GOVERNMENT OF THE PEOPLE'S REPUBLIC OF BANGLADESH

LOCAL GOVERNMENT ENGINEERING DEPARTMENT

ANNUAL EFFECT MONITORING AND EVALUATION REPORT

2013 - 2014

Small Scale Water Resources Development Project
in Greater Mymensingh, Sylhet and Faridpur Areas

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SMALL SCALE WATER RESOURCES DEVELOPMENT PROJECT
in Greater Mymensingh, Sylhet and Faridpur Areas

Acronyms

BADC	Bangladesh Agriculture Development Corporation
BFRI	Bangladesh Fisheries Research Institute
BME	Benefit Monitoring and Evaluation
BWDB	Bangladesh Water Development Board
CAD	Command Area Development
DAE	Department of Agriculture Extension
DD	Detailed Design
DI	Drainage Improvement
DLIAPEC	District Level Interagency Project Evaluation Committee
DLS	Department of Livestock Service
DoF	Department of Fisheries
EIA	Environmental Impact Assessment
EIRR	Economic Internal Rate of Return
EME	Effect Monitoring and Evaluation
FM	Flood Management
FMD	Flood Management and Drainage
FS	Feasibility Study
FSDD	Feasibility Study and Detailed Design
FY	Fiscal Year
GoB	Government of Bangladesh
ICM	Integrated Crop Management
IEE	Initial Environmental Examination
IPM	Integrated Pest Management
IWRMU	Integrated Water Resources Management Unit
JICA	Japan International Cooperation Agency
LCS	Labour Contracting Society
LGD	Local Government Division
LGED	Local Government Engineering Department
MIS	Management Information System
NGO	Non-Governmental Organization
O&M	Operation and Maintenance
PMO	Project Management Office
PRA	Participatory Rural Appraisal
PSC	Project Steering Committee
RDA	Rural Development Academy (Bogra)
SP	Subproject
SRDI	Soil Resources Development Institute
SSW-1	Small Scale Water Resources Development Project-1 (1996-2002)
SSW-2	Small Scale Water Resources Development Project-2 (2002-2009)
SSW-3	SSWRD Project in Greater Mymensingh, Sylhet & Faridpur (2009-2015)
SSW-4	Participatory SSWRD Project (2010 - 2016)
UDCC	Upazila Development Coordination Committee
UP	Union Parishad
WC	Water Conservation
WMCA	Water Management Cooperative Association

FARM CATEGORIES

Land Holding		Farm Category
(ac)	(ha)	
<0.01	< 0.01	Landless
0.01 – 0.49	0.01 - 0.19	Marginal Farmer
0.50 – 2.49	0.20 – 1.00	Small Farmer
2.50 – 7.49	1.01 – 3.03	Medium Farmer
>7.50	>3.03	Large Farmer

LAND CATEGORIES

Depth of Monsoon Flooding		Land Category
(m)	(ft)	
0	0	Highland
0-0.9	0-3	Medium Highland
0.9-1.8	3-6	Medium Lowland
1.8-3.0	6-10	Lowland
>3.0	>10	Bottom Land

SUBPROJECT TYPES

Subproject Type		Typical Works
CAD	Command Area Development	Development of existing irrigation schemes by providing better water distribution systems (improved canal network, lining of canals, installation of buried pipelines, installation of control structures, etc.) to extend the irrigated area
DR	Drainage	Re-excavation of drainage channels (khals) to increase the capacity of drainage systems to benefit agriculture as well as fisheries and local navigation
FM	Flood Management	Rehabilitation and / or construction of embankments and / or sluices / regulators to reduce the extent and duration of flooding of farmland
WC	Water Conservation	Development of the water retention capacity of existing haors, beels, and channels to increase availability of irrigation water by installing water retention structures and by re-excavating the bed of water bodies and channels
FMD	Flood Management & Drainage	Combinations of the above - there are many different possible combinations
FMWC	Flood Management & Water Conservation	

CONTENTS

Annex A: Tables

I. INTRODUCTION

A. Document Purpose

1. The purpose of the annual Effect Monitoring and Evaluation (EME) reports is to document the changes in agriculture and fisheries production that have occurred as a result of the investments in water management infrastructure in subprojects completed under the Small Scale Water Resources Development Sector Projects. Efforts are also made to provide some insight into the overall institutional strength of the respective water management cooperative associations and the operational status of these subprojects.

2. The current Project, SSW-3 in Greater Mymensingh, Sylhet and Faridpur Areas monitors subprojects using the same monitoring framework[1] used for the SSW-1 and SSW-2 projects of ADB. This is the second SSW-3 EME report and is prepared after completion of the first 83 subprojects. In total development of 235-250 SPs is planned under the Project (revised DPP, 2013).

3. Separate from the annual EME reports Impact Assessment studies are carried out to determine longer term impacts of the subproject investments. These comprise two major steps, a Baseline Survey for 20 subprojects and then the actual Impact Assessment carried our 5 years after the completion of the subprojects. The Baseline studies and reports were completed in 2012 and 2013[2].

B. Data Collection

1. Subprojects and Period Covered

4. This 2nd EME report report is for the first 83 subprojects to be completed. Preparation of these subprojects started from April 2009. Construction works were completed by March 2013, except for some subprojects for the WMCA offices.

5. The data used in this EME refers to the following periods:

i. Construction Costs	• Engineers Estimate: 2010-2011 and 2011-2013 LGED Schedules of Rates • Contract Amounts: tendered amounts in 2010/11; 2011/12 and 2012-2013
ii. Institutional data	• As of April 2014
iii. Agricultural data	• Rabi (winter) crop: December 2012 to March 2013 • Pre-monsoon (Kharif I): April to July 2013 • Monsoon (Kharif II): July to November 2013
iv. Fisheries data	• To end 2013
v. Operation and Maintenance data	• As of April 2014

[1] A suite of Guidelines is expected to be prepared over the next 2-3 years for SSWR development and is expected to include for improved monitoring and grading assessments as part of maintenance support and performance enhancement, along with improvements to the MIS system. If implemented these additional data will considerable strengthen the EME reports, particularly the institutional and operational performance assessments.

[2] The final baseline synthesis (summary) report was submitted in November 2013. Baseline reports for the 20 individual subprojects were submitted over several months from late 2012.

6. Details of subproject location, area and type are given in **Table A-1** and summarised below. Twenty seven of the subprojects are *"non-regulatory*", ie infrastructure works comprise just khal excavation and / or embankment strengthening, while fifty four are "*regulatory"* with investments in (gated) water management structures as well as earthworks, and two are CAD (buried pipe irrigation system) types. The category and type of subproject has implications for operation and maintenance.

Category of SP	Type of SP	Nr	Area (ha)	Avg Area (ha)	Cost (Tk million)		Unit Area Cost	
							Tk /ha	US$/ha
CAD	CAD	2	960	480	61.9	61.9	64,500	806
Regulatory (Gated)	WC&CAD	1	540	540	19.8	912.3	36,700	458
	FMD&WC	12	6,680	557	236.3		35,400	442
	WC	9	3,712	412	176.5		47,500	594
	FM	2	1,334	667	25.3		18,900	237
	DR&WC	13	8,445	650	200.6		23,700	297
	FMD	13	5,667	436	183.0		32,300	404
	FM&WC	3	1,545	515	51.9		33,600	420
	FMD&IRR	1	800	800	18.9		23,700	296
Non-regulatory (no gates)	DR&IRR	20	10,872	544	178.2	235.6	16,400	205
	DR	7	4,365	624	57.4		13,200	164
Totals		**83**	**44,920**	**541**	**8**	**1,209.8**	**26,933**	**337**

2. Operation and Maintenance Data

7. O&M training for LGED district and upazila staff and for the WMCA committee / O&M sub-committee members started in May 2013. No O&M data for individual subprojects are available for this report.

8. It is envisaged that O&M data will first be prepared by the WMCAs with the assistance of the Assistant Engineer and the Upazila Engineers, and then forwarded to LGED's IWRM Unit through the district Executive Engineers. All data will then be entered in the Project's MIS.

3. Institutional and Related Data

9. Institutional and related data were obtained from reports submitted by the Community Participation Officers based in each district, and also by the project consultant's institutional development staff.

4. Agriculture Data

10. Agriculture data for the three cropping seasons: (i) winter season (2012-2013), (ii) Kharif I 2013, and (iii) Kharif II 2013 was collected by the SSW-3 Agriculture Facilitators posted at district level. In some cases the Department of Agricultural Extension field officers, the Sub-Assistant Agriculture Officer were also consulted.

5. Fisheries Data

11. Fisheries data for 2013 were collected and submitted by the SSW-3 Fisheries Facilitators. The fisheries data base is rather weak. These data are probably among the most difficult to collect. Another problem is the lack of a reliable baseline (pre-Project) for fisheries data.

C. Capital Investment Costs

12. The capital investment cost for each subproject varied from Tk 35.6 million for SP33053 Lunglia Chara in Moulavibazar to just Tk 2.3 million for SP32016, Mamudpur-Jikarbari in Gopalganj, and averaged Tk 14.6 million (US$ 182,200 / subproject).

13. SP33053 Lunglia Chara is a water conservation (regulatory) type of subproject and the high costs are due to four rather large water retention structures as well excavation of two khals. By contrast SP32016, Mamudpur-Jikarbari is a drainage & irrigation (non-regulatory) subproject where only khal excavation works were carried out.

14. About 64% of the investment cost was for water management structures (and WMCA offices where these were provided) constructed by professional contractors. The remaining 36% of the investment cost was for earthworks, both khal excavation and embankment strengthening, and was done by LCS groups, see **Table A-1**.

15. LCS works used to be wholly carried out manually by locally employed (usually landless) men and women. However in recent years, and for bulk excavation of large volumes of soil, excavators are also being used.

16. WMCA Offices have been built[1] for 70 of the 83 subprojects, where land was made available. In other subprojects rented buildings are used by the WMCAs.

17. Unit area construction costs varied from Tk 6,670 / ha to Tk 118,700 / ha (US$ 83 – 1,480 / ha) and averaged Tk 26,900 / ha (US$ 337 / ha).

18. The construction cost of the 54 regulatory subprojects was Tk 912.3 million, with unit costs varying from US$ 237 to 594 / ha. These subprojects make up 75.4 percent of the investment to date. Good gate operation is required to make the most of the regulatory structures.

19. The construction cost of the 27 non-regulatory subprojects was just Tk 235.6 million, with unit costs varying from US$ 164 to 205 / ha. These subprojects make up 19.5 percent of the investment to date. These are the cheapest type of subprojects as they have no regulatory (gated) structures, however their long term effectiveness depends maintenance of the earthworks, in particular removal of sediments from channels.

20. The construction cost of the two regulatory subprojects was Tk 61.9 million, with unit costs averaging US$ 806 / ha. These subprojects make up just 5.1 percent of the investment to date. To be effective intensive training and support for operation is required, including support for WMCAs to procure pumps.

[1] Some of the offices are still under construction, May 2013

II. INSTITUTIONAL PERFORMANCE ASSESSMENT

A. Membership and Capital Funds

21. Membership and the accumulation of capital funds is reviewed over time and the current position for the 83 completed subprojects is tabulated in **Table A-2** and subproject averages are given below:

- Area: 541 ha
- Number of beneficiary households: 459
- Number of members per subproject: 331 (male) and 91 (female)
- Capital funds per subproject: Tk 133,500 (US$ 1,670)
- Capital funds per member: Tk 306 (US$ 3.83)
- O&M funds collected per subproject: Tk 223,700 (US$ 2,796), 99.5% of target
- O&M funds collected per member: Tk 667 (US$ 8.34)

22. Capital funds include: (i) *shares* – each member is required to buy a minimum number of shares at a fixed price per share; (ii) *savings* – any member may save money with the WMCA capital account thereby increasing his / her shareholding, interest accrues according to the number of shares held; and (iii) *other* – for example donations from interested party or sale of communal assets. The proportion of capital funds from *shares*, *savings* and *other* is as follows:

- Savings: Tk 79,352 / SP (59.4%)
- Shares: Tk 38,665 /SP (29.0%)
- Other: Tk 15,484 / SP (11.6%)
- Total: Tk 133,501 / SP (100%)

23. Capital funds are available for use by members who wish to take out small loans. At the end of March 2014, micro-credit had been initiated in just fourteen of the 83 completed subprojects and data for these is given in **Table A-3**.

For these fourteen subprojects the total loan amount disbursed averaged Tk 317,830 / subproject (US$ 3,973), of which Tk 157,000 (49%) had been repaid. Borrowers were mostly men (80%), and the average loan amount was Tk 8,600 (US$ 108) to 517 borrowers.

24. Interest rates on loans are typically 15% / year, made to individuals and / or small groups and paid back within 12 months.

25. It is too early to draw conclusions concerning WMCA and subproject sustainability – this will depend on O&M activities as well as membership, saving trends and micro-credit activities.

B. Poverty Reduction

26. LCS earthworks for khal excavation and embankment strengthening are intended to provide employment opportunities to rural poor, men and women. For the 83 completed subprojects the LCS investment averaged 5,219,000 / subproject (US$ 65,200). Over the years the use of excavators for large, bulk excavation has gradually increased, with labour being used to spread and compact the excavated material and dress side slopes. Nonetheless LCS works remains a valid pro-poor way of implementing earthworks works.

27. After construction poor / destitute women are often engaged to plant and take care of tree saplings on embankments and / or along khals.

28. Longer-term and more sustainable employment will result from infrastructure maintenance activities, from increases in agriculture production, and from increases in fish production.

C. Skill Development, Empowerment and Income Generating Activities

29. Skill development and empowerment play an important role in providing individuals with better control over their economic and social environment. Skill development is related to the training for resource management (agriculture and fisheries) that is provided by the Project. Empowerment comes through the networks that are established for, by, and on behalf of the local stakeholders with various government and non-government agencies. These include linkages to support income generating activities.

30. Farmers are provided with training on improved agriculture practices, integrated pest management, and so on. This translates into increased production, which increases farm incomes and generates employment. The Project also provides training to fishers to extend skills related to pond aquaculture, establishing and operating nurseries and so on. While much of these trainings are for men, the Project includes women in many of the courses, for example for seed production and establishment of homestead gardens.

31. To ensure that women benefit from the Project, special trainings are arranged for women with a focus on Income generation. The categories of income generating activities that have been supported by the Project are tabulated below, and comprised: (i) livestock, poultry, vegetable gardening and fish cultivation for women; (ii) tailoring; and (iii) handcrafts.

Category of Training	No. of Batches	No. of SPs	Duration	No. of Participants	Trainee Days	Impact Assessment Grading*			
						Very Good	Good	Moderate	Poor
Training on small-livestock, poultry, vegetable gardening & fish cultivation	11	22	3 days	254	762	20	83	136	15
Training on Tailoring	08	09	25 / 30 days	104	2,660	5	40	50	09
Training on handicrafts (Nakshi-kantaha)	02	03	7 / 30 days	41	620	-	10	14	17
Training on handicrafts (Candle making)	01	01	10 days	10	100	-	-	-	10
Total	22	35		409	4142	25 (6%)	133 (33%)	200 (49%)	51 (12%)

**Very Good- average monthly income tk. 10,000 to above*
**Good- average monthly income tk. 5000 -10,000*
**Average- average monthly income tk. 500-4,900*
**Poor- not in work*

32. Out of 104 participants who attended tailoring training, 100 participants purchased new sewing machines (cost around tk. 6000) using their training / own money and also by taking loans from the WMCA.

33. Of these the greatest success was for small livestock, etc, and tailoring as the majority of the participants for these categories subsequently reported good / moderate monthly incomes as a result. Handicrafts were less successful, in particularly candle making was not successful.

34. The IGA training has multiple positive impacts which are not quantified, for example:

- Ensuring food deficiency of their family members,
- Earning money by making dresses, selling vegetable, eggs, chicks etc,
- Changing attitudes / views, growing self-confidence and establishing control over their income, and
- Establishing savings like operating Deposit Pension Schemes (DPS), initiated life insurance.

III. AGRICULTURE PERFORMANCE ASSESSMENT

A. Introduction

35. The crop information presented are for: (i) Rabi or winter crop season (December 2012 through March 2013); (ii) Kharif 1 or pre-monsoon crop season (April 2013 through July 2013); and (iii) Kharif 2 or monsoon crop season (July 2013 through November 2013). The assessments covered those subprojects substantially completed / constructed prior to the onset of each of these crop seasons, and were 48 for winter, 78 for pre-monsoon and 83 for the monsoon season.

B. Land Use and Incremental Crop Production – Summary

36. Incremental production during this period was estimated at 31,536 tons for cereals, and 14,432 tons for non-cereals from a net cultivated area of 45,246 ha. Incremental cereal cropped area was 2,933 ha and non-cereal cropped area was 3,002 ha. On average, the annual cropping intensity in the 83 subprojects increased by 13 percentage points from 116 to 129 percent (see **Table A.4**).

37. The table below provides a summary of the changes in crop production. The data show that cereal and non-cereal production increased in all three crop seasons. Cereal crop production increased in 48 subprojects in the winter season, in 34 subprojects in the pre-monsoon season and in 76 subprojects in the monsoon season. The non-cereal crop production increased noticeably in more subprojects in the pre-monsoon season. Expansion of jute and vegetable growing area is attributable mainly to drainage improvement and water conservation. Nevertheless, the Project's investment for flood management, drainage improvement, water conservation, and command area development contributed to an increase in both cereal and non-cereal crop production in the subprojects monitored in 2013.

Production Changes (Number of Subprojects)

Change	Winter (2012 – 2013)*		Pre-Monsoon (2013)*		Monsoon (2013)*	
	Cereal	Non-Cereal	Cereal	Non - cereal	Cereal	Non-cereal
Decrease	1	1	10	4	1	2
No change	0	5	36	5	4	37
Increase	47	42	32	69	78	44
Nr of SPs	48		74		83	

*: No. of subprojects taken into account in the analysis was 48 in the winter, 74 in the pre-monsoon and 83 in the monsoon seasons.

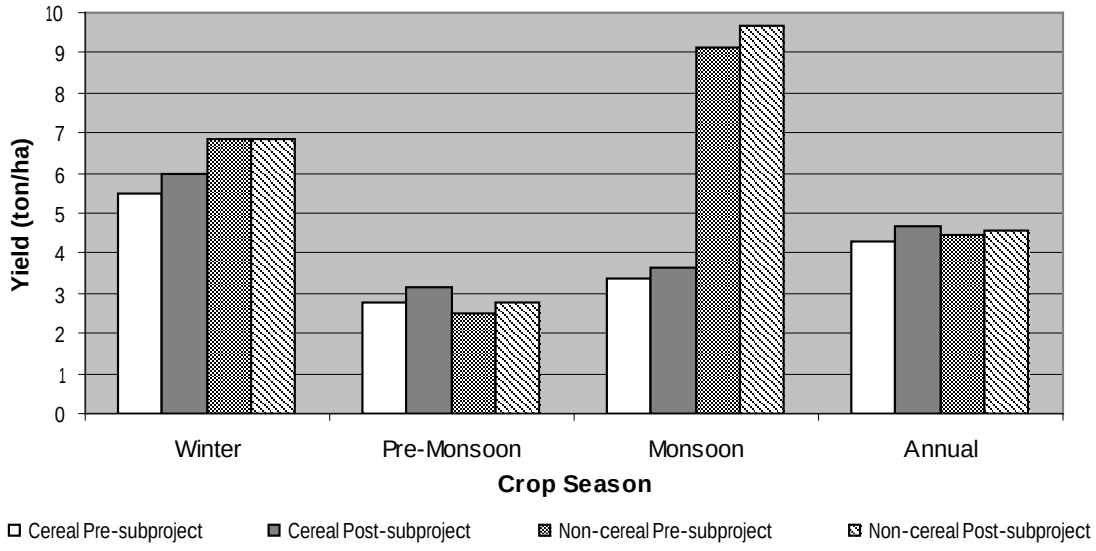
38. Crop production increased in all three seasons (Figure 1). The increment was higher in the winter and monsoon seasons. Overall for the year, cereal crop production increased in 80 subprojects. Replacement of rice with vegetable or jute and changes in crop variety reduced cereal production in 3 subprojects. In 77 of the 83 subprojects increase in both cereals and non-cereals production were recorded. In 5 subprojects there was no change in non-cereal production. Among these the crop production assessment was initiated in 2 subprojects in the monsoon season when heavy rainfall restricts non-cereal crop cultivation and 3 subprojects are in low-lying haor areas. Non-cereals production fell in a subproject due to the decrease in sugarcane growing area.

39. Crop area also increased in all three seasons. In the Kharif 1 (pre-monsoon) season cropped area remained relatively low (Figure 2). Cereal cropped area increased in 67 subprojects, decreased in 15 subprojects and remained the same in 1 subproject. The non-cereal cropped area increased in 75 subprojects. No change was reported in 5 subprojects which were assessed from the monsoon season or in low-lying haor area. These subprojects were Drainage and Water Conservation (DR&WC) or Flood Management, Drainage and

Water[39.] Conservation (FMD&WC) types. Non-cereal crops were not grown in these subprojects in the monsoon season in the pre-subproject period. Farmers in these subprojects may attempt to grow non-cereal crops in the monsoon season, if drainage of floodwater improved or their lands are completely flood free. Non-cereal cropped areas reduced in 3 subprojects with a decrease in jute cultivation. The subprojects are in Jamalpur and Habiganj where heavy rainfall during plantation time may have restricted jute cultivation on relatively low-lying areas.

40. Cereal crop yields increased in all crop seasons (Figure 3). The increase in cereal crop yield was more in the winter season due to better irrigation and fertilizer management. The non-cereal crop yield increased more in the monsoon season due mainly to the cultivation of vegetable with drainage improvement, water conservation and flood management and improved crop management.

Figure 3: Changes between Pre- and Post-subproject Crop Yields



41. Command area development and combinations of flood management and water conservation subprojects had the most impact on cereal crop yield levels in the winter season as shown in the following table. These types of subprojects provided adequate water for irrigation and protected crops from early flooding. The engineering improvements enabled farmers to plant vegetable, spice and oilseed crops timely, irrigate the crops and protect them from flooding.

42. Drainage improvement and water conservation increased jute yield in the pre-monsoon season. Drought stress at the early growth stage reduced jute yield in greater Faridpur area. Many jute growers in subprojects in this area now benefit from water conservation.

43. Cereal and non-cereal crop yields in the monsoon season increased for the flood management, drainage improvement and supplementary irrigation. Plantation of deepwater rice over a greater area, replacement of local varieties with high-yielding varieties of transplanted aman rice and vegetable cultivation with drainage improvement and irrigation water availability were reported in Gopalganj and Shariatpur districts. Drainage improvement allowed farmers to plant vegetable, spice and oilseeds crops timely in the post-monsoon period. Changes in type of crop, such as replacement of sugarcane by vegetables, spice and pulse crops reduced average non-cereal yield in some subprojects areas.

Incremental crop Yield by Subproject Type (ton/ha)

Subproject		Winter (2012-2013)		Pre-Monsoon (2013)		Monsoon (2013)		Total	
Type*	No	Cereal	Non-Cereal	Cereal	Non-Cereal	Cereal	Non-Cereal	Cereal	Non-Cereal
CAD, CAD&WC/ DR	3	0.84	0.33	0.67	0.08	0.19	0.28	0.48	0.15
WC	9	0.65	**2.72**	0.47	**1.89**	0.19	1.81	0.40	1.48
DR&WC	13	0.29	-0.98	-0.27	0.34	**0.42**	4.67	0.32	-0.01
DR&IRR	21	0.42	0.30	0.67	0.22	0.19	**2.17**	0.27	0.28
FM	2	0.61	0.40	-	0.34	**0.49**	0.25	0.61	0.25
FM&WC	3	**0.95**	**0.67**	0.32	**1.22**	0.03	-1.65	0.41	0.68
FMD	12	0.47	**2.41**	0.28	0.27	**0.47**	-3.88	0.47	1.03
FMD&WC	13	0.72	0.20	0.31	0.34	0.32	1.16	0.47	1.08
DR	7	0.56	**1.29**	0.41	0.13	0.25	0.02	0.38	0.65
Weighted Average	83	0.51	0.01	0.35	0.30	0.30	0.56	0.39	0.10

* WC – Water Conservation, CAD – Command Area Development, DR – Drainage, FM – Flood Management, and IRR – Irrigation.

44. Improvement in irrigation water supply in command area development subprojects (CAD, CAD&WC and CAD&DR) increased cereal crop yield more than of non-cereal in the winter and pre-monsoon seasons. It has less impact on the crop yields in the monsoon season.

45. For many subprojects timely plantation, irrigation water availability, protection of crop from flooding and improved crop management increased crop yields in the subproject areas.

C. Winter Season (2012 – 2013)

46. In the 48 subprojects assessed in the winter season, the production of cereals increased by 17,410 tons and non-cereals by 5,810 tons. The incremental winter cereal accounts for the largest contribution to the total production increased in 2013. The cereal and non-cereal cropped areas in this season increased by 1,161 ha and 844 ha, respectively. The production increases represent an increase of 16 percent and 27 percent, respectively over the pre-subproject production. **Table A.5** provides the data by subproject.

47. Major reasons that contributed to the improvement of crop production in the subprojects areas in this season were increases in irrigated areas due to more water retained in the re-excavated khals, increase in residual soil moisture, conservation of seepage water for recycling, expansion of single lifting irrigated area, improved water use efficiency, timely transplantation of rice crops, early drainage allowing non-rice crop plantation, increase in irrigated crop areas and yields, decrease in pest infestation early for transplantation, adoption of improved farming technology and crop protection from inundation which was due to poor drainage of rainwater.

48. The positive impact on the winter season production is most likely only partly due to the physical infrastructure provided under the Project. Cereal cropped areas increased in 47 subprojects and non-cereal cropped areas increased in 42 subprojects in this crop season. Yields levels of cereal crops increased in 47 subprojects and non-cereal crops in 37 subprojects due to post-monsoon water retention. A secondary impact of water retention may have been increased residual soil moisture. This supported plantation of non-cereal crops after the harvest of aman rice in the monsoon season. Conjunctive use of surface water and ground water was found to have a positive effect on crop establishment as well as yield. This was most common in the subprojects in Faridpur and Mymensingh areas. Crops were initially irrigated using surface water pumped from the re-excavated khals and then groundwater was used. This resulted in proper growth and increased yields while minimizing (pumping) costs. There were also a number of subprojects wherein drainage improvements facilitated increases in the area cropped, specifically area under non-cereals because planting could be completed earlier in the winter season.

49. In Pudda Khali Khal FMD project, SP33045, in Netrokona district expansion of vegetable growing area reduced cereal production during winter season.

50. More vegetables, wheat and rice production replaced sugarcane due to improved availability of irrigation water from water conservation in the khal reduced total non-cereal production in Machpara-Lakshmandia DR&WC subproject, SP 33064, in Rajbari district.

51. Drainage improvement and water conservation increased crop areas and yields in 41 subprojects.

52. Drainage improvement contributed to an increase in the high-yielding variety (HYV) boro growing area in 36 subprojects. Deepwater rice cropping reduced in favour of the more HYV boro crop production in 13 subprojects in the Greater Faridpur area. Drainage

improvement enabled an increase in non-rice production in the winter season. In most subprojects vegetable, oilseed and pulse crops cultivation increased.

53. Water conservation in the khal diversified crop production with cultivation of vegetable, onion, mustard and lentil. More water availability inspired farmers to increase irrigated crop area in Shomschura Ranjana Khal WC subproject, SP31005, in Sherpur district. The WMCA collected irrigation fees at the rate of Taka 1,500 per acre from 110 water user farmers. In Talbaria Beel FMD&WC subproject, SP 32014, and Nimtala DR&WC subproject, SP 32015, in Rajbari district seepage water conservation increased irrigation water availability for rice and non-rice crops. In Bansgari WC subproject, SP 32020, in Madaripur district more water availability in the khal increased the single lifting irrigated area. This has reduced irrigation (pumping) costs by about 40%, diversified crop production with cultivation of more mustard and pulses. According to an irrigation water supplier, he required 22 barrels (200 liters/barrel) of diesel to irrigate 50 to 65 acres of land before the subproject implementation. In 2013 he procured 14 barrels of diesel to irrigate the same area.

***Box 1**:*
Assuming a pumping efficiency of 50 m3 water / l of fuel, then 22 barrels of fuel (200 l/ barrel) gives a volume of 220,000 m^3. Spread over 60 acres, this equates to 0.91 m (1 acre = 0.4047). Using just 14 barrels of diesel indicates that just 0.58 m was pumped.

54. Adequate irrigation increased crop yields. Similar benefits were also reported in Phuleswari FMD subproject, SP32030, in Kishoreganj district. In Bapail Beel DR&WC subproject, SP 33048, in Mymensingh district more than 50 LLPs were installed along the khal embankments and operated until mid-February. Later DTW were used for irrigation. This conjunctive use of water helped farmers reduce irrigation (pumping) costs.

55. Agriculture training and extension services provided by DAE, DLS, SRDI and RDA and quality seed supply by BADC supported adoption of improved crop production technology. These included demonstrations on improved irrigation water management methods such as alternate wet and drying (AWD) in boro crop fields and mixed cropping; training on fertilizer management and application methods, soil resource management, crop yield gap reduction and livestock disease management; determination of nutrient contents of the soil and recommendations of fertilizer application rates; motivation on LCC use; supply of rice, wheat, vegetable and pulse seeds of improved varieties, fodder seedlings, new breeds of duck and poultry; support for establishment of tree plants nursery and poultry farm; and vaccination of livestock animals and poultry. The agriculture training and extension activities motivated subproject farmers to improve cultivation methods, use quality seeds, adopt seed treatment using organic method and seedbed management; irrigation planning, balanced and organic fertilizer use, mixed cropping such as potato and maize, inter-cropping between aman and boro rice crops, early vegetable production, IPM practice, organic pesticide use, grafting of fruit seedlings, homestead vegetable production WMCA woman members, production of quality seeds, seed preservation using improved method, and orchard development.

56. The Project has helped in developing farmer capability and linkage between WMCAs and the DAE, SRDI, DLS through agriculture production planning and on-farm activities on agriculture resources management and sustainable agriculture production.

D. Pre-Monsoon (Kharif I) Season (2013)

57. The pre-monsoon cereal production increased by about 1,114 tons and the non-cereal production by about 6,942 tons in the 78 subprojects assessed in this season. This represents an increase of more than 16 percent for cereal and about 62 percent for non-cereal crop production in the pre-monsoon (Kharif I) season. The incremental pre-monsoon

non-cereal accounts for the largest contribution to the total non-cereal crop production increase in 2013. The cereal cropped area increased by 64 ha while non-cereal cropped area increased by 1,999 ha in this crop season. **Table A.6** provides data by subprojects.

58. Major reasons that contributed to the improvement of crop production in the subprojects in this season included the: (i) opportunity to plant jute, deepwater rice and vegetables with drainage improvement; (ii) improved availability of water in the re-excavated khal for irrigation at planting stage; (iii) protection of crop during early growth stages by improved flood control; (iv) cultivation of short duration boro rice variety in the winter allowing jute plantation following the harvest of the boro crop; (v) sowing of deepwater aman rice in jute fields allowing the rice crop to grow after the harvest of jute, and so on.

59. Land use for cereal crop cultivation in the pre-monsoon season was limited in the subproject areas. Aus rice was reported to be cultivated in 42 subprojects. This included a subproject where Aus rice production actually decreased. The Aus rice growing area was less than 1 to 19 percent of the cultivated land in 34 subprojects and between 29 to 78 percent in 8 subprojects. The maximum area under Aus rice was reported in a subproject in Moulvibazar district.

60. Cereal production in this season reduced in three subprojects due to an increase in jute and vegetable cultivated area and replacement of Aus rice to cultivate boro rice in the winter season.

61. The non-cereal cropped area increased in 63 subprojects and reduced in 6 subprojects. Re-excavation of khals and construction of water retention structures favourably impacted non-cereal crop production during the pre-monsoon season. This resulted in an increase in area planted to jute, deepwater rice, vegetables and spice crops. In a number of subprojects in the Greater Faridpur area drainage improvement increased jute and spice growing areas.

62. In those subprojects where non-cereal production declined in the pre-monsoon season, there was a decrease in vegetable, spice and jute growing area. Instead of jute, HYV Aus rice was grown with irrigation at the early growth stage.

63. Jute cultivation increased in subprojects in Faridpur, Gopalganj and Madaripur districts. Spice growing area in the pre-monsoon season increased in Rajbari and Gopalganj. Vegetable cultivation in this season also expanded in subprojects in Gopalganj and Rajbari as well as in Mymensingh.

64. In Basan Beel FMD subproject, SP 32036, and Barasila DR&WC subproject, SP32025, in Tangail district farmers cultivated short duration (140-day) boro rice variety (BR28) in the winter season, and then planted jute in the pre-monsoon season following the harvest of the boro crop. Drainage improvement in the pre-monsoon season provided this opportunity. Drainage improvement in the pre-monsoon increased jute and spice planted areas in the Baneswardi CAD subproject, SP33059, in Faridpur district. Farmers planted deepwater aman seed sown in jute crop fields taking advantage of drainage improvement. After the harvest of jute in July the deepwater aman continues to grow until mature in October.

65. DAE supported project efforts with quality seed production on farmers level, demonstrations on seed production under the Jute Seed Production Project, balanced fertilizers use, training on jute crop management and jute retting and motivation on use of improved technology for deepwater aman rice cultivation, vegetable production, soil management and quick compost preparation.

E. Monsoon (Kharif II) Season (2013)

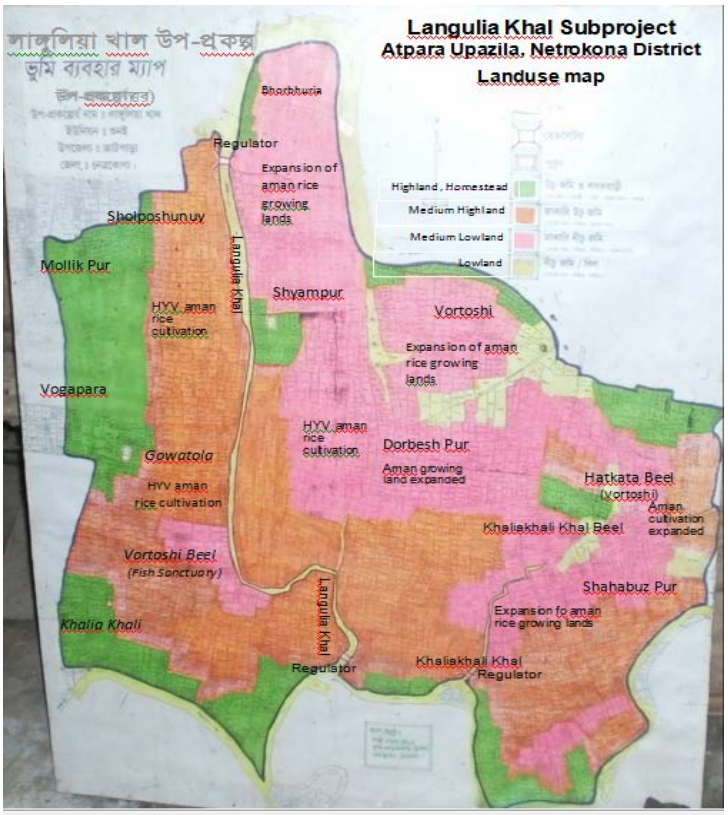
66. In the 83 subprojects, the production of monsoon season cereals increased by 13,012 tons and the production of non-cereals by 1,681 tons. This represents an increase of 18 percent and 69 percent, respectively over the pre-project production. These incremental rates were the highest among the three crop seasons. The cereal cropped area increased by 1,768 ha and non-cereal cropped area by 158 ha in the monsoon crop season. **Table A.7** provides the data by subproject.

67. Much of the increase in crop production in this season was attributable to drainage improvement as well as floodwater control. This allowed timely plantation, use of HYVs, providing of supplementary irrigation, and use of more land for crop production.

68. The cereal cropped increased in 78 subprojects, remained the same in 4 subprojects and decreased in one subproject due to cultivation of rice over a smaller area. Non-cereal crops were grown in 47 subprojects and cereal crops replaced non-cereal crops in one subproject. The area under non-cereal crops increased in 43 subprojects, remained the same in three subprojects and decreased in one subproject. Cereal production increased in 78 subprojects and non-cereal production increased in 44 subprojects.

69. A large improvement in crop production in the monsoon season was reported in Langulia Khal FM&WC subproject, SP 32010, in Netrokona district. Flood management and water retention provided the opportunity to grow transplanted aman crop and use HYV in five villages in this subproject area. Drainage of floodwater, timely transplantation and supplementary irrigation contributed to the expansion of aman growing area as well as increase in yields. As a result transplanted aman rice production increased considerably.

70. A similar benefit was reported in Goilla Beel FMD subproject, SP 33042, in Tangail district. Aman production increased with HYV adoption in low-lying areas due to drainage improvement. The Samotkur, Dayarambari, Pirpur, Charabhanga and Hajorbari villages benefited from the drainage improvement. Aman rice was transplanted as early as in July. In pre-subproject period farmers transplanted late in September due to poor / delayed drainage. Timely transplantation increased yield levels. For example, Md. Hafizuddinn in Samotkur village could produce 1.04 to 1.40 ton per acre before the subproject construction. In 2013 he achieved 1.64 ton per acre with cultivation of HYV. He applied balanced fertilizers instead of low doze earlier. Rawsonara, a women farmer in Dayarambari and Mr. Rezaul Karim in Kadomtali village also reported that they harvest more aman rice than before.



Map1: Changes in Rice Production in the Monsoon Season in 2013 for Flood Management and Water Conservation in Langulia Khal Subproject, Netrokona District

71. Farmers in Roail-Helalpur FMD&WC subproject, SP32013, in Sunamganj district increased their HYV aman rice growing area with flood management and water retention.

72. In Barua-Kumuria FMD&IRR subproject, SP 31007, and Mahmudpur-Jikarbari DR&IRR subproject, SP 32016, in Gopalganj district, drainage improvement by the re-excavation of khal and as well as retention of water in the khal for irrigation at planting time in the pre-monsoon season contributed to increase deepwater aman rice grown through the monsoon season. In the Amgram DR&IRR subproject, SP33078, in Madaripur district re-excavation of the Khagradia, Sitkibari and Vennabari Khals improved drainage in four villages. This has increased transplanted aman rice production replacing broadcast aman.

73. In Habiganj district, the Dhanchari DR&IRR subproject, SP32031, and the Ferani Beel DR&IRR subproject, SP33087, were historically subjected to water logging with no monsoon cropping. Here the channel re-excavation enabled farmers to produce crops in the monsoon season.

74. In several subprojects farmers produced non-cereal crops in this season. These include Khorma-Tilokpur FMD subproject, SP32022, in Jamalpur district; Sherpur Katakhali DR&IRR subproject, SP33074, in Habiganj district; Phulsuti DR&IRR subproject, SP 34130, in Faridpur; and Dakshinbari Khal DR&WC subproject, SP 33095, in Rajbari district.

75. Supplementary irrigation with use of water from khals was reported in a number of subprojects. In Shomschura Ranjana Khal WC subproject, SP31005, in Sherpur district irrigation of transplanted aman rice land covered 70 acres and the water users paid Taka 1,000 per acre.

76. HYV aman rice cultivation increased due to availability of water for supplementary irrigation in Laghata WC subproject, SP 32021, and Shial Chhara FMD&WC subproject, SP 33047, in Moulvibazar district.

77. Cereal production increased more than 20 percent in 33 subprojects. In Char Narayannpur-Naogaon Khal and Chitalia Khal subprojects in Shariatpur, Phuleswari-Sonai Beel subproject in Kishoreganj, Laxmiganj-Rupriya Khal subproject in Madaripur and Puddakhali Khal subproject in Netrokona district cereal production more than doubled.

78. Production of non-cereals crops increased more than 20 percent in 24 subprojects. More vegetable and spice crop production increased the non-cereal production. Drainage improvement and flood control enabled farmers to introduce non-cereal crop production in 14 subprojects.

79. The DAE supports aman rice production planning, quality seed supply, use of improved method for seedbed preparation, balanced fertilizers use, motivation on granular urea use, training on crop pest and disease management, motivation on IPM practice supplementary irrigation and demonstration on quality seed production, processing and preservation. DAE supplied a power tiller supply with 50% subsidy to the WMCA in Dubir Boro Dhair FM subproject, SP33052, in Kishoreganj district. Crop marketing by WMCA to ensure fair prices was reported in subprojects in Madaripur district.

F. Extension Support

80. Project staff supported the WMCA in each subproject on sustainable agriculture production. Each WMCA has formed an agriculture sub-committee. The sub-committee listed beneficiary farmers, and subproject agriculture production plans and land use maps have been prepared with DAE support in consideration of farmers' response to the new

agro-hydraulic regime enabled by the engineering works. Selected farmers received ICM / IPM training. Demonstrations were organized on improved agriculture technology such as new crop or crop varieties that match with the changes in the agro-hydraulic regime. These demonstrated opportunities for enhancement of agricultural production in terms of what crops to grow and when to grow them, what services and other inputs are required, where and how to procure them, and how to market the produce. DAE supplied quality seeds, leaf colour charts (LCCs), tree plant seedlings, fertilizers and devices for granular urea application.

81. The DLS provided support on vaccination of livestock animals, ducks and poultry. Farmers received training on livestock disease management. Support was provided on fodder production, beef fattening and new breed poultry bird procurement.

82. SRDI supported training on agriculture resources uses, soil sample collection, analysis of soil nutrient content of the sample and determination of fertilizer application rates.

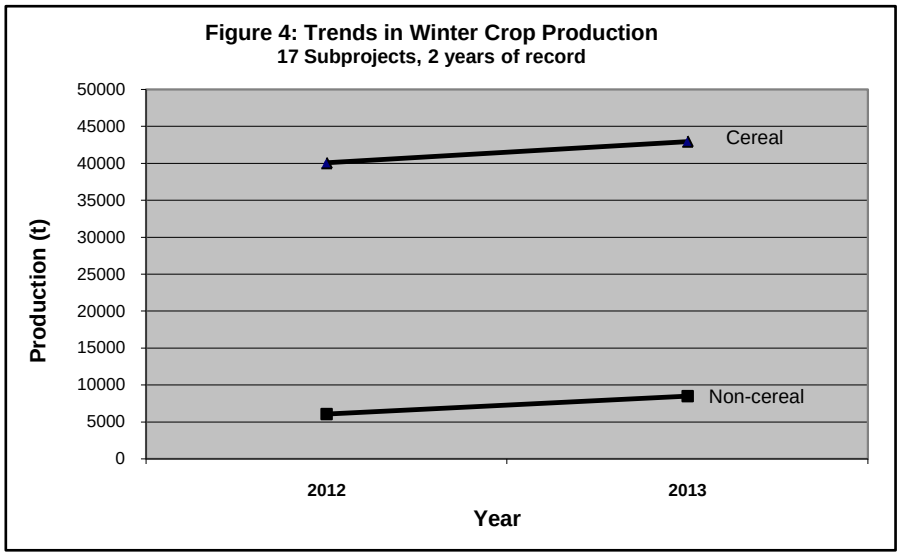
83. BADC supplied quality seeds of improved varieties. SAAO, DAE supported WMCA on the procurement of seeds.

G. Production Trends

84. It is assumed that crop production practice is not spontaneously changed by farmers unless they are persuasively motivated. In the subprojects beneficiary farmers observe the changes in the natural agro-hydraulic regime after completion of the engineering works and then decide on any new crop production practice. Accordingly crop production increases steadily following subproject completion. Crop production in the subprojects was compared between 2012 and 2013 to examine the incremental trend over the year.

1. Winter Crop Production Trends

85. As indicated in Figure 4, cereal and non-cereal production in the winter season increased in 2013 from that was recorded in 2012 in 17 subprojects.



86. This increase reflects adaption of crop production practice by farmers commensurate with improved post-monsoon drainage, water availability for irrigation, and drainage improvement and flood management in the pre-monsoon season.

87. The rate of increase was more for non-cereal crop production. Drainage improvement in the post-monsoon season provided more opportunity to grow non-cereal crops in the early winter season. In Arura Kolkolia WC subproject, SP 31004, in Habiganj district, HYV boro and vegetable production increased. Some farmers in this subproject also initiated wheat and potato production.

88. HYV boro, wheat and vegetable cultivation increased in Shomschura Ranjana Khal WC subproject, SP31005, in Sherpur district. Framers introduced more non-cereal crops in 2013.

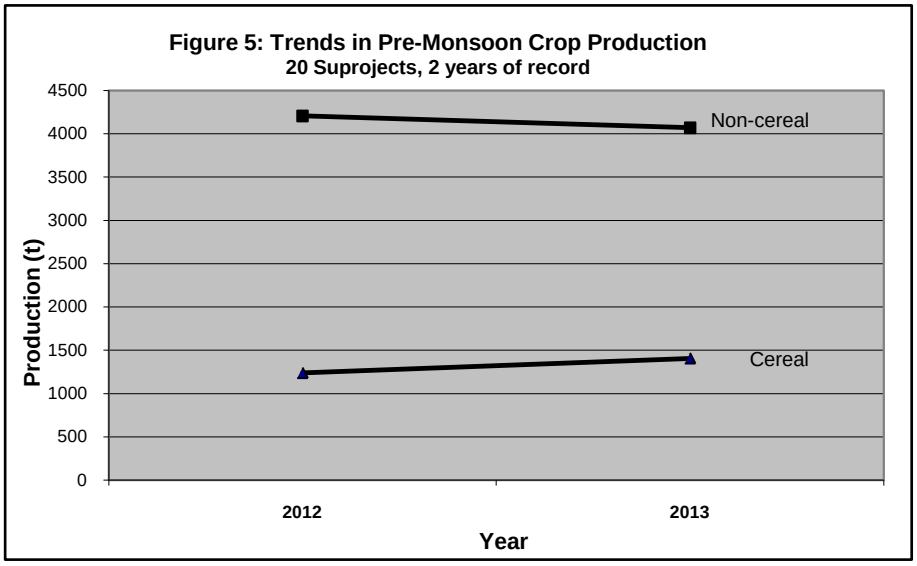
89. Availability of more water persuaded farmers to increase irrigated cropped area. Farmers in Lauer Beel DR&IRR subproject, SP32028, in Madaripur district continued to increase oilseed and pulse cropped area due to drainage improvement in the post-monsoon season. Irrigation water availability increased HYV boro growing area in this subproject.

90. In Pukuria Khal-Uziakhali Khal FM subproject, SP 31008, in Netrokona district only HYV was grown prior to the project. The engineering works enabled farmers to increase the HYV boro growing area and begin wheat, potato, vegetable, spice, oilseeds and pulse cultivation in 2012. The area under these crops increased further in 2013.

91. Farmers in Satgavia Beel DR&WC subproject, SP32009, in Faridpur district reduced their sugarcane growing area, choosing instead to crop more wheat, vegetables, spices and oilseed crops.

2. Pre-monsoon Crop Production Trends

92. In the pre-monsoon season the cereal cropped area covers a smaller area than non-cereal crops. Aus rice was the only cereal crop produced in this season in the 20 subprojects assessed to examine the incremental trend. It covered 16% of the area cultivated in the pre-monsoon season in 2012 and 17% in 2013.

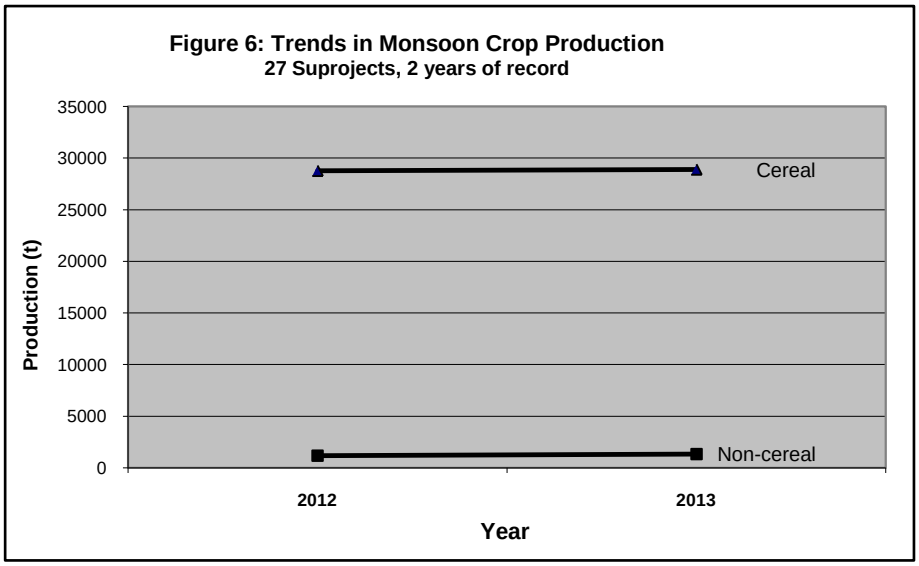


93. Between 2012 and 2013 cereal crop production increased in the 20 subprojects (Figure 5). However, there was decrease in non-cereal production during the same period. This was due to a reduction in jute production in 8 subprojects in Faridpur, Rajbari Madaripur, and Shariatpur districts. Heavy rainfall in 2013 damaged the crop at seedling stage reducing area and / or yield in 2013 compared in 2012.

3. Monsoon Crop Production Trends

94. In the monsoon season cereal and non-cereal crop production increased (Figure 6) for the 27 subprojects assessed. Drainage improvements resulted in more vegetables and spices being cropped in a number of subprojects. Water retention for supplementary irrigation contributed to improved crop yields.

95. A subproject planning related lesson is that the ability to drain floodwater can have a significant impact on monsoon cereal production. The data also suggest this occurred in many of the drainage subprojects. However, in 5 subprojects the monsoon cereal production was found to have significantly decreased in 2013 compared in 2012.



96. While not to the same extent, this reduction occurred in Narshanda-Tongi Khal subproject designed as drainage system, in Satgavia Beel, Barashila Beel and Bapail Beel subprojects designed as drainage systems with water conservation; and in Bowlar Beel subproject designed as flood management and drainage system. In most cases local aman, which is mainly grown in low-lying lands, covered less area in 2013 compared in the preceding year in these subprojects. This indicates that the drainage capacity of the subprojects may have reduced in the second year of operation, possibly due to siltation, fisheries in the khal, or some other other possible reason.

97. In Pudda Khali Khal and Katarbari-Karagati subproject the HYV boro growing area reduced in 2013 - presumably drainage in the post-monsoon season was not as effective as in 2012. Farmers in Pudda Khali Khal tried to compensate the loss of boro with cultivation of vegetable following the drainage of floodwater. In 2012 vegetables were not grown. About 88% of the cultivated land in this subproject is low-lying.

IV. FISHERIES PERFORMANCE ASSESSMENT

A. Introduction

98. Fisheries resource development support begins after the Implementation Agreement is signed. This support usually comprises a 14 step support program, after which further support may be provided by the Department of Fisheries. Key support activities included establishment of carp nurseries, establishment and demonstrations of good aquaculture practices in ideal ponds and other training and technical support.

99. Be the end 2013 carp nurseries had been established in 37 of the 48 subprojects assessed, and ideal ponds in 27 subprojects.

100. Little progress has been made in formal leasing of public water bodies for the benefit of the WMCA members.

101. Fisheries Performance in 2013 was assessed for the 48 subprojects listed in **Table A.8**, and included collection of information on fisheries ecosystems (water areas), producers - both fishers and fish farmers, production and annual income. These 48 subprojects comprise various types, as listed below, with 14 being non-regulatory and 34 regulatory.

Fisheries Assessment - Types of subprojects by District

	District	Type and category											Development Group			
		Non-Regulatory (14)		Regulatory (34)								Total	1	2	3	4
		DR	DR & IRR	CAD	CAD & WC	DR & WC	FM	FM& WC	FMD	FMD & WC	WC					
1	Mymensingh	-	-	1	-	2	-	1	2	1	-	7	1	1	5	0
2	Tangail	-	-	-	-	1	-	-	3	-	-	4	0	2	2	0
3	Netrokona	-	-	-	-	-	1	-	1	-	-	2	1	0	1	0
4	Kishoregonj	-	-	-	-	-	-	-	1	-	-	1	0	1	0	0
5	Jamalpur	-	-	-	-	-	-	-	3	-	-	3	0	3	0	0
6	Sherpur	-	-	-	1	-	-	-	-	-	1	2	1	1	0	0
7	Sylhet	-	-	-	-	-	-	1	-	-	-	1	1	0	0	0
8	Moulavi Bazar	-	-	-	-	-	-	-	-	-	2	2	0	1	1	0
9	Habigonj	-	5	-	-	-	-	-	-	1	1	7	1	2	2	2
10	Sunamgonj	-	-	-	-	-	-	-	-	2	2	4	0	3	1	0
11	Faridpur	1	-	-	-	2	-	-	-	-	-	3	0	2	1	0
12	Rajbari	-	-	-	-	3	-	-	-	1	-	4	0	2	2	0
13	Gopalgonj	-	3	-	-	-	-	-	-	-	-	3	-	2	1	0
14	Madaripur	-	3	-	-	-	-	-	-	-	-	3	0	3	0	0
15	Shariatpur	-	2	-	-	-	-	-	-	-	-	2	0	1	1	0
	Total	1	13	1	1	8	1	2	10	5	6	48	5	24	17	2

102. There is regional variation in fish production opportunities. For example, in the southern part of the Greater Faridpur districts, Madaripur, Gopalgonj and Shariatpur, tidal canals and huge beel areas provide good ecosystems for natural fisheries development. In the Greater Mymensingh region, for upland areas of Mymensingh, Sherpur, Jamalpur, Tangail the focus is on farming fish, while the Haor districts of Sunamgonj, Habigong and KIshoregonj enable natural fisheries development.

103. According to the project provisions, and a Memorandum of Understanding (MOU) signed between LGED and the Department of Fisheries (DOF), Ministry of Livestock and Fisheries, the DoF provides fisheries development support for the SSW subprojects. In

addition, a MOU has been signed between LGED and Bangladesh Fisheries Research Institute (BFRI) to support training and the fisheries program.

104. In line with the MoUs line agency staff of DOF and BFRI support fisheries training, provided technical support and supplied quality fish hatchlings to subproject farmers. In addition, DoF provided fish fingerlings for open water (Beel) stocking, established a Fish sanctuary in Satgavia Beel Subproject (Faridpur) and Char Narayanpur (Shariatpur).

105. Efforts to minimize any adverse impacts of the gated regulators and other structures, includes establishment of 'Fish Shelters' in re-excavated canals and 'Fish Sanctuaries' in the Beels. In Satgavia Beel such interventions increased fish production significantly. Also the project supports use of hydraulic infrastructure to ensure that water bodies (and ponds) do not dry up

B. Summary of Performance

106. Overall fish production increased in 43 of the 48 subprojects (90%), decreased in three subprojects (6%), and remained unchanged in two (4%). For Capture fisheries production increased in 23 subprojects (48%), decreased in eight (17%) subprojects and remained unchanged in 17 (35%). For Culture fisheries, production increased in 44 subprojects (92%), decreased in none and remained unchanged in four (8%).

107. The number of fishers decreased in 17 subprojects (35%), remained unchanged in 21 (44%) and increased in 10 (21%). Annual income of fishers decreased in four subprojects (8%), remained static in 19 (40%) and increased in 25 (52%).

108. For culture fisheries, the number of fish farmers increased in 38 subprojects (79%), remained unchanged in 10 (21%) but decreased in none. Annual incomes of fish farmers increased in 25 subprojects (52%), decreased in one (2%) and remained unchanged in 22 (46%).

109. Concerning fishery habitat, in the capture fisheries sector, habitat (fisheries ecosystem[1]) decreased in 29 subprojects (60%), increased in five (19%) and remained unchanged in 13 (27%).

110. Culture fisheries sector has done better than the capture fisheries sector.

Summary of Performance
(Number of SPs)

Change	Capture Fisheries				Culture Fisheries				
	Habitat	Production	Fisher (#)	Annual Income/ Fisher	Habitat	Incremental Production	Fish Farmer (#)	Annual Income / Fish Farmer	Overall
Decrease	29 (60%)	8 (17%)	17 (35%)	4 (8%)	12 (25%)	-	-	1 (2%)	3 (6%)
No Change	13 (27%)	17 (35%)	21 (44%)	19 (40%)	-	4 (8%)	10 (21%)	22 (46%)	2 (4%)
Increase	5 (19%)	23 (48%)	10 (21%)	25 (52%)	36 (75%)	44 (92%)	38 (79%)	25 (52%)	43 (90%)

111. In 2013 the overall incremental fisheries production for the 48 subprojects was estimated at 93 tons with 12 tons from capture fisheries ecosystems and 81 tons from culture fisheries, see table below.

[1] The fisheries ecosystem comprises permanent water bodies (non-cultivated low land) plus flood plains (land types F2 & F3)

112. For capture fisheries the overall increase was 12 tons of fish despite a 92 ha loss of fisheries ecosystem area and -140 in the number of fishers. The incremental annual income was estimated at about Tk 1,000 per fisher – this was due to an increase in fish prices along with the reduced number of fishers.

113. For culture fisheries the overall increase was 81 tons in production, an increase of 48 ha in fish farming area, and 195 of fish farmers. The incremental annual income was estimated at about Tk 1,500 per fish farmer.

Fisheries Performance by subproject Type
(Incremental values for different types of Subprojects)

Subproject Type	No.	Capture Fisheries Changes				Culture Fisheries Changes				Overall (ton)
		Fish Habitat (ha)	Production (ton)	Fisher (#)	Annual Income/ Fisher ('000 Taka)	Fish Habitat (ha)	Production (ton)	Fish Farmer (#)	Annual Income/ Fish Farmer ('000 Tk)	
1	2	3	4	5	6	7	8	9	10	11=(4+8)
Non-Regulator Subprojects										
1.DR	1	-7	-1	-6	1	0	2	7	1	1
2. DR & IRR	13	-27	3	-62	2	12	27	57	1	30
Regulatory Subprojects										
3.CAD	1	0	0	-9	2	1	5	12	2	5
4.CAD & WC	1	0	0	1	1	3	1	7	2	1
5.DR&WC	8	-33	6	-37	2	17	15	32	1	21
6.FM	1	0	-2	-7	0	0	1	7	2	-1
7.FM&WC	2	-5	1	-9	-1	2	4	7	2	5
8. FMD	10	-27	2	-7	0	5	18	27	1	20
9. FMD&WC	5	0	1	-9	-1	2	4	7	2	5
10. WC	6	7	2	5	2	6	4	27	2	6
Total Values (# of SPs)	48	-92 (10)	+12 (10)	-140 (10)	+10 / 1 0 = 1 / Fisher	48 (10)	81 (10)	195 (10)	15/10 =1.5 / Fish farmer	+93 (10)
Decrease: Value (# of Sp types)		-99 (5)	-3 (2)	-146 (8)	-1 (1)	-	-	-	-	-3 (1)
No Change		0 (4)	0 ((2)	-	0 (2)	0 (2)	-	-	-	-
Increase: Value (# of Sp types)	(48)	+7 (1)	+15 (6)	+6 (2)	+12 (7)	+48 (8)	+81 (10)	+195 (10)	15 (10)	+96 (9)

114. In 2012 just 27 subprojects were assessed, while this 2013 report includes data for 48 subprojects. Incremental production in 2012 was about 1 ton per subproject, and this increased to 1.9 tons in 2013 (93 tons in 48 subprojects).

115. Capture fisheries production usually increased in DR, WC and DR&IRR subprojects but decreased in FM, FMD, FMD&WC, DR&WC, WC&CAD subprojects. The capture fisheries ecosystem usually decreased in FM subprojects, and often in the DR subprojects, due to the reduced flooding and improved drainage. In two DR subprojects the fisheries ecosystem improved with the excavation of khals along with improved hydraulic connectivity. The numbers of fishers decreased in almost all the subprojects.

116. For culture fisheries production increased for all types of subprojects.

117. The performance of the different types of subproject is discussed below.

C. Performance of Different Categories and Types of Subprojects

1. Non-regulatory subprojects

a. Drainage Type (1 Nr)

118. Drainage (DR) subprojects facilitate drainage by khal excavation and often have an adverse impact on fisheries. A 20% loss in fishery habitat is usually assumed in the feasibility reports in the absence of actual data. However in reality a positive impact may result from the drainage interventions if hydraulic connectivity between Beels and rivers is improved / re-established.

119. In the single DR subproject, Akhoter Char Nolertek khal of Faridpur, overall fisheries production increased by 1 ton: -1 ton from capture fisheries and +2 tons from culture fisheries, see table below. In the capture fisheries sector, habitat, production and number of fishers decreased though the income of the fishers increased due to an increase in fish prices and reduced number of fishers. In the culture fisheries sector, all aspects of the fisheries recorded increases except the fish habitat which remained unchanged.

b. Drainage and Irrigation type (13 Nr)

120. DR&IRR subprojects drain excess water from farmers' fields but have sufficient khal depth to allow irrigation in the dry season. A negative impact arises from smaller fisheries habitat, but this may be compensated due to improved hydraulic connectivity of Beels and rivers.

121. For the 13 subprojects of this type the water body decreased by 27 ha, the numbers of fishers decreased by 62, but overall capture fisheries production increased by 3 tons. For culture fisheries all indicators were positive.

122. In Katarbari Katargati (SP 32019, Sadar, Gopalgonj) , Chitolia Khal (SP 33066, Sadar, Shariatpur), natural fisheries have flourished due to the re-establishment of connections between the Beel and rivers which facilitated migratory movements including breeding migrations.

2. Regulatory subprojects

a. CAD type (1 Nr)

123. The only CAD subproject assessed was Rouha of Gafargaon, Mymensingh. CAD subprojects do not impinge on the fisheries sector and so no mitigation measures are needed. However, in view of the considerable culture fisheries resources (fish ponds) and interest of the local stakeholders, technical support for culture fisheries development was provided with good results. There has remarkable increase in fish fingerling production – there was a nursery in the subproject area and now six nurseries are established supplying fingerlings over a wide area.

124. Another innovative plan is to provide "pipe" outlets so that CAD systems can provide water to household ponds – however this has not been provided to the Rouha system which was designed as part of project preparation.

b. Command area Development and Water Conservation type (1 Nr)

125. In CAD & WC subprojects, a gated structure and excavated khal conserves water for dry season cropping. Water distribution efficiency / extent is improved by CAD interventions – either open channel or buried pipeline. Improved WC may improve the fishery habitat, though gate operations should not prevent fish movement.

126. In Sutiar Khal of Sherpur, there was no change in overall fish production with 1 ton increase in culture fisheries production and 1 ton decrease in capture fisheries production. There is no change in the capture fisheries ecosystem but 1 ha increase in culture fisheries. Use of the CAD water to maintain the health of fishponds is proposed.

c. Drainage and Water Conservation type (8)

127. DR&WC subprojects typically included gated regulators and khal excavation and improve drainage following heavy rainfall – usually for Aus cropping, and conserve water in late monsoon for dry season irrigation. While drainage usually reduces the fisheries habitat area it may improve hydraulic connectivity, and water conservation may increase the potential for fish culture.

128. In the eight DR&WC subprojects overall production increased 21 tons mostly from an increase in culture fishery production.

d. Flood Management type (1 Nr)

129. Flood Management (FM) subprojects typically have one or more gated regulators and improved earthen embankments and reduce flooding. A 50% loss in fishery habitat is usually assumed in the feasibility reports in the absence of actual data. However these subprojects often result in an increase in fish farming, partly to compensate for the loss in capture fishery production but also facilitated by the improved protection afforded to fish farms / ponds.

130. For Pukuria Uziakhali Khal subproject of Netrokona, capture fisheries production and number of fishers decreased as expected, and was only partly compensated by a small increase in culture fishery production.

e. Flood Management and Water Conservation type (2 Nr)

131. Flood management interventions usually negatively impact on fisheries, as described above, while water retention often provides an extended habitat for fish farming. In the two FM&WC subprojects overall production increased by about 5 tons.

f. Flood Management and Drainage type (10 Nr)

132. Both the Flood Management and Drainage interventions usually have a negative impact on fisheries, although flood management may enable increased culture fisheries by protecting fish farm ponds, while deepened khals may enable increased migrations. Overall for the 10 FMD subprojects there was a decrease in the capture (open water) fisheries ecosystem area, production and number of fishers, but an increase in culture fisheries.

g. Flood Management, Drainage and Water Conservation type (5 Nr)

133. For the five FMD&WC subprojects capture fisheries indicators were mostly negative, while culture fisheries were positive. The overall incremental production was 5 tons, 1 ton from capture fisheries and 4 to from culture fisheries.

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h. WC type (6 Nr)

134. Water Conservation subprojects typically include khal excavation and construction of gated regulators increasing water availability for dry season irrigation. These subprojects therefore also support increased fish production.

135. In all six WC subprojects, all aspects of the fisheries sector - fisheries ecosystem, production, number and income of producers - were positive.

136. In Arua kalkalia subproject, Habigonj, there has been significant increase in the open water fish production, as the Khal connecting the river to the beel was re-excavated and augmented fish migration.

3. Conclusion

a. Impact of Hydraulic Infrastructures on the Fisheries

137. The capture (open water) fishery habitat comprises permanent (non-cropped) water bodies as well as flood plains - land types F2-Medium Lowland and F3-Lowland.

138. In the absence of actual data it is commonly assumed that Flood Management and Drainage subprojects cause 50% and 25% reduction in capture fisheries production respectively. However, the re-excavated drainage canals often improve hydraulic connectivity between rivers and beels and facilitate fish migrations. The deepened drainage canals may be permanent water bodies and may be used for culture fisheries if closed off with nets / cages. Also flood embankments may increase culture fisheries by protecting ponds from flooding and damage.

139. Water Conservation (WC) subprojects retain water in canals and typically have a positive impact on fisheries, particularly if gate operations allow fish migrations at the appropriate time.

140. Command Area Development and irrigation subprojects can have a positive impact on the health and sustainability of fish ponds if provision is made for pumping of water to ponds.

b. Capture Fisheries

141. For capture fisheries there was an overall reduction in the fisheries habitat, production and number of fishers. However income of fishers increased due to an increase in fish price, low investment needed and the reduced number of fishers.

142. The EME data indicate that the impact of the subprojects on capture fisheries is not as severe as assumed in the feasibility reports. While there is loss of ecosystem, this is mitigated to some extent by improved hydraulic connectivity between rivers and beels. Examples of this are Arua Kalakalia (Habigonj), Lauer Beel (Madaripur), Katarbari Karargati (Gopalgonj, and Chitalia Khal (Shariatpur). Other mitigation measures include: (i) creation of fish shelter in canals and fish sanctuaries in Beels as done in Satgavia Beel (Faridpur); (ii) establishment of community based fisheries; and (iii) establishment of carp nurseries and stocking of Beels with good locally raised fingerlings.

c. Culture Fisheries

143. Culture fisheries received relatively more support from the Project. Constraints included shortage of locally produced fish fingerlings and adoption of good (ideal) fish farming practices. To address these at least one fish nursery (firstly carp nursery) and an ideal fish pond was established in subprojects with fisheries potential. For 60% of the 48 assessed subprojects carp nurseries have been established and ideal farm ponds are being established.

144. In all subprojects, except one, there has been increase in production.

V. OPERATIONAL PERFORMANCE ASSESSMENT

A. Subprojects Handed-Over

145. Subprojects are handed over to the WMCA one year after construction. To end April 2014, 42 subprojects had been handed over.

B. Capacity Building and O&M Plans

146. Subproject O&M Plans are typically prepared within one year of completion of construction works, within the maintenance (defects liability) period for any works built by a contractor. The format and content of these Plans depend on the category of subproject. They cover only maintenance for unregulated subprojects without structures, but both operation and maintenance for regulated and CAD types of subproject. Typical contents of the O&M Plans are tabulated below.

Content	O&M Plan Content		
	Un-regulated SPs	Regulated SPs	CAD SPs
Brief about SP	A short brief about the SP is given for all categories		
Description of SP Infrastructure	The SSSWR infrastructure is described in reasonable detail		
Maintenance Aspects	Describes maintenance requirements, categories and process including pre- and post-monsoon annual walkthroughs and maintenance plans (budgets)		
Operation Aspects	n/a	Presents operation calendar and gate operators	A comprehensive section covering objectives, procedures and SP operating institutions and staff
O&M Costs	Only for earthworks maintenance	For both earthworks, structures and gate operators	For infrastructure, system operators, pumping and electrical equipment and energy costs.

147. O&M plans have been prepared and O&M training of WMCA / O&M subcommittee members carried out in the regional training centres of Faridpur, Mymensingh and Sylhet for 81 subprojects.

C. O&M Performance Assessment

148. No data are yet available.

TABLES

Table A.1: Subproject Areas and Construction Costs

	District	Upazila	Subproject ID & Name	Type of SP	Benefited Area (ha)	Structure Cost (Tk)		LCS Cost (Tk)		Total Cost (Tk)		Contract Amount	
						Engineer's Estimate	Contract Amount	Engineer's Estimate	Contract Amount	Engineer's Estimate	Contract Amount	Unit Cost (Tk/ha)	Unit Cost (US$/ha)
1.	Mymensingh	Gafargaon	SP31001, Rouha CAD Subproject	CAD	644	31,770,932	29,610,508			31,770,932	29,610,508	45,979	575
2.	Faridpur	Nagarkanda	SP31003, Beel Gobindapur Subproject	FMD&WC	708	18,973,828	23,239,264	9,977,077	9,977,077	28,950,905	33,216,341	46,916	586
3.	Habiganj	Nabiganj	SP31004, Arua Kalkalia Subproject	WC	546	4,889,025	5,847,357	9,826,654	9,826,654	14,715,679	15,674,011	28,707	359
4.	Sherpur	Nalitabari	SP31005, Ranjana Jharna Khal Subproject	WC	380	15,396,190	16,133,368	187,369	187,369	15,583,559	16,320,737	42,949	537
5.	Sylhet	Sadar	SP31006, Bawa-Chamurakandi Boro Haor Subproject	FM&WC	200	8,783,074	7,997,536	6,266,784	5,983,761	15,049,858	13,981,297	69,906	874
6.	Gopalgonj	Kotalipara	SP31007, Barua-Kumaria Subproject	FMD&IRR	800	13,518,866	13,408,802	5,525,368	5,525,368	19,044,234	18,934,170	23,668	296
7.	Netrokona	Kalmakanda	SP31008, Pukuria-Uziakhali Khal Subproject	FM	784	7,666,370	7,321,072	5,601,404	5,601,404	13,267,774	12,922,476	16,483	206
8.	Faridpur	Madhukhali	SP32009, Satgavia Beel Subproject	DR&WC	890	13,588,372	11,201,277	4,799,721	4,782,654	18,388,093	15,983,931	17,959	224
9.	Netrokona	Atpara	SP32010, Langulia Khal Subproject	FM&WC	731	23,815,512	26,844,092	306,852	306,852	24,122,364	27,150,944	37,142	464
10.	Shariatpur	Damuddya	SP32011, Char Narayanpur-Naogaon Khal Subproject	DR&IRR	350	904,972	879,392	3,816,086	3,816,356	4,721,058	4,695,748	13,416	168
11.	Sunamgonj	Jaggannathpur	SP32013, Roail-Helalpur Subproject	FMD&WC	960	17,153,713	20,867,575	9,392,667	9,392,667	26,546,380	30,260,242	31,521	394
12.	Rajbari	Baliakandi	SP32014, Talbaria Beel Subproject	FMD&WC	322	7,031,749	7,690,534	543,663	543,663	7,575,412	8,234,197	25,572	320
13.	Rajbari	Sadar	SP32015, Nimtala Beel Subproject	DR&WC	563	6,575,086	7,136,955	894,516	894,516	7,469,602	8,031,471	14,265	178
14.	Gopalgonj	Kasiani	SP32016, Mamudpur-Jikarbari Subproject	DR&IRR	350			2,332,917	2,332,917	2,332,917	2,332,917	6,665	83
15.	Jamalpur	Sharishabari	SP32017, Rothkhola-Kamarbari Subproject	FMD	191	2,377,862	2,245,538	559,483	559,483	2,937,345	2,805,021	14,686	184
16.	Jamalpur	Islampur	SP32018, Batikamari Beel Subproject	FMD	844	11,315,819	11,829,754	9,046,671	8,741,254	20,362,490	20,571,008	24,373	305
17.	Gopalgonj	Sadar	SP32019, Katarbari-Karagati Subproject	DR&IRR	730			7,339,412	7,339,412	7,339,412	7,339,412	10,054	126
18.	Madaripur	Kalkini	SP32020, Bansgari Subproject	DR&IRR	424	996,739	995,540	7,159,550	7,159,550	8,156,289	8,155,090	19,234	240
19.	Moulavibazar	Kamalganj	SP32021, Laghata Chhara Subproject	WC	378	8,590,763	9,870,401	2,490,306	2,490,306	11,081,069	12,360,707	32,700	409
20.	Jamalpur	Dewanganj	SP32022, Khorma-Tilokpur Subproject	FMD	453	5,696,870	6,073,951	5,082,527	5,082,527	10,779,397	11,156,478	24,628	308
21.	Habiganj	Nabiganj	SP32023, Raiarpur Boro Khal Subproject	FMD&WC	650	6,415,739	7,215,546	4,229,551	4,229,551	10,645,290	11,445,097	17,608	220
22.	Tangail	Gopalpur	SP32025, Barasila Beel Subproject	DR&WC	405	5,276,109	6,633,784	2,096,174	2,096,174	7,372,283	8,729,958	21,555	269
23.	Sherpur	Nalitabari	SP32026, Sutiar Khal Subproject	WC&CAD	540	16,266,665	17,700,640	2,097,293	2,097,293	18,363,958	19,797,933	36,663	458
24.	Mymensingh	Fulpur	SP32027, Kharia Nadi Subproject	DR&WC	1,000	11,893,014	11,534,229	6,531,287	6,531,288	18,424,300	18,065,517	18,066	226
25.	Madaripur	Sadar	SP32028, Lauer Beel Subproject	DR&IRR	520	904,972	904,173	5,615,103	5,615,103	6,520,075	6,519,276	12,537	157
26.	Sunamgonj	Chhatak	SP32029, Teli Haor Subproject	FMD&WC	412	9,342,013	9,226,480	2,515,699	2,515,699	11,857,712	11,742,180	28,500	356
27.	Kishoregonj	Tarail	SP32030, Phuleswari-Sonai Beel Subproject	FMD	246	9,245,803	9,830,364	2,619,597	2,619,597	11,865,400	12,449,961	50,610	633
28.	Habiganj	Lakhai	SP32031, Dhanchari Khal Subproject	DR&IRR	250	1,641,589	1,461,646	1,702,472	1,702,472	3,344,060	3,164,118	12,656	158
29.	Madaripur	Rajoir	SP32032, Kamarer Khal Subproject	DR&IRR	700			9,571,267	9,571,267	9,571,267	9,571,267	13,673	171
30.	Sunamgonj	Sadar	SP32033, Mugai Khal Subproject	WC	575	16,031,750	17,379,695	3,702,243	3,702,243	19,733,993	21,081,938	36,664	458
31.	Faridpur	Sadarpur	SP32035, Akoterchar-Nolertek-Chaiterkole Khal Subproject	DR	950	4,911,361	5,248,748	5,033,885	5,033,885	9,945,246	10,282,633	10,824	135
32.	Tangail	Gopalpur	SP32036, Basan Beel Subproject	FMD	491	7,049,893	9,319,777	2,906,154	2,906,154	9,956,047	12,225,931	24,900	311
33.	Madaripur	Sadar	SP32038, Laxmiganj-Rupriya Khal Subproject	DR&IRR	520	3,416,429	3,932,491	8,490,535	8,490,535	11,906,964	12,423,026	23,890	299
34.	Moulavibazar	Kamalganj	SP33039, Kurma Chhara Subproject	WC	380	12,324,464	13,940,951	2,893,616	2,893,616	15,218,080	16,834,567	44,301	554
35.	Gopalgonj	Moksudpur	SP33040, Ghechua-Simulsur-Kalinagar Subproject	DR&IRR	440	1,668,378	1,827,610	4,758,818	4,758,818	6,427,196	6,586,428	14,969	187
36.	Tangail	Dhanbari	SP33041, Goalia (Dhanbari) Beel Subproject	FMD	137	2,350,552	2,702,013	306,653	306,653	2,657,205	3,008,666	21,961	275
37.	Tangail	Dhanbari	SP33042, Goilla Beel Subproject	FMD	197	7,265,396	8,285,546	1,544,451	1,544,451	8,809,847	9,829,997	49,898	624
38.	Netrokona	Atpara	SP33045, Pudda Khali Khal Subproject	FMD	193	8,256,071	9,445,351	5,133,793	5,133,793	13,389,864	14,579,144	75,540	944
39.	Faridpur	Boalmari	SP33046, Rupadia-Majurdia Khal Subproject	DR	300			7,595,321	7,595,321	7,595,321	7,595,321	25,318	316
40.	Moulavibazar	Kamalganj	SP33047, Shial Chhara Subproject	FMD&WC	287	9,000,337	8,280,895	1,703,001	1,703,001	10,703,338	9,983,896	34,787	435
41.	Mymensingh	Nandail	SP33048, Bapail Beel Subproject	DR&WC	1,000	11,515,594	12,102,777	5,560,759	5,560,759	17,076,353	17,663,536	17,664	221
42.	Mymensingh	Nandail	SP33049, Bawlar Beel Subproject	FMD	860	8,896,169	9,555,455	5,244,402	5,244,402	14,140,571	14,799,857	17,209	215
43.	Mymensingh	Nandail	SP33050, Narsunda-Tongi Khal Subproject	DR	860	3,311,325	3,702,020	9,935,302	9,935,302	13,246,627	13,637,322	15,857	198
44.	Kishoregonj	Nikli	SP33052, Dubir Boro Dhair Subproject	FM	550	12,747,807	11,510,844	849,878	850,678	13,597,685	12,361,522	22,476	281

	District	Upazila	Subproject ID & Name	Type of SP	Benefited Area (ha)	Structure Cost (Tk)		LCS Cost (Tk)		Total Cost (Tk)		Contract Amount	
						Engineer's Estimate	Contract Amount	Engineer's Estimate	Contract Amount	Engineer's Estimate	Contract Amount	Unit Cost (Tk/ha)	Unit Cost (US$/ha)
45.	Moulavibazar	Sreemongal	SP33053, Lunglia Chhara Subproject	WC	300	30,969,394	34,085,342	1,515,259	1,515,259	32,484,653	35,600,601	118,669	1,483
46.	Sylhet	Gowainghat	SP33054, Shialar Haor Subproject	FMD	520	21,117,297	24,125,053	7,650,465	7,650,465	28,767,762	31,775,518	61,107	764
47.	Mymensingh	Dhobaura	SP33055, Tarai Nadi Subproject	DR&WC	613	21,091,819	22,694,044	2,675,044	2,675,044	23,766,863	25,369,088	41,385	517
48.	Kishoregonj	Karimganj	SP33057, Saguli-Prayag Beel Subproject	FMD	245	4,400,976	3,556,724	2,361,299	2,361,299	6,762,275	5,918,023	24,155	302
49.	Moulavibazar	Sadar	SP33058, Lekha Beel Subproject	DR&WC	513	7,674,252	8,679,611	2,552,134	2,552,134	10,226,386	11,231,745	21,894	274
50.	Faridpur	Nagarkanda	SP33059, Baneswardi Subproject	CAD&DR	316	26,763,650	31,813,445	484,697	484,697	27,248,347	32,298,142	102,209	1,278
51.	Gopalgonj	Tungipara	SP33060, Lebutala-Bashbaria Subproject	FMD&WC	325	19,827,721	18,832,554	7,702,710	7,702,710	27,530,431	26,535,264	81,647	1,021
52.	Gopalgonj	Sadar	SP33061, Urafi-Jangal Danga Subproject	DR&IRR	640			5,506,189	5,506,189	5,506,189	5,506,189	8,603	108
53.	Rajbari	Kalukhali	SP33063, Betbaria Khal Subproject	DR&WC	569	5,681,361	6,413,308	6,489,364	6,489,364	12,170,725	12,902,672	22,676	283
54.	Rajbari	Pangsha	SP33064, Machpara-Lakshmandia Khal Subproject	DR&WC	551	7,042,302	8,028,519	6,467,052	6,467,052	13,509,354	14,495,571	26,308	329
55.	Sylhet	Kanaighat	SP33065, Surai Khal Subproject	WC	315	18,087,179	19,164,514	3,643,316	3,643,316	21,730,495	22,807,830	72,406	905
56.	Shariatpur	Sadar	SP33066, Chitalia Khal Subproject	DR&IRR	450	1,666,426	1,812,191	7,190,694	7,190,694	8,857,120	9,002,885	20,006	250
57.	Moulavibazar	Kamalganj	SP33068, Kala Chhara Subproject	FMD&WC	214	19,043,323	19,725,014	2,159,504	2,159,504	21,202,827	21,884,518	102,264	1,278
58.	Jamalpur	Sharishabari	SP33071, Borobaria-Suakair Subproject	FMD	870	22,752,782	21,277,782	15,164,638	13,909,293	37,917,420	35,187,075	40,445	506
59.	Habiganj	Nabiganj	SP33074, Sherpur Katakhali Khal Subproject	DR&WC	352	1,594,448	1,417,651	11,932,836	11,932,836	13,527,284	13,350,487	37,928	474
60.	Shariatpur	Sadar	SP33076, Chandrapur Khal Subproject	DR&IRR	341			3,756,992	5,126,716	3,756,992	5,126,716	15,034	188
61.	Madaripur	Rajoir	SP33078, Amgram Subproject	DR&IRR	976	1,512,969	1,222,693	7,599,550	7,599,550	9,112,519	8,822,243	9,039	113
62.	Mymensingh	Gafargaon	SP33079, Chait Beel Subproject	FMD	420	7,476,083	7,640,199	1,021,015	1,021,015	8,497,098	8,661,214	20,622	258
63.	Mymensingh	Fulbaria	SP33080, Gujakuri Khal Subproject	FMD&WC	563	9,676,126	10,983,577	3,163,146	3,163,146	12,839,272	14,146,723	25,127	314
64.	Mymensingh	Fulbaria	SP33081, Salnar Khal Subproject	FM&WC	614	7,400,808	8,377,679	2,440,849	2,440,849	9,841,657	10,818,528	17,620	220
65.	Mymensingh	Fulbaria	SP33082, Kalmina Khal Subproject	FMD&WC	950	26,791,550	22,757,391	893,779	893,779	27,685,330	23,651,171	24,896	311
66.	Habiganj	Lakhai	SP33087, Ferani Beel-Shakhati Khal Subproject	DR&IRR	900	1,641,589	1,461,646	6,950,315	6,950,315	8,591,904	8,411,961	9,347	117
67.	Mymensingh	Fulbaria	SP33088, Foliar Khal Subproject	FMD&WC	550	11,787,727	13,562,267	3,025,312	3,025,312	14,813,039	16,587,579	30,159	377
68.	Shariatpur	Bhedarganj	SP33091, Chukdar Kandi Khal Subproject	DR&IRR	480	6,213,279	7,291,859	5,828,064	5,828,064	12,041,343	13,119,923	27,333	342
69.	Jamalpur	Sadar	SP33093, Nachna Salika Khal Subproject	FMD&WC	739	15,194,815	17,473,629	11,155,201	11,155,201	26,350,016	28,628,830	38,740	484
70.	Rajbari	Baliakandi	SP33095, Dakshinbari Khal Subproject	DR&WC	499	6,088,987	6,959,621	3,107,091	3,107,091	9,196,078	10,066,712	20,174	252
71.	Sylhet	Gowainghat	SP34107, Binnakandi Subproject	WC	309	12,399,530	13,938,642	2,663,298	2,663,298	15,062,829	16,601,940	53,728	672
72.	Moulavibazar	Sadar	SP34109, Kachuar Khal Subproject	DR&WC	680	21,352,707	23,339,671	5,152,086	5,152,086	26,504,793	28,491,757	41,900	524
73.	Madaripur	Kalkini	SP34113, Urarchar-Snanghata-Akalbaris Khal Subproject	DR&IRR	300	1,398,042	1,276,930	9,819,884	9,819,884	11,217,926	11,096,814	36,989	462
74.	Madaripur	Kalkini	SP34114, Char Lakshmipur Khal Subproject	DR&IRR	950	1,398,042	1,196,195	28,870,282	28,870,282	30,268,324	30,066,477	31,649	396
75.	Habiganj	Nabiganj	SP34116, Rashukhali Khal Subproject	DR&IRR	451			6,672,477	6,672,477	6,672,477	6,672,477	14,795	185
76.	Habiganj	Nabiganj	SP34123, Muktahar Khal Subproject	DR&WC	810	8,766,670	9,668,770	6,537,742	6,537,742	15,304,412	16,206,512	20,008	250
77.	Habiganj	Nabiganj	SP34124, Bara Chhara (Nabiganj) Subproject	WC	529	9,618,359	10,601,479	8,618,649	8,618,649	18,237,008	19,220,128	36,333	454
78.	Habiganj	Baniachang	SP34127, Borak Khal-Kata Khal (Khagaura) Subproject	DR&IRR	750	1,358,914	1,227,283	10,553,077	10,553,077	11,911,991	11,780,360	15,707	196
79.	Faridpur	Nagarkanda	SP34130, Phulsuti Subproject	DR&IRR	350	1,398,042	1,519,795	6,267,086	6,267,086	7,665,128	7,786,881	22,248	278
80.	Habiganj	Sadar	SP34135, Morabotai-Longlapur Khal Subproject	DR	998	1,358,914	1,277,021	10,256,201	10,256,201	11,615,115	11,533,222	11,556	144
81.	Habiganj	Madhabpur	SP34138, Jangal Khal Subproject	DR	345	1,401,766	1,411,594	3,420,314	3,420,314	4,822,080	4,831,908	14,006	175
82.	Faridpur	Saltha	SP34141, Atghar-Durgapur Khal Subproject	DR	512			4,709,523	4,859,106	4,709,523	4,859,106	9,490	119
83.	Habiganj	Madhabpur	SP34142, Baksair Beel Subproject	DR	400	1,400,830	1,266,572	3,414,661	3,414,661	4,815,491	4,681,233	11,703	146
			Total	83	**44,920**	**732,125,849**	**777,014,214**	**433,178,077**	**432,837,604**	**1,165,303,926**	**1,209,851,817**	**26,933**	**337**
			Average/SP		**541**	**8,820,793**	**9,361,617**	**5,219,013**	**5,214,911**	**14,039,806**	**14,576,528**		
							64.2%		35.8%		100.0%		

Table A.2: WMCA MEMBERSHIP, CAPITAL FUNDS AND O&M CONTRIBUTIONS

Subproject ID & Name			District	Upazila	Area (ha)	Beneficiary Households (Nos.)	Membership			Capital Funds (Tk.)					O&M Contribution (Tk.)			
							Male	Female	%	Savings	Shares	Others	Total	Taka / Member	Target	Collected	Taka / Member	% of Target
1.	SP31001	Rouha CAD Subproject	Mymensingh	Gafargaon	644	1,494	736	335	72%	671,450	24,500	59,260	755,210	705	371,301	371,000	346.41	100%
2.	SP31003	Beel Gobindapur Subproject	Faridpur	Nagarkanda	708	750	498	233	97%	65,770	36,550	14,620	116,940	160	299,283	300,000	410.4	100%
3.	SP31004	Arua Kalkalia Subproject	Habiganj	Nabiganj	546	358	699	414	311%	1,212,240	799,600	52,035	2,063,875	1,854	213,937	308,000	276.73	144%
4.	SP31005	Ranjana Jharna Khal Subproject	Sherpur	Nalitabari	380	384	320	65	100%	204,410	24,250	3,850	232,510	604	255,000	256,000	664.94	100%
5.	SP31006	Bawa-Chamurakandi Boro Haor Subproject	Sylhet	Sadar	200	205	191	85	135%	91,940	13,800	40,607	146,347	530	231,906	318,600	1154.35	137%
6.	SP31007	Barua-Kumaria Subproject	Gopalgonj	Kotalipara	800	1,088	527	240	70%	53,000	38,000	15,340	106,340	139	251,208	252,000	328.55	100%
7.	SP31008	Pukuria-Uziakhali Khal Subproject	Netrokona	Kalmakanda	784	1,060	491	219	67%	95,090	47,680	33,130	175,900	248	431,820	540,000	760.56	125%
8.	SP32009	Satgavia Beel Subproject	Faridpur	Madhukhali	890	850	654	240	105%	79,050	44,700	17,880	141,630	158	299,012	300,000	335.57	100%
9.	SP32010	Langulia Khal Subproject	Netrokona	Atpara	731	565	409	50	81%	85,640	63,250	79,254	228,144	497	315,774	315,774	687.96	100%
10.	SP32011	Char Narayanpur-Naogaon Khal Subproject	Shariatpur	Damuddya	350	329	247	109	108%	74,201	39,660	12,320	126,181	354	89,971	107,971	303.29	120%
11.	SP32013	Roail-Helalpur Subproject	Sunamgonj	Jaggannathpur	960	438	305	130	99%	182,590	38,500	19,250	240,340	553	400,500	414,000	951.72	103%
12.	SP32014	Talbaria Beel Subproject	Rajbari	Baliakandi	322	322	105	25	40%	21,000	20,650	13,000	54,650	420	73,047	91,100	700.77	125%
13.	SP32015	Nimtala Beel Subproject	Rajbari	Sadar	563	343	95	25	35%	23,000	6,000	12,000	41,000	342	131,910	150,000	1250	114%
14.	SP32016	Mamudpur-Jikarbari Subproject	Gopalgonj	Kasiani	350	535	340	40	71%	19,000	19,000	7,600	45,600	120	68,806	87,000	228.95	126%
15.	SP32017	Rothkhola-Kamarbari Subproject	Jamalpur	Sharishabari	191	600	350	88	73%	54,530	53,150	4,380	112,060	256	72,954	75,300	171.92	103%
16.	SP32018	Batikamari Beel Subproject	Jamalpur	Islampur	844	1,210	248	88	28%	11,600	16,800	7,650	36,050	107	300,048	318,050	946.58	106%
17.	SP32019	Katarbari-Karagati Subproject	Gopalgonj	Sadar	730	715	494	26	73%	40,000	26,000	10,400	76,400	147	181,601	200,000	384.62	110%
18.	SP32020	Bansgari Subproject	Madaripur	Kalkini	424	653	426	108	82%	120,500	62,500	40,880	223,880	419	187,171	200,000	374.53	107%
19.	SP32021	Laghata Chhara Subproject	Moulavibazar	Kamalganj	378	375	220	65	76%	28,500	28,500	300	57,300	201	150,600	225,000	789.47	149%
20.	SP32022	Khorma-Tilokpur Subproject	Jamalpur	Dewanganj	453	1,700	311	299	36%	16,540	30,500		47,040	77	215,052	197,058	323.05	92%
21.	SP32023	Raiarpur Boro Khal Subproject	Habiganj	Nabiganj	650	426	485	106	139%	319,000	59,100	32,105	410,205	694	198,930	300,000	507.61	151%
22.	SP32025	Barasila Beel Subproject	Tangail	Gopalpur	405	704	427	76	71%	93,620	25,150	14,970	133,740	266	80,493	98,493	195.81	122%
23.	SP32026	Sutiar Khal Subproject	Sherpur	Nalitabari	540	753	658	95	100%	51,660	37,650	7,530	96,840	129	294,209	312,024	414.37	106%
24.	SP32027	Kharia Nadi Subproject	Mymensingh	Fulpur	1,000	963	680	120	83%	39,690	16,000	32,000	87,690	110	463,950	482,000	602.5	104%
25.	SP32028	Lauer Beel Subproject	Madaripur	Sadar	520	714	450	151	84%	98,580	60,100	48,080	206,760	344	169,003	190,888	317.62	113%
26.	SP32029	Teli Haor Subproject	Sunamgonj	Chhatak	412	186	205	35	129%	94,000	24,000	14,000	132,000	550	138,000	150,000	625	109%
27.	SP32030	Phuleswari-Sonai Beel Subproject	Kishoregonj	Tarail	246	520	292	44	65%	24,100	16,800	6,720	47,620	142	171,105	171,200	509.52	100%
28.	SP32031	Dhanchari Khal Subproject	Habiganj	Lakhai	250	199	197	106	152%	97,550	30,300	12,120	139,970	462	52,032	80,000	264.03	154%
29.	SP32032	Kamarer Khal Subproject	Madaripur	Rajoir	700	401	230	130	90%	39,666	23,000		62,666	174	178,315	196,500	545.83	110%
30.	SP32033	Mugai Khal Subproject	Sunamgonj	Sadar	575	554	371	20	71%	93,200	39,100	15,450	147,750	378	228,000	200,000	511.51	88%
31.	SP32035	Akoterchar-Nolertek-Chaiterkole Khal Subproject	Faridpur	Sadarpur	950	210	188	76	126%	90,500	30,000	5,280	125,780	476	146,250	146,250	553.98	100%
32.	SP32036	Basan Beel Subproject	Tangail	Gopalpur	491	366	229	72	82%	51,200	15,050	8,940	75,190	250	106,197	124,197	412.61	117%
33.	SP32038	Laxmiganj-Rupriya Khal Subproject	Madaripur	Sadar	520	602	305	155	76%	86,000	46,000	27,350	159,350	346	306,696	306,696	666.73	100%
34.	SP33039	Kurma Chhara Subproject	Moulavibazar	Kamalganj	380	610	397	30	70%	21,350	21,350	12,810	55,510	130	259,350	278,849	653.04	108%
35.	SP33040	Ghechua-Simulsur-Kalinagar Subproject	Gopalgonj	Moksudpur	440	520	225	58	54%	40,705	15,650	6,260	62,615	221	196,882	136,000	480.57	69%
36.	SP33041	Goalia (Dhanbari) Beel Subproject	Tangail	Dhanbari	137	316	139	50	60%	17,800	9,450	5,670	32,920	174	64,282	59,205	313.25	92%
37.	SP33042	Goilla Beel Subproject	Tangail	Dhanbari	197	355	167	74	68%	64,000	12,050	7,230	83,280	346	156,591	98,897	410.36	63%
38.	SP33045	Pudda Khali Khal Subproject	Netrokona	Atpara	193	294	243	63	104%	30,000	30,600	14,340	74,940	245	151,560	152,000	496.73	100%
39.	SP33046	Rupadia-Majurdia Khal Subproject	Faridpur	Boalmari	300	410	302	68	90%	45,700	18,500	18,500	82,700	224	153,900	153,900	415.95	100%
40.	SP33047	Shial Chhara Subproject	Moulavibazar	Kamalganj	287	264	202	15	82%	11,638	11,736	6,510	29,884	138	130,500	130,500	601.38	100%
41.	SP33048	Bapail Beel Subproject	Mymensingh	Nandail	1,000	923	470	20	53%	16,000	24,500	14,700	55,200	113	395,640	396,000	808.16	100%
42.	SP33049	Bawlar Beel Subproject	Mymensingh	Nandail	860	708	498	48	77%	28,440	27,300	16,800	72,540	133	279,900	280,000	512.82	100%
43.	SP33050	Narsunda-Tongi Khal Subproject	Mymensingh	Nandail	860		420	150		46,000	28,500		74,500	131	238,320	238,500	418.42	100%
44.	SP33052	Dubir Boro Dhair Subproject	Kishoregonj	Nikli	550	404	203	100	75%	95,960	15,300	9,090	120,350	397	188,250	188,250	621.29	100%
45.	SP33053	Lunglia Chhara Subproject	Moulavibazar	Sreemongal	300	285	171	25	69%	10,100	9,800	5,880	25,780	132	358,998	298,500	1522.96	83%
46.	SP33054	Shialar Haor Subproject	Sylhet	Gowainghat	520	419	486	242	174%	51,680	36,400	72,800	160,880	221	488,994	490,000	673.08	100%
47.	SP33055	Tarai Nadi Subproject	Mymensingh	Dhobaura	613	625	560	85	103%	30,395	32,250	19,350	81,995	127	252,420	251,250	389.53	100%
48.	SP33057	Saguli-Prayag Beel Subproject	Kishoregonj	Karimganj	245	400	210	54	66%	27,000	13,200	7,920	48,120	182	180,000	180,000	681.82	100%
49.	SP33058	Lekha Beel Subproject	Moulavibazar	Sadar	513	352	270	25	84%	25,000	14,750	6,750	46,500	158	227,655	190,155	644.59	84%
50.	SP33059	Baneswardi Subproject	Faridpur	Nagarkanda	316	353	265	75	96%	180,000	140,000	12,510	332,510	978	303,707	289,000	850	95%
51.	SP33060	Lebutala-Bashbaria Subproject	Gopalgonj	Tungipara	325	635	376	72	71%	122,200	22,400	22,400	167,000	373	290,153	282,000	629.46	97%
52.	SP33061	Urafi-Jangal Danga Subproject	Gopalgonj	Sadar	640	616	395	95	80%	21,500	21,500	12,500	55,500	113	145,656	156,000	318.37	107%
53.	SP33063	Betbaria Khal Subproject	Rajbari	Kalukhali	569	270	199	86	106%	34,000	14,250	22,800	71,050	249	400,500	280,000	982.46	70%
54.	SP33064	Machpara-Lakshmandia Khal Subproject	Rajbari	Pangsha	551	650	103	22	19%	43,550	7,800	10,000	61,350	491	280,589	284,000	2272	101%

Subproject ID & Name			District	Upazila	Area (ha)	Beneficiary Households (Nos.)	Membership			Capital Funds (Tk.)					O&M Contribution (Tk.)			
							Male	Female	%	Savings	Shares	Others	Total	Taka / Member	Target	Collected	Taka / Member	% of Target
55.	SP33065	Surai Khal Subproject	Sylhet	Kanaighat	315	352	277	23	85%	85,500	15,000	30,000	130,500	435	136,496	127,500	425	93%
56.	SP33066	Chitalia Khal Subproject	Shariatpur	Sadar	450	625	543	103	103%	55,500	52,600	13,461	121,561	188	162,816	15,000	23.22	9%
57.	SP33068	Kala Chhara Subproject	Moulavibazar	Kamalganj	214	203	124	16	69%	7,180	7,000	4,200	18,380	131	246,600	253,700	1812.14	103%
58.	SP33071	Borobaria-Suakair Subproject	Jamalpur	Sharishabari	870		698	58		15,120	37,800		52,920	70	477,004	357,000	472.22	75%
59.	SP33074	Sherpur Katakhali Khal Subproject	Habiganj	Nabiganj	352	222	484	28	231%	117,520	72,800	25,600	215,920	422	324,662	388,800	759.38	120%
60.	SP33076	Chandrapur Khal Subproject	Shariatpur	Sadar	341	366	295	106	110%	57,850	38,500	11,320	107,670	269	86,170	93,046	232.03	108%
61.	SP33078	Amgram Subproject	Madaripur	Rajoir	976		335	162		24,850	24,850	14,910	64,610	130	230,678	231,000	464.79	100%
62.	SP33079	Chait Beel Subproject	Mymensingh	Gafargaon	420	434	275	45	74%	6,400	16,000	9,600	32,000	100	118,563	140,500	439.06	119%
63.	SP33080	Gujakuri Khal Subproject	Mymensingh	Fulbaria	563	620	402	138	87%	16,840	27,000		43,840	81	166,758	111,500	206.48	67%
64.	SP33081	Salnar Khal Subproject	Mymensingh	Fulbaria	614	550	322	160	88%	22,700	24,100	350	47,150	98	134,316	102,000	211.62	76%
65.	SP33082	Kalmina Khal Subproject	Mymensingh	Fulbaria	950		364	70		12,620	21,700		34,320	79	361,173	300,000	691.24	83%
66.	SP33087	Ferani Beel-Shakhati Khal Subproject	Habiganj	Lakhai	900	397	238	55	74%	64,380	29,400	14,700	108,480	370	207,900	210,500	718.43	101%
67.	SP33088	Foliar Khal Subproject	Mymensingh	Fulbaria	550		421	81		102,980	25,100	18,120	146,200	291	184,664	184,000	366.53	100%
68.	SP33091	Chukdar Kandi Khal Subproject	Shariatpur	Bhedarganj	480	524	470	101	109%	63,618	60,000	6,030	129,648	227	249,114	195,000	341.51	78%
69.	SP33093	Nachna Salika Khal Subproject	Jamalpur	Sadar	739		819	154		19,640	97,300		116,940	120	190,200	400,488	411.6	211%
70.	SP33095	Dakshinbari Khal Subproject	Rajbari	Baliakandi	499	320	249	77	102%	68,000	16,300	16,300	100,600	309	174,476	176,400	541.1	101%
71.	SP34107	Binnakandi Subproject	Sylhet	Gowainghat	309	184	294	85	206%	71,000	11,370	14,720	97,090	256	210,075	20,000	52.77	10%
72.	SP34109	Kachuar Khal Subproject	Moulavibazar	Sadar	680	409	260	27	70%	14,350	14,350	8,610	37,310	130	356,250	358,500	1249.13	101%
73.	SP34113	Urarchar-Snanghata-Akalbaris Khal Subproject	Madaripur	Kalkini	300	550	320	100	76%	42,000	42,000	21,000	105,000	250	150,432	143,000	340.48	95%
74.	SP34114	Char Lakshmipur Khal Subproject	Madaripur	Kalkini	950	700	370	120	70%	49,000	49,000	24,500	122,500	250	398,040	416,000	848.98	105%
75.	SP34116	Rashukhali Khal Subproject	Habiganj	Nabiganj	451	140	151	37	134%	47,800	18,800	9,400	76,000	404	174,450	170,000	904.26	97%
76.	SP34123	Muktahar Khal Subproject	Habiganj	Nabiganj	810	162	86	36	75%	49,650	12,200	6,100	67,950	557	317,625	330,000	2704.92	104%
77.	SP34124	Bara Chhara (Nabiganj) Subproject	Habiganj	Nabiganj	529	162	111	47	98%	51,780	15,800	7,900	75,480	478	316,770	300,000	1898.73	95%
78.	SP34127	Borak Khal-Kata Khal (Khagaura) Subproject	Habiganj	Baniachang	750	162	367	115	298%	76,100	48,200	24,100	148,400	308	308,512	270,000	560.17	88%
79.	SP34130	Phulsuti Subproject	Faridpur	Nagarkanda	350	199	104	25	65%	20,500	6,450	6,450	33,400	259	74,070	60,195	466.63	81%
80.	SP34135	Morabotai-Longlapur Khal Subproject	Habiganj	Sadar	998	118	78	6	71%	39,620	8,400	4,200	52,220	622	337,414	300,000	3571.43	89%
81.	SP34138	Jangal Khal Subproject	Habiganj	Madhabpur	345	158	94	23	74%	40,220	12,300	6,150	58,670	501	159,943	143,000	1222.22	89%
82.	SP34141	Atghar-Durgapur Khal Subproject	Faridpur	Saltha	512	312	119	20	45%	13,760	6,950	6,950	27,660	199	104,400	114,166	821.34	109%
83.	SP34142	Baksair Beel Subproject	Habiganj	Madhabpur	400	208	129	19	71%	37,880	14,800	7,400	60,080	406	79,650	60,000	405.41	75%
83				Totals	**44,920**	**38,058**	**27,483**	**7,564**		**6,586,193**	**3,209,196**	**1,285,192**	**11,080,581**	**25,427**	**18,657,149**	**18,569,402**	**55,377**	**99.5%**
				Average/SP	**541**	**459**	**331**	**91**		**79,352**	**38,665**	**15,484**	**133,501**	**306**	**224,785**	**223,728**	**667**	
										59.4%	29.0%	11.6%	100.0%					

Table A.3: Micro Credit Loans

Subproject ID & Name			District	Upazila	WMCA Membership (nos.)			Loan Information (Tk)			Borrowers (nos.)			Disbursed / Borrower (Tk)
					Male	Female	Total	Total Disbursed	Total Realized	%	Male	Female	Total	
1.	SP31004	Arua Kalkalia Subproject	Habiganj	Nabiganj	699	414	1,113	2,374,000	1,263,000	53	260	30	290	8,186
2.	SP31008	Pukuria-Uziakhali Khal Subproject	Netrokona	Kalmakanda	491	219	710	50,000			2	3	5	10,000
3.	SP32014	Talbaria Beel Subproject	Rajbari	Baliakandi	105	25	130	46,000			8	4	12	3,833
4.	SP32017	Rothkhola-Kamarbari Subproject	Jamalpur	Sharishabari	350	88	438	22,000	14,200	65	14	1	15	1,467
5.	SP32018	Batikamari Beel Subproject	Jamalpur	Islampur	248	88	336	130,000			18	20	38	3,421
6.	SP32020	Bansgari Subproject	Madaripur	Kalkini	426	108	534	405,600	136,560	34	17	4	21	19,314
7.	SP32023	Raiarpur Boro Khal Subproject	Habiganj	Nabiganj	485	106	591	339,000	286,000	84	26	5	31	10,935
8.	SP32031	Dhanchari Khal Subproject	Habiganj	Lakhai	197	106	303	50,000	7,500	15	4	6	10	5,000
9.	SP32032	Kamarer Khal Subproject	Madaripur	Rajoir	230	130	360	20,000	5,400	27	3	2	5	4,000
10.	SP32035	Akoter Char Nolertek Chaiterkole Khal Subproject	Faridpur	Sadarpur	188	76	264	470,000	240,000	51	30	20	50	9,400
11.	SP33059	Baneswardi Subproject	Faridpur	Nagarkanda	265	75	340	215,000	150,000	70	8	1	9	23,889
12.	SP33060	Lebutala-Bashbaria Subproject	Gopalgonj	Tungipara	376	72	448	155,000	86,000	55	11	4	15	10,333
13.	SP33064	Machpara-Laksmandia Khal Subproject	Rajbari	Pangsha	103	22	125	138,000	6,000	4	12	3	15	9,200
14.	SP33095	Dakshinbari Khal Subproject	Rajbari	Baliakandi	249	77	326	35,000	3,500	10	1		1	35,000
14				Total	4,412	1,606		4,449,600	2,198,160	49	414	103	517	8,607
				Avereage/SP	315	115		317,829	157,011		30	7	37	

Table A.4: Agriculture Land Use by Subproject in 2013

Subproject		Net Area	Cropped Area (ha)			Crop Intensity (%)			Incremental Crop Production (t)	
No.	Name	(ha)	Base	2,013	Increment	Base	2,013	Increment	Cereal	Non-cereal
31001	Rouha	644	1,511	1,415	-96	235	220	-15	50	336
31003	Tekhala-Naodhara-Katajora Khal	708	1,640	2,107	467	232	298	66	329	1,418
31004	Arura Kolkolia	546	539	644	105	99	118	19	859	238
31005	Shomschura Ranjana Khal	380	423	541	119	111	142	31	618	310
31006	Bawa-Chamurakandi Boro Haor	200	189	201	12	94	101	6	293	94
31007	Barua-Kumaria	800	1,448	1,751	303	181	219	38	516	1,277
31008	Pukuria Khal-Uziakhali Khal	784	1,301	1,380	79	166	176	10	1,264	163
32009	Satgavia Beel	890	1,470	2,117	647	165	238	73	591	2,020
32010	Langulia Khal	731	1,070	1,426	357	146	195	49	1,756	192
32011	Char Narayanpur-Naogaon Khal	350	416	657	241	119	188	69	1,031	98
32013	Roail-Helalpur	960	1,367	1,386	19	142	144	2	779	0
32014	Talbaria Beel	322	606	653	47	188	203	14	498	43
32015	Nimtala Beel	563	1,089	1,134	44	194	201	8	611	119
32016	Mahmudpur- Jikarbari	350	395	517	122	113	148	35	404	95
32017	Rothkhola Kamarbari	191	430	469	39	225	245	20	179	119
32018	Batikamari Beel	844	293	289	-4	35	34	0	35	19
32019	Katarbari-Karagati	730	885	946	61	121	130	8	310	73
32020	Bansgari	425	350	486	136	82	114	32	623	207
32021	Laghata Chhara	378	292	354	62	77	94	16	229	55
32022	Khorma-Tilokpur	453	772	769	-3	170	170	-1	467	898
32023	Raiarpur Boro Khal	650	729	819	90	112	126	14	1,173	93
32025	Barashila Beel	386	581	659	78	151	171	20	58	150
32026	Shutiar khal	540	797	874	77	148	162	14	314	191
32027	Kharia Nadi	1,000	997	1,015	18	100	101	2	385	215
32028	Lauer Beel	520	609	770	161	117	148	31	668	313
32029	Teli Haor	412	472	497	25	114	121	6	349	0
32030	Phuleswari-Sonai Beel	503	594	680	86	118	135	17	389	167
32031	Dhanchari Khal	250	250	258	8	100	103	3	80	40
32032	Kamarer Khal	700	930	1,015	85	133	145	12	805	109
32033	Mugai Khal	575	620	674	54	108	117	9	481	0
32035	Akterchar-Nolertek-Chaiterkole Khal	950	1,621	1,786	165	171	188	17	735	908
32036	Basan Beel	491	724	744	20	148	152	4	117	118
32038	Laxmiganj-Rupriya Khal	520	654	714	60	126	137	11	667	46
32039	Kurma Chhara	380	379	554	175	100	146	46	719	88
33040	Ghechua-Simulsur-Kalinagar	440	389	555	166	88	126	38	273	240
33041	Goalia Beel	137	249	270	21	182	197	15	95	261

Subproject		Net Area	Cropped Area (ha)			Crop Intensity (%)			Incremental Crop Production (t)	
No.	Name	(ha)	Base	2,013	Increment	Base	2,013	Increment	Cereal	Non-cereal
33042	Goila Beel	197	349	360	11	177	183	5	196	106
33045	Pudda Khali Khal	193	255	317	62	132	164	32	-33	440
33046	Rupadia-Majurdia Khal	300	319	372	53	106	124	18	75	46
33047	Shial Chhara	287	338	487	149	118	170	52	634	137
33048	Bapail Beel	1,000	1,963	1,973	11	196	197	1	509	258
33049	Bowlar Beel	860	1,632	1,725	93	190	201	11	1,117	134
33050	Narshanda-Tongi Khal	860	1,769	1,833	64	206	213	7	1,231	230
33052	Dubir Boro Dhair	550	554	550	-4	101	100	-1	238	44
33053	Lunglia Chhara	300	358	424	66	119	141	22	317	45
33054	Shialar Haor	520	87	90	3	17	17	1	12	53
33055	Tarai Nadi	613	955	1,023	68	156	167	11	915	109
33057	Saguli-Prayag Beel	332	216	266	51	65	80	15	390	101
33058	Lekha Beel	513	419	422	3	82	82	1	243	0
33059	Baneswardi	316	547	620	73	173	196	23	225	113
33060	Lebutala-Bashbaria	325	509	534	25	157	164	8	223	17
33061	Urafi-Jangal Danga	640	692	752	60	108	118	9	482	41
33063	Betbaria Khal	569	1,160	1,343	182	204	236	32	476	476
33064	Machpara-Lakshmandia Khal	551	913	993	80	166	180	15	665	-527
33065	Surai Khal	315	325	341	16	103	108	5	146	141
33066	Chitalia Khal	450	505	776	271	112	172	60	939	91
33068	Kala Chhara	214	224	304	79	105	142	37	312	126
33071	Borobaria-Suakair	870	243	206	-36	28	24	-4	-53	27
33074	Sherpur Katakhali Khal	352	314	321	7	89	91	2	56	25
33076	Chandrapur Khal	341	357	405	47	105	119	14	72	55
33078	Amgram	976	1,029	1,131	102	105	116	10	768	71
33079	Chait Beel	420	232	233	1	55	55	0	92	10
33080	Gujakuri Khal	563	499	491	-8	89	87	-1	133	164
33081	Salnar Khal	614	485	441	-43	79	72	-7	-92	268
33082	Kalmina Khal	950	773	789	16	81	83	2	385	121
33087	Ferani Beel-Shakhati Khal	900	900	904	4	100	100	0	233	11
33088	Foliar Khal	550	702	669	-34	128	122	-6	55	104
33091	Chukdar Kandi Khal	480	500	532	32	104	111	7	43	152
33093	Nachna Salika Khal	739	1,035	1,024	-11	140	139	-1	73	41
33095	Dakshinbari Khal	499	573	635	63	115	127	13	222	186
34107	Binnakandi	309	324	330	5	105	107	2	34	54
34109	Kachuar Khal	680	413	640	227	61	94	33	831	0
34113	Urarchar-Snanghata-Akalbaris Khal	300	80	100	19	27	33	6	103	10
34114	Char Lakshmipur Khal	950	26	36	11	3	4	1	44	6

Subproject		Net Area	Cropped Area (ha)			Crop Intensity (%)			Incremental Crop Production (t)	
No.	Name	(ha)	Base	2,013	Increment	Base	2,013	Increment	Cereal	Non-cereal
34116	Rashukhali Khal	451	0	3	3	0	1	1	8	7
34123	Muktahar Khal	810	188	191	3	23	24	0	16	13
34124	Bara Chhara	529	412	417	5	78	79	1	53	17
34127	Borak Khal-Kata Khal	750	706	707	1	94	94	0	4	2
34130	Phulsuti	350	153	213	60	44	61	17	86	130
34135	Morabotai-Longlapur Khal	998	587	590	3	59	59	0	9	7
34138	Jangal Khal	345	353	362	9	102	105	2	38	31
34141	Atghar-Durgapur Khal	512	141	181	40	28	35	8	205	26
34142	Baksair Beel	400	389	399	10	97	100	2	58	7
	TOTALS	**45,246**	**52,584**	**58,580**	**5,995**	**116**	**129**	**13**	**31,536**	**14,432**

Table A.5: Rabi (Winter) Agriculture Production by Subproject in 2012-2013

Subproject		Winter (Rabi+Boro) Production (t)							
		Base Production		2013 Production		Incremental Production (t)		Increment (%)	
No.	Name	Cereal	Non-cereal	Cereal	Non-cereal	Cereal	Non-cereal	Cereal	Non-cereal
31001	Rouha	1,195	794	1,498	883	303	89	25	11
31003	Tekhala-Naodhara-Katajora Khal	2,063	2,531	2,307	3,106	244	576	12	23
31004	Arura Kolkolia	2,098	11	2,891	223	793	212	38	2,020
31005	Shomschura Ranjana Khal	330	28	610	232	280	204	85	716
31006	Bawa-Chamurakandi Boro Haor	535	91	828	184	293	93	55	103
31007	Barua-Kumaria	2,345	8,662	2,625	9,118	280	457	12	5
31008	Pukuria Khal-Uziakhali Khal	3,732	0	4,609	147	877	147	23	Introduced
32009	Satgavia Beel	4,014	965	4,205	994	191	28	5	3
32010	Langulia Khal	4,445	638	5,077	689	632	52	14	8
32011	Char Narayanpur-Naogaon Khal	1,009	45	1,848	83	839	39	83	87
32013	Roail-Helalpur	4,592	0	5,050	0	457	0	10	Introduced
32014	Talbaria Beel	1,429	112	1,727	150	298	38	21	34
32015	Nimtala Beel	2,127	340	2,285	427	158	87	7	26
32016	Mahmudpur- Jikarbari	1,265	88	1,650	144	385	55	30	63
32017	Rothkhola Kamarbari	592	95	723	137	130	42	22	44
32018	Batikamari Beel	0	0	0	0	0	0	-	-
32019	Katarbari-Karagati	3,641	44	3,840	113	199	69	5	158
32020	Bansgari	1,228	112	1,722	332	494	220	40	197
32021	Laghata Chhara	0	0	0	0	0	0	-	-
32022	Khorma-Tilokpur	1,183	2,021	1,632	2,839	448	819	38	41
32023	Raiarpur Boro Khal	2,312	122	3,415	188	1,103	66	48	55
32025	Barashila Beel	1,868	79	1,896	138	28	59	2	74
32026	Shutiar khal	692	206	929	391	236	184	34	89
32027	Kharia Nadi	0	0	0	0	0	0	-	-
32028	Lauer Beel	2,856	66	3,419	247	563	181	20	275
32029	Teli Haor	1,521	0	1,771	0	250	0	16	Introduced
32030	Phuleswari-Sonai Beel	2,900	318	3,036	468	136	150	5	47
32031	Dhanchari Khal	**1,296**	**34**	**1,360**	**60**	64	26	5	76
32032	Kamarer Khal	3,103	87	3,683	130	580	43	19	49
32033	Mugai Khal	1,962	0	2,366	0	404	0	21	Introduced
32035	Akterchar-Nolertek-Chaiterkole Khal	3,791	705	4,417	1,519	626	814	17	115
32036	Basan Beel	2,352	151	2,457	218	105	67	4	44
32038	Laxmiganj-Rupriya Khal	2,898	79	3,463	117	565	38	19	48
32039	Kurma Chhara	0	0	0	0	0	0	-	-
33040	Ghechua-Simulsur-Kalinagar	1,730	35	1,970	76	239	40	14	114
33041	Goalia Beel	678	0	685	220	7	220	1	Introduced

		Winter (Rabi+Boro) Production (t)							
Subproject		Base Production		2013 Production		Incremental Production (t)		Increment (%)	
No.	Name	Cereal	Non-cereal	Cereal	Non-cereal	Cereal	Non-cereal	Cereal	Non-cereal
33042	Goila Beel	1,015	100	1,039	182	24	82	2	82
33045	Pudda Khali Khal	1,286	77	1,095	481	-191	404	-15	522
33046	Rupadia-Majurdia Khal	0	0	0	0	0	0	-	-
33047	Shial Chhara	0	0	0	0	0	0	-	-
33048	Bapail Beel	5,201	140	5,481	280	280	140	5	100
33049	Bowlar Beel	3,766	96	4,505	153	739	57	20	59
33050	Narshanda-Tongi Khal	4,387	236	5,126	382	739	146	17	62
33052	Dubir Boro Dhair	3,017	27	3,255	71	238	44	8	162
33053	Lunglia Chhara	0	0	0	0	0	0	-	-
33054	Shialar Haor	0	0	0	0	0	0	-	-
33055	Tarai Nadi	3,083	96	3,847	150	764	55	25	57
33057	Saguli-Prayag Beel	1,071	69	1,461	170	390	101	36	146
33058	Lekha Beel	0	0	0	0	0	0	-	-
33059	Baneswardi	0	0	0	0	0	0	-	-
33060	Lebutala-Bashbaria	2,120	83	2,274	99	154	16	7	20
33061	Urafi-Jangal Danga	2,800	124	3,097	145	297	21	11	17
33063	Betbaria Khal	2,113	368	2,256	440	143	72	7	20
33064	Machpara-Lakshmandia Khal	620	1,653	787	1,091	166	-563	27	-34
33065	Surai Khal	0	0	0	0	0	0	-	-
33066	Chitalia Khal	1,695	206	2,257	264	562	58	33	28
33068	Kala Chhara	0	0	0	0	0	0	-	-
33071	Borobaria-Suakair	0	0	0	0	0	0	-	-
33074	Sherpur Katakhali Khal	1,486	0	1,518	0	32	0	2	-
33076	Chandrapur Khal	0	0	0	0	0	0	-	-
33078	Amgram	4,546	55	5,188	119	642	64	14	115
33079	Chait Beel	0	0	0	0	0	0	-	-
33080	Gujakuri Khal	0	0	0	0	0	0	-	-
33081	Salnar Khal	0	0	0	0	0	0	-	-
33082	Kalmina Khal	0	0	0	0	0	0	-	-
33087	Ferani Beel-Shakhati Khal	4,951	0	5,173	0	222	0	4	-
33088	Foliar Khal	0	0	0	0	0	0	-	-
33091	Chukdar Kandi Khal	0	0	0	0	0	0	-	-
33093	Nachna Salika Khal	0	0	0	0	0	0	-	-
33095	Dakshinbari Khal	0	0	0	0	0	0	-	-
34107	Binnakandi	0	0	0	0	0	0	-	-
34109	Kachuar Khal	0	0	0	0	0	0	-	-
34113	Urarchar-Snanghata-Akalbaris Khal	0	0	0	0	0	0	-	-

		Winter (Rabi+Boro) Production (t)							
Subproject		Base Production		2013 Production		Incremental Production (t)		Increment (%)	
No.	Name	Cereal	Non-cereal	Cereal	Non-cereal	Cereal	Non-cereal	Cereal	Non-cereal
34114	Char Lakshmipur Khal	0	0	0	0	0	0	-	-
34116	Rashukhali Khal	0	0	0	0	0	0	-	-
34123	Muktahar Khal	0	0	0	0	0	0	-	-
34124	Bara Chhara	0	0	0	0	0	0	-	-
34127	Borak Khal-Kata Khal	0	0	0	0	0	0	-	-
34130	Phulsuti	0	0	0	0	0	0	-	-
34135	Morabotai-Longlapur Khal	0	0	0	0	0	0	-	-
34138	Jangal Khal	0	0	0	0	0	0	-	-
34141	Atghar-Durgapur Khal	0	0	0	0	0	0	-	-
34142	Baksair Beel	0	0	0	0	0	0	-	-
	TOTAL	**110,941**	**21,789**	**128,351**	**27,599**	**17,410**	**5,810**	**16**	**27**

Table A.6: Pre-monsoon (Kharif I) Agriculture Production by Subproject in 2013

Subproject		Pre-Monsoon (kharif 1) Production (t)							
		Base Production		2013 Production		Incremental Production (t)		Increment (%)	
No.	Name	Cereal	Non-cereal	Cereal	Non-cereal	Cereal	Non-cereal	Cereal	Non-cereal
31001	Rouha	647.9	537.7	312.5	740.0	-335.4	202.3	-51.8	37.6
31003	Tekhala-Naodhara-Katajora Khal	351.2	652.8	182.0	1425.0	-169.2	772.2	-48.2	118.3
31004	Arura Kolkolia	217.7	0.0	261.0	11.0	43.3	11.0	19.9	Introduced
31005	Shomschura Ranjana Khal	57.6	0.0	134.4	123.5	76.8	123.5	133.3	Introduced
31006	Bawa-Chamurakandi Boro Haor	0.0	8.2	0.0	8.2	0.0	0.0	-	0.6
31007	Barua-Kumaria	0.0	204.3	23.1	1025.0	23.1	820.7	Introduced	401.7
31008	Pukuria Khal-Uziakhali Khal	0.0	5.0	0.0	21.0	0.0	16.0	-	320.0
32009	Satgavia Beel	0.0	214.0	13.2	1529.7	13.2	1315.7	Introduced	614.8
32010	Langulia Khal	0.0	114.5	0.0	252.5	0.0	138.0	-	120.5
32011	Char Narayanpur-Naogaon Khal	26.4	38.4	50.4	74.6	24.1	36.2	91.1	94.1
32013	Roail-Helalpur	0.0	0.0	0.0	0.0	0.0	0.0	-	-
32014	Talbaria Beel	0.0	260.5	0.0	236.5	0.0	-24.0	-	-9.2
32015	Nimtala Beel	119.2	360.5	111.6	364.1	-7.6	3.6	-6.4	1.0
32016	Mahmudpur- Jikarbari	0.0	210.1	0.0	249.5	0.0	39.4	-	18.7
32017	Rothkhola Kamarbari	0.0	43.8	0.0	105.5	0.0	61.7	-	140.9
32018	Batikamari Beel	0.0	24.9	0.0	42.8	0.0	17.9	-	72.0
32019	Katarbari-Karagati	12.6	14.4	15.3	17.9	2.7	3.5	21.4	24.4
32020	Bansgari	0.0	115.2	46.4	101.6	46.4	-13.6	Introduced	-11.8
32021	Laghata Chhara	66.0	45.0	121.6	100.0	55.6	55.0	84.2	122.2
32022	Khorma-Tilokpur	0.0	17.5	0.0	69.6	0.0	52.2	-	298.9
32023	Raiarpur Boro Khal	264.6	0.0	284.0	12.3	19.4	12.3	7.3	Introduced
32025	Barashila Beel	0.0	25.8	0.0	115.6	0.0	89.8	-	348.1
32026	Shutiar khal	76.8	0.0	80.0	4.8	3.2	4.8	4.2	Introduced
32027	Kharia Nadi	0.0	316.0	0.0	435.8	0.0	119.8	-	37.9
32028	Lauer Beel	0.0	0.0	32.7	132.0	32.7	132.0	Introduced	Introduced
32029	Teli Haor	0.0	0.0	0.0	0.0	0.0	0.0	-	-
32030	Phuleswari-Sonai Beel	0.0	92.7	0.0	109.9	0.0	17.2	-	18.6
32031	Dhanchari Khal	0.0	0.0	0.0	6.6	0.0	6.6	-	Introduced
32032	Kamarer Khal	165.8	107.1	223.3	153.0	57.5	45.9	34.7	42.9
32033	Mugai Khal	0.0	120.0	0.0	120.0	0.0	0.0	-	0.0
32035	Akterchar-Nolertek-Chaiterkole Khal	111.2	423.7	97.5	518.0	-13.7	94.3	-12.3	22.3
32036	Basan Beel	0	45	0	96	0.0	51.0	-	113.3
32038	Laxmiganj-Rupriya Khal	20.7	64.5	35.5	62.4	14.8	-2.1	71.3	-3.3
32039	Kurma Chhara	462.0	52.5	900.0	140.0	438.0	87.5	94.8	166.7
33040	Ghechua-Simulsur-Kalinagar	0.0	49.5	0.0	249.6	0.0	200.1	-	404.1
33041	Goalia Beel	0.0	0.0	0.0	34.8	0.0	34.8	-	Introduced

Subproject		Pre-Monsoon (kharif 1) Production (t)							
		Base Production		2013 Production		Incremental Production (t)		Increment (%)	
No.	Name	Cereal	Non-cereal	Cereal	Non-cereal	Cereal	Non-cereal	Cereal	Non-cereal
33042	Goila Beel	0.0	14.8	0.0	31.9	0.0	17.0	-	114.9
33045	Pudda Khali Khal	0.0	64.0	0.0	100.0	0.0	36.0	-	56.3
33046	Rupadia-Majurdia Khal	13.2	536.4	20.1	547.5	6.9	11.1	52.3	2.1
33047	Shial Chhara	490.0	66.0	880.0	202.5	390.0	136.5	79.6	206.8
33048	Bapail Beel	545.1	211.8	425.3	281.0	-119.9	69.3	-22.0	32.7
33049	Bowlar Beel	382.8	123.0	486.0	199.5	103.2	76.5	27.0	62.2
33050	Narshanda-Tongi Khal	459.8	208.0	607.5	292.5	147.7	84.5	32.1	40.6
33052	Dubir Boro Dhair	0.0	0.0	0.0	0.0	0.0	0.0	-	-
33053	Lunglia Chhara	401.7	120.0	525.0	165.0	123.3	45.0	30.7	37.5
33054	Shialar Haor	96.3	186.3	108.0	214.7	11.7	28.4	12.2	15.2
33055	Tarai Nadi	0.0	40.8	0.0	72.0	0.0	31.2	-	76.5
33057	Saguli-Prayag Beel	0.0	0.0	0.0	0.0	0.0	0.0	-	-
33058	Lekha Beel	0.0	0.0	0.0	0.0	0.0	0.0	-	-
33059	Baneswardi	0.0	765.0	0.0	864.5	0.0	99.4	-	13.0
33060	Lebutala-Bashbaria	0.0	15.2	0.0	16.3	0.0	1.2	-	7.7
33061	Urafi-Jangal Danga	0.0	186.2	0.0	205.9	0.0	19.7	-	10.6
33063	Betbaria Khal	0.0	751.2	140.0	1122.3	140.0	371.1	Introduced	49.4
33064	Machpara-Lakshmandia Khal	0.0	480.6	30.0	516.7	30.0	36.1	Introduced	7.5
33065	Surai Khal	220.8	148.0	254.3	245.7	33.5	97.7	15.1	66.0
33066	Chitalia Khal	9.6	148.2	20.8	181.0	11.2	32.8	116.7	22.1
33068	Kala Chhara	143.0	54.0	270.0	180.0	127.0	126.0	88.8	233.3
33071	Borobaria-Suakair	0.0	7.8	0.0	34.5	0.0	26.8	-	345.2
33074	Sherpur Katakhali Khal	0.0	0.0	0.0	10.4	0.0	10.4	-	Introduced
33076	Chandrapur Khal	36.0	316.2	18.0	371.0	-18.0	54.8	-50.0	17.3
33078	Amgram	27.75	13.52	45.74	20.80	18.0	7.3	64.8	53.8
33079	Chait Beel	105.28	11.25	100	21.25	-5.3	10.0	-5.0	88.9
33080	Gujakuri Khal	118.65	211.7	62.5	360	-56.2	148.3	-47.3	70.1
33081	Salnar Khal	370.72	127.5	187.5	322.5	-183.2	195.0	-49.4	152.9
33082	Kalmina Khal	0	169.8	0	248	0.0	78.2	-	46.1
33087	Ferani Beel-Shakhati Khal	0	0	0	3.35	0.0	3.4	-	Introduced
33088	Foliar Khal	631.8	48	560	122.5	-71.8	74.5	-11.4	155.2
33091	Chukdar Kandi Khal	66.56	405.47	91.98	546.12	25.4	140.7	38.2	34.7
33093	Nachna Salika Khal	0	498	0	531.5	0.0	33.5	Introduced	6.7
33095	Dakshinbari Khal	28	339.45	34.1	507	6.1	167.6	21.8	49.4
34107	Binnakandi	247.5	74.48	262.6	119.7	15.1	45.2	6.1	60.7
34109	Kachuar Khal	0	0	0	0	0.0	0.0	-	-
34113	Urarchar-Snanghata-Akalbaris Khal	0	0	0	0	0.0	0.0	-	-

Subproject		Pre-Monsoon (kharif 1) Production (t)							
		Base Production		2013 Production		Incremental Production (t)		Increment (%)	
No.	Name	Cereal	Non-cereal	Cereal	Non-cereal	Cereal	Non-cereal	Cereal	Non-cereal
34114	Char Lakshmipur Khal	0	0	0	0	0.0	0.0	-	-
34116	Rashukhali Khal	0	0	0	7	0.0	7.0	-	Introduced
34123	Muktahar Khal	0	0	0	7.04	0.0	7.0	-	Introduced
34124	Bara Chhara	66.5	35	90	46.15	23.5	11.2	35.3	31.9
34127	Borak Khal-Kata Khal	0	402.55	0	404.49	0.0	1.9	-	0.5
34130	Phulsuti	0	22	0	76.5	0.0	54.5	-	247.7
34135	Morabotai-Longlapur Khal	0	0	0	6.68	0.0	6.7	-	Introduced
34138	Jangal Khal	0	34.7	3.54	50.27	3.5	15.6	Introduced	44.9
34141	Atghar-Durgapur Khal	0	0	0	0	0.0	0.0	-	-
34142	Baksair Beel	79.06	215.784	106.4	213.6	27.3	-2.2	34.6	-1.0
	TOTAL	**7139.6**	**11215.9**	**8253.7**	**18157.5**	**1114.0**	**6941.6**	**15.6**	**61.9**

Table A.7: Monsoon (Khrif II) Agriculture Production by Subproject in 2013

		Monsoon (kharif 2) production (t)							
Subproject		Base Production		2013 Production		Incremental Production (t)		Increment (%)	
No.	Name	Cereal	Non-cereal	Cereal	Non-cereal	Cereal	Non-cereal	Cereal	Non-cereal
31001	Rouha	2,506.2	369.0	2,588.6	413.6	82.4	44.6	3.3	12.1
31003	Tekhala-Naodhara-Katajora Khal	2,764.5	70.0	3,018.8	140.4	254.3	70.4	9.2	100.6
31004	Arura Kolkolia	120.6	0.0	143.8	14.5	23.2	14.5	19.2	Introduced
31005	Shomschura Ranjana Khal	1,329.2	17.6	1,590.0	0.0	260.8	-17.6	19.6	-100.0
31006	Bawa-Chamurakandi Boro Haor	0.0	0.0	0.0	0.0	0.0	0.0	-	-
31007	Barua-Kumaria	1,444.0	0.0	1,657.6	0.0	213.6	0.0	14.8	-
31008	Pukuria Khal-Uziakhali Khal	1,662.0	0.0	2,049.0	0.0	387.0	0.0	23.3	-
32009	Satgavia Beel	1,937.9	124.0	2,325.4	800.0	387.5	676.0	20.0	545.2
32010	Langulia Khal	337.5	0.0	1,461.2	2.2	1,123.7	2.2	332.9	Introduced
32011	Char Narayanpur-Naogaon Khal	255.0	9.0	423.0	32.0	168.0	23.0	65.9	255.6
32013	Roail-Helalpur	1,618.9	0.0	1,940.5	0.0	321.6	0.0	19.9	-
32014	Talbaria Beel	485.6	27.1	685.6	56.0	200.0	28.9	41.2	106.8
32015	Nimtala Beel	931.7	43.5	1,392.6	71.5	461.0	28.0	49.5	64.3
32016	Mahmudpur- Jikarbari	57.6	0.0	76.5	0.0	18.9	0.0	32.8	-
32017	Rothkhola Kamarbari	455.0	4.0	504.0	20.0	49.0	16.0	10.8	400.0
32018	Batikamari Beel	689.9	9.0	724.5	10.0	34.6	1.0	5.0	11.1
32019	Katarbari-Karagati	466.3	0.0	574.2	0.0	108.0	0.0	23.2	-
32020	Bansgari	48.0	0.0	130.7	0.0	82.7	0.0	172.4	-
32021	Laghata Chhara	919.2	0.0	1,092.5	0.0	173.3	0.0	18.9	-
32022	Khorma-Tilokpur	533.4	0.0	552.5	27.0	19.1	27.0	3.6	Introduced
32023	Raiarpur Boro Khal	362.4	0.0	413.2	14.8	50.8	14.8	14.0	Introduced
32025	Barashila Beel	642.6	6.0	672.8	7.6	30.2	1.6	4.7	26.5
32026	Shutiar khal	1,853.7	2.0	1,928.0	4.1	74.3	2.1	4.0	105.8
32027	Kharia Nadi	2,696.1	149.0	3,080.7	244.4	384.6	95.4	14.3	64.0
32028	Lauer Beel	56.4	0.0	128.8	0.0	72.4	0.0	128.4	-
32029	Teli Haor	491.5	0.0	590.4	0.0	99.0	0.0	20.1	-
32030	Phuleswari-Sonai Beel	96.2	0.0	348.7	0.0	252.5	0.0	262.6	-
32031	Dhanchari Khal	0.0	0.0	15.5	7.4	15.5	7.4	Introduced	Introduced
32032	Kamarer Khal	129.0	0.0	296.9	20.2	167.9	20.2	130.1	Introduced
32033	Mugai Khal	832.9	0.0	909.8	0.0	76.8	0.0	9.2	-
32035	Akterchar-Nolertek-Chaiterkole Khal	1,028.1	90.0	1,150.8	90.0	122.7	0.0	11.9	0.0
32036	Basan Beel	620.5	20.0	632.4	20.0	11.9	0.0	1.9	0.0
32038	Laxmiganj-Rupriya Khal	22.3	0.0	109.3	10.1	86.9	10.1	389.2	Introduced
32039	Kurma Chhara	773.4	0.0	1,054.5	0.0	281.1	0.0	36.3	-
33040	Ghechua-Simulsur-Kalinagar	149.8	0.0	183.5	0.0	33.7	0.0	22.5	-

		Monsoon (kharif 2) production (t)							
Subproject		Base Production		2013 Production		Incremental Production (t)		Increment (%)	
No.	Name	Cereal	Non-cereal	Cereal	Non-cereal	Cereal	Non-cereal	Cereal	Non-cereal
33041	Goalia Beel	364.2	0.0	452.6	6.5	88.4	6.5	24.3	Introduced
33042	Goila Beel	499.6	13.0	671.5	19.5	171.9	6.5	34.4	50.0
33045	Pudda Khali Khal	35.0	0.0	193.5	0.0	158.5	0.0	452.7	-
33046	Rupadia-Majurdia Khal	383.9	55.5	451.8	90.5	67.9	35.0	17.7	63.0
33047	Shial Chhara	630.4	0.0	874.5	0.0	244.1	0.0	38.7	-
33048	Bapail Beel	4,116.0	63.5	4,465.4	112.2	349.4	48.7	8.5	76.7
33049	Bowlar Beel	3,364.5	0.0	3,638.8	0.0	274.3	0.0	8.2	-
33050	Narshanda-Tongi Khal	2,931.2	0.0	3,275.3	0.0	344.1	0.0	11.7	-
33052	Dubir Boro Dhair	0.0	0.0	0.0	0.0	0.0	0.0	-	-
33053	Lunglia Chhara	738.4	0.0	932.0	0.0	193.6	0.0	26.2	-
33054	Shialar Haor	0.0	242.0	0.0	266.5	0.0	24.5	Introduced	10.1
33055	Tarai Nadi	1,557.0	48.3	1,708.0	71.7	151.0	23.4	9.7	48.4
33057	Saguli-Prayag Beel	0.0	0.0	0.0	0.0	0.0	0.0	-	-
33058	Lekha Beel	1,418.0	0.0	1,660.9	0.0	242.9	0.0	17.1	-
33059	Baneswardi	830.6	32.0	1,055.2	45.1	224.6	13.1	27.0	40.9
33060	Lebutala-Bashbaria	352.1	0.0	421.3	0.0	69.2	0.0	19.6	-
33061	Urafi-Jangal Danga	340.4	0.0	524.8	0.0	184.4	0.0	54.2	-
33063	Betbaria Khal	840.7	40.8	1,033.5	73.8	192.8	33.0	22.9	80.8
33064	Machpara-Lakshmandia Khal	1,036.8	28.0	1,505.3	28.0	468.5	0.0	45.2	0.0
33065	Surai Khal	571.3	180.0	684.0	223.2	112.8	43.2	19.7	24.0
33066	Chitalia Khal	66.6	0.0	432.5	0.0	365.9	0.0	549.4	-
33068	Kala Chhara	574.8	0.0	760.0	0.0	185.2	0.0	32.2	-
33071	Borobaria-Suakair	508.0	0.0	455.0	0.0	-53.0	0.0	-10.4	-
33074	Sherpur Katakhali Khal	78.8	0.0	102.8	14.8	24.0	14.8	30.5	Introduced
33076	Chandrapur Khal	301.8	0.0	391.6	0.0	89.8	0.0	29.7	-
33078	Amgram	269.3	0.0	377.2	0.0	108.0	0.0	40.1	-
33079	Chait Beel	697.1	0.0	794.5	0.0	97.4	0.0	14.0	-
33080	Gujakuri Khal	1,593.1	171.0	1,782.4	186.6	189.3	15.6	11.9	9.1
33081	Salnar Khal	1,536.0	210.0	1,627.5	282.8	91.5	72.8	6.0	34.7
33082	Kalmina Khal	2,879.0	98.5	3,263.5	141.2	384.5	42.7	13.4	43.4
33087	Ferani Beel-Shakhati Khal	0.0	0.0	10.8	7.4	10.8	7.4	Introduced	Introduced
33088	Foliar Khal	2,175.3	108.0	2,302.5	137.4	127.2	29.4	5.8	27.2
33091	Chukdar Kandi Khal	342.2	21.0	360.0	32.0	17.8	11.0	5.2	52.4
33093	Nachna Salika Khal	1,888.7	22.5	1,962.0	30.0	73.4	7.5	3.9	33.3
33095	Dakshinbari Khal	1,161.0	0.0	1,376.7	18.8	215.7	18.8	18.6	Introduced
34107	Binnakandi	1,097.9	40.0	1,117.2	48.3	19.4	8.3	1.8	20.8
34109	Kachuar Khal	1,404.0	0.0	2,235.0	0.0	831.0	0.0	59.2	-

		Monsoon (kharif 2) production (t)							
Subproject		**Base Production**		**2013 Production**		**Incremental Production (t)**		**Increment (%)**	
No.	**Name**	**Cereal**	**Non-cereal**	**Cereal**	**Non-cereal**	**Cereal**	**Non-cereal**	**Cereal**	**Non-cereal**
34113	Urarchar-Snanghata-Akalbaris Khal	211.7	0.0	314.6	10.1	102.9	10.1	48.6	Introduced
34114	Char Lakshmipur Khal	87.7	0.0	131.3	6.3	43.6	6.3	49.7	Introduced
34116	Rashukhali Khal	0.0	0.0	7.7	0.0	7.7	0.0	Introduced	-
34123	Muktahar Khal	582.3	0.0	597.9	5.9	15.5	5.9	2.7	Introduced
34124	Bara Chhara	1,056.3	29.9	1,085.8	35.9	29.5	6.0	2.8	20.0
34127	Borak Khal-Kata Khal	1,712.8	0.0	1,716.3	0.0	3.5	0.0	0.2	-
34130	Phulsuti	434.0	0.0	520.0	75.0	86.0	75.0	19.8	Introduced
34135	Morabotai-Longlapur Khal	2,006.6	0.0	2,015.4	0.0	8.8	0.0	0.4	-
34138	Jangal Khal	979.8	30.1	1,014.2	45.2	34.4	15.1	3.5	50.0
34141	Atghar-Durgapur Khal	276.8	63.0	481.5	88.8	204.7	25.8	74.0	41.0
34142	Baksair Beel	1,008.2	0.0	1,039.1	9.0	30.9	9.0	3.1	Introduced
	TOTAL	**73,256.8**	**2,437.4**	**86,269.1**	**4,118.1**	**13,012.3**	**1,680.7**	17.8	69.0

Table A.8: Fishery Assessment Findings

	District	Upazila	SP No. & Name	Type	IA Sign Date	Capture				Culture				Total Production
						Water Area (ha)	Produc-tion (t)	Fisher (#)	Annual Income / Fisher ('000 Tk)	Water Area (ha)	Produc-tion (t)	Fish Farmer (#)	Annual Income / Fisher ('000 Tk)	
01	Mymensingh	Gafargaon	3001 Rouha	CAD	14/3/10	0		-9	2	1	5	12	2	5
			TOTAL			0		-9	2	1	5	12	2	5
02	Sherpur	Nalitabari	31026 Sutiar Khal	WC&CAD	31/7/11	-0	0	1	1	3	1	7	2	1
			TOTAL			-0	0	1	1	3	1	7	2	1
03	Mymensingh	Fulpur	32027 Kharia Nadi	DR&WC	15/12/10	0	2	-9	7	4	4	10	2	6
04	Mymensingh	Nandail	33048 Bapail Beel		22/11/11	0	3	8	4	3	4	9	3	7
05	Tangail		32025 Barashilla Beel		5/4/11	0	2	0	4	0	1	0	0.5	3
06	Faridpur	Madhukhali	32009 Satgavia Beel		6/10/10	0	1	8	3	3	2	1	1	2
07	Faripur	Boalmari	33046 Rupdia-Majurdia		21/6/12	0	0	0	0	2	1	0	1	3
08	Rajbari	Kalukhali	33063 Betbaria Khal		10/1/12	12	1	7	-1	0	1	2	0.5	2
09	Rajbari	Sadar	32015 Nimtala Beel		2/3/10	-5	-2	0	-1	3	1	5	0	-1
10	Rajbari	Baliakandi	33095 Dakhinbari Khal		25/4/12	16	-1	-5	0	2	1	4	0	0
			TOTAL			-33	6	-37	16/4=2	17	15	32	8/8=1	21
11	Mymensingh		33048 Bawlar Beel	FMD	22/11/11	0	2	-2	6	1	4	5	2	6
12	Mynensingh	Gafargaon	33079 Chait Beel		13/5/12	0	1	0	3	1	2	3	0	4
13	Tangail		32036 Basan Beel		5/4/11	-6	-1	2	3.5	0	1	0	1	1
14	Tangai		33041 Goalia Beel		24/11/11	0	1	0	2	0	2	0	.0	2
15	tangail		33042 Goilla Beel		4/1/12	0	0	0	1	0	.1	5	2	1
16	Netrokona		33045 Pudda Khali Khal		29/11/11	- 9	- 2	0	4	1	1	3	1	3
17	Kishor	Tarail	32030 Phuleshwari-Sonai Beel		27/4/11	0	1	-3	4	0.5	2	3	1	4
18	Jamal	Sharishabari	32017 Rothkhola-Kamarbari		5/10/10	0	0	2	5	0.5	1	3	1	1
19	Jamal	Islampur	32018 Batikamari Beel		27/2/11	-12	0	0	5	0.3	2	5	1	2
20	Jamal	Dewangonj	32022 Khorma-Tilokpur		31/1/11	0	0	-2	5	0.7	2	0	1	2
			TOTAL			-27	2	-7	0	5	18	27	1	20

	District	Upazila	SP No. & Name	Type	IA Sign Date	Capture				Culture				Total Production
						Water Area (ha)	Produc-tion (t)	Fisher (#)	Annual Income / Fisher ('000 Tk)	Water Area (ha)	Produc-tion (t)	Fish Farmer (#)	Annual Income / Fisher ('000 Tk)	
21	Mymemsingh		33081 Salnar Khal	FM&WC	12/3/12	0	1	0	6	1	3	8	1	4
22	Sylhet	Sadar	31006 Bawa-Chamurakandi Baro Haor		14/2/10	0	0	-9	-7	1	2	4	0	2
			TOTAL			0	1	-9	-1	2	5	12	1	6
23	Mymensingh		33088 Foliar Khal	FMD &WC	1/4/12	0	0.5	2	2	1	4	5	1	4.5
24	Habignj		32023 Raiapur Baro Khal		17/1/11	1	4	0	0	0	0	0	0.5	4
25	Rajbari	Baliakandi	32014Talbaria Beel		1/2/11	-1	-3	7	-2	1	1	3	0	-2
26	Sunam	Jagannathpur	32013 Roail-Helalpur		2/1/11	0	0.5	0	2	0	0	2	0	0.5
27	Sunamgonj	Chatak	32029Teli haor		24/1/11	0	1	0	0	0	0	0	0	1
			TOTAL			0	1	-9	-1	2	4	7	2	5
28	Netrokopna	Kalmakanda	31008 Pukuria Uziakhali Khal	FM	11/8/10	0	-2	-7	0	0	1	7	2	-1
			TOTAL			0	-2	-7	0	0	1	7	2	-1
29	Sherpur	Nalitabari	31005 Ranjana Jharna Khal	WC	5/9/10	0	0.5	0	1	1..5	1.5	9	1	2
30	MviBazar	Kamalgonj	32021 Laghata Chara		22/211	0	0.5	0	1	0.2	1.5	8	1	2
31	Mvibazar	Sadar	33058 Lekha Beel		18/4/12	0	0	-2	0	1	0.5	2	0	0.5
32	Habigonj	Nabigonj	31004 Arua kalkalia		4/2/10	1	1	7	0	1	1	4	0	2
33	Sunamgonj	Sadar	32033 Mugai Khal		30/7/11	0	0	0	0.5	0.5	0.5	4	0	0.5
34	Sunamgonj	Sadar	33092 Nokiar Chara		291212	6	0	0	0	0	0	0	0	0
			TOTAL			7	2	5	2	6	5	27	2	7
35	Faridpur	Sadarpur	32035 Akoterchar-N-Ch Khal	DR	17/11/11	-7	-1	-6	4	0	2	7	1	1
			TOTAL			-7	-1	-6	4	0	2	7	1	1
36	Habignj		32031 Dhanchari Khal	DR&IRR	17/11/11	0	0	-8	0	1	2.5	8	0	2.5
37	Habogonj		33074 Sherpur Katha khali		1/12/11	2	0	-9	0	1	2	7	10	2
38	Habogonj	Sadar	33087 Ferani Beel Shakati Khal		18/1/12	0	-0.5	-7	0	1	2	5	0.5	1.5

	District	Upazila	SP No. & Name	Type	IA Sign Date	Capture				Culture				Total Production
						Water Area (ha)	Produc-tion (t)	Fisher (#)	Annual Income / Fisher ('000 Tk)	Water Area (ha)	Produc-tion (t)	Fish Farmer (#)	Annual Income / Fisher ('000 Tk)	
39	Habogonj	Nabigonj	34116 Rashukhali Khal		3/10/12	0	0	0	0	0.5	1.5	4	0	1.5
40	Hobigong	Bania chong	34127 Borak khal Kata khal		20/12/12	0	0.5	0	0	1	1.5	6	0	2
41	Gopalgonj	Kasiani	32016 Mamudpur Jhukabari		11/1/11	-2	0	-5	0	1	2.5	2	-0.5	2.5
42	Gopalgonj	Sadar	32019 Katarbari-Katargati		10/1/11	-3	0.5	2	1	1	3	3	1	2.5
43	gopalgonj	Sadar	33061 Urfi-Jangal danga		20/11/11	0	0	-7	0	0.5	3	0	0	3
44	Madaripur	Kalkini	32020 Bansgari		17/1/11	-5	0	-9	0	0	1	4	0	1
45	Madaripur	Sadar	32028Lauer Beel		10/1/11	-2	0.5	0	0	1	2.5	3	0	3
46	Madaripur	Rajoir	32032 Kamarer Kha		2/10/11	-12	0.5	-9	0	1	1	0	0	1.5
47	Shariatpur	Damuddya	32011 Char narayanpur-Naogaon Khal		12/1/11	-2	.0.5	0	1	1.5	1.5	7	0	2
48	shariatpur	Sadar	33066 Chitalia Khal		8/1/12	-3	1	0	0	1.5	3	8	0	4
			TOTAL			-27	3	-52	2	12	27	57	1	30