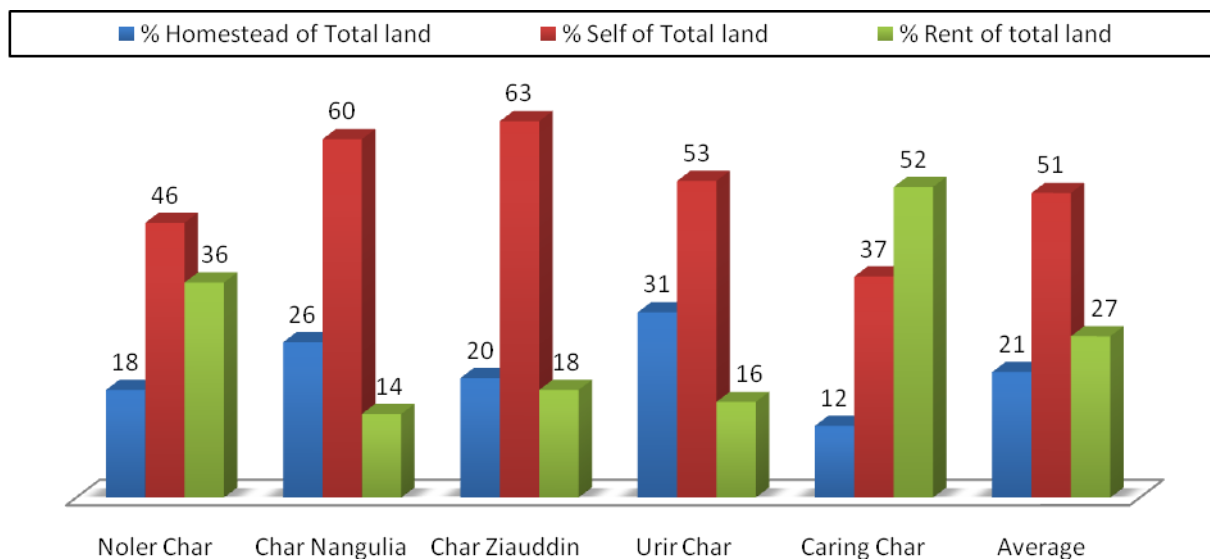


Figure 3: Land possess by farmer's owned and rental

4.2 Distribution of land (ha) and cropping intensity

4.2.1 Distribution of land (ha) in PAS

Distribution of land has been included under single, double and triple cropped area. In compared to the ABS, single cropped area of each HH has been decreased by 28% from 77% (ABS 2012) to 49% (PAS 2013), on contrary double cropped area has been increased by 29% from 15% to 44% and triple cropped area is almost remain same as it was found in ABS. So, a cropped area stands at 11226 ha belongs to single cropped area, 10212 ha double cropped area and 1634 ha triple cropped area (Table 4).

Out of 3 seasons in project chars T.aman is the main and common crop followed by limited aus area. There are limitations in Rabi with high salinity in soil and unavailability of irrigation water. So, at the initial years immediate thrust was given into these two

seasons with an aim to increase double cropped area and triple cropped areas which ultimately contribute for increasing cropping intensity.

Table 4: Distribution of land into cropped area (PAS 2014)

Name of Chars	Single cropped area (ha)	Double cropped area (ha)	Triple cropped area (ha)	Total cropped area (ha)	Net cropped area (ha)
Char Ziauddin	33	74	42	307	149
Char Nangulia	281	165	21	674	467
Noler char	224	304	60	1012	588
Caring char	121	201	5	538	327
Urir char	283	111	10	535	404
Total by sample basis	941	856	137	3066	1935
Total	11226	10212	1634	36554	23080
% of the total area	32	28	4	100	--
% of NCA	49	44	7	--	100

4.2.2 Cropping intensity (%) of ABS and PAS

The maximum cropping intensity in Agriculture Benchmark Survey 2012 was found 148% in Char Ziauddin. Also the intensity was highest 206% in Periodic Agriculture Survey 2014 in the same char. Char Ziauddin has got some advantages such as geographical location having prior embankment, lower soil salinity level, lowest acreage and population in compared to other CDSP-IV chars but there was absence of extension support activities and HYV seed etc. In Noler char it has been increased 49% from 123% to 172% which is the 2nd highest amongst 5 chars. Caring char has also shown positive changes 53% from 111% to 164%. But very little improvement was observed in Char Nangulia 5% and Urir char 7% at 135% and 132% cropping intensity respectively (Fig. 04).

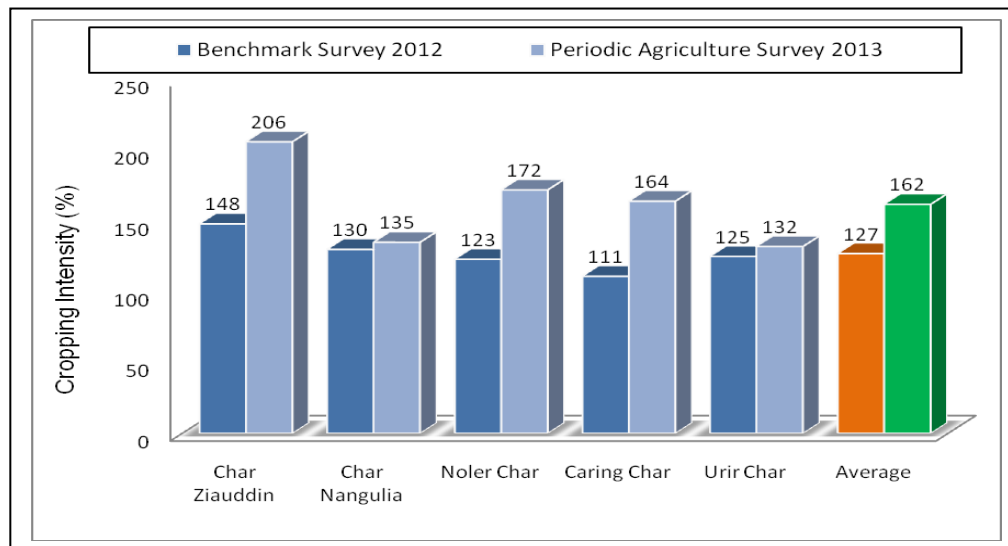


Fig. 04: Cropping Intensity comparison between ABS 2012 and PAS 2013.

4.3 Land topography

(In PAS no new topographical data has been collected. For relevant comparison with other progress and factors the data collected during ABS are presented in this report).

Land topography is an important factor in agriculture for crop selection according to the level of the land, suitability, crop management, cropping intensity etc. Nevertheless, coastal agriculture faces scarcity of high land where a reasonably low salinity exists, hence particular crop selection considering land topography is important

4.3.1 High land

Among the surveyed chars high land is found maximum at 32% in Char Ziauddin followed by 15% in Char Nangulia and 12% in Noler char. There is no high land found in Caring char and Urir Char (Table 8). There is only 11.8 % high land on average in the 5 chars.

4.3.2 Medium high land

Char Ziauddin, Char Nangulia, Noler Char and Urir Char occupy 38, 44 and 28 and 8 % of medium high land respectively. There is no medium high land found in Caring Char. Average 23.2 % of this type of land is available among the 5 chars which is slightly higher than high land.

4.3.3 Medium low land

The average medium low land of the 5 chars is found to be 34.8%, which is the maximum land type in the chars. Caring Char is covering the highest 82%, followed by 49% in Noler char. Remaining Char Ziauddin 15%, Urir char 44% and Char Nangulia 28% of the land is under this land type.

4.3.4 Low land

In the survey it was found the highest in Urir Char with 48 % low land, followed by Caring Char 18%. In Noler Char 11% land is under this type while 15% in Char Ziauddin and 13 % Char Nangulia (Table 5).

Table 5: Land distribution as per topography (%)

Name of Chars	High land (F0)	Medium high land (F1)	Medium low land(F2)	Low land (F3)
Char Ziauddin	32	38	15	15
Char Nangulia	15	44	28	13
Noler char	12	28	49	11
Caring char	0	0	82	18
Urir char	0	8	44	48
Average	11.8	23.6	43.6	21

- F0= 0-30, F1= 30-90, F2= 90-180 & F3= >180 cm, flood water depth

4.4 Cropping pattern

Cropping pattern is mainly depends on traditional practices and other related physical and socio economic factors of the area. Among the physical factors soil condition, climate, rainfall, irrigation and drainage condition are the main ones, while socio economic factors include farmer's choice for own consumption, market demand, cost of production and availability of inputs. By considering all the related factors farmers developed and practice a cropping sequence throughout the year.

In PAS cropping pattern was not included because it is very difficult to assess the improvement within a year or two. *But a remarkable change has been observed in Char Nangulia the traditional local crop Bontil/ Talmakna is being replacing by T. aman after protection by embankment (partly) where frequent inundation and late drainage occurred during unprotected period.*

In CDSP-IV area T. Aman is the major crop during the monsoon as this cropping season is suitable due to low salinity in soil and water because of dilution of soil salinity in the rainy season. Some crops are practiced during Kharif-I and rabi season. Hence during the ABS in different CDSP-IV chars the following cropping patterns were found.

Table 6: Major cropping patterns of CDSP IV chars

Name of char	Kharif-I	Kharif-II	Rabi
Char Ziauddin	Aus B. Aus Fallow	T.Aman T.Aman T.Aman	Rabi Fallow Rabi
Char Nangulia	Aus Fallow Fallow	T. Aman T. Aman Bontil/T.aman	Rabi Fallow Fallow
Noler char	Fallow Fallow B. Aus	T. Aman T. Aman T. Aman	Rabi Fallow Fallow
Caring char	Fallow Fallow	T. Aman T. Aman	Rabi Fallow
Urir Char	Fallow Fallow	T. Aman T. Aman	Rabi Fallow

4.5 Cropping season and production practices

Like in other areas of the country there are three cropping seasons in the project area. These are as follows:

- Kharif-I (March 16- July15),
- Kharif –II (July 16- October15) and
- Rabi (October 16-March 15)

4.5.1 Kharif-I: Aus Crop in ABS

In Kharif-I season crop production depends on the soil condition of the particular area i.e. soil salinity and start of monsoon. Therefore, the area planted in the Kharif-I season is uncertain or unpredictable and it varies from year to year. Early rainfall of the year is suitable for Kharif-I to cover more area for transplanting during the season.

In Kharif-I, Aus (dibbling &transplanted) and a few summer vegetables are the main crop grown in the season, Shaita a local aus rice variety occupied 52% in Char Ziauddin and 5% in Char Nangulia while 1% land was found to be occupied by this crop in Noler Char. It was insignificant in Caring char and Urir char.

China IRRI, a local traditional improved variety under aus crop was found negligible at 16% of land in Char Ziauddin and in no other char it was found in practice.

HYV rice variety BRRIDhan 27 was found on 4% of land in only Char Ziauddin. In Urir Char two local varieties namely Shaita and Boilam covered 2% of the land but these varieties are not found in other chars.

Other aus rice varieties were found 3 and 1% in Char Ziauddin and Char Nangulia respectively.

4.5.2 Kharif-I in PAS

Aus

In Kharif-1, Aus and summer vegetables are practiced against unfavorable ecosystem in all project chars as mentioned in ABS (4.5.1). Only 13% area on average is under aus crop. Previously local variety Shaita, to some extent saline tolerant and draught resistant variety covered the maximum area (52%) followed by China IRRI (16%) a traditional Local Improved Variety (LIV). In PAS it was found that Shaita is still covering major area (30%) in aus (table 7) but replacing by BRRIdhan 27 another saline tolerant HYV. Maximum 20% area covered by BRRIdhan 27 in Char Ziauddin followed by Char Nangulia and Noler char 10% each char. Caring char has covered only 5% but in Urir char no significant coverage was found because soil salinity is still higher and due to tidal flow during the growing period.

Coverage of other saline tolerant varieties such as BRRIdhan 42, BRRIdhan 43 and BRRIdhan 48 did not find significant result in respect of acceptance of HH. It is expected that BR-14 and other HYV may have potentiality for adaptation after completion of all infrastructural project intervention and establishment water management systems in the project area.

Summer Vegetables

Cucumber, Better gourd, Snake gourd and Okra are the most potential vegetables are practiced in project chars through Sorjan method in limited scale due to high soil salinity and unavailability of irrigation water during dry period. A number of HYV were introduced and practiced through extension activities, farmers of the project chars were adapted and harvested a better yield from the following crops and varieties:

Cucumber: Alavi, Elin, Green line (Hybrid), **Bitter gourd:** Tia (Hybrid), Papiya

Okra: BARI derosh 1, Local improved, Hi-soft (Hybrid)

Table 7: Area covered by Kharif-I (Variety wise)

Aus season	Char Ziauddin		Char Nangulia		Noler Char		Caring Char		Urir Char		Av. area covered	Average of 5 chars
	Area covered	Area by Variety	Area covered	Area by Variety	Area covered	Area by Variety	Area covered	Area by Variety	Area covered	Area by Variety		
Shaita	32%	33	7%	14	10%	35	7%	60	6%	0	11%	30
Kerandol		0		0		5		0		0		1
Boilam		2		5		10		0		0		3
BR 14		0		1		5		0		0		1
BR 21		2		0		0		0		0		0
BRRRI dhan27		20		10		10		5		0		9
BRRRI dhan 42		5		0		0		0		0		0
BRRRI dhan 43		0		0		0		0		0		0
BRRRI dhan48		0		0		0		0		0		0
China IRRRI		15		5		10		30		0		12
Cucumber		8		45		5		0		75		18
Bitter Gourd		4		10		5		0		15		7
Others		10		10		15		5		10		8

Sorjan method of summer vegetables

During earlier phases of the project the Sorjan method was introduced for production of vegetable crops during dry period i.e. in March-May with high salinity and deep flooded area 60-90 cm (PDZ 2 &3) at monsoon. Under this topography, fields are not suitable for rice and non rice crops production. Some local traditional low yielding T. Aman rice varieties are usually grown. It is an Indonesian



Indigenous technology by making alternate rows of ridge and furrows were practiced in the field. After introduction of this technology in CDSP-IV area farmers are practicing intensively species like cucumber, bitter gourd, ridge gourd growing into the ridge and short duration fish culture is practiced in furrows and the technology is getting popular in Char Nangulia, Noler char and Urir. In near future after implementation of all intervention (embanked) of CDSP-IV the scenario may be changed in Char Ziauddin, Char Nangulia and Noler char. But due to lack of protection in Caring char and Urir char the technology would be more important for the farmers of the area.

4.5.3 Kharif II T.aman

Transplanted aman rice is the major crop grown during monsoon throughout the country. In CDSP- IV most of the land has same cropping system. This is the only crop grown in the project area as physical and climatic condition favor its production. T. aman is transplanted during rainy season when salinity becomes lower because of heavy rainfall, but it may be affected during the tillering stage due to draught and submergence during spring tide at flowering stage. Higher depth of standing water due to late drainage was also a constraint for introducing HYV.

However, recent couple of years, BRRi and BINA released some saline tolerant, short duration, submergence tolerant and taller varieties suitable for the season and adaptable in coastal area as follows:

Saline tolerant: BRRIdhan 40, BRRIdhan 41, BRRIdhan 53, BRRIdhan54

Short duration: BR23, BRRIdhan 53 (125days) ,BRRIdhan54(115days), BRRIdhan56 (110 days), BRRIdhan57 (105days) and BINA dhan7

Submergence tolerant: BRRIdhan 51 and BRRIdhan 52, BINA dhan 11

Taller: BRRIdhan 40 and BRRIdhan 41

Nutritional variety: BRRIdhan 62

4.5.4 T.aman in ABS

Due to absence of extension activities in project chars and unavailability of HYV seed, farmers have a very little scope for practicing these HYV and modern technologies. Two local varieties of rice varieties namely Rajashail and Kajalshail occupied the lion share of the land covered by T. aman crop. Out of that, Rajashail occupied 15% in Char Ziauddin, 67% in Char Nangulia, 46% in Noler Char, 97% in Caring Char and 60% in Urir Char.

Kajalshail, another local aman rice variety occupied 79% in Char Ziauddin, 28% in Char Nangulia, 26% in Noler Char, 19% in Caring Char and 39% in Urir Char.

Among the HYV rice varieties, BRRi Dhan41 occupied 10% area and BR23 occupied 8% area of Char Ziauddin. Gigas, another local variety, covered 3-6 % area except in Urir Char. Other HYV varieties were not practice in all the chars. A scenario of T.aman crop is presented in table 8 as data obtained during PAS.

4.5.5 Kharif II in PAS

The major constraints in pre project of CDSP-IV areas were non availability of HYV seeds, lack of adaptable variety and extension activities during T.aman. So it was a prior task of DAE to ensure availability of quality HYV seed for the farmers along with appropriate modern technologies. Effort was intensified for HYV seed availability by appointing 5 seed dealers under BADC. Subsequently, intensive support was given to the farmers through various intervention of DAE. After 2 years of time it is revealed that significant achievements have been found in respect of average introduction and adoption of HYV covered 29% HH in all the chars in place of 71% HH by traditional varieties (Table 8).

Table 8: Percentage of HH adoption in T. aman rice varieties (PAS 2014)

T.aman season	Char Ziauddin			Char Nangulia			Noler Char			Caring Char			Urir Char			Av adoption
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	
Raja Shail	21	39	30	37	57	47	58	70	64	56	64	60	42	38	40	
Kajol Shail	7	13	10	9	19	14	6	20	13	27	29	28	46	54	50	
Gigoj	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Betichikon	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Agun Shail	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Nona Shail	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Kala mota	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Dhola mota	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Adoption%	28	52	40	46	76	61	64	90	77	83	93	88	88	92	90	71%
BR 11	7	15	11	8	6	7	7	3	5	6	4	5	4	2	3	
BR 23	12	6	9	5	3	4	3	1	2	0	0	0	0	0	0	
BRRIdhan 39	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
BRRIdhan 40	36	20	28	27	13	20	14	2	8	10	2	6	6	4	5	
BRRIdhan41	0	0	0	0	0	0	3	1	2	0	0	0	1	1	1	
BRRIdhan51	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
BRRIdhan52	14	6	10	10	1	5.5	9	3	6	0	0	0	1	1	1	
BRRIdhan54	3	1	2	0	0	0	0	0	0	0	0	0	0	0	0	
Others	0	0	0	4	1	2.5	0	0	0	1	1	1	0	0	0	
Adoption%	72	48	60	54	24	39	36	10	23	17	7	12	12	8	10	29%

Indicators: A= HH % in Farmers Forum, B= HH % Out of Farmers Forum, C= Average HH%

A total of 12 numbers of HYVs were introduced and practiced during last two years (2 seasons) but 5-6 varieties were found more accepted by the farmers of which BRRIdhan

40 covers the maximum HH (17%) followed by BR 11 (9%) and BRRIdhan 52 (7%). This may be due to BRRIdhan 40 and BRRIdhan 41 is the taller varieties like local Rajashail and Kajalshail. Although BRRIdhan 41 is taller, the variety was not popularized may be due to low yield and not strong enough for sustainable in heavy rain water or prolonged drainage congestion as compared to BRRIdhan 40. On the other hand BRRIdhan 52 is gaining more popularity due to its submergence tolerant character and also highest yielder among the newly introduced varieties in all the project chars. For example, average yield harvested more than 3 times (more than 5 mt/ha) than that of local variety per unit area (1.8mt/ha). Among the other varieties such as BR 11 & BR 23 (as a late variety) it was found a significant adoption rate in all chars except caring char and Urir char. It may be due to the traditional local variety is still higher as these two chars are open i.e. unembanked. The adoption rate of BRRIdhan 41 & BRRIdhan 54 is also insignificant. Remaining varieties such as BRRIdhan 44, 49, 51, 53 are not popularized although some of these have some special characteristics like saline and submergence tolerance. But it is too early to conclude about the acceptance of those HYV by the farmers. Fact remains, local varieties are covering by the maximum HH. However in T.aman season considering the varietal characteristics, land topography, yield and location, farmers have more options for adoption of varieties as appropriate.

Country bean

Country bean, a traditional and most common crop is found in all CDSP-IV project chars, farmers were started introduction of this crop around homestead area during pre-settlement period of these char; locally it is known as Shim. Almost every HH is produced shim for their own consumption and marketing country bean seed (raw) inside and outside the country. Seed contains 21-25% protein and 85% unsaturated available fat that indicates high nutritious for human. In the Periodic Agriculture Survey 2014, it was found intensively produced in Char Nangulia, Char Zia Uddin, Noler Char, and Caring Char and covers more than 1000 ha.



United Leasing Company (private company) has given loan to the farmers of Country Bean seed production. It became a commercial cash crop and farmers are marketing the products viz. country bean, raw seed, and dry seed. They prepared bed for seeding in May-June. It takes about 4-5 months for harvesting the crop in the month of November-February. Farmers are utilizing their land (road side, homestead area) for Country bean because of low salinity in high land. It has a special character that farmers can grow well without using any chemical fertilizer and less cultural practices. Average yield 10 ton/ha but a good harvest could be obtained if modern practices are followed. The average price of the seed is found to be Tk 40-50/Kg (in local market). Local Foriya (middle man) transport these country bean seed to Kawran Bazar, Dhaka, Comilla and Chittagong.

4.5.6 Rabi crop

Cropping in Rabi season entirely depends on soil salinity and availability of irrigation water. In some areas it is again difficult to cultivate due to prolonged drainage congestion if it rains long after the monsoon hence only non irrigated crops like Khesari (green gram), Felon (Cow pea), Tishi, Methi etc could be grown. Scarcity of irrigation water and high salinity during this season was found in all the chars, leaving the majority of the area to remain fallow.

Apart, a very few saline tolerant varieties have been released from the research institutes but seeds are not available at farmers doorstep. Moreover, high salinity in soil

during the dry period tends to be very difficult for introduction of these HYV varieties. So, the technological development in coastal area in Rabi season as such is facing an unfavorable situation in practice.

Hence to combat these factors it was emphasized for adoption of some proven varieties and technologies for a better harvest of some crops and varieties.

Among the rabi crops (i) vegetables like country bean, bottle gourd and okra are found to be cultivated as common crops in all the chars. (ii) Pulse crops are Khesari (green gram), and felon (iii) Among the spices crops; Tishi, Methi (Fenugreek) chili and turmeric (iv) Sweet potato is also grown with large area coverage (v) recently Soybean and ground nut were introduced as oil crop in Char Ziauddin.

Some varieties were found potential as follows:

- Tomato Roma VF a high yielding variety was found with better performance at existing soil salinity during the growing time. So a significant area has been covered by this variety.
- Tripti and Kamala Sundari of HYV sweet potato
- Some hybrid varieties of Chilli,
- Glory of hybrid watermelon,
- BARI Lau 4 (HYV bottle gourd),
- Shohag, BARI Soybean 5 & 6
- Kagor notuky of Yard long bean,
- BINA Chinabadam 5 & 6 (Saline tolerant),
- Diamant of potato,
- Some local improved varieties of Okra, Felon, Sweet gourd, Chilli, Green gram etc are being long practiced by the farmers are found medium yield.

From the table 9 it is revealed that country bean is the major crop of the project chars. The crop is grown in homestead, around the homestead, adjacent land to the homestead, road side and the high land where soil salinity is low. Advantage of this crop is profuse fruiting and obtained yield without or less care and cultural practice. Country bean seed has a good marketing network inside and export market.

Significant progress in Rabi season is expected after completion of all project intervention of CDSP-IV when the soil salinity become lower and all the modern technologies could be practiced by the farmers.

Table 9: Percentage of HH with major rabi field crops (PAS 2014)

Rabi session	Char Ziauddin			Char Nangulia			Noler Char			Caring Char			Urir Char		
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
Country bean	97	93	95	92	88	90	82	78	80	30	30	30	95	95	95
Chilli	16	14	15	10	14	12	24	16	20	3	1	2	12	8	10
Tomato	19	11	15	16	14	15	7	3	5	-	--	-	10	26	18
S. Potato	3	3	3	12	18	15	23	17	20	1.5	0.5	1	3	5	4
Khesari	1	1	1	8	12	10	2	2	2	2	4	3	15	45	30
Soybean	23	17	20	6	2	4	1	1	1	-	--	-	--	--	--
Sweet gourd	16	14	15	4	2	3	7	3	5	--	--	--	2	8	5
Okra	13	15	14	10	14	12	1	1	1	--	--	--	--	--	--

Tishi(linseed)	2	3	--	7	13	10	11	19	15	25	35	30	14	16	15
Ground nut	1	1	1	4	2	3	1.5	0.5	1	-	-	-	--	--	--
Methi (Fenugreek)	-	-	-	-	-	-	9	31	20	7	23	15	---	---	--
Watermelon	3	3	3	-	-	-	1.5	0.5	1	-	-	-	---	---	--
Brinjal (Egg plant)	--	-	-	4	2	3	4	2	3	-	-	-	----	---	--
Felon (cow pea)	9	7	8	1	1	1	-	--	-	-	--	-	---	--	--
Yard long bean	--	--	--	7	3	5									
Mustard	--	--	--	--	--	--	--	--	--	--	--	--	5	11	8
BRRI dhan28	-	-	-	1.5	0.5	1	-	--	-	-	-	-	--	--	--
Hybrid dhan	-	-	-	1	5	3	-	-	-	-	--	-			--
Others	--	--	--	2	8	5	--	--	---	2	2	2	5	5	5

Indicators: A= HH % in Farmers Forum, B= HH % Out of Farmers Forum, C= Average HH%

4.6 Use of fertilizer in PAS

Expected yield depends on modern practices of technology. A balanced dose of fertilizer can increase the crop yield up to 15-20%. But in the project area indiscriminate use of fertilizer was observed during ABS which has a negative effect on soil and yield for future.

The overall situation of fertilizer use in all the char has shown a positive trend in PAS most importantly in using organic manure and gypsum (Table 10). But in case of inorganic fertilizer use and dose per unit area is found still indiscriminate way. But however, it could not be expected a balance use of fertilizer within two years of time. Remarkably it is appreciated the use of TSP and MoP which was previously very disappointing. However, onward emphasis should be given for improvement of soil fertility by using more organic manure through establishing demo on quick compost, vermi compost, pit compost and use balance dose of fertilizer.

Table 10: Use of inputs in T. aman (PAS 2014)

Fertilizer	Char Ziauddin			Char Nangulia			Noler Char			Caring Char			Urir Char		
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
Urea (kg/ha)	130	94	112	105	85	95	155	135	145	130	120	125	140	130	135
TSP(kg/ha)	85	65	75	75	65	70	52	38	45	50	40	45	90	80	85
MOP(kg/ha)	60	50	55	42	32	37	35	29	32	32	22	25	48	42	45
Gypsum (kg/ha)	35	25	30	36	32	34	28	22	25	42	38	40	60	50	55
Organic manure (ton/ha)	2.2	1.8	2.0	1.2	0.8	1.0	1.2	1.1	1.15	1.4	1.3	1.35	1.05	0.95	1.0

Indicators: A= HH % in Farmers Forum, B= HH % Out of Farmers Forum, C= Average HH %

4.7 Source of seed

Seed is one of the vital inputs for crop production; from the benchmark survey it was revealed that the major numbers of HHs are using seed for crop cultivation from farmer's own source in ABS. These seeds may identify as non formal i.e. unknown quality.

To ensure quality seed at the doorstep of farmers is a priority task for getting better yield of the crop. Hence it was ensured after appointment of 5 seed dealers by the BADC

and availability from private seed company. Subsequently, DAE distributed seed as input support to the participants during one day and 4 days trainings. Seed replacement ratio during two years was found a satisfactory trend through seed dealer in Urir char (40% HH) followed by Char Ziauddin (38%HH). Noler char, Caring char and Char Nangulia have more potential for increasing trend of quality seed in the area (Table 11).

Table 11: Percentage of HH for Seed Source (PAS 2014)

Seed source	Char Ziauddin			Char Nangulia			Noler Char			Caring Char			Urir Char		
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
Self	54	70	62	70	78	74	83	89	86	73	87	80	52	68	60
Dealer	46	30	38	30	22	26	17	11	14	27	13	20	48	32	40

Indicators: A= HH % in Farmers Forum, B= HH % Out of Farmers Forum, C= Average HH %

4.8 Crop yield

Information on production of major crops in the various seasons was collected from the farmers during the survey. Yields in different cropping seasons were found to be very low in ABS compared to the national average and yield potential of the particular variety. In all the 5 chars usually local varieties are practiced with various constraints causing the low yields. Table 12 gives a summarized picture of yields trend in the three seasons.

Table 12: Average yield (mt/ha) of major crops

Aus varieties	As per ABS	As per PAS
Shaita/Hashikalmi/Boilam	1.9	1.5
China IRRI	2.3	3.0
BRRIDhan27	3.3	3.5
BR14	--	3.3
BR21	--	2.5
BRRi dhan42	--	3.0
Bitter gourd	--	6.8
Cucumber	--	12
Yard long bean	--	6.4

T. Aman varieties	As per ABS	As per PAS
Raja shail	2.2	2.1
Kajal shail	2.0	1.8
BR11	3.2	3.3
Kalamota	2.2	2.0
BRRIDhan 41	3.4	3.2
BR 23	--	3.8
BRRi dhan 39	--	2.9
BRRi dhan 40	--	4.0
BRRi dhan 51	--	3.9
BRRi dhan 52	--	4.2

Rabi Varieties	As per ABS	As per PAS
Country Bean	5.3	5.4
Okra	3.3	4.5

Rabi Varieties	As per ABS	As per PAS
Ground nut	--	1.5
Sesame	--	0.5
Linseed	--	0.3
Mustard	--	1.0
Tomato	--	9.1
Bottle gourd	--	14.0
Egg plant	--	16.0
Hybrid dhan(Hira, etc)	--	5.1

Khesari	0.5	0.5
Felon	0.8	1.0
Chili	0.7	1.0
Sweet Potato	9.6	10.5
Methi	1.7	1.5
Soybean	1.2	1.5
Water melon	25-28	30

5.0 Adoption of modern technology

Adoption of technology was insignificant in all the project area during ABS. Only rat control technology was found widely adapted, with exception of Urir Char. Practice of use of farm composed was insignificant but no other practice was found in Urir Char.

In PAS, it was found that the significant changes were observed in adoption of modern technology except Urea Super Granule (USG) and Leaf Color Chart (LCC). Use of organic manure and piercing in rice was found a progressive trend in all the chars. Char Ziauddin has average 20% HH followed by Char Nangulia 12%. Regarding adoption of pheromone trap in some particular crop such as cucumber, watermelon, bitter gourd etc is also encouraging. But use of organic pesticides is in embryonic stage (Table 13).

Table 13: Practice of modern technology (%) in PAS (HH)

Agricultural technologies	Char Ziauddin			Char Nangulia			Noler Char			Caring Char			Urir Char		
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
Line sowing	17	13	15	6	4	5	7	3	5	6	4	5	3	1	2
USG use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Organic manure	70	56	63	42	38	40	20	10	15	34	26	30	59	41	50
piercing	25	15	20	18	6	12	13	7	10	5	3	4	12	8	10
LCC use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pheromone trap use	8	2	5	3	1	2	1	1	1	0	0	0	0	0	0
Organic pesticide use	4	2	3	4	2	3	6	4	5	0	0	0	2	2	2

Indicators: A= HH % in Farmers Forum, B= HH % Out of Farmers Forum, C= Average HH %

5.1 Comparison adoption between FF and non FF farmers in PAS

T. Aman is the main and common crop in the project char covered almost maximum land in Kharif-II season. Hence priority was given to introduced HYV and modern technology during the season for an immediate significant result with the support of project intervention. In PAS it was an objective to find out the comparison of implementation status between FF and non FF of the previous years. It was observed that in T.Aman HYV adoption was 38HH by the FF member's on the contrary non FF members only 20 HH. FF members are almost double than non FF in adaptation of HYV

in T.aman. Rabi crops mainly Country bean, Chilli, Tomato, S. potato, Sweet gourd and Soybean adaptation by both FF and Non FF are almost same with no significant difference. In practice of modern technology in most of items, FF members are ahead than non FF members except use of USG and LCC. No use of USG and LCC was found in both the users. Also in case of fertilizer in T. aman season by FF members are using more quantity of fertilizers/ha than that of non FF members but in both the cases balance use is not satisfactory.

Table 14: Comparison with FF and Non FF adoption of variety and technology

Items	Adoption by HH%	
	FF	Non FF
T. Aman		
HYV	38	20
Local	62	80
Rabi crop		
Country bean	80	77
Chilli	13	11
Tomato	11	11
S. Potato	9	9
Sweet gourd	6	5
Soybean	6	4
Practice of modern technology		
Line sowing	8	5
USG use	0	0
Organic manure	45	34
piercing	15	8
LCC use	0	0
Pheromone trap use	3	1
Organic pesticide use	3	2
Fertilizer use in T aman(kg/ha)		
Urea	132	113
TSP	70	58
MOP	44	35
Gypsum	40	33
Organic manure (ton/ha)	1.41	1.19

6.0 Gender participation in post harvest activities/operation as per ABS

(Gender participation in post harvest was not included in PAS)

Gender participation in agricultural activities and more specific in post harvest technology are important to ascertain future interventions like planning of training.

In most of the HHs, it was found that women participation in post harvest activities is very much encouraging. Man and woman work together in most of the activities, which is found to be significantly more in comparison to other areas of the country.

6.1 Harvesting

Harvesting operation is done by men of 42% of HHs in Char Ziauddin, 67% in Char Nangulia, 69% in Noler Char, 51% in Caring char and 2% in Urir Char.

By women it is 9% in Char Ziauddin, 1% in Char Nangulia, 3% in Noler Char, 0% in Caring Char and 30% in Urir Char.

Same operation is done jointly by both man and women at 38% of HHs in Char Ziauddin, 19% in Char Nangulia, 18% in Noler Char, 41% in Caring Char and 64% in Urir Char, the highest percentage in Urir Char may be due their farm land is situated near and around their homestead (Table 15).

Table 15: Gender participation in harvesting (%)

Gender	Char Ziauddin	Char Nangulia	Noler Char	Caring Char	Urir Char
Man	42	67	69	51	2
Woman	9	1	3	0	30
Man & Woman	38	19	18	41	64

6.2 Carrying

Carrying of farm produces was found to be done by man and woman in the following rates. Men do this post harvest operation in the rate of 52% in Char Ziauddin, 69 in Char Nangulia, 69 in Noler Char, 51 in Caring Char and 22 percent in Urir Char.

By women it is 7% in Char Ziauddin, 2 in Char Nangulia, 3 in Noler Char, 0 in Caring Char and 56 percent in Urir Char.

Same activity is done jointly by both man and women in 30% of HHs in Char Ziauddin, 16 in Char Nangulia, 19 in Noler Char and 41 percent in Caring Char and 19% in Urir Char (Table 16).

Table 16: Gender participation in carrying (%)

Gender	Char Ziauddin	Char Nangulia	Noler Char	Caring Char	Urir Char
Man	52	69	69	51	22
Woman	7	2	3	0	56
Man & Woman	30	16	19	41	19

6.3 Threshing

Fifty seven percent of men are doing the threshing in Urir Char, which is the highest among the 5 chars followed by 41% in Char Nangulia. It is 31 in Char Ziauddin, 33 in Noler Char and 11% in Caring Char while by women it is 21, 7, 6, 4, and 0 percent respectively. Same work is done by both man and women in 49, 39, 53, 83 and 17% of

HHs in Char Ziauddin, Char Nangulia, Noler Char, Caring Char and Urir Char respectively. So it is highest in Caring Char (Table 17).

Table 17: Gender participation in threshing (%)

Gender	Char Ziauddin	Char Nangulia	Noler Char	Caring Char	Urir Char
Man	31	41	33	11	57
Woman	6	7	4	0	21
Man & Woman	49	39	53	83	17

6.4 Winnowing

Winnowing is done by man in the rate of 3% of HHs in Char Ziauddin, 2 in Char Nangulia, 5 in Noler Char, 0 in Caring Char, and 8 % in Urir Char. By women it is 60% of HHs in Char Ziauddin, 55 in Char Nangulia, 72 in Noler Char, 52 in Caring Char and 31 % in Urir Char.

Same operation is done by both man and women in 22% of HHs in Char Ziauddin, 31 in Char Nangulia, 13 in Noler Char 41, in Caring char and 57 per cent in Urir Char (Table 18).

Table 18: Gender participation in winnowing (%)

Gender	Char Ziauddin	Char Nangulia	Noler Char	Caring Char	Urir Char
Man	3	2	5	0	8
Woman	60	55	72	52	31
Man & Woman	22	31	13	41	57

6.5 Drying

This post harvest operation is mainly done by women in other parts of the country which is a common phenomenon and the same is seen in the project area.

Men do this operation at the rates of 5% of HHs in Char Ziauddin, Char Nangulia 0, and Noler Char 2, Caring Char 0 and Urir Char 3 percent. By women, in Char Ziauddin 57, Char Nangulia 79, Noler Char 80, Caring Char 52 and Urir Char 78 percent.

Both men and women are involved in drying operation by 25% of HHs in Char Ziauddin, Char Nangulia 8, Noler Char 9, Caring Char 41 and Urir Char 13 percent (Table 19).

Table 19: Gender participation in drying (%)

Gender	Char Ziauddin	Char Nangulia	Noler Char	Caring Char	Urir Char
Man	5	0	2	0	3
Woman	57	79	80	52	78
Man & Woman	25	8	9	41	13

6.6 Grading

In Char Ziauddin, men are active to do this operation up to 4 % of the HHs, one percent in Char Nangulia, 1 in Noler char, 0 in Caring Char and 33% in Urir Char, which is the highest.

By women it was 55% of HHs in Char Ziauddin, 55 in Char Nangulia, 62 in Noler Char, 47 in Caring Char and 32 percent in Urir Char.

Same activity is done by both man and women, with Caring Char in highest position with 97% of HHs, Char Ziauddin 28, Char Nangulia 30, Noler char 26 and Urir char 31 percent (Table 20). This operation is usually done by women and that is a common phenomenon in this country.

Table 20: Gender participation in grading (%)

Gender	Char Ziauddin	Char Nangulia	Noler Char	Caring Char	Urir Char
Man	4	1	1	0	33
Woman	55	55	62	47	32
Man & Woman	28	30	26	97	31

7.0 Use of agricultural equipment (%HH)

As regards to use of agricultural equipment, there are some changes in PAS as compared to ABS. Power tiller is on top of the list (Table 21), because it is readily available on hired with a reasonable price. Taka 250-300 is charged for ploughing one acre of land. Use of country plough is declining rapidly may be because of problems for raring cow due to scarcity of feed during dry season, high wages of labor. Thresher use by the respondents is significantly increased with the same reason as in case of power tiller.

With the change of agricultural developments use of sprayer is increased although it has negative impact on IPM but however farmers intended to ensure safety crop against any sort of hazardous situation.

Table 21: Use of agricultural equipment (%) PAS (HH)

Agricultural Instruments	Char Ziauddin	Char Nangulia	Noler Char	Caring Char	Urir Char
Country plough	4	3	30	35	0
Power tiller	96	97	70	65	100
Tractor	0	0	0	0	0
Sprayer	29	60	70	50	50
Thresher	40	70	60	50	100
Power pump	12	15	1	0	0

8.0 Number of trees per HH in and around homestead

Banana is a common fruit crop in project chars; hence most of the families possess banana plants resulted banana plants occupied maximum numbers among the fruit plants. As project intervention, a huge number of fruit plants are planned to be distributed to the HH by DAE and PNGOs. So the distribution of various types of sapling to the beneficiaries is one of the activities which is undergoing in every year. But very

few medicinal species are found in the area which needs to be more attention with the aim to produce raw materials for organic pesticides.

Table 22: Percentage of HHs holding various species of trees

Name of species	Char Ziauddin	Char Nangulia	Noler Char	Caring Char	Urir Char
Fruit	92	97	90	85	95
Timber	81	88	85	85	52
Medicinal	10	12	15	14	4
Others	15	20	12	6	5

Distribution of species wise fruit plants and medicinal plants are presented in table 22 and 23. From the obtained data it shows that in general banana, coconut and mango are the most common species in all the chars. In Urir char Date palm is found as a potential crop where most of the HH planted in the area.

Table 23: Number of Fruit tree per HH @PAS

Fruit plant	Char Ziauddin	Char Nangulia	Noler Char	Caring Char	Urir Char
Mango	16	17	10	10	33
Blackberry	3	5	3	2	11
Jackfruit	8	8	7	6	9
Papaya	5	5	6	5	9
Guava	5	9	8	6	7
Lemon	1	1	1	1	1
Coconut	13	13	11	5	22
Banana	72	57	74	75	68
Palm	2	2	2	1	1
Date palm	9	14	8	8	16

Table 24: Number of Medicinal plant per HH

Medicine Tree	Char Ziauddin	Char Nangulia	Nolar Char	Caring Char	Urir Char
Arjun	1	1	1	1	1
Hortoki	0	0	0	0	0
Bohera	0	0	0	0	0
Neem	2	1	2	1	6
Others	0	1	6	9	2

Boro rice

Boro rice is a rabi season crop. Among the CDSP-IV areas, cultivation of boro rice is recently introduced and observed only in Char Nangulia (Subarnachar part). Hira dhan, and some other hybrid variety, has been cultivating in this area as boro rice since CDSP's intervention. The farmers are using Shallow Tube well for irrigation. There are at least 30 shallow tube wells for irrigation covering about 800 acre. These areas included; Nobir Pukur Somaj, Baker Bazar Somaj, 40 Dag Somaj, Musa Mia Somaj, Alauddin Somaj, Noyapara Somaj, Kabir Somaj, Kerani Bazar Somaj, Fakir Market Somaj, Abdul Haque Somaj, Rob Bazar Somaj, Obaydiya Somaj, East Belal Bazar Somaj and West Belal Bazar Somaj.



Farmers of these areas have been practicing aquaculture which ultimately helps to cultivate boro rice. The average yield of Hira dhan is 5-6 ton per hectare. But it needs more information regarding technical feasibility of extraction of ground water in coastal area, quality of water, elements in water etc.

Cucumber (Shosa)

Cucumber is found in some CDSP-IV char areas viz. Char Nangulia and Urir Char. According to the farmers they have been cultivating cucumber from pre settlement period with traditional local varieties.

After introduction of project intervention with hybrid varieties such as Alavi, Elin, Green line farmers started producing it during summer, (Kharif-I) by Sorjan method and harvesting a better yield.

In the Periodic Agriculture Survey 2014, it was found extensively produced in Bangla Bazar, Mia Bazar, Namar Bazar, Janata Bazar, Coloni Bazar and Razib Bazar area of Urir Char; Idris Bazar, Saiyer Vita, Akram Bazar, Kaladur Bazar, Soleman Bazar, Vumihin Bazar and Akter Miar Hat area of Char Nangulia and different area of Urir chars covers about 1500ha.

United Leasing Company has given loan Tk 15-18 million to the farmers of Char Nangulia as agriculture loan for cultivation of Cucumber.



It became a commercial crop and farmers are marketing the products as a cash crop. They prepared bed for seeding in March-April. It takes about 35-40 days for harvesting the crop from May-August. Almost all the farmers produced cucumber through Sorjan method by making dyke and seeding on the pit and in furrow are doing short period fish culture.

Average yield 12 ton/ha but could be increased if more intensive modern practices are followed. The average price is found Tk 15-20/Kg (in local market) and marketing this Cucumber through value chain to, Dhaka, Chittagong and Comilla

Bontil/Talmakna

Bontil, a traditional crop, is found in Char Nangulia. According to the farmers opinion it was found during the pre-settlement period of this char; locally it is known as Bontil or Talmakna.



After introduction of this crop farmers started producing it during monsoon, confined to some low lying area where no other crops can be grown. In the benchmark survey it was found intensively produced in Beker bazaar, Belal bazaar, Selim bazaar, Tobakati, Tara market and Nabir pukur area and covers about 800-1000 ha.

It was a commercial crop and farmers are marketing the product (seed) as an element of “Ayurved medicine”. They prepared seed bed for seeding in June-August and transplant stem cutting in the month of August – September. It takes about 8-9 months for harvesting the crop in the month of February- March. Farmers are utilizing their land for Bontil/ Talmakna while no other crops are possible during T. Aman season due to late draining and frequent inundation occurring by high tide. It has the special characteristic that it can sustain 15-20 days under water.

Average yield is very low, only 750-1000 kg /ha but a good harvest could be obtained if modern practices are followed. The average price of the seed is found to be Tk 250.00-350.00/kg. Some exporters are of the opinion that it has a good export potentiality in Korea and China.

In PAS it was observed that the cropped area become declining because in recent days price of bontil seed is reducing at Tk 100-150/kg, on the other hand part of these area were protected by embankment hence these area is covered by T.Aman.

Chapter 9: CONSTRAINTS AND RECOMMENDATION

9.1 Summarized constraints and recommendations

During the survey a number of issues related to agriculture were identified which need to be addressed for future agricultural development. The focal constraints are summarized and possible strategies are given below:

Constraints of project chars

- Scarcity of sweet water for irrigation in dry season
- High salinity of soil and water during dry season from December –April
- Only T. aman is the main crop in newly accreted chars
- Low yielding varieties like Rajashail, Kajalshail, Betichikon, Shaita etc are now replacing by HYV
- Lack of saline tolerant varieties for Kharif-1 and Rabi crops
- Scarcity of inputs like fertilizers and if available price is high
- No land titling and recording
- Low soil fertility
- Serious drainage congestion prevailing in rainy season in Noler Char and Char Nangulia as all infrastructural interventions is yet to be completed.

Recommendations and mitigation (by project)

- Project interventions are improving the situation, as we have seen in PAS, introducing HYV and modern technology etc.
- Screening of suitable varieties and crops for unfavorable ecosystem should be given priority for increasing productivity within short possible time and appropriate crop, water and soil management technologies should be applied, as developed for coastal chars by the research organizations. Cooperation on this will be sought with BARI, BRRI and other research institutes.
- Introduction of high value homestead crops by PNGOs.
- Ownership of land by titling and recording by MoL.
- Rain water harvesting and conservation schemes may be taken up for irrigation support in the dry season.
- Government dealer for inputs such as seed & fertilizer and private seed companies should extend their services in the char areas
- Productivity zoning will be introduced soon in the project areas so that suitable crops could be adapted based on land topography and salinity.

CHAPTER 10: SALINITY EFFECT ON CROP PRODUCTION

Salinity has negative effect and influence on the crop production in different stages of the growing period. The nature of the effect of salinity is shown in below table:

Table 25: Effect of salinity on crop production

E _{Ce} ; ds/m	Soil salinity class	Characteristics
0-2	Non-saline	effect negligible
2-4	Slightly saline	Yield very sensitive, crops may be restricted
4-8	Saline	Yield of many crops restricted
8-16	Strongly saline	Yield satisfactory for tolerant crops
>16	Extremely saline	Yield satisfactory for very few tolerant crops

Project salinity data during the ABS and PAS

Soil salinity test was conducted in November, 2011 and April, 2012 during the agriculture benchmark survey in CDSP-IV area and a synopsis of the average test results of 120 samples at different locations is given below:

Table 26: Salinity trend from ABS to PAS (Top soil readings)

Name of char	November 2011	April 2012	November 2012	April 2013	November 2013	April 2014
Char Nangulia	11.2	25.3	5.3	16.1	2.0	7.2
Noler Char	4.8	28.0	4.2	13.0	4.0	9.8
Caring Char	6.6	32.2	3.9	15.1	4.5	11.0
Char Ziauddin	10.6	14.2	2.3	3.1	1.6	2.8
Urir Char	8.5	16.1	7.1	11.1	4.6	10.3
Average	8.2	23.2	4.6	11.7	3.3	8.2

*E_{Ce}, ds/m= Electrical conductivity, desi siemen/ meter. Top soil=0-10 cm,

Graphical re-presentation of average salinity for project chars

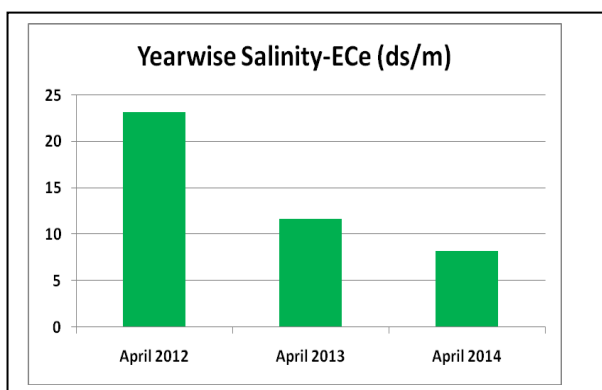


Fig. 05

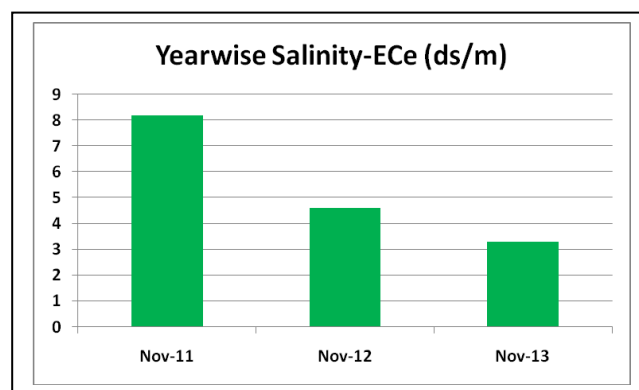


Fig. 06

CHAPTER 11: POTENTIAL TECHNOLOGIES FOR THE PROJECT

11.1 An inventory of potential technologies

An inventory of the potential technologies is prepared based on the available information, technological literature developed in the previous phases of CDSP and experience gained during implementation of project interventions. Recently some varieties and technologies were released from the research institutions adaptable for the area, which have also been included in the proposed interventions.

Table 27: Potential technologies suitable for the project chars

Cropping seasons	Crop, Variety, Technologies	Remarks
Kharif-1	<p>Aus HYV: BR14, BRRIdhan27, BRRIdhan 42, BRRIdhan 43,</p> <p>Vegetables Amaranth: BARI Data-1 Okra: BARI Derosh-1, Local improved Kang Kong: BARI Gima kalmi-1, Bottle gourd: BARI Lau-4</p> <p>Pulses BARI Mug-5&6 BINA Mug-5,6,7</p> <p>Oil seed Sesame: T-6 Til: BARI Til-2,3,4 Ground nut: BARI China badam 2,3,4</p> <p>Spices Chili: Local improved BARI Morich-1 Turmeric: BARI Tumeric-1&3</p>	<ul style="list-style-type: none"> Seeds to be dibbled at least 5 cm deep into the soil. For high and medium high land Raised bed/ Elevated seed bed or Sorjan method is effective for salinity. Mulching is effective during dry period BRRIdhan27 found saline tolerant
Kharif-II	<p>T.Aman HYV: BR 11, BR 22,23, BRRIdhan 41, 42, 51,52, 53, 54, BINA7 Local: Kajalshail, Rajashail,</p>	<ul style="list-style-type: none"> In high & medium high land In high, medium high and medium low land In late draining and low land area BRRIdhan 41,53,54 released as saline tolerant
Rabi season	<p>Root crops Potato: Diamant BARI Alu-27 BARI Alu-29 Sweet potato: BARI Misti Alu-4 BARI Misti Alu-5</p>	<ul style="list-style-type: none"> Straw mulching needed for moisture conservation. Mulching can be practiced for moisture conservation in potato, water melon and cucumber production

Cropping seasons	Crop, Variety, Technologies	Remarks
	<p>BARI Misti Alu-6 BARI Misti Alu-7 BARI Misti Alu-8 BARI Misti Alu-9</p> <p>Aroid: Latiraj</p> <p>Vegetables</p> <p>China sak: BARI Batisak-1 Eggplant: BRAI Begun-9,10 Country bean: BARI Shim-5, 6 Yard long bean: Kagor notuky Bottle gourd: BARI Lau-1,3,4 Tomato: Roma-VF, Hybrid</p> <p>Pulses</p> <p>Khesari: BARI Khesari-1,2 Mung Bean: BARI Mug-3,4 Felon: BARI Felon-1,2 Chick pea: BARI Chola2,3,5,6 Lentil: BINA Mashur-3,4 BARI Masur-5,6 Garden pea: IPSA motor suti 2,3</p> <p>Oil crops</p> <p>Mustard: BARI Sharisa-11&16 BINA Sharisa-5 &6 Ground nut: BARI Chinbadam-8,9 Dhaka-1 BINACHinabadam 5&6 Soybean: Shohag (PB-1), BARI Soybean-6</p> <p>Spices</p> <p>Chili: BARI Morich-1 Local improved Onion: BARI Pyaj-1&4 Taherpuri Garlic: BARI Rashun-1&2 Methi: BARI Methi-1&2 Coriander: BARIDhonia-1</p> <p>Cerials</p> <p>Rice: BRRI dhan 47& 55 BINA dhan 8,10 Barley: BHL-15 (Line) Maize: Hybrid</p>	<ul style="list-style-type: none"> • Drip irrigation for pit crops • BRRI dhan 47,55 and BINA Dhan 8 released as saline tolerant

11.2 Proven and practiced technologies

Proven and practiced technologies of various crops were found at different level of soil salinities during previous phases of CDSP. Some technologies were adapted by the farmers traditionally and on those basis CDSP experts working in the field and experiment conducted by the research organization. A synopsis of these tested technologies is presented below:

Dibbling method of aus rice

There are two types of aus rice culture; direct seeding and transplanting. In the direct seeding method, farmer are generally sow the dry seeds by broadcast or dibble the seeds directly into the sub-soil layer just after first shower in late March to early April and are grown under rain fed conditions until the crop is harvested in July/August. If monsoon starts early, direct seeding particularly dibbling is beneficial otherwise transplanting is an easy tool to avoid salt injury since planting of rice can be done in late April to early May.

Post harvest tillage

After crop harvest soil salinity is tends to go up quickly because of capillary rise. Post harvest tillage after T aman and rabi crop will break the soil crust and thus uprising of salinity along with the capillary water will be minimized. Repeat this tillage practiced again after rain which will help reduce soil salinity during sowing time.

Sorjan method

Production of vegetables in most parts of the coastal areas is often suffered from late drainage at the time of sowing vegetables. Sorjan method is a system for year round technology which enables to grow vegetables throughout the year. Raised beds alternates with low beds, have the opportunity for year round growing of non rice crops on the raised beds and rice in the low beds. Generally in the coastal region, the farmers grow vegetables on the edge of the access roads which connect their houses with main road. Washing down of salinity from top of this road side is creates a favorable environment for growing vegetables.

Summer Vegetables

Potentiality of summer vegetables is mainly depends on some factors; of that early rainfall and reduced of soil salinity during that period. However, farmers are generally practicing by raising seedling in their around homestead and planted after shower on pond ridge/dyke or roadside high land. Mainly cucumber, sponge gourd, bitter gourd, snake gourd are practiced in this technology and getting better yield.

In Kharif-1; Groundnut, Mung, Okra and Soybean are practiced in late rabi and early Kharif-1 and it is found suitable in PDZ-1 area. Some leafy vegetables such as red amaranth (lalsak) and spinach are found grow well during this period.

Relay cropping

Relay cropping of green gram into T. aman rice is a traditional practice in char areas. At maturity stage of rice, after drainage of stagnant water the green gram seed may be broadcasted with the available soil moisture at ripening stage of T.aman.

Early sowing of Tishi

Early sowing of Tishi Just after harvesting of previous crop (T.aman) having available soil moisture is the appropriate time to avoid high salinity at maturity stage of the crop.

Use of mulching

Farmers are generally practiced mulching in raised seed bed of chilly and other seedling raising crops. Now this technology is practiced in potato, sweet potato and some vegetables. After tillage and fertilizer application, straw mulch is placed on the top of bed at 4-5 cm thick which preserved soil moisture and prevent uprising of salinity. Mulching is also help weed control.

Drip irrigation for some crops

Irrigation through drop by drop into the pit is termed as drip irrigation. Scope of irrigation is very limited in coastal chars. Ponds and ditches near homestead are the main sources of water in dry season. So, drip method of irrigation is followed for maximum utilization of limited resource of water in crop production during rabi season. Farmers of char have small area for vegetable cultivation, so water can be supplied by a drum is connected by rubber pipe and placed at a higher elevation of the plot for watering into the pit crops. High value crop such as tomato, watermelon and some pit crops can be grown by using this technology. Locally available water pot (locally known as mog) and garden sprinkler (Zanjri) is also using by the children or woman for watering.

Sowing time management of various crops to avoid salinity

Management of sowing time can help to avoid salinity for crop production by early or late sowing of some crops to ensure yield. Some examples are given below:

Table 28: Sowing time management of various crops to avoid salinity

Crops	Favorable sowing time in saline soil	Optimum sowing time
Wheat	November 1-20	November 2nd week- December 1st week
Chick pea	before 15th November	November 15th –mid December
Tishi	Before 15 th November	Mid October-mid November
Tomato	September-November (seed bed) October-December (transplanting)	November- mid January (transplanting)
Chili	November 1- December 10	October-December

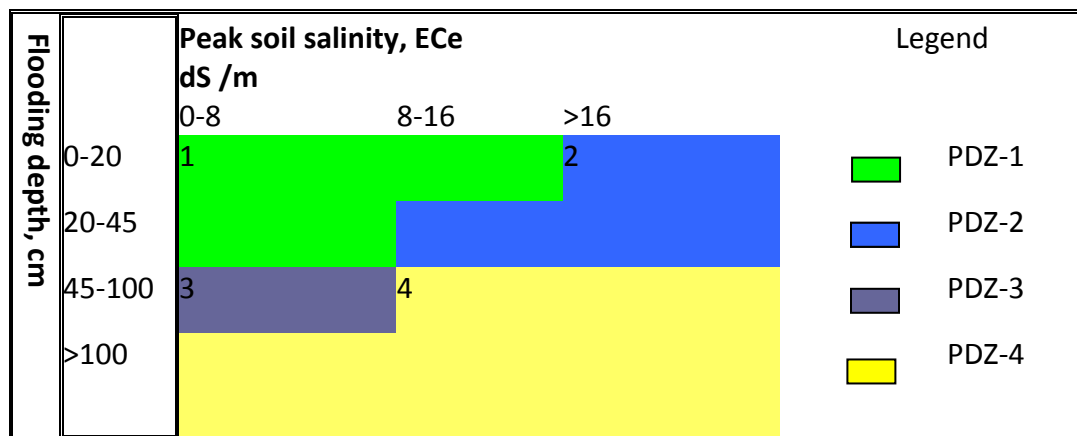
Crops	Favorable sowing time in saline soil	Optimum sowing time
Garlic	November 15-December 15	November- mid December
Onion	October (seed bed) 15th November-15th December (planting)	October
Groundnut	15th November-15th December	mid November-mid December
Soybean	November	mid December- mid January
Sunflower	1st fortnight of November	mid November- mid December
Sweet potato	Mid January	mid October-mid November
Mung	Before 31st January	Last week of January-mid February

11.3 Productivity Zones (PDZ)

Productivity zoning of crop production in the previous phases of CDSP have been tried to implement in different char areas and recommended to practice this technology with specific crops/variety in a particular flooding depth of area and salinity level. In CDSP-IV areas it is under process to identify the zoning category, intensity of salinity and flooding depth of particular area. So at present it is not possible to recommend location wise suitable crops/varieties, but in general, the previous practiced technology is given, so that extension worker at field level can use it in consultation during Farmers Forum group meeting. After construction of all water management structure, productivity zoning will be reviewed and updated based on field condition.

11.3.1 Land zoning of agriculture (General concept of PDZ)

Two variables in productivity zone; a) flooding depth and b) soil salinity



PDZ-1: Shallow flooding low to medium salinity favorable condition in all seasons

- High to medium land
- Flooding depth up to 45cm; after rain drain few hrs- 3 days (Mid Oct-mid Nov.)
- Direct seeded dibbled aus can be grown successfully
- HYV Aman have potential but late plantation may suffer from drought
- Different aman varieties may be needed for high and medium land
- In high land Rabi can be planted early but may suffer from water scarcity and salinity stress in April.

PDZ-2: “Shallow flooding, medium to high salinity”. Favorable for aman but limitations for aus and Rabi due to salinity

- High land flooded up to 20cm depth with high salinity
- Medium high land flooded 20-45 cm with medium salinity
- T. aus can be grown in medium high land
- HYV aman have potential but late transplanted aman may suffer from droughts unless late rain
- T. aus can be grown in medium high land
- Rabi crops tolerant to moderate soil salinity and less tolerant to late planting in medium land.

PDZ-3: “Medium to deep flooding, low salinity”, flooding depth limits options in all seasons suitable for short season Rabi crops

- Medium-low to low areas with low salinity water logging may continue to early December and extend to January if late rain
- Transplanted aus rice is suitable if monsoon flooding not too deep (0.45–1.0 m), otherwise aman transplanting will be hampered.
- Currently available aman HYV are not suitable
- Late planted Rabi crops in risk of water congestion at maturation
- 'Sorjan' method can be tried with summer and winter vegetables
- Pit crops can be planted with drip irrigation

PDZ-4: “Deep to very deep flooding” only suitable for tall aman varieties, boro if water is available

- Low to very low lying areas; similar hydrological conditions as PDZ 3, but longer period of water logging after monsoon
- Tall varieties of T. Aman are the only crop suited for this zone. Not possible in very deeply flooded (>1m) areas
- Boro can be grown if irrigation water is available.

CHAPTER 12: CONCLUSION

It can be concluded from the survey findings that the status of agriculture in the char areas is still lagging behind compared to other areas of the country. T.aman is almost the only crop the farmers are practicing during the rainy season at lower salinity with some traditional low yielding varieties. Some crops such as aus, summer vegetables, pulses, oil crops etc are insignificant in terms of land coverage due to constraints of high salinity, non availability of irrigation water, scarcity of inputs, lack of saline tolerant HYV, and lack of knowledge on modern technology. Cropping intensity is very low compared to the national average.

Considering all these factors of coastal chars after intervention of project activities the overall significant improvements have been taken place after two years of project period. A diversified program and activities have been undertaken for continuous improvement of agricultural development. Hence, it is expected that after implementation of all project interventions of CDSP-IV, the livelihood of the char people will improve, as it was observed in the earlier phases of the project.

ANNEX-1

CDSP-IV (DAE Part
DAE, Noakhali
Agricultural Sample Survey 2013

Date of Interview: _____

Name of Upazilla: _____

Name of Farmer: _____

Name of Char: _____

Name of Father/Husband: _____

Name of Shomaj: _____

1. Land utilization (decimal):

a) Homestead area: _____

b) Cultivated area: _____

c) Total cultivated area: _____

d) Single cropped area: _____

e) Double cropped area: _____

f) Triple cultivated area: _____

g) Net cropped area: _____

2. Name of Crop (variety and area yield t/ha) (Source of seed (✓) tick mark)

Name of crop	Local			HYV			Source of seed used	
	Variety (code)	Land area (decimal)	Yield	Variety (code)	Land area (decimal)	Yield	Own	Seed dealer
Aus								
Aman								
Rabi								
Vegetable								

3. Fertilizer use (Kg/ha)

Name of crop	Urea	TSP	MoP	DAP	Gypsum	Zinc Sulphate	Organic manure
Aus							
Aman							
Boro							
Vegetable							
Water Melon							

4. Crop wise pesticide use (put (v) tick mark)

Name of crop	Quantity		Other method use to control pests	Name of method
	Fungicide	Insecticide		

5. Use of Agricultural Equipment (put v (tick) mark)

Equipment name	Own	Hired/rental	Name of equipment	Own	Hired/rental
Country plough			Sprayer		
Power tiller			Harvester		
Tractor			LLP		

6. Use of modern technology (put v (tick) mark)

Technology	Yes	No	%	Technology	Yes	No	%
Line sowing				LCC			
Super granule				Pheromone trap			
compost				Organic insecticide			
Piercing							

7. Fruit plant/Tree in homestead area

Fruit plant	Number	Wood tree	Number	Medicinal plant	Number
Mango					
Black berry					
Jack fruit					
Papaya					
Guava					
Lemon					
Coconut					
Banana					
Palm cabbage					
Date palm					
Jujube					
Amloki					
Safota					

8. Constraints in crop production in the area

- a.
- b.
- c.
- d.
- e.

9. Recommendation for remedy

- a.
- b.
- c.
- d.
- e.
- f.

Crop wise code #

Aus (Local)	Code #	Aman (Local)	Code #	Aus (HYV)	Code #
Shaita	01	Rajashail	05	BR-14	13
Kerandol	02	Kajolshail	06	BR-21	14
Boilam	03	Gigas	07	BRRI Dhan 27	15
Khadia	04	Betichikon	08	BRRI Dhan 42	16
		Agunshail	09	" 43	17
		Nonashail	10	" 48	18
		Kalamota	11	China IRRI	19
		Dholamota	12	Others	20

Aman (HYV)	Code #	Rabi	Code #	Vegetable	Code #
BR-11	21	Soybean	31	Cucumber	44
BR-23	22	Watermelon	32	Bitter gourd	45
BRRI Dhan 39	23	Chilli	33	Okra	46
" 40	24	Groundnut	34	Country bean	47
" 41	25	Til	35	Tomato	48
" 51	26	Tishi	36	Bottle gourd	49
" 52	27	Mustard	37	Yard long bean	50
" 53	28	Sweet gourd	38	Brinjal	51
" 54	29	Felon	39	Other	52
BINA Dhan 7	30	Green gram	40		
		BRRI Dhan 28	41		
		BRRI Dhan 29	42		
		Hybrid	43		

Signature of enumerator

Name of enumerator:

Designation:

ANNEX-2: LIST OF SHOMAJ**Char Nangulia**

SL #	Name of Village/Samaj	Total HH
1	Raselgram	257
2	South Mohammedpur (7)	153
3	Hazi gram(7)	404
4	Bhuiyan gram(7)	407
5	Purba Baskhali (7)	172
6	Uttar Mohammadpur (7) Mohammedpur	216
7	Ranigram	218
8	Uttar Paschim Chowdhurygram	504
9	Mollagram	261
10	Adasha gram	418
11	Miaji gram	222
12	Mohammadpur	328
13	Nasirpur(Kaladur)	292
14	Rasulpur	172
15	Daxkin Hemayetpur	353
16	Sayedpur	335
17	Purba Faridpur	220
18	Paschim Faridpur	351
19	Purba Char Basar	178
20	Paschim Char Basar	311
21	4 No Ward (Kayum member samaj)	333
22	24 Dag Samaj(9)	225
23	90 dag	136
24	Paschim Belal bazar (9)	106
25	Haji Para/Chamber plot(9)	148
26	Naya Para(9)	97
27	Nobir Pukur(9)	197
28	Beker Bazar	201
29	Purbo Belel Bazar	93
30	Rahamatpur 200 dag	134
31	Bissapur	97
32	Islampur	151
33	Tubakathi	136
34	Selim Bazar	71
35	Rikshapara	152

36	40 dag	108
37	Iddris Bazar	400
38	Kamolar Baper dokan	62
39	Siraj koloni	47
40	Rasulpur	74
41	Akram Bazar	298
42	Kabir samaj	112
43	Purbo Rob Bazar	54
44	Kerani Bazr	44
45	30 dag	92
46	Musa samaj	144
47	50 dag	193
48	Alauddin samaj	114
49	Fakir market	104
50	Babri mosjid	63
51	Abdul Haque samaj	117
52	Obaidia samaj	184
53	Tara market	121
54	Dipty samaj	141
55	Hemayet Bazar	51
56	Berak samaj	77
57	20 dag	58
58	Al -Amin samaj	337
59	Char Noman	385
60	Paschim Char Konak	276
61	Uttar Char Mojam	88
62	Char Laxmi Mojam	155
63	Char Akram	147
64	Bazar(Akram) samaj	137
65	Chon Khola	224
66	Char Jamil	117
67	Hazrat Ali samaj	158
68	Alimpur	105
69	Dakkin Char Noman	118
Total of Nangulia		12954

Noler char

SL #	Name of Village /Samaj	Total HH
70	Daxkin santipur	237
71	Paschim Adarshagram(ChanandiBazar)	274
72	Purba Majlishpur	305
73	Daxkin Mojlishpur	330
74	Mid. Mojlishpur	161
75	Maddah Musapur	164
76	Uttar Musapur	220
77	Uttar Majlishpur	142
78	Daxkin musapur	98
79	Aladingram (Ziabazar)	255
80	Rasulpur (Hridoy bazar)	171
81	Islampur	232
82	Mannan Nagar	324
83	Mollahgram	120
84	Al-Amin Samaj	215
85	Thanarhat	95
86	Purba Adarshawgram	111
87	West Adarshawgram(Ghat)	165
88	Purba Adarshawgram(Champaghat)	102
89	Uttar Azim Nagar	195
90	West Adarshawgram(Daspara)	234
91	Rahmatpur	381
92	Project Phar(Sabnaj Mosjid))	208
93	Tomij pur	166
94	Maddah Shantipur	163
95	Uttar shantipur	225
96	South Azimnagar	160
97	East Azimnagar(Madrassa Bazar)	140
98	South Azimnagar(Mohammadpur)	157
Total of Noler Char		5750

Caring char

SL #	Name of Village /Samaj	Total HH
99	Mohammadpur	122
100	Batankhali	172
101	Rasulpur	116
102	CDSP Gram	60
103	Krisna Nagar	252
104	Mollah gram	189
105	Dhansheri	102
106	Motipur	152
107	East Adarshawgram	228
108	Chowdhurygram	161
109	Jagannathpur mondir(W Adarshagram)	116
110	Shahebani	102
111	Moulvigram	106
112	Mollah gram	42
113	Islampur	224
Total of Caring Char		2144

Char Ziauddin

SL #	Name of Village/Samaj	Total HH
114	Polder	187
115	Shahabuddin	201
116	Lalkhalu	125
117	Shafineta	183
118	Abdur Rob	96
119	Rahamatpur (9Tikkerkhal)	140
120	Hossain Miah	158
121	Idris mazi	159
122	Chowdhury Mazi	186
123	Mostafa	130
124	Mohammadia	188
125	Sheraj Maji	68
126	Ziar Bazar	359
Total of Char Ziauddin		2180

Urir char

SL #	Name of Village/Samaj	Total HH
127	7 No. Digi	64
128	Saiketpara	240
129	Forest office para	150
130	Kolony para	457
131	Islam Member para	213
132	Thana para	330
133	Bangla Bazar	241
134	Janata Bazar	393
Total of Urir char		2088
Grand Total of 5 Chars		25116