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Technical Note 22 Cycle 11 FFS



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Cycle 11 FFS

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Comparing benchmark and end data

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Summary

This report presents the basic data and the findings of the FFS participants of 11th cycle based on the analysis of the data collected at the start and end of the FFSs to show the differences in production and household income. Eleventh cycle Farmer Field School (FFS) took place from April 2018 to November 2018. A total of 166 FFSs implemented in Khulna (polders 25, 27/1, 27/2, 28/1, 28/2, 34/2-part, 31-part), Patuakhali (55/2A, 55/2C, 47/3 & 47/4) and Satkhira (Polder-2). From this cycle of FFS, BGP has taken a demand-based single module approach instead of the bundle of modules approach and emphasized the inclusion of resource poor. The FFS included Poultry, Beef fattening, Fish, Fruit, Dyke and Homestead vegetable modules with market orientation.

The collected benchmark and end line data are discussed in this report.

TA farmer trainer and community development facilitators collected the data. Random sampling technique followed for data collection with Poultry, Beef Fattening, and Fish module. Purposive sampling technique followed for homestead vegetable, dyke vegetable and fruit module. A semi-structured questionnaire was used for data collection.

Bringing the sampling data of 166 FFS together creates a data set with information over 4150 farmers. Totals and averages of the collected benchmark and end data are presented side by side for easy visualization. The calculated averages of collected data at the beginning and end of the FFS can be used to get an idea of the effect of the training.

Brief features of the report are discussed here in the summary;

Poultry module

The poultry module is of special interest for women. 98% women participated with 11th cycle Poultry FFS. Almost all participants are registered WMG members. The majority of farmers are literate and the percentages belong to primary 46% and secondary 32% respectively. Inclusions of the poorest people were 49%. Survey reveals that almost all farmers are using *haza/s* for hatching chicks, have adopted the practice of candling eggs, and separation of chicks from mother hen after one or two weeks. This was not a common practice before the FFS. Result reflected the positive changes on poultry production. It was found from the survey that number of egg production/hen/year increased from 50 to 96 and egg/duck/year increased from 81 to 111 respectively. Number of selling eggs per months increased about 3 times and average, annual poultry sales increased by 5 times. The number of eggs eaten each week by FFS members increased by double. On an average, every farmer family ate two birds per month. Linkages between the Department of Livestock Services (DLS) and FFS members increased during FFS period.

Beef Fattening (BF) module

Although the beef fattening activities mainly dominated by men, 69% women participated with beef fattening FFS with 11th cycle FFS. The majority of farmers are literate and the percentage belongs to primary (47%). Young and dynamic participants attended the FFS and the average age of the participants was 36 years. Inclusion of the poorest people was 30%. It found from the data that farmers adapted technical knowledge on improvement of cattle shed, feeding and health management. At the time of end line survey significant percentages of farmer reported that cattle shed cleaning, keep ventilation, gutter for drainage and practice of daily cleaning put in practice while these practices were very less likely during the benchmark survey. Farmers also reported significant increases regarding production of green fodder, urea molasses straw preparation (4% to 99%) and feeding (2% to 99%). Farmers are taking services from animal health worker. Farmers learned to measure body weight of animal and the percentages increased from 3% to 99% which helped to bargain with traders.

Homestead and dyke vegetable Module

With 11th cycle FFS 100% and 93% women participated in homestead and dyke vegetable module respectively. All participants are registered WMG members. The majority of participated farmers are literate. Inclusions of the poorest people were 50% and 23% with homestead and dyke module respectively. Survey result shows the practice of different technologies among the FFS farmers. The number of different types of vegetables grown within a homestead and the dyke increased significantly. In homestead vegetable production, instead of relying mainly on sunny open areas to grow vegetables farmers started growing their vegetables in different locations within their homestead. After the training, almost all farmer followed proper pit, raised bed and IPM methods for vegetable production in their

homestead and dyke. These percentages were very insignificant during the benchmark time. At the start of the cycle, there was little if any use of Farm Yard Manure (FYM), but at the end of the FFS, almost all farmers were preparing FYM. The training gave them the inspiration to undertake homestead gardening in a more commercial manner, and as a result nowadays 24% farmers are selling their homestead vegetables more than half while before the training it was only 3%. On the other hand, dyke vegetable growers had more commercial thinking before the training, as a result, the percentage of selling more than half is 52% at the end while before the training it was 34%.

Homestead fruit Module

Due to farmer demand a separate module was developed for Homestead fruit production with 11th cycle FFS. 93% young and dynamic women participated with this module. Survey shows the technology adaptation status among the FFS farmer of fruit production. The average number of trees in each homestead area has increased. It is important to note that some saplings were distributed as practical materials. During benchmark farmers had less attention on using of improved technologies. During FFS session some easy technologies demonstrated to FFS members. At the end of FFS, farmers utilized their learning in practice as the result shows that almost all farmers started to follow space planning, fertilization, pruning, propagation and IPM. On the other hand, a significant percentage of FFS farmers sold fruit. All farmers (100%) followed space planning and proper fertilization for fruit production. For fruit tree improvement pruning followed by 97% farmer and propagation practiced by 99%.

Fish module

Although Fish production activities mainly dominated by male, 78% women were participated with this fish module. Inclusions of poorest people were 29%. Young, energetic and literate farmer attended the FFS. Farmer reported that they have started using different improved technologies like pond preparation, fingerling selection, stocking density, feed management, sampling etc. for getting better production. The adaptation of those technologies ranged from 93% to 100%. Using of these technologies helped them to get a considerable higher fish production from 4 kg to 11 kg per decimal after completion of the FFS fish module.

Trends in market orientation with different modules

Market orientation issues were incorporated within FFS sessions to enable farmers produce quality product and increase their income from selling. To stimulate farmers to think about market orientation questions are asked in the benchmark survey and end line survey on record keeping, networking, Information and communication technologies, collective action, linkages etc. Training inspired farmer on market orientation issues. At the end 96% farmer considered agricultural activities as a business and started keeping record. It was found from the survey that 90% and 72% farmer started collective action for input collection and sale respectively. 76% participants reported that they used ICT for agricultural information collection.

Gender Perspective

With 11th cycle FFS there were some questions set to know about the position of women in decision making process on FFS activities and to stimulate them to think about market orientation. In this cycle, 90% participants were women. It is important to note that significant percentages of women participated in male dominated beef fattening (96%), fish (78%) and dyke (78%) vegetable modules. In addition, in the training session, farmers got motivated hearing the benefits of collective action and farming as a business. As a result, decision making on input management, eating and selling of surplus production shifted from individual decision to joint approach. It is noted that after attending FFS, women linked with local market and started to communicate with market actors by using mobile phone. 50% women had the market actor phone number with them and among them 78% started to communicate with market.

1. Introduction

Blue Gold Program follows a Farmer Field School approach as a prime vehicle for trials, learning and adoption of improved farm technologies at homestead areas. For utilization of homestead resources, the program is undertaking different modules at different polders.

This is a report of data collected in cycle 11, which took place from April 2018 to November 2018 in Khulna, Patuakhali and Satkhira. From this cycle of FFS, BGP has taken a demand-based single module approach instead of the bundle of module approach. The modules were poultry, beef fattening, homestead vegetable, fruit, and dyke with market orientation. 76 Farmer Trainers involved as Facilitators under Community Development Facilitator (CDFs) supervision to run cycle 11 FFS.

1.1 Methodologies

A semi-structure questionnaire used for collecting bench mark and end line data. The questionnaire focused on content of each module (Poultry Rearing, Beef Fattening, Fish, Homestead and Dyke vegetable, Fruit). Data on 166 FFS members collected by Farmer Trainer (FTs). On-line questionnaire prepared by using ODK (Open Data Kit) tools. Open Data Kit (ODK) is a free and open-source set of tools which help manage mobile data collection solutions

In Khulna, the FFSs took place in polders 25, 27/1, 27/2, 28/1, 28/2, 34/2-part, 31-part, in Patuakhali the FFSs were in polders 55/2A, 55/2C, 47/3 and 47/4 and in Sathkira P-2.

The WMG executive committee helps selecting FFS participants according to a set of criteria. During FFS member selection, special emphasis given to select poor farmer. The criteria for selecting poorest farmer are;

1. Does any of your HH members work as agriculture labour?
2. How much agricultural land does your household own?
3. What is the status of your household structure? (Code: 1= Jhupri; 2=Kutchra; 3= Semi Pucca; 4= Pucca)

Type of house	Construction
Pucca	Solid, permanent construction with bricks and concrete, possibly corrugated iron roofing.
Semi-Pucca	Concrete floors, walls partially of bricks (e.g., brick foundation), partially of bamboo or iron sheets, corrugated iron roofing.
Kutchra	Earthen floor, walls of mud bricks or woven materials (jute, bamboo), roof of thatch or occasionally corrugated iron.
Jhupri	Earthen floor, walls of mud bricks or jute sacks, roof of thatch or corrugated iron.

The prospective poorest households in rural areas would therefore be agricultural labourers residing in jhupri or single structure thatch owning up to 0.5 acres of land.

The below table shows different sampling technique used for data collection.

Module Wise sample size for survey

SI no.	Module with no. of FFS	Sample size at 95% significance level	Sampling	Feasible data for final analysis
1.	Poultry (80)	323	Random	316
2.	Beef Fattening (25)	239	Random	210
3.	Fish (38)	274	Random	267
4.	Vegetable (07)	112	Purposive	112
5.	Dyke (09)	90	Purposive	90
6.	Fruit (07)	80	Purposive	68

Bringing the sample data of 166 FFS together, creates a dataset with information of over 4150 farmers. But some care should be taken when trying to draw conclusions. The data were collected by the same facilitators who organized the FFS, who may be biased to show good results. And the farmers themselves may also be tempted in the end survey to give answers that show how good they are, especially when questions are asked about changes in behaviour.

In the below discussion of the data, comments are included to help with the interpretation of the results.

1.2 Objectives

When comparing and interpreting these data it is important to understand the objectives of data collection in the FFS.

At the start of the FFS, the objectives of the “benchmark survey” are:

- To establish benchmarks that can be used by farmers and facilitators for measuring progress (e.g. in production) or to identify changes in behaviour
- To generate interest among participants and introduce them to the topics which will be discussed and practiced during the FFS.

At the end of the FFS, the “end survey” is a repetition of the same questions. This allows the FFS participants to verify their own progress, and they can present their results (e.g. an increase of egg or meat, fish and vegetable production etc), during farmer field days.

2. Poultry Module with market orientation

A total of 80 Farmer Field School (FFS) implemented at Khulna, Patuakhali and Sathkita with Poultry module. The below table shows polder wise implemented FFS status.

Polder wise Implemented Poultry FFS

SL no.	Zone	Polder	No. of FFS
1	Khulna (56)	P-25	26
		P-27/1	4
		P-27/2	3
		P-28/1	3
		P-28/2	6
		P-34/2-Part	10
		P-31-Part	4
2	Patuakhali (21)	P-47/3	3
		P-47/4	9
		P-55/2C	9
3	Sathkira (03)	P-2	3
		Total	80

2.1 General information of FFS participants with poultry module

The table below shows the profile of the FFS participants with poultry module in Patuakhali, Khulna and Sathkira. When selecting participants for the FFS we try to include young dynamic farmers, preferably younger and it is found from the table that young and energetic farmer participated with Poultry FFS. Average age of the participants was 34 years.

The poultry module is of special interest for women. 98% women participated with 11th cycle Poultry FFS. Almost all participants are registered WMG members. The majority of farmers are literate and the percentages belong to primary 46% and secondary 32% respectively. Inclusions of the poorest people were 49%.

Sl no.	Particulars	Result
1	Average age	34
2	Gender	98%
3	WMG member	99%
4	Education	Primary (46%) , Secondary (32%)
5	Inclusion Poorest people	49%

2.2 Result on Poultry Module

FFS cycle 11 included the poultry module with market orientation. Objective of this module is to increase the production of birds and eggs and reduce losses due to diseases. Technical topics in the poultry module include housing, feeding, use of *hazal*, separating chicks from the mother hen, candling, and vaccination. For market orientation, topics include networking, collective action, linkages with input providers, community poultry workers and department of livestock.

2.2.1 Number of birds

The following tables show the average number of chickens, chicks, ducks and ducklings per household. The end survey shows increases in the number of birds. This can be partly attributed to improved rearing methods, and is also partly explained because some chicks or ducklings were distributed to FFS participants.

Number of birds	Patuakhali, Khulna, Sathkira (average per household)	
	Benchmark (n=320)	End FFS (n=316)
Chickens	4	11
Chicks	9	18
Ducks	5	13
Ducklings	8	9

2.2.2 Eggs per bird

In the FFS the participants learn techniques to increase egg production (e.g. separating chicks from hen after 1 week). The following tables show how the farmers estimated the egg production per year for their chickens and ducks. These numbers are of course rough estimates and it seems that in the end survey the estimates were too high.

Number of birds	Patuakhali, Khulna, Sathkira (average per household)	
	Benchmark (n=320)	End FFS (n=316)
Eggs per hen	50	96
Eggs per duck	81	111

2.2.3 Egg and poultry consumption

With the increase in birds and the increase in egg production we see that households consume more of their own eggs and birds.

Egg and poultry consumptions	Patuakhali, Khulna, Sathkira (average per household)	
	Benchmark (n=320)	End FFS (n=316)
Consume own eggs/week	5	10
Consume own birds/monthly	1	2

2.2.4 Selling of eggs

The next tables show that in the FFS the number of farmers selling eggs increased and also that the number of eggs sold per month increased. On average we see that farmers reported selling more than 3-4 times as many eggs each month.

Selling of eggs	Patuakhali, Khulna, Sathkira (average per household)	
	Benchmark (n=320)	End FFS (n=316)
Farmers selling eggs/month	9.7	26

Selling of poultry	Patuakhali, Khulna, Sathkira (average per household)	
	Benchmark (n=320)	End FFS (n=316)
Farmers selling poultry /year	6	30

2.2.5 Poultry rearing practices

In the poultry module, the FFS farmers learn several improved poultry rearing practices, such as vaccination of the birds, the use of *hazals*, and candling of eggs. Many farmers at the end of the FFS report that they have adopted these practices. Follow up surveys will have to show if these practices are sustained.

Vaccinations depend of course on the availability of vaccination services by community poultry workers, but most farmers report that they practice vaccinations sometimes or always. Facilitators of the FFS invited poultry workers to the FFS sessions and field days in order to link them with the FFS participants.

Almost all farmers report that they started using *hazals*, and all farmers adopted the practicing of candling their eggs. Most farmers separate chicks from hen after one or two weeks, while this was not a common practice before the FFS.

Poultry rearing practices	Patuakhali, Khulna, Sathkira (% farmer)	
	Benchmark (n=320)	End line (n=316)
Vaccinate always	1	70
Vaccinate sometimes	15	30
Vaccinate never	84	0
Use <i>hazal</i>	11	99
Use candling	14	100
Separate chicks after 1 week	3	88
Separate chicks after 2 weeks	3	11
Separate chicks never	89	0

2.3 Trends in market orientation with Poultry Module

Market orientation issues were incorporated within FFS sessions to enable farmers produce quality product and increase their income from selling. More emphasis was now evident on improving linkage with value chain actors. To stimulate farmers to think about market orientation questions are asked in the benchmark survey and end line survey on record keeping, networking, Information and Communication technologies, collective action, linkages etc.

Training inspired them to keep linking with markets; as a result, a considerable percentage of participants reported that they have communicated with market actors and used ICT for agricultural information collection after the training. In addition, in the training session, farmers got motivated hearing the benefits of collective action. It is noted that after attending FFS, women participants started to communicate with market actors.

From each of the FFS, one advance farmer trained as a Resource Farmer (RF) on market orientation issues. They all are attended an exposure visit to local market. Result showed that Resource Farmers started providing support to FFS member.

The following table shows the positive changes among the members on marketing issues in practice.

2.3.1 Stimulation on agriculture is a business and record keeping

Generally farmer does not think that poultry rearing could be an agri-business. After attending FFS they have an idea why it would be a business activity. The following table shows that 80% considered poultry rearing as a business and started keeping record.

Particulars	Khulna, Patuakhali, Sathkira	
	Benchmark (n=320)	End FFS (n=316)
Poultry rearing is a business	16%	80%

Particulars	Khulna, Patuakhali, Sathkira	
	Benchmark (n=320)	End line (n=316)
Record keeping	8%	100%

2.3.2 Source of input collection

The table shows that at the end of FFS, farmer collecting their input for poultry rearing from different sources. It was because of the list of input seller and other information supplied to them.

Sources	Patuakhali, Khulna, Sathkira (% farmer)	
	Benchmark (n=320)	End line (n=316)
Local hat from hat day	59	33
Local retailer Shop	45	74
Neighbour	10	3
Hatchery	0	0
others	0	0

2.3.3 Use of ICT for agricultural information collection

For information collection on input management and technical knowledge by using mobile phone, at the end of FFS 55% farmer started using ICT.

Particulars	Patuakhali, Khulna, Sathkira (% farmer)	
	Benchmark (n=320)	End line (n=316)
Never	93	36
Sometimes	7	55
always	0	9

2.3.4 Collective action

The below tables show that 93% started collective action for input collection and 77% involved with collective cell. Farmer also linked with resource farmers.

Input collection

Collectively input collection	Patuakhali, Khulna, Sathkira (% farmer)	
	Benchmark (n=320)	End line (n=316)
Yes	1	93
No	99	7

Collective sales

Collective cell	Patuakhali, Khulna, Sathkira (% farmer)	
	Benchmark (n=320)	End line (n=316)
Never	93	8
Sometimes	7	77
always	-	15

2.3.5 Resource farmer support

Resource farmer support	Patuakhali, Khulna, Sathkira (% farmer)	
	Benchmark (n=320)	End line (n=316)
Input purchase, selling		80
Technical information		18
None		2
Not applicable	100	-

2.4 Gender perspective with poultry module

With 11th cycle FFS there were some questions set to know about the position of women in decision making process on poultry rearing activities. During FFS, emphasis given to make poultry rearing as an agri-business and it's allowed to make some decision like input purchase, market linkages, ICT use etc. The table shows that the decision-making process shifted from individual to joint effort. It may happen as the participants start giving priority to poultry rearing as an agri-business. So from input and output management got importance among the family. Women started keeping and using mobile phone for communicating with market actors. Data showed that 45% women have market actors' phone number and among them 37% started using it. On input management for poultry rearing and selling and eating poultry, decision making process shifted from individual to joint approach.

2.4.1 Decision making for selling /eating poultry

Particulars	Patuakhali, Khulna, Sathkira (% farmer)	
	Benchmark (n=320)	End line (n=316)
Myself	42	8
My spouse	17	10
Jointly	9	82
Not applicable	30	0

2.4.2 Women linkages with market actor

Particulars	Patuakhali, Khulna, Sathkira (% farmer)	
	Benchmark (n=320)	End line (n=316)
Women Have market actor phone number	3%	45%
Use frequency		
Sometimes	0%	37%

2.4.3 Women involvement on input management

Particulars	Patuakhali, Khulna, Sathkira (% farmer)	
	Benchmark (n=320)	End line (n=316)
Myself	46	23
jointly	16	61
Spouse or other family	12	9
Not applicable	26	6

3. Beef fattening Module with market orientation

A total of 25 Farmer Field School (FFS) implemented at Khulna , Patuakhali with Beef Fattening module . The below table shows polder wise implemented FFS data.

Polder wise Implemented Poultry FFS

SI no.	Zone	Polder	No. of FFS
1	Khulna (14)	P-25	9
		P-27/1	3
		P-27/2	1
		P-34/2-Part	1
2	Patuakhali (11)	P-47/3	1
		P-47/4	6
		P-55/2A	1
		P-55/2C	3
		Total	25

3.1 General information of FFS participants with Beef Fattening module

The table below shows the profile of the FFS participants with Beef fattening module in Patuakhali and Khulna. Average age of the participants was 36 years. Its means that young and dynamic participants also included with BF module. The Beef Fattening activities mainly dominated by men. Women are encouraged to participate with Beef Fattening module. As priority given to encourage women, it was found that 69% women participated with 11th cycle Beef Fattening FFS. All participants are registered WMG members. The majority of farmers are literate and the percentages belong to primary 47% and secondary 35% respectively. Special emphasis given to select poor farmer and the following table shows inclusion of the poorest people were 30%. The percentage is less compared to poultry module, as the Beef Fattening activities need more capital investment.

SI no.	Particulars	Result
1	Average age	36
2	Women	69%
3	WMG member	100%
4	Education	Primary 47% , Secondary 35%
5	Inclusion Poorest people	30%

3.2 Results on Beef Fattening (BF)Module

Objective of the Beef Fattening module is to improve the efficiency and profitability of beef fattening as an income generating activity. Technical topics in the module include cattle housing, cattle selection, feeding, green fodder crops, use of urea molasses straw (UMS), concentrated feed, vaccination and de-worming. The FFS BF modules also emphasize linkages and networking with input providers, service providers (such as animal health workers), markets, and with staff of the department of livestock services (DLS). In this chapter, some data of the BF module is presented for the two districts.

3.2.1 Number of cattle per farmer

The following table shows the average number of animals owned by the FFS farmers. On average, farmers who attended the FFSs had 3 animals. An observation is that the number of bulls had

decreased during the end survey, which is because during the Eid festival farmers sold their fattened animals.

Number of cattle	Patuakhali, Khulna (Average number of animals)	
	Benchmark (n=230)	End line (n=210)
Number milk producing cow	0.73	0.69
Number non milk producing cow	0.56	0.67
Number of male calf	0.66	0.55
Number of female calf	0.47	.48
Number of bull	1.02	0.91
Total cattle	790	695

3.2.2 Cattle housing

Beef fattening module try to motivate farmers to improve the housing of their animals, both the design (ventilation, gutter for drainage, hard concrete or brick floor) as well as the hygiene (daily cleaning).

The following table shows that in the endline in both districts good progress is reported for ventilation, gutter and cleaning. For the floor of the cattle shed farmer improved their floor using hard materials (bricks, concrete) at the end of the FFS.

Cattle shed	Khulna, Patuakhali (% farmers)	
	Benchmark (n=230)	End line (n=210)
Cattle shed has ventilation	37%	100%
Cattle shed has gutter for drainage	23%	92%
Cattle shed is cleaned daily	30%	99%
Floor is partly bricks and/or concrete	51%	63%

3.2.3 Feeding the cattle

Providing balanced feed to cattle will lead to better production in beef fattening. The following table shows that at the end of the FFS most farmers report that have shifted to a better way of feeding their animals.

Cattle feed used	Khulna, Patuakhali (% farmers)	
	Benchmark (n=230)	End line (n=210)
Only roughage	19	0.26
Only concentrate	0	0
Only straw	18	0
Roughage and concentrate	1	0
Roughage and straw	52	53.87
Concentrate and straw	9	45.88
Roughage concentrate and straw	0	0

3.2.4 Green fodder

Farmers are stimulated to start producing green fodder for their animals. The following table shows for different types of green fodder how many farmers reported growing it. At the benchmark, very few

farmers grow fodder. At the end of the FFS farmer started cultivating some green fodder for their animal.

Green fodder	Number of farmers	
	Benchmark (n=230)	End line (n=210)
No fodder	224	124
Napier	6	81
Lucern	0	0
Jambo	0	3
Para	0	2
Maize	0	9
German grass	0	8

3.2.5 Urea Molasses Straw (UMS)

In Khulna and Patuakhali, where the FFS included the beef fattening module, the benchmark survey included questions about the use of Urea Molasses Straw (UMS). At the end of the FFS almost all farmers know how to make UMS and most of them report that they feed it to their cattle.

UMS	Percentage farmers	
	Benchmark (n=230)	End line (n=210)
Know how to make UMS	4	99
Feed UMS to cattle	2	99

3.2.6 Measure body weight

For beef fattening it is important that farmers can measure the body weight of their animals. Know body weight help farmer to bargain with the trader during selling. It helped to treat the animal properly. The following table shows that almost all farmers learned this in the FFS

Body weight	Khulna, Patuakhali (percentage farmers)	
	Benchmark (n=230)	End line (n=210)
Know how to measure body weight	3	99

3.2.7 De-worming

De-worming of cattle was not a common practice at the beginning of the FFS, but in the end survey most farmers report that they de-worm their animals regularly.

De-worming	Khulna, Patuakhali (% farmers)	
	Benchmark (n=230)	End line (n=210)
De-worm cattle regularly	5	100

3.2.8 Receiving animal health

Farmers were asked if they receive or make use of animal health services, for example from community livestock workers or from staff of DLS. During the FFS the facilitators try to promote the linkages

between farmers and these health services. An indicator for this is whether the farmers have a telephone number of these service providers. The following table shows the reported progress in linking with service providers.

Receive animal health service	(Percentage farmers)	
	Benchmark (n=230)	End line (n=210)
Never	90	7
Sometimes	9	68
Always	0	25
Have phone number of service provider	5	98

3.2.9 Meat production by all farmer

The next table shows the datasets of all farmer for beef fattening from two districts together. If we compare benchmark with end data we see a total of 8856 extra kg meat produced by the FFS members at the end of FFS.

Increase of meat production by FFS members			
Meat production in 2 districts	Benchmark	End line	Extra meat production
Total meat production (kg)	28000	36856	8856
Meat production per farmer (kg)	122	155	33kg

3.3 Trends in market orientation with beef fattening module

Market orientation issues were incorporated within FFS sessions to enable farmers produce quality product and increase their income from selling. The following tables show that at the beginning 38% farmers considered as an economic activity. But at the end of FFS, 100% farmer admitted that Beef fattening is a business and almost all started to keep record on this activities. 92% participants had positive response on collective input collection and majority percent involved with collective selling. For input collection farmer are now connecting with different sources and shifted local hat to retailer as they got a list of local retailer. Farmers reported that now and then they are using ICT for information collection. FFS members are now communicated with Resource Farmer (RF) for technological issues and market purpose.

3.3.1 Beef fattening is a business

Particulars	Patuakhali, Khulna (% farmer)	
	Benchmark (n=230)	End line (n=210)
Beef fattening is a business	38%	100%
Record keeping	2%	99%

3.3.2 Input collection source

Source	Patuakhali, Khulna (% farmer)	
	Benchmark (n=230)	End line (n=210)
Local hat from hat day	131	22
Local retailer Shop	1	167

3.3.3 Use of ICT

Number with person	Patuakhali, Khulna (no. of farmer)	
	Benchmark (n=230)	End line (n=210)
Never	226	82
Sometimes	4	100
Always	0	28

3.3.4 Collectively input collection

Collectively input collection

Collectively input collection	Patuakhali, Khulna (% farmer)	
	Benchmark (n=230)	End line (n=210)
Yes	1.30%	92%
No	98.70%	8%

Collective sales

Collective cell	Patuakhali, Khulna (% farmer)	
	Benchmark (n = 230)	End line (n=210)
Never	92.61	22
Sometimes	6.96	62
always	.43	16

Resource farmer support

Resource farmer support	Patuakhali, Khulna (% farmer)	
	Benchmark (n=230)	End line (n=210)
Input purchase, selling		87.62
Technical info		11.90
None		0
Not applicable	100	.48

3.4 Gender perspective in FFS with Beef Fattening module

Women participated with beef fattening module played positive role on decision making process. The below tables shows that, for networking 50% women are involved with keeping phone number of different market actors. Among them 66% started communicating with market. After getting into FFS, economic benefit of beef fattening activities getting more priority among the FFS member. As a result decision making on input collection shifted from individual to joint approach and the percentages were myself 37% and jointly 76% respectively.

3.4.1 Decision taking for Fatten cattle selling

Particulars	Patuakhali, Khulna (% farmer)	
	Benchmark (n=230)	End line (n=210)
Myself	18	7
My spouse	43	30

Particulars	Patuakhali, Khulna (% farmer)	
	Jointly	29
Not applicable	9	0

3.4.2 Women linkages with market actor

Particulars	Patuakhali, Khulna (% farmer)	
	Benchmark (n=230)	End line (n=210)
Women Have market actor phone number	2%	50%
Use frequency		
Sometimes		65.71%

3.4.3 Input collection decision

Collectively input collection	Patuakhali, Khulna (% farmer)	
	Benchmark (n=230)	End line (n=210)
Myself	37	20
jointly	35	76
Spouse or other family	0	0
Not applicable	28	4

4. Homestead Vegetable Module with market orientation

A total of 07 Farmer Field School (FFS) implemented at Khulna and Sathkira with Homestead Vegetable module. The below table shows polder wise implemented FFS data.

Polder wise Implemented Homestead vegetable FFS

SL no.	Zone	Polder	No. of FFS
1	Khulna (01)	P-34/2-Part	1
2	Sathkira (06)	2	6
		Total	7

4.1 General information of FFS participants with Homestead vegetable module

The table below shows the profile of the FFS participants with homestead vegetable module in Khulna and Sathkira. The homestead vegetable activities mainly dominated by women. It was found that 100% women participated with 11th cycle homestead vegetable module FFS. Average age of the participants was 36 years. Its means that young and dynamic participants included with homestead vegetable module. Inclusions of poorest people were 50%. The majority of farmers are literate and the percentages are 39% and 26% primary and can sign only respectively.

Sl no.	Particulars	Result
1	Average age	36
2	Women	100%
3	WVG member	100%
4	Education	Can sign (26%), Primary (39%)
5	Inclusion Poorest people	50%

4.2 Result on Vegetable Module

FFS Cycle 11 included the homestead vegetable module, which tries to promote and increase the production of vegetables for home consumption and as an income generating activity.

Technical topics in the module include space planning, preparation of pits and raised bed for vegetable, use of quality seeds and fertilizers, integrated pest management (IPM), and preparation of farm yard manure (FYM). The module also emphasizes linkages and networking with input providers.

4.2.1 Growing homestead vegetables

All attended farmer had a homestead vegetable garden and involved with vegetable cultivation. This was the selection criteria for homestead vegetable module.

Homestead vegetables	Khulna, Sathkira (percentage of farmers)	
	Benchmark (n=112)	End FFS (n=112)
Farmers growing homestead vegetables	100%	100%

4.2.2 Types of vegetables grown

The percentage of farmers growing a certain type of vegetable is shown in the following table.

At the beginning gourds are mainly cultivated by farmer at homestead level. But at the end after farmer went with different kinds of vegetables. Leafy vegetables came forward as the nutrition value may understand by the members.

The increase of drumstick seen in Khulna and Sathkira is probably not an actual increase in trees, but as drumstick was discussed during the FFS this made farmers realize they have more of these trees in their homestead.

Type of vegetables	Khulna, Sathkira (percentage of farmers)	
	Benchmark (n=112)	End FFS (n=112)
Gourds	90	83
Brinjal	30	52
Leafy vegetables	48	95
Ladies finger	23	20
Cabbage / Cauliflower	1	58
Radish	3	18
Tomato	7	41
Aroids	78	92
Drumstick	31	89
Other vegetables	31	69

4.2.3 Crop diversification

The number of different types of vegetables grown within a homestead increased significantly. This is of course a direct result of some inputs (seeds, seedlings) provided during the training.

Crop diversification	Khulna, Sathkira (average)	
	Benchmark (n=112)	End FFS (n=112)
Number of different vegetables grown within the same homestead	3.43	6.25

4.2.4 Selling of surplus vegetables

Increase of vegetable production during the FFS season resulted in surplus vegetables which can be sold. At the beginning of the FFS, vegetables sell percentages less than and more than half was 21% and 3% respectively. But at the end, vegetables sell percentages less than and more than half increased from 34% and 24% respectively.

What happens with vegetables produced	Khulna, Sathkira (percentage farmers)	
	Benchmark (n=112)	End FFS (n=112)
Sell none	47	13
Sell less than half	21	34
Sell and eat about half	29	29
Sell more than half	3	24
Sell all	0	0

4.2.5 Homestead space planning

In the FFS farmers learn to plan their homestead more efficiently and grow vegetables in different locations.

The table shows in which locations the FFS participants grow their vegetables. For the benchmark data, the average number of farmers was calculated for farmers who already grew vegetable before the FFS.

Locations used for vegetables	Khulna, Sathkira (percentage farmers)	
	Benchmark (n=112)	End FFS (n=112)
Sunny open place	86.6	97
Shady place	21.42	98
Wet marshy land	51.78	74
Hedges and fences	4.46	26
Roof	61.60	75
Pond side	4.46	10
Macha	26.79	65
Pond side macha	6.25	13
Pots	3.57	61
Other places	56.25	68

Instead of relying mainly on sunny open areas to grow vegetables farmers started growing their vegetables in more and different locations within their homestead space. The next table shows how many locations were used on average.

Locations used for vegetables	Khulna, Sathkira (average)	
	Benchmark (n=200)	End FFS (n=200)
Number of different locations used within the same homestead	3.23	5.87

4.2.6 Fertilizer use in homestead vegetables

Most farmers who already grew vegetables before they became FFS participants had already experience using fertilizer in their homestead vegetables. At the end of the FFS almost all participants reported that they had applied fertilizers.

Fertilizer use in homestead vegetables	Khulna, Sathkira (percentage farmers)	
	Benchmark (n=112)	End FFS (n=112)
Farmers using fertilizers	91%	97%

The following table shows what types of fertilizers were used. The percentage of farmers is calculated only for farmers who grow vegetables and who used some fertilizers. At the benchmark survey we see that a lot of farmers already used Urea, TSP and cow dung. At the end survey many reported that they were using also MOP, gypsum, zinc, cow dung, chicken manure, FYM and compost.

Type of fertilizers used in homestead vegetables	Khulna, Sathkira (percentage farmers)	
	Benchmark (n=112)	End line (n=112)

Urea	92	99
TSP	85	88
MOP	28	51
Gypsum	3	0
Zinc	1	1
Cow dung	79	41
Chicken manure	7	9
FYM	8	100
Compost	2	8

4.2.7 Follow proper pit method for homestead vegetables

In the vegetable module, the FFS farmers learn several improved vegetable production methods such as pit and raised bed. Homestead vegetable module try to motivate farmer to follow proper pit methods for *cucurbitaceae* group vegetable production (Different types of gourds). All farmers at the end of the FFS report that they have adopted these practices.

Production technologies –Pit methods	Khulna, Sathkira (percentage farmers)	
	Benchmark (n=112)	End line (n=112)
Yes	5	100
No	87	0
Partly	8	0

4.2.8 Follow proper raised bed method for homestead vegetables

Farmers are motivated to follow raised bed for crop rotation, proper management and year round vegetable production etc. All farmers at the end of the FFS report that they have adopted these practices.

Production technologies –Raised bed methods	Khulna, Sathkira (percentage farmers)	
	Benchmark (n=112)	End line (n=112)
Yes	4	100
No	84	0
Partly	12	0

4.2.9 Pest management

In the FFS farmers learn to use Integrated Pest Management (IPM) methods in their vegetables field. The following table shows the shift in pest management practices.

Pest management	Khulna, Sathkira (percentage farmers)	
	Benchmark (n=112)	End FFS (n=112)
Do nothing	43.57	0.89

Use chemicals only	56.25	1.79
Use Integrated Pest Management methods	0	97.32

4.2.10 Money used for pesticides

The next table shows the percentage of farmers who spend money on pesticides. This increase is probably linked to the intensification and diversification of vegetable production in the homesteads.

Buying pesticides	Khulna, Sathkira (percentage farmers)	
	Benchmark (n=112)	End Line (n=112)
Farmers buying pesticides	63%	73%

The following two tables show how much money is used on pesticides. Here we see that these farmers in all cases spend a bit less money to buy pesticides.

The conclusion is that as more vegetables were produced, more farmers started using pesticides, but that the total use per farmer was reduced. Because the integrated pest management practices in farmer field .

Money for pesticides (only participants who use pesticides)	Khulna, Sathkira (Taka)	
	Benchmark (n=112)	End FFS (n=112)
Total money spend on pesticides	20686	7958
Average money spend per farmer (average for farmers using pesticides)	291	91

4.2.11 Farm Yard Manure

The following table shows that before the FFS farmers hardly prepared FYM, but at the end of the FFS almost all farmers had started preparing it. A follow up survey after one or two years is needed to verify if this practice will sustain.

Farm Yard Manure	Khulna, Sathkira (percentage farmers)	
	Benchmark (n=112)	End line (n=112)
No FYM pit	91	4
Pit without shade	9	91
Pit with shade	0	5

4.2.12 Vegetable Eating

A question was asked to estimate how much vegetables they eat in a week. We see that an increased consumption at the end of FFS. It may happen as all attended with vegetables module and have some extra production.

Vegetable eating	Khulna, Sathkira (average)	
	Benchmark (n=112)	End line (n=112)
Amount of vegetables (gram/ farmers/week)	732	1174

4.3 Trends in market orientation with homestead vegetable module

At the end of FFS, 99% farmer considered vegetable production is a business and almost all started to keep record on vegetable production activities. For input collection farmer are now connecting with different sources and shifted local hat to retailer as they got a list of local retailer. In the training session, farmers got motivated hearing the benefits of collective action and at the end the learning put in action by the participants. 91% participants had positive response on collective input collection and majority percent involved with collective selling. 86% Farmers reported that they are using ICT for information collection. FFS members are now communicated with Resource Farmer (RF) for technological issues and market purpose.

4.3.1 Agriculture is a business

Particulars	Khulna, Sathkira (No. farmer)	
	Benchmark (n=112)	End line (n=112)
Vegetable production is a business	15	99
Record keeping	3	99

4.3.2 Input collection source

Source	Khulna, Sathkira (No. farmer)	
	Benchmark (n=112)	End line (n=112)
Local hat from hat day	79	33
Local retailer Shop	71	105
Neighbour	0	23
Hatchery	0	0
others	101	0

4.3.3 Use of ICT

Number with person	Khulna, Sathkira (percentage of farmer)	
	Benchmark (n=112)	End line (n=112)
Never	98	13
Sometimes	2	86
Always	0	0.89

4.3.4 Collectively input collection

Collectively input collection	Khulna, Sathkira (% farmer)	
	Benchmark (n=112)	End line (n=112)
Yes	2	91
No	98	9

4.3.5 Collective sales

Collective sales	Khulna, Sathkira (% farmer)	
	Benchmark (n =112)	End line (n=112)
Never	98	23
Sometimes	2	75
always	0	1.8

4.3.6 Resource farmer support

Resource farmer support	Khulna, Sathkira (% farmer)	
	Benchmark (n =112)	End line (n =112)
Input purchase, selling	NA	100
Technical info	NA	0
None	NA	0
Not applicable	NA	0

4.4 Gender perspective in FFS with vegetable module

Generally women are mainly involved with homestead vegetable production. Entered into the FFS members understand about the profitability of vegetable production and market issues. It found from the below tables that women started keeping phone number of market actors with themselves or by other family. For networking, 84% women kept market actor phone number with their family and started communicating with them. Farmer realized that homestead vegetable production is an economic activity. As a result decision making on input collection, selling and eating decision shifted from individual to joint approach.

4.4.1 Women linkages with market actors

Particulars	Khulna, Sathkira (% farmer)	
	Benchmark (n-112)	End line (n-112)
None	93.75	0
Myself	1.79	15
Spouse and others	4.46	84
Use frequency (if women have number)		
Sometimes	100	100

4.4.2 Decision making for Selling & Eating vegetables

Decision	Khulna, Sathkira (percentage farmers)	
	Benchmark (n=112)	End FFS (n=112)
Myself	44.76	15
My spouse	15.24	8.9
Jointly	40	75.9

4.4.3 Input collection decision

Collectively input collection	Khulna, Sathkira (% farmer)	
	Benchmark (n=112)	End line (n=112)
Myself	39	2
jointly	60	98
Spouse or other family	0	0
Not applicable	0	0

5. Dyke Vegetable Module with market orientation

Khulna farmers are more involved with dyke vegetable production. A total of 09 Farmer Field School (FFS) implemented at Khulna with Dyke Vegetable module at polder 25 for the first time.

Polder wise Implemented Dyke vegetable FFS

SI no.	Zone	Polder	No. of FFS
1	Khulna (01)	P-25	9
		Total	9

5.1 General information of FFS participants with Dyke vegetable module

The dyke vegetable activities mainly dominated by men. As priority given to encourage women, it was found from the following table that 78% women participated with 11th cycle dyke vegetable module FFS. The majority of farmers are literate and the percentages belong to primary 42% and secondary 31% respectively. Inclusion of poorest people was 23% and average age of the participants was 37 years.

SI no.	Particulars	Result
1	Average age	37
2	Women	78%
3	WVG member	100%
4	Education	Primary (42%) , Secondary (31%)
5	Inclusion Poorest people	23%

5.2 Result on dyke vegetable Module

FFS Cycle 11 included the dyke vegetable module, which tries to promote and increase the production of vegetables for home consumption and as an income generating activity.

Technical topics in the module include space planning, preparation of pits and raised bed for vegetable, hand pollination use of quality seeds and fertilizers, integrated pest management (IPM), and preparation of farm yard manure (FYM). The module also emphasizes linkages and networking with input providers.

In this chapter, the sets of “end data” are used to describe the profile of the FFS participants.

5.2.1 Types of dyke vegetables grown

All attended farmer had a dyke and involved with vegetable cultivation. An average size of a dyke was 20 decimal. The number of different types of vegetables grown within a dyke increased significantly and the number increased by doubled. At dyke farmer mainly produce different kind of gourds.

The number of different types of vegetables grown within a dyke increased significantly. This is of course a direct result of some inputs (seeds, seedlings) provided during the training.

Number of vegetables	Khulna (average)	
	Benchmark (n=90)	End FFS (n=90)
Number of different vegetables grown within the same dyke	2	3.6

The percentage of farmers growing a certain type of vegetable is shown in the following table.

Type of vegetables	Khulna (percentage of farmers)	
	Benchmark (n=90)	End FFS (n=90)
Bottle Gourd	87	98
Bitter Gourd	47	70
Ash Gourd	17	64
Snake Gourd	9	44
Sponge Gourd	14	47
Sweet Gourd	51	66
Cucumber	26	41

5.2.2 Selling of surplus vegetables

Increase of vegetable production during the FFS season resulted in surplus vegetables which can be sold. At the beginning of the FFS, vegetables sales percentages less than and or more than half was 22% and 35% respectively. But at the end, vegetables sales percentages less than and or more than half increased from 6 % and 52% respectively.

What happens with vegetables produced	Khulna (percentage farmers)	
	Benchmark (n=90)	End FFS (n=90)
Sell less than half	22	6
Sell more than half	34	52

5.2.3 Production plan and technologies adaptation status for dyke vegetable production

The below table shows the technology adaptation status for dyke vegetable production. Farmer started making production plan for dyke. Hand pollination is a key technology for *cucurbitaceae* family vegetables (Different gourds, cucumber etc.). Almost all farmer followed hand pollination along with proper pit and raised bed methods for dyke vegetable production. Pest management with chemicals is a risky method for dyke vegetable. During FFS special emphasis given on Integrated Pest Management Methods. The table shows that at the end 87% percent farmer started following Integrated Pest management for pest control. Moreover farmer started using different kind of fertilizers and put Farm Yard Manure Preparation (FYM) in practice.

Technologies in practice	Khulna	
	Benchmark (n=90)	End FFS (n=90)
Number of different vegetables grown within the same dyke (Average)	2	3.6
Have production plan for dyke vegetable production (%) of participants	1%	99%
Follow hand pollination for dyke vegetable production (%) of participants	0%	100%
Follow pit and raised bed methods (%) of participants	0%	97%
Use Integrated Pest Management methods (%) of participants	7%	87%

5.2.4 Fertilizer use in dyke vegetables

Most farmers who already grew vegetables before they became FFS participants had already experience using fertilizer in their dyke vegetables. At the end of the FFS almost all participants reported that they had applied fertilizers.

Fertilizer use in dyke vegetables	Khulna (percentage farmers)	
	Benchmark (n=90)	End FFS (n=90)
Farmers using fertilizers	90%	99%

The following table shows what types of fertilizers were used. The percentage of farmers is calculated only for farmers who grow vegetables and who used some fertilizers. At the benchmark survey we see that a lot of farmers already used Urea, TSP and cow dung. At the end survey many reported that they were using also MOP, gypsum, zinc, cow dung, chicken manure, FYM and compost.

Type of fertilizers used dyke vegetables	Khulna (percentage farmers)	
	Benchmark (n=90)	End line (n=90)
Urea	100	100
TSP	96	100
MOP	20	94
Gypsum	20	66
Zinc	20	38
Cow dung	22.5	89
Chicken manure	1	47
FYM	1	88
Compost	5	34

5.2.5 Money used for pesticides

The following two tables show how much money is used on pesticides. Here we see that these farmers in all cases spend a bit less money to buy pesticides.

The conclusion is that as more vegetables were produced, more farmers started using pesticides, but that the total use per farmer was reduced. Because the integrated pest management practices in farmer field.

Money for pesticides	Khulna (Taka)	
	Benchmark (n=90)	End FFS (n=90)
Total money spend on pesticides	62098	60133
Average money spend per farmer	776	675

5.2.6 Farm Yard Manure

The following table shows that before the FFS farmers hardly prepared FYM, but at the end of the FFS almost all farmers had started preparing it. A follow up survey after one or two years is needed to verify if this practice will sustain.

Farm Yard Manure	Khulna (percentage farmers)
------------------	-----------------------------

	Benchmark (n=90)	End line (n=90)
No FYM pit	100%	6.67%
Pit without shade	0%	41.11
Pit with shade	0%	52.22%

5.2.7 Vegetable Eating

A question was asked to estimate how much vegetables they eat in a week. We see that an increased consumption at the end of FFS. It may happen as all attended with dyke vegetables module and have some extra production.

Vegetable eating	Khulna (average)	
	Benchmark (n=90)	End line (n=90)
Amount of vegetables (gram/farmers/week)	1123.80	1778.89

5.3 Trends in market orientation with dyke vegetable module

At the beginning 72% farmer considered dyke vegetable production is a business activities. At the end 99% farmer considered it as a business and started to keep record on vegetable production activities. For input collection farmer are now connecting with different sources and shifted local hat to retailer as they got a list of local retailer. In the training session, farmers got motivated hearing the benefits of collective action and at the end the learning put in action by the participants. 93% participants had positive response on collective input collection and majority percent involved with collective selling. Farmers reported that they are using ICT for information collection. FFS members are now communicated with Resource Farmer (RF) for technological issues and market purpose.

5.3.1 Agriculture is a business

Particulars	Khulna (No. farmer)	
	Benchmark (n=90)	End line (n=90)
Vegetable production is a business	72%	99%
Record keeping	2%	99%

5.3.2 Input collection source

Source	Khulna (No. farmer)	
	Benchmark (n=90)	End line (n=90)
Local hat from hat day	66	47
Local retailer Shop	43	55
Neighbour	1	2
others	1	0

5.3.3 Use of ICT

Number with person	Khulna (percentage of farmer)	
	Benchmark (n=90)	End line (n=90)
Never	99	0
Sometimes	1	96

Number with person	Khulna (percentage of farmer)	
Always	0	4

5.3.4 Collectively input collection

Collectively input collection	Khulna (% farmer)	
	Benchmark (n=90)	End line (n=90)
Yes	0	93

5.3.5 Collective sale

Collective sale	Khulna (% farmer)	
	Benchmark (n =90)	End line (n=90)
Never	100	6.45
Sometimes	0	82.80
always	0	10.75

5.3.6 Resource farmer support

Resource farmer support	Khulna (% farmer)	
	Benchmark (n =90)	End line (n =90)
Input purchase, selling	0	0
Technical info	0	72
None	52	24
Not applicable	47.78	4

5.4 Gender perspective in FFS with dyke vegetable module

Entered into the FFS, farmer gave more attention to the profitability of vegetable production and market issues. It found from the below tables that women started keeping phone number of market actors with themselves or by other family member. For networking, 55% women kept market actor phone number with their family and started communicating with them. Farmer realized that dyke vegetable production is an economic activity. As a result decision making on input collection, selling and eating decision shifted from individual to joint approach.

5.4.1 Women linkages with market actors

Particulars	Khulna (% farmer)	
	Benchmark (n-90)	End line (n-90)
None		2
Myself		55
Spouse and others		42
Use frequency (if women have number)		
Sometimes		100

5.4.2 Decision making for Selling & Eating vegetables

Decision	Khulna (percentage farmers)	
	Benchmark (n=90)	End FFS (n=90)
Myself	32	3
My spouse	26	34
Jointly	42	62

5.4.3 Input collection decision

Collectively input collection	Khulna (% farmer)	
	Benchmark (n=90)	End line (n=90)
Myself	37.70	9
jointly	31.15	89
Spouse or other family	0	0
Not applicable	31.15	1.35

6. Homestead Fruit Module with Market orientation

A total of 07 FFS implemented with Fruit production module at Khulna and Patuakhali. Due to farmer demand a separate module has been developed for Homestead fruit production with 11th cycle FFS.

Polder wise Implemented Fruit module FFS

SI no.	Zone	Polder	No. of FFS
1	Khulna	P-25	06
2	Patuakhali	P-55/2C	01
		Total	07

6.1 General information of FFS participants with Fruit module

Inclusions of the poorest people were 43% with 11th cycle FFS. The table below shows the profile of the FFS participants with fruit module in Khulna and Patuakhali. 93% young and dynamic women participated with fruit module with market orientation. Average age of the participants was 36 years. The majority of farmers are literate and the percentages are 52% and 38% primary and secondary respectively.

SI no.	Particulars	Result
1	Average age	36%
2	Women	93%
3	WVG member	100%
4	Education	Primary (52%), Secondary (38%)
5	Inclusion Poorest people	43%

6.1 Result on Vegetable Module

FFS Cycle 11 included the homestead fruit module, which tries to promote and increase the production of fruit for home consumption and as an income generating activity.

Technical topics in the module include planning, fruit tree management, simple propagation technique, use of quality sapling and fertilizers, integrated pest management (IPM), and preparation of farm yard manure (FYM). The module also emphasizes linkages and networking with input providers.

6.1.1 Fruit trees

All attended farmer involved with fruit production at their homestead. This was the selection criteria for fruit production module. The following table shows for farmers who have fruit trees the average number of each type of tree. Mango, banana and coconut are the most common fruit trees grown at the homestead.

Types of fruit trees in homestead garden	Khulna, Patuakhali (no. of trees)	
	Benchmark (n=79)	End line (n=68)
Mango total	4.86	9
Mango grafted	1.99	4
Litchi total	.38	2

Types of fruit trees in homestead garden	Khulna, Patuakhali (no. of trees)	
	Benchmark (n=79)	End line (n=68)
Litchi grafted	.32	2
Lemon total	.68	2
Lemon grafted	1.75	2
Guava total	.48	4
Guava grafted	.37	2
Jujube total	1.54	1
Jujube grafted	3.82	0
Sapodilla total	.82	1
Sapodilla grafted	.41	1
Jackfruit	2.61	2.43
Blackberry	.77	.75
Coconut	3.82	4.90
Date palm	.82	1.8
Palm tree	.41	.62
Papaya	2.61	4.21
Banana	6.33	9.22
Other fruit trees	5.78	

The following table shows how many fruit trees were reported by the farmers; it shows the average number of trees in each homestead area. The difference between benchmark and end data reflected the result of more accurate counting during the FFS and the supplied sapling as a practical input.

Fruit trees in homestead garden	Khulna, Patuakhali (average)	
	Benchmark (n= 79)	End FFS (n=68)
Number of trees	30.61	48.51

6.1.2 Technology adaptation status with fruit module

It was found that farmer give less attention on fruit tree fertilization, improvement, propagation and pest management due to lack of awareness and knowledge. During FFS session some easy technologies demonstrated to FFS members. At the end farmer put those knowledges in practice. The table shows that almost all farmer started space planning, fertilization, fruit tree improvement technique (pruning and propagation) and Integrated Pest Management (IPM).

Moreover, farmer started using different kind of fertilizers and put Farm Yard Manure Preparation (FYM) in practice.

Technology adaptation status	Khulna , Patuakhali (percentage farmers)	
	Benchmark (n=79)	End FFS (n=68)
Follow space planning (%) of participants	3%	100%
Using fertilizer in fruit trees (%) of participants	1%	100%
Follow proper fertilizer use methods (%) of participants	0%	100%

Technology adaptation status	Khulna , Patuakhali (percentage farmers)	
Practice Integrated Pest Management (%) of participants	1%	78%
Practice pruning for fruit tree improvement (%) of participants	0%	97%
Practice propagation for fruit tree multiplication (%) of participants	0%	99%

6.1.3 Money used for pesticides

The next table shows the percentage of farmers who spend money on pesticides. Chemical Pesticide use in homestead gardens is discouraged during the FFS.

The following two tables show how much money is used on pesticides.

Money for pesticides	Khulna, Patuakhali (percentage farmers)	
	Benchmark (n=79)	End FFS (n=68)
Average money spend per farmer (average for farmers using pesticides)	333	195

6.1.4 Farm Yard Manure

The following table shows that before the FFS farmers hardly prepared FYM, but at the end of the FFS almost all farmers had started preparing it. A follow up survey after one or two years is needed to verify if this practice will sustain.

Farm Yard Manure	Khulna, Patuakhali (percentage farmers)	
	Benchmark (n=79)	End FFS (n=68)
No FYM pit	98.73	27.94
Pit without shade	1.27	45.59
Pit with shade	0	26.47

6.1.5 Utilization of fruit

Farmer got message on fruit production with market orientation. That stimulate farmer to start selling their harvest along with eating. The following table shows the eating and selling status of produced fruit at homestead area.

What happens with fruit produced	Khulna, Patuakhali (percentage farmers)	
	Benchmark (n=79)	End FFS (n=68)
Sell less than half	9%	32%
Sell more than half	0%	10%

6.1 Trends in market orientation with Fruit Module

Training inspired them to keep linking with markets; as a result a considerable percentage of participants reported that they have communicated with market actors and used ICT for agricultural information collection after the training. In addition, in the training session, farmers got motivated hearing the benefits of collective action. It is noted that after attending FFS, women participants started to communicate with market actors.

From each of the FFS, one advance farmer trained as a Resource Farmer (RF) on market orientation issues. They all are attended an exposure visit to local market. Result showed that Resource Farmers started providing support to FFS member.

The following table shows the positive changes among the members on marketing issues in practice.

After attending FFS they have an idea why it would be a business activity. The following table shows that before the FFS farmers hardly understand it. They are not used to keep record on their income and expenditure for fruit production. But at the end of FFS they showed their positive response. The table also shows that at the end of FFS, farmer collecting their input for fruit production from different sources. It was because of the list of input seller and other information supplied to them. 50% participants started using ICT for information collection. Farmers are also linked with resource farmer.

6.1.1 Stimulation on agriculture is a business and record keeping

Particulars	Khulna, Patuakhali	
	Benchmark (n=79)	End FFS (n=68)
Agriculture is a business	35%	100%
Record keeping	0%	100%

6.1.2 Source of input collection

Sources	Khulna, Patuakhali (percentages)	
	Benchmark (n=79)	End line (n=68)
Local hat from hat day	94	56
Nursery	11.37	57
Neighbour	9	1
others	1	14

6.1.3 Use of ICT for agricultural information collection

Particulars	Khulna, Patuakhali (percentages)	
	Benchmark (n=79)	End line (n=68)
Never	0	48.53
Sometimes	0	50
always	0	1.47

6.1.4 Collective action

Input collection

Collectively input collection	Khulna, Patuakhali (percentages)	
	Benchmark (n=79)	End line (n=68)
Never	100	16.18
Sometimes	0	79.41
always	0	4.41

Collective sale

Collective cell	Khulna, Patuakhali (percentages)	
	Benchmark (n=79)	End line (n=68)
Never	100	22.86
Sometimes	0	71.43
always	0	5.71

6.1.5 Resource farmer support

Resource farmer support	Patuakhali, Khulna (% farmer)	
	Benchmark (n=79)	End line (n=68)
Input purchase, selling		83.32
Technical information		16.18
None		0
Not applicable	100	0

6.2 Gender perspective with fruit module

With 11th cycle FFS there were some questions set to know about the position of women in decision making process on fruit production activities. During FFS, emphasis given to make fruit production as an agri-business and it's allowed to make some decision like input purchase, market linkages, ICT use etc. The table shows that the decision-making process shifted from individual to joint effort. It may happen as the participants start giving priority to fruit production as an agri-business. So from input and output management got importance among the family. Women started keeping and using mobile phone for communicating with market actors. Data showed that 50% women have market actors' phone number and among them 88% started using it. On input management for fruit production and eating decision making process shifted from individual to joint approach.

6.2.1 Decision making for selling /eating fruit

Particulars	Patuakhali, Khulna (% farmer)	
	Benchmark (n=79)	End line (n=68)
Myself	51.90	15
My spouse	13.92	31
Jointly	7.59	54
Not applicable	-	-

6.2.2 Women linkages with market actor

Particulars	Patuakhali, Khulna (% farmer)	
	Benchmark (n=79)	End line (n=68)
Women Have market actor phone number	8	50
Use frequency		
Sometimes	0	88

6.2.3 Women involvement on input management

Particulars	Patuakhali, Khulna (% farmer)	
	Benchmark (n=79)	End line (n=68)
Myself	43	13
jointly	8.86	87
Spouse or other family	0	0
Not applicable	48	0

7. Fish Module with Market orientation

A total of 38 Farmer Field School (FFS) implemented at Khulna and Patuakhali with Fish module . The below table shows polder wise implemented FFS status.

Polder wise Implemented Fish FFS

SL no.	Zone	Polder	No. of FFS
1	Khulna (10)	P-25	3
		P-28/1	4
		P-28/2	1
		P-31-Part	2
2	Patuakhali (28)	P-47/3	3
		P-47/4	4
		P-55/2A	16
		55/2C	5
		Total	38

7.1 General information of FFS participants with Fish module

The table below shows the profile of the FFS participants with fruit module in Khulna and Patuakhali. Young and dynamic farmer participated with fish module and market orientation and average age of the participants was 36 years.

78% women participated with 11th cycle fish module FFS which generally dominated by men. All participants are registered WMG members. The majority of farmers are literate and the percentages are 53% and 28% primary and secondary respectively. During FFS member selection, special emphasis given to select poor farmer and inclusion of poorest people were 29% with Fish module.

SI no.	Particulars	Result
1	Average age	36
2	Women	78%
3	WMG member	100%
4	Education	Primary (53%), Secondary (28 %)
5	Inclusion Poorest people	29%

7.2 Result on Fish Module

Objective of this module is to improve the efficiency and productivity of household ponds. Technical topics in the module include pond preparation, selection of fingerlings, stocking ratio, stocking density, use of supplementary feed, fertilizing ponds for natural feed, different problems of fish culture, fish diseases, and harvesting. Linkages with input providers and with staff of the department of fisheries are strengthened.

7.2.1 Technology adaptation status with fruit module

Several questions are asked in the benchmark survey, such as a question about practicing fish pond Preparation, fingerling selection, stocking density and some knowledge questions. These questions are asked to generate interest and create expectations on what will be covered in the FFS. It is therefore no surprise to see big “improvements” in the end survey. The below table shows the big positive changes at the end of FFS.

Use of different technologies	Khulna, Patuakhali (% of farmers)	
	Benchmark (n=267)	End line (n=266)
Fish pond preparation	6	93.98
Fingerling selection	<1	98.49
Use of Supplementary feed	21	94.73
Knowledge on stocking density	<1	100
Natural Feed testing	1	100
Knowledge on sampling	<1	100

7.2.2 Type of fish in the pond

Farmers have different types of fish types their ponds. There is a clear difference between benchmark and end data. Probably this is because farmers learned during the FFS to recognize more fish species, which can be used to stock 3 layers of the pond, or made better production observations in their ponds. The most popular fish species are Tilapia, Silver carp, and catla.

Types of fish	Khulna, Patuakhali (percentages)	
	Benchmark (n=267)	End line (n=266)
Tilapia	51	67
Silver Carp	79	92
Catla	69	94
Rui	63	92
Mrigel	48	81
Mirror Carp	12	26
Common Carp	6	18
Rajputi	45	12
Shrimp	5	2
Others	12	2

7.3 Production of fish

Farmers reported a considerable higher fish production after completion of the FFS Fish Module compared to the status of the production before getting fish modules training. Comparison of the end line data with the benchmark for all fish, data shows that per decimal fish production increased from 4 kg to 11 kg .

Table: Comparison of Fish production (Kg) per farmer between benchmark and end line in Khulna and Patuakhali.

All fish production	Khulna, Patuakhali	
	Benchmark (n=267)	End line (n=266)
Total all fish produce (kg)	13089	32788
Total all fish per farmer (kg)	49	123
Total all fish per decimal (kg)	4	11

7.3.1 Selling of surplus fish

Increase of fish production during the FFS season resulted in surplus fish which can be sold. At the beginning of the FFS, fish sales percentages less than and or more than half was 20% and 18% respectively. But at the end, vegetables sales percentages less than and or more than half increased from 6 % and 31% respectively. Fish eating per week increased (day/farmers/week) one day more that is from 2.67 days to 4 days.

What happens with fish produced	Khulna, Patuakhali (percentage farmers)	
	Benchmark (n=.....)	End FFS (n=.....)
Sell less than half	20	18
Sell more than half	6	31

7.4 Source of fingerlings

The FFS curriculum pays attention to market orientation and linking farmers with input suppliers. Therefore, the benchmark survey included questions about where the farmers obtain their fingerlings. During the benchmark survey most farmers reported that they use local vendors, while hatcheries and nurseries were hardly used. Some farmers use different sources (so the total of percentages can exceed 100%).

Source of ingerling	Khulna, Patuakhali (percentages)	
	Benchmark (n=267)	End line (n=266)
Local vendor	98	48
Local nursery	4	56
Hatchery	<1	42

7.1 Trends in market orientation with Fish Module

Training inspired them to keep linking with markets; as a result, a considerable percentage of participants reported that they have communicated with market actors and used ICT for agricultural information collection after the training. In addition, in the training session, farmers got motivated hearing the benefits of collective action. It is noted that after attending FFS, women participants started to communicate with market actors.

From each of the FFS, one advance farmer trained as a Resource Farmer (RF) on market orientation issues. They all are attended an exposure visit to local market. Result showed that Resource Farmers started providing support to FFS member.

The following table shows the positive changes among the members on marketing issues in practice.

7.1.1 Stimulation on Fish culture is a business and record keeping

After attending FFS they have an idea why it would be a business activity. The following table shows that before the FFS farmers hardly understand it. They are not used to keep record on their income and expenditure for fruit production. But at the end of FFS they showed their positive response.

Particulars	Khulna, Patuakhali (% farmer)	
	Benchmark (n=267)	End line (n=266)
Agriculture is a business	27	100
Record keeping	0%	97.74

7.1.2 Use of ICT for agricultural information collection

Particulars	Khulna, Patuakhali (percentages)	
	Benchmark (n=267)	End line (n=266)
Never	94	14
Sometimes	5	69
always	.38	17

7.1.3 Collective action

Input collection

Collectively input collection	Khulna, Patuakhali (percentages)	
	Benchmark (n=267)	End line (n=266)
Yes		94
No	100	6

Collective sale

Collective cell	Khulna, Patuakhali (percentages)	
	Benchmark (n=267)	End line (n=266)
Never	99	12
Sometimes	1	73
always	0	15

7.1.4 Resource farmer support

Resource farmer support	Patuakhali, Khulna (% farmer)	
	Benchmark (n=267)	End line (n=266)
Input purchase, selling		91
Technical information		6
None		3
Not applicable		0

7.2 Gender perspective with fish module

At polder areas fish activities mainly dominated by men. But with 11th cycle FFS there were some questions set to know about the position of women in decision making process on fish production activities. During FFS, emphasis given to make fish production as an agri-business and it's allowed to make some decision like input purchase, market linkages, ICT use etc. The table shows that the decision-making process shifted from individual to joint effort. It may happen as the participants start giving priority to fruit production as an agri-business. So, from input and output management got importance among the family. Women started keeping and using mobile phone for communicating with market actors. Data showed that 85% women have market actors' phone number and among them 78% started using it. On input management for fish production and selling and eating fish, decision making process shifted from individual to joint approach.

7.2.1 Decision making for selling /eating fish

Particulars	Patuakhali, Khulna (% farmer)	
	Benchmark (n=267)	End line (n=266)
Myself	36	3
My spouse	22	33
Jointly	26	64
Not applicable	16	-

7.2.2 Women linkages with market actor

Particulars	Patuakhali, Khulna (% farmer)	
	Benchmark (n=267)	End line (n=266)
Women Have market actor phone number	4	85
Use frequency		
Sometimes	<1	78

7.2.3 Women involvement on input management

Particulars	Patuakhali, Khulna (% farmer)	
	Benchmark (n=267)	End line (n=266)
Myself	47	10
jointly	25	87
Spouse or other family	0	0
Not applicable	27	3

8. Conclusion

The data presented in this report were collected in the benchmark and end surveys of cycle 11 and represent the results of about 1063 farmers.

Comparing end data with benchmark data shows some immediate effects of the FFS training, such as a considerable increase of eggs, poultry, fish, fruit, meat and vegetable production. This has resulted in higher consumption and in selling of surplus produce to generate some extra income. Market orientation issues enhanced their income and access to market.

Some inputs (chicks, vegetable seed, fingerling, fruit sapling, cattle feed etc.) were distributed during the FFS, which explains some of the increases in production. Information supplied on market actors and line department experts help increase networking and linkages among farmers and market actors.

We can also expect some bias in the answers, as both the interviewers (FFS facilitators) and the interviewees (farmers) can be tempted to report positive results. However even if we consider this bias, we can conclude that the FFSs in cycle 11 have successfully increased production and income of the participants during the FFS season.

Annex-1: A report on – Aquaculture Production on FFS Trial Pond (11th Cycle)