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Cycle 13 FFS

Khulna, Patuakhali, Satkhira

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Comparing benchmark and end data

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Executive summary

A total of 120 Farmer Field Schools (FFSs) implemented in Khulna (Polders 25, 27/1, 27/2, 34-2 part) Satkhira (P-2) and Patuakhali (polders 43/2A, 43/2B, 55/2A). FFSs ran with native poultry rearing, beef fattening and fish culture modules with market orientation. This report presents consolidated data from benchmark and end line survey of FFS members and demonstrated the technology adoption status on three modules and their impact on poultry, beef fattening and fish production.

A semi-structure questionnaire used for collecting bench mark and end line data. The questionnaire was used to collect data through interviews on technology adaptation, surplus production, utilization of surplus income, dietary changes of FFS members before and after FFS. Random sampling technique used for participant's selection at 95% confidence level. Data collected by Community Development Facilitators (CDFs). Open Data Kit (ODK) tools used for data collection by using mobile phone. The sample size was 442, 376 and 211 for poultry, beef fattening and fish modules respectively.

Totals and averages of the collected benchmark and end data are calculated by entering into excel sheet from html version. Data on income levels was consolidated from household consumption and sales data. The calculated averages of collected data at the beginning and end of the FFS show an impact of homestead production of poor farmer on their food security.

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

Poultry module

Women are traditionally playing an important role in native poultry rearing. It was found from the survey that 99% young women aged 36 years were participated in poultry module. Inclusion of poorest farmer was 84%.

FFS the learning by doing approach has made a vital role to enrich their knowledge and process of practices. The result showed that 81.88% farmer vaccinated their birds regularly which was <1% at the beginning. *Hazol* adoption percentages increased from 4.77% to 98% at the end of FFS and the candling practices increased from 6.43% to 100%. Chick separation from a mother hen had a good impact on increasing production cycle of a poultry bird and the practices (chick separation after 1 week) increased to 92% at the end of FFS. Survey result shows that native poultry rearing has made a significant contribution at homestead level production. The production has increased 2-3 folds after adopting the FFS learning. The number of egg production/hen/year increased from 47 to 83 and egg/duck/year increased from 61 to 109 respectively. Number of selling eggs per months increased from 6 to 19 at the end of FFS and the annual poultry sales increased from 6 to 17 at the end.

Beef fattening module

The Beef Fattening activities mainly dominated by men. But it was found from survey that 76% women were participated with 13th cycle Beef Fattening module. Inclusion of poorest farmer was 44%. Beef fattening module try to motivate farmers to improve cattle housing, feeding and health management for increasing fattening efficiency of a cattle. At the time of end line survey significant percentages of farmer reported that housing management activities (daily cleaning of cattle shed, ventilation, gutter for drainage) were in practice while these were very less likely

during the benchmark survey. Farmer started feeding their cattle with combination of roughage concentrate and straw increased from 21% to 87%. At the end of FFS all farmers involved with preparation and feeding of Urea Molasses Straw (UMS, chemical treatment of straw) which was vital for fattening. All farmers reported that they de-worm their animals regularly which was 13% at the beginning. Farmers are taking services from animal health worker. Farmers learned to measure body weight of animal and the percentages increased from 1.9 % to 100% which helped to bargain with traders. 100% farmer started keeping service providers phone number and among them 62% farmer getting service when necessary at the end of FFS. The survey shows that farmer adopted their learning resulted higher meat production at the end. Average body weight gained per animal was 48.48 kg.

Fish module

It was found from the survey that after FFS intervention farmer were able to increase their pond production efficiency. Although Fish production activities mainly dominated by male, 38% women were participated with this module. Inclusions of poorest people was 74%. 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% at the end of FFS. Average number of cultivated fish species increased from almost double (3.42 to 6). Using of these technologies helped them to get a considerable higher fish production and the production increased from <1 kg to 7.33 kg per decimal after completion of the FFS. Extra production had impact on their dietary changes and fish intake increased one day more/week.

Market orientation in different modules

Generally farmer does not think that agricultural is an agri-business. After attending FFS they have an idea why it would be a business activity. Before FFS 23% farmers hardly understand that concept. They are not used to keep record on their income and expenditure for poultry, fish and beef fattening activities. But at the end of FFS all members showed their positive response. At the end of FFS 98% FFS member have collected input collectively which was null at the beginning. The collective selling percentage rose to 85% at the end of FFS. Use of ICT for agricultural information collection increased to 43% at the end of FFS compare to 1.50 % at the beginning.

Gender issues in different modules

87% women were participated with 13th cycle FFS. It is noteworthy that significant percentages of women were participated with male dominated Beef fattening and fish modules with market issues. It showed at end line data that 70% women started keeping mobile number of different market actors, service providers and started communication when needed. Decision making process on input management and utilization of surplus product shifted from individual to joint approach. Women were able to motivate their counterpart in decision making process for homestead production. The result shows that for input collection 63% FFS members took decision by their own at the beginning. But at the end of FFS decision making process shifted to joint (72%) approach. 82% FFS member took decision jointly on surplus product utilization compare to 49% of individual decision at the beginning.

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. Farmer Field School (FFS) is an experimental learning approach. BGP has managed to demonstrate advanced production technologies for integrated homestead production on Poultry rearing, beef fattening and fish production with market orientation module with poor farmer. Through FFS BGP targeted poor households as the primary beneficiaries placing knowledge and skills in their hands. BGP has focused on enabling smallholder farmers to increase agricultural production and productivity as a means of food security.

This is a report of data collected in cycle 13, which took place from April 2019 to November 2019 in Khulna, Patuakhali and Sathkira. The modules were poultry, beef fattening and fish with market orientation. 36 Farmer Trainers involved as Facilitators under Community Development Facilitator (CDFs) supervision to run cycle 13 FFS.

1.1 Methodologies

A semi-structured questionnaire was used for collecting benchmark and end line data. The questionnaire focused on content of each module (Poultry Rearing, Beef Fattening and Fish production with market orientation). Data on 120 FFS members collected by Farmer Trainer (FTs). Open Data Kit (OK) tools used for data collection by using mobile phone. The sample size was 469, 360 and 208 for poultry, beef fattening and fish modules respectively.

The questionnaire was used to collect data through interviews on technology adaptation, surplus production, utilization of surplus production, dietary changes of FFS members before and after FFS.

Totals and averages of the collected benchmark and end data are calculated by entering into excel sheet from html version. Data on income levels was consolidated from household consumption and sales data. The calculated averages of collected data at the beginning and end of the FFS show an impact of homestead production of poor farmer on their food security.

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=Kutchha; 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.

Type of house	Construction
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.

Table 1: Module wise sample size for survey

Sl no.	Module with no. of FFS	Sample size at 95% significance level	Sampling	Feasible data for final analysis
1.	Poultry (67)	446	Random	469
2.	Beef Fattening (40)	372	Random	360
3.	Fish (13)	211	Random	208

Bringing the sample data of 120 FFS together, creates a dataset with information of over 3000 farmers.

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, and fish production etc), during farmer field days.

2. Poultry Module with market orientation

A total of 67 Farmer Field School (FFS) implemented at Khulna , Patuakhali and Sathkita with Poultry module . The below table shows polder wise implemented FFS status .

Table 2: Polder wise implemented Poultry FFS

SL no.	Zone	Polder	No. of FFS	Male	Female	Total
1	Khulna (32)	P-25	20	36	464	500
		P-27/1	3	1	74	75
		P-27/2	1	0	25	25
		P-34/2-Part	8	0	200	200
2	Patuakhali (24)	P-43/2A	6	1	149	150
		P-43/2B	6	1	149	150
		P-55/2A	12	1	299	300
3	Sathkira (11)	P-2	11	0	275	275
		Total	67	40	1635	1675

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 35 years.

The poultry module is of special interest for women. 99% women participated with 13th cycle Poultry FFS. Almost all participants are registered WMG members. The majority of farmers are literate and the percentages belong to primary 44.56% and secondary 30.49% respectively. Inclusions of the poorest people were 83.96%.

Table 3: General information on FFS participants with poultry module

Sl no.	Particulars	Result
1	Average age	35
2	Gender	99%
3	WMG member	100
4	Education	Primary (45%), Secondary (30%)
5	Inclusion Poorest people	84%

2.2 Result on Poultry Module

FFS cycle 13 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 and linkages with input providers, community poultry workers and department of livestock.

2.2.1 Numbers of birds and egg production

The following tables show the average number of chicken, chicks, ducks and ducklings per household. The end survey shows big increases in the number of birds. This can be partly attributed to improved rearing methods. In the FFS the participants learn techniques to increase egg production (e.g. separating chicks from hen after 1 week). The following figure-1 shows 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 the estimates were too high.

Table 4: Comparison between benchmark and end line regarding number of poultry per household and egg production per bird

Particulars	Patuakhali, Khulna, Sathkira (average)	
	Benchmark (482)	End line (469)
Average number of chicken/household	3.24	9.50
Average number of chicks/households	5.82	3.92
Average number of ducks/households	3.09	5.46
Average number of duckling/households	2.97	3.02

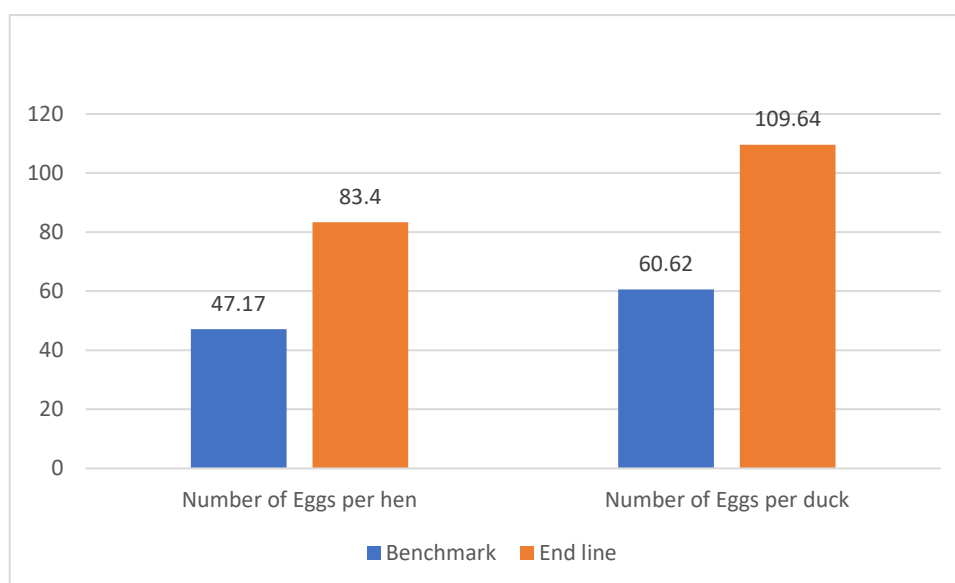


Figure 1: Egg production/year/hen/duck

Utilization of eggs and birds

The following table also shows that in the end of FFS, egg and poultry selling has increased. We see that the number of egg selling increased more than three times compared to benchmark survey. Yearly poultry selling also increased significantly. Concurrently with the increase in birds and egg production, households consume more of their own eggs and birds.

Table 5: Comparison between benchmark and end line regarding the sale and consumption of eggs and poultry per HH

Particulars	Patuakhali, Khulna, Sathkira (average per household)	
	Benchmark (482)	End line (469)
Consume own eggs/week	3.92	7.43
Consume own birds/monthly	0.99	2.05
Selling eggs/month	6	19
Selling poultry /year	4.54	17

2.2.2 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 etc. Many farmers at the end of the FFS report that they have adopted these practices. By following FFS principle trial on housing, use of *hazal* (earthen device) for broody hen management, candling, chick separation established with every FFS.

Diseases are the number one problem limiting small scale poultry production of FFS members. Farmer got knowledge on preventive measures under the topic bio-security and access to vaccination by poultry worker resulted the positive involvement of FFS member in vaccination. Facilitators of the FFS invited poultry workers to the FFS sessions and field days in order to link them with the FFS participants. The result showed (Table-below) that before FFS 94% farmer never vaccinated their birds, 5.81% sometimes and 0.62 % farmer involved with always vaccination. At the end of FFS farmer showed positive changes in their vaccination practices. The regular vaccination percentage rose to 81.88% followed by 18% sometimes and 0% never respectively.

The below table shows that at the end of FFS 98% farmers 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.

Table 6: Comparison between benchmark and end line regarding improved poultry rearing practices

Poultry rearing practices	Patuakhali, Khulna, Sathkira (% farmer)	
	Benchmark (482)	End line (469)
Vaccinate always	0.62	82
Vaccinate sometimes	5.82	18
Vaccinate never	94	0
Use <i>hazal</i>	4.77	98
Use candling	6.43	100
Separate chicks after 1 week	1.66	92
Separate chicks after 2 weeks	1.24	7.89
Separate chicks never	98	0.43

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. Before FFS 17.84% farmers hardly understand that concept. They are not used to keep record on their income and expenditure for poultry rearing. But at the end of FFS all members showed their positive response.

Generally farmer does not think that. After attending FFS they have an idea why it would be a business activity. The following table shows that 100% considered poultry rearing as a business and all most all stated started keeping record.

Table 7: Comparison between benchmark and end line regarding Poultry rearing is a business with poultry module

Particulars	Khulna, Patuakhali, Sathkira	
	Benchmark (482)	End line (469)
Poultry rearing is a business	18%	100%
Record keeping	1.46%	100%

2.3.2 Use of ICT for agricultural information collection

For information collection on input management and technical knowledge by using mobile phone, farmer using ICT sometimes and the percentages increased to 51.50% at the end compare to 1.45 % at the beginning.

Table 8: Comparison between benchmark and end line on use of ICT with poultry module

Particulars	Patuakhali, Khulna, Sathkira (% farmer)	
	Benchmark (482)	End line (469)
Never	99	45
Sometimes	1.45	52
always	0.00	3.63

2.3.3 Collective action

The below tables shows at the end of FFS 99% FFS member collect input collectively which was <1% at the beginning. The collective selling percentage rose to 76% at the end of FFS. Farmer also linked with resource farmers.

Table 9: Comparison between benchmark and end line on collective Input collection with poultry module

Collectively input collection	Patuakhali, Khulna, Sathkira (% farmer)	
	Benchmark (482)	End line (469)
Yes	0.21	99
No	99	1.70

Table 10: Comparison between benchmark and end line on collective sales with poultry module

Collective cell	Patuakhali, Khulna, Sathkira (% farmer)	
	Benchmark (482)	End line (469)
Never	100	7.49
Sometimes	0.41	76
always	0	17

2.3.4 Resource farmer support

Table 11: Comparison between benchmark and end line on resource farmer support with poultry module

Resource farmer support	Patuakhali, Khulna, Sathkira (% farmer)	
	Benchmark (482)	End line (469)
Input purchase, selling	0.21	69
Technical information	1.04	31
None	0.00	0.00
Not applicable	0.21	0.21

2.4 Gender perspective with poultry module

With 13th 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.

It showed at end line data that 40% women started keeping mobile number of different market actors, and service providers, among them 61% started communication when needed. Decision making process on input management and utilization of surplus product shifted from individual to joint approach. The result show that for input collection 56% FFS members took decision by their own but the end of FFS decision making process shifted to joint (56%) approach. 80% FFS member took decision jointly on surplus product utilization compare to 47% of individual decision at the beginning.

2.4.1 Women linkages with market actor

Table 12: Comparison between benchmark and end line on women linkages with market actor with poultry module

Particulars	Patuakhali, Khulna, Sathkira (% farmer)	
	Benchmark (482)	End line (469)
Women Have market actor phone number	2.07	34
Use frequency		
Sometimes	1.08	61

2.4.2 Women involvement on input management

Table 13: Comparison between benchmark and end line on women involvement for input management with poultry module

Particulars	Patuakhali, Khulna, Sathkira (% farmer)	
	Benchmark (482)	End line (469)
Myself	56	12
jointly	15	56
Spouse or other family	24	31
Not applicable	4.47	0.21

2.4.3 Decision making for selling /eating poultry

Table 14: Comparison between benchmark and end line on women decision making status with poultry module

Particulars	Patuakhali, Khulna, Sathkira (% farmer)	
	Benchmark (482)	End line (469)
Myself	47	7
My spouse	35	13
Jointly	19	80

3. Beef fattening Module with market orientation

A total of 40 Farmer Field School (FFS) implemented at Khulna , Patuakhali with Beef Fattening module . The below table shows polder wise implemented FFS data .

Table 15: Polder wise implemented Beef Fattening FFS

Sl no.	Zone	Polder	No. of FFS	Male	Female	Total
1	Khulna (26)	P-25	18	12	438	450
		P-27/1	2	19	31	50
		P-27/2	1	2	23	25
		P-34/2	5	16	109	125
2	Patuakhali (6)	P-43/2A	6	86	64	150
3	Satkhira (8)	P-2	8	48	152	200
		Total	40	183	817	1000

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 Khulna, Patuakhali, and Satkhira. 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 76% women participated with 13th cycle Beef Fattening FFS. All participants are registered WMG members. The majority of farmers are literate and the percentages belong to primary 45% and secondary 36% respectively. Special emphasis given to select poor farmer and the following table shows inclusion of the poorest people were 44%. The percentage is less compared to poultry module, as the Beef Fattening activities need more capital investment.

Table 16: General information of FFS participants with Beef Fattening module

Sl no.	Particulars	Result
1	Average age	36
2	Women	76%
3	WMG member	100%
4	Education	Primary 45% , Secondary 36%
5	Inclusion Poorest people	44%

3.2 Results on Beef Fattening (BF) Module

To build a successful, sustainable cattle fattening business, farmer require sufficient knowledge (i.e. cattle fattening techniques like cattle selection, feed management, disease management and proper planning) on how to fatten a cattle efficiently and those technologies are provided through FFS. Objective of beef fattening module is to increase the efficiency of beef fattening, which for many farmers is an income generating activity, especially in the period before the Eid festival. Technical topics in the module include cattle housing, feeding, preparation of Urea Molasses Straw (UMS), HYV fodder crops, de-worming and vaccination. The module also emphasizes linkages and networking with input providers, service providers (such as animal health worker), markets actors and staff of the department of livestock services (DLS).

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.

Table 17: Comparison between benchmark and end line regarding number of cattle per household

Number of cattle	Patuakhali, Khulna & Satkhira (Average number of animals)	
	Benchmark (n=366)	End line (n=360)
Number milk producing cow	0.49	0.66
Number non milk producing cow	0.52	0.53
Number of male calf	0.63	0.79
Number of female calf	0.48	0.49
Number of bull	0.84	0.92
Total cattle	2.96	3.39

3.2.2 Cattle housing

Beef fattening module try to motivate farmers to improve the housing of their animals. The following table shows that cattle housing improved significantly. 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 and the percentages increased up to 99%. During survey period the improvement of floor remain same as it involved some capital cost.

Table 18: Comparison between benchmark and end line regarding cattle shed improvement

Cattle shed	Khulna, Patuakhali, Satkhira (%) farmers	
	Benchmark (n=366)	End line (n=360)
Cattle shed has ventilation	50	99
Cattle shed has gutter for drainage	25	99
Cattle shed is cleaned daily	52	97
Floor is partly bricks and/or concrete	52	52

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. Farmer started feeding with combination of Roughage concentrate and straw increased from 21% to 87% at the end of FFS.

Table 19: Comparison between benchmark and end line regarding cattle feeding

Cattle feed used	Khulna, Patuakhali, Satkhira (%) farmers	
	Benchmark (n=366)	End line (n=360)
Only roughage	2.72	0.56
Only concentrate	0.00	5.83
Only straw	19.35	0.28
Roughage and concentrate	0.82	0.02
Roughage and straw	59	90
Concentrate and straw	29	1.94
Roughage concentrate and straw	21	87

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. Data shows that few farmers producing more than one green fodder for their animals. Some farmer involved with production of more than one green fodder.

Table 20: Comparison between benchmark and end line regarding green fodder production

Green fodder	Khulna, Patuakhali, Satkhira (No. farmers)	
	Benchmark (n=366)	Benchmark (n=360)
No fodder	356	115
Napier	9	238
Lucern	6	5
Jambo	4	2
Para	4	2
Maize	4	6
German grass	7	2

3.2.5 Urea Molasses Straw (UMS)

The benchmark survey included questions about the use of chemical treatment of straw called UMS (Urea Molasses Straw) which has significant role in Beef Fattening. The survey show that FFS learning on UMS preparation and feeding were in practice among the FFS member. At the end of the FFS farmers reported significant increases of Urea Molasses Straw (UMS) preparation (1.37% to 100%), and feeding of UMS (1.09% to 100%) increased from at the end.

Table 21: Comparison between benchmark and end line regarding UMS preparation and use

UMS	Khulna, Patuakhali, Satkhira (% farmers)	
	Benchmark (n=366)	End line (n=360)
Know how to make UMS	1.37	100
Feed UMS to cattle	1.09	100

3.2.6 Measure body weight

For beef fattening it is important that farmers can measure the body weight of their animals. By following body weight technique farmer had a good bargaining power to fix their cattle market price. Knowledge on body weight measurement helped to administer de-worming and other disease management. The following table shows that almost all farmers learned this in the FFS.

Table 22: Comparison between benchmark and end line regarding body weight measurement knowledge

Body weight	Khulna, Patuakhali, Satkhira (% farmers)	
	Benchmark (n=366)	End line (n=360)
Know how to measure body weight	1.09	100

3.2.7 De-worming

De-worming of cattle was less practiced at the beginning of the FFS, but in the end survey most farmers reported that they de-worm their animals regularly.

Table 23: Comparison between benchmark and end line regarding de-worming

De-worming	Khulna, Patuakhali, Satkhira (% farmers)	
	Benchmark (n=366)	End line (n=360)
De-worm cattle regularly	13	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.

Table 24: Comparison between benchmark and end line regarding receiving animal health service

Receive animal health service	Khulna, Patuakhali, Satkhira (% farmers)	
	Benchmark (n=366)	End line (n=360)
Never	82	14
Sometimes	17	62
Always	1.04	24
Have phone number of service provider	7.65	100

3.2.9 Meat production by all farmer

The next table shows the datasets of all farmer for beef fattening from three districts together. If we compare benchmark with end data we see a total of 23925 extra kg meat produced by the FFS members at the end of FFS.

Table 25: Comparison between bench mark and end line regarding meat Production in Khulna, Patuakhali and Sathkira

Meat production in 3 district	Benchmark	End line	Extra meat production
Total meat production (kg)	38660	62585	23925
Meat production per farmer (kg)	125	174	48

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. 99% participants had positive response on collective input collection and majority percent involved with collective selling. 69% farmers reported that now and then they are using ICT for information collection when needed.

3.3.1 Beef fattening is a business

Table 26: Comparison between bench mark and end line regarding Beef Fattening is a business

Particulars	Khulna, Patuakhali, Satkhira (% farmers)	
	Benchmark (n=366)	End line (n=360)
Beef fattening is a business	38	100
Record keeping	10	99

3.3.2 Collectively input collection

Table 27: Comparison between benchmark and end line on collectively input collection with Beef Fattening module

Collectively input collection	Khulna, Patuakhali, Satkhira (% farmers)	
	Benchmark (n=366)	End line (n=360)
Yes	0.27	94
No	100	5.56

Table 28: Comparison between benchmark and end line on collectively input sales with Beef Fattening module

Collective cell	Khulna, Patuakhali, Satkhira (% farmers)	
	Benchmark (n=366)	End line (n=360)
Never	97	39
Sometimes	2.73	55
Always	0.00	6.11

3.3.3 Use of ICT

Table 29: Comparison between benchmark and end line on use of ICT with Beef Fattening module

Number with person	Khulna, Patuakhali, Satkhira (% farmers)	
	Benchmark (n=366)	End line (n=360)
Never	98	25
Sometimes	1.64	69
Always	0	5.83

3.4 Gender perspective in FFS with Beef Fattening module

It was noteworthy that FFS learning and practices initiative was taken to disseminate technologies to female farmer, that had enriched their knowledge on beef fattening as the activities mainly male dominated. Women participated with beef fattening module played positive role on decision making process. The below tables shows that, at the end of FFS for networking 70% women are involved with keeping phone number of different market actors. Among them 76% 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 major percentages were myself (33%) at the beginning and jointly (77%) at the end of FFS. Decision on selling fattening cattle changed to joint approach (33% to 75%) at the end of FFS.

3.4.1 Women linkages with market actor

Table 30: Comparison between benchmark and end line on women linkages with market actor with Beef Fattening module

Particulars	Khulna, Patuakhali, Satkhira (% farmers)	
	Benchmark (n=366)	End line (n=360)
Women Have market actor phone number	7.56	70
Use frequency		
Sometimes	50	76

3.4.2 Input collection decision

Table 31: Comparison between benchmark and end line on women involvement for input management with Beef Fattening module

Collectively input collection	Khulna, Patuakhali, Satkhira (% farmers)	
	Benchmark (n=366)	End line (n=360)
Myself	33	20
jointly	59	77
Spouse or other family	0.0	-
Not applicable	7.65	2.5

3.4.3 Decision taking for Fatten cattle selling

Table 32: Comparison between benchmark and end line on women decision making status with Beef Fattening module

Particulars	Khulna, Patuakhali, Satkhira (% farmers)	
	Benchmark (n=366)	End line (n=360)
Myself	32.79	5.56
My spouse	51.09	19
Jointly	14	75
Not applicable	2	-

4. Fish Module with Market orientation

A total of 13 Farmer Field School (FFS) implemented at Khulna and Patuakhali with Fish module. The below table shows polder wise implemented FFS status .

Table 33: Polder wise implemented Fish FFS

SL no.	Zone	Polder	No. of FFS	Male	Female	Total
1	Khulna (3)	P-27/1	1	6	19	25
		P-34/2-Part	2	22	28	50
2	Patuakhali (10)	P-43/2A	4	64	36	100
		P-43/2B	6	99	51	150
		Total	13	191	134	325

4.1 General information of FFS participants with Fish module

The table below shows the profile of the FFS participants with fish module in Khulna and Patuakhali. Young and dynamic farmer participated with fish module and market orientation and average age of the participants was 37 years.

38% women participated with 13th 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 42% and 37% can sign only and primary respectively. During FFS member selection, special emphasis given to select poor farmer and inclusion of poorest people 74% with Fish module.

Table 34: General information of FFS participants with Fish module

Sl no.	Particulars	Result
1	Average age	37
2	Women	38%
3	WMG member	100%
4	Education	Can sign (42%), Primary (37%)
5	Inclusion Poorest people	74%

4.2 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. For making pond fisheries economically viable market orientation issues are also include with this module.

4.2.1 Technology adaptation status with fish 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.

Table 35: Comparison between benchmark and end line regarding technology adoption status

Use of different technologies	Khulna, Patuakhali (% of farmers)	
	Benchmark (n=212)	End line (n=208)
Fish pond preparation	0.94	100
Fingerling selection	2.83	100
Use of Supplementary feed	6.13	100
Knowledge on stocking density	0.47	100
Natural Feed testing	1.89	100
Knowledge on sampling	4.72	100

4.2.2 Type of fish in the pond

Farmers have different types of fish in 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, catla and Rajputi. It is found from the below table that average number cultivated species increased from 3.42 to 6 at the end of FFS.

Table 36: Comparison between benchmark and end line regarding number species cultivated in pond

(Types of fish)	Khulna, Patuakhali (percentages)	
	Benchmark (n=212)	End line (n=208)
Tilapia	86	94
Silver Carp	61	100
Catla	55	68
Rui	54	66
Mrigel	14	47
Mirror Carp	7.08	40
Common Carp	9.91	75
Rajputi	31	97
Shrimp	10	12
Others	13	1.92
Average number species (number)	3.42	6

4.3 Production of fish

Small size homestead ponds were almost abundant and farmer did not give attention for economic production rather considered as a chance production. Pond preparation steps had a tremendous role on changing pond environment that is the quality of ponds. It is found from the survey that the technologies like pond preparation, different layers fish production, applying supplementary feed, pond observation etc. resulted high production.

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 0.99 kg/dec. to 11kg/dec.

Table 37: Comparison of Fish production (Kg) per farmer between benchmark and end line

All fish production	Khulna, Patuakhali	
	Benchmark (n=212)	End line (n=208)
Total all fish produce (kg)	3062	23288
Total all fish per farmer (kg)	12	88
Total all fish per decimal (kg)	0.99	7.53

4.3.1 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 .94% and 6.13% respectively. But at the end, fish sales percentages less than and or more than half increased from 55% and 5.29% respectively. Fish eating per week increased (day/farmers/week) one day more that is from 1.66 days to 3.23 days.

Table 38: Comparison of utilization of fish produce between benchmark and end line

What happens with fish produced	Khulna, Patuakhali (percentage farmers)	
	Benchmark (n=212)	End FFS (n=208)
Sell less than half	0.94	56
Sell more than half	6.13	5.29
Fish consumption days/per week	1.66	3.23

4.3.2 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. At the end of FFS source of fingerling collection shifted from local vendor to local nursery and hatchery ensured quality fingerling. Some farmers use different sources so the total percentages exceed.)

Table 39: Comparison of source of fingerling collection between benchmark and end line

Source of fingerling	Khulna, Patuakhali (percentages)	
	Benchmark (n=212)	End line (n=208)
Local vendor	97	9.86
Local nursery	4.23	79
Hatchery	0	13

4.4 Trends in market orientation with Fish Module

At the benchmark and end line survey some market orientation issues were asked to stimulate them. Training inspired them to keep linking with markets, record keeping, using ICT and involved with collective actions and take took pond fish activities as an economic activities.

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

4.4.1 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 fish production. But at the end of FFS they showed their positive response.

Table 40: Comparison between bench mark and end line regarding Fish Production is a business

Particulars	Khulna, Patuakhali (% farmer)	
	Benchmark (n=212)	End line (n=208)
Agriculture is a business	14	100.00
Record keeping	2.83	100.00

4.4.2 Use of ICT for agricultural information collection

The below table shows that at the end few farmer started using ICT for agricultural information collection which was less likely at the beginning.

Table 41: Comparison between benchmark and end line on ICT use for fish production

Particulars	Khulna, Patuakhali (percentages)	
	Benchmark (n=212)	End line (n=208)
Never	99	79
Sometimes	1.42	8.65
always	0.00	13

4.4.3 Collective action

Training inspired them in benefit of collective actions and at the end of FFS farmer started collective input collection and selling of their product. Farmer also started taking advice from resource farmer.

Table 42: Comparison between benchmark and end line on collectively input collection with Fish module

Collectively input collection	Khulna, Patuakhali (percentages)	
	Benchmark (n=212)	End line (n=208)
Yes	0.94	100
No	99	0

Table 43: Comparison between benchmark and end line on collective sale with Fish module

Collective cell	Khulna, Patuakhali (percentages)	
	Benchmark (n=212)	End line (n=208)
Never	97	0.00
Sometimes	2.83	88
always	0	12

4.4.4 Resource farmer support

Table 44: Comparison between benchmark and end line on resource farmer support with Fish module

Resource farmer support	Patuakhali, Khulna (% farmer)	
	Benchmark (n=212)	End line (n=208)
Input purchase, selling	0	94
Technical information	2.36	6.25
None	84	0
Not applicable	13	0

4.5 Gender perspective with fish module

At polder areas fish activities mainly dominated by men. But with 13th 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 fish 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 at the end of FFS 100% women have market

actors' phone number and among them 88% started using it. On input management for fish production and selling and eating fish, decision making process shifted from individual to joint approach. Considering pond fisheries is an agricultural activities women involved their counter part

4.5.1 Women linkages with market actor

Table 45: Comparison between benchmark and end line on women linkages with market actor in Fish module

Particulars	Patuakhali, Khulna (% farmer)	
	Benchmark (n=212)	End line (n=208)
Women Have market actor phone number	5.39	100
Use frequency		
Sometimes	33	88

4.5.2 Decision making for selling /eating fish

Table 46: Comparison between benchmark and end line on women decision making status with Fish module

Particulars	Patuakhali, Khulna (% farmer)	
	Benchmark (n=212)	End line (n=208)
Myself	67	2.89
My spouse	25	5.77
Jointly	8.96	91
Not applicable	0.00	0

4.5.3 Women involvement on input management

Table 47: Comparison between benchmark and end line on women involvement in input management with fish module

Particulars	Patuakhali, Khulna (% farmer)	
	Benchmark (n=212)	End line (n=208)
Myself	47	10
jointly	25	87

5. Conclusion

The data presented in this report were collected in the benchmark and end surveys of cycle 13 and represent the results of about 3000 farmers.

Comparing end data with benchmark data shows some immediate effects of the FFS training, such as a considerable increase of eggs, poultry, fish and meat 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.

It was found from the survey that practicing improved native poultry rearing technologies playing a major role for the poor WMGs member with respect to their subsidiary income. Women are traditionally playing an important role in this sector. But they have limited access to knowledge, training and extension services. FFS the learning by doing approach has made a vital role to enrich their knowledge and process of practices.

Data shows that cattle fattening for beef production have become an important business of the small farmer in polder areas. Through FFS women are more encouraged to involve with this activities. Linkages with service provider and Department of Livestock had a positive role in this enterprise development. By following body weight technique farmer had a good bargaining power to fix their cattle market price.

Data stated that following technologies like pond preparation, different layers fish production, applying supplementary feed, pond observation increased the better pond environment resulted high production. Involvement of women in male dominated fish modules helped them to increase their technical knowledge on pond fish production.

Information supplied on market actors and line department experts help increase networking and linkages among farmers and market actors. Through FFS women have showed their positive involvement in homestead based economic activities.

From above result we can conclude that the FFSs in cycle 13 have successfully increased production and income of the participants during the FFS season.

Appendix A

Appendix A: Poultry Module Result

Sample size: Bench Mark: 482, End line: 469, Zones: Patuakhali, Khulna, Satkhira

General information

Age (years)

Average age	35
Youngest	17
Oldest	50

Gender (nos.)

Men	3
Women	466
Total	469

Agricultural land

Average agriculture (decimal)	28.0
Average HG land (decimal)	8.50

Inclusion of poorest (nos.)

Poorest	178
Others	34

Education (%)

Illiterate & can sign	19
Primary	45
Secondary	30
HCC and above	6.18

WMG member (nos.)

Member	468
Non member	1

Technical information- Bench mark

Number of Poultry (nos.)

Total chicken	1561
Average chicken	3.24
Total duck	1489
Average Duck	3.09
Total chicks	2800
Average Chicks	5.81
Total duckling	1405
Average duckling	2.97

Technical information - End line

Number of poultry (nos.)

Total chicken	4457
Average chicken	9.50
Total duck	2559
Average Duck	5.46
Total chicks	1837
Average Chicks	3.92
Total duckling	1417
Average duckling	3.02

Egg production /hen/duck/year (nos.)

Average egg /hen	47.17
Average egg /duck	60.62

Egg production /hen/duck /year (nos.)

Average/hen	83.40
Average egg /duck	109.64

Blue Gold Program

Own egg consumption per week (nos.)

Max	25
Average	3.92
Total (all members)	1889

Own poultry consumption per month (nos.)

Max	14
Average	0.99
Total (all member)	478

Egg sold per month (nos.)

Total (all members)	2884
Average	6

Poultry sold per year (nos.)

Total (all members)	2190
Average	4.54

Poultry vaccination (no. of farmer)

Never	451
Sometimes	28
Always	3

Use of hazol (no. of farmer)

Yes	23
No	459

Chick separation (no. of farmer)

After 1 week	8
After 2 week	6
Never	467

Candling (no. of farmer)

Yes	31
No	451

Own egg consumption per week (nos.)

Max	81
Average	7.43
Total (all members)	3484

Own poultry consumption per month (nos.)

Max	25
Average	2.05
Total (all member)	960

Egg sold per month (nos.)

Total (all members)	8795
Average	19

Poultry sold per year (nos.)

Total (all members)	8008
Average	17.07

Poultry vaccination (no. of farmer)

Never	0
Sometimes	85
Always	384

Use of hazol (no. of farmer)

Yes	461
No	8

Chick separation (no. of farmer)

After 1 week	430
After 2 week	37
Never	2

Candling (no. of farmer)

Yes	469
No	0

Market orientation issues

Poultry rearing is a business (no. of farmer)

Yes	86
No	396

Record keeping (no. of farmer)

Yes	7
No	472

Use of ICT for Poultry rearing (no. of farmer)

Never	475
Sometimes	7
Always	0

Collective sell (no. of farmer)

Never	481
Sometimes	2
Always	0

Collective input collection (no. of farmer)

Yes	1
No	481

Resource farmer support (no. of farmer)

Yes	7
No	249
Not applicable	226

Types of support (no. of farmer)

Input purchase Selling	1
Technical	5
Never	220
Not applicable	256

Market orientation issues

Poultry rearing is a business (no. of farmer)

Yes	469
No	0

Record keeping (no. of farmer)

Yes	467
No	2

Use of ICT for Poultry rearing (no. of farmer)

Never	210
Sometimes	241
Always	17

Collective sell (no. of farmer)

Never	35
Sometimes	355
Always	79

Collective input collection (no. of farmer)

Yes	463
No	5

Resource farmer support (no. of farmer)

Yes	467
No	0
Not applicable	2

Types of support (no. of farmer)

Input purchase Selling	324
Technical	114
Never	0
Not applicable	1

Blue Gold Program



Gender issues

Have market actor no. and use (%)

Myself (%)	2.07
Sometimes (%)	1.08

Decision on input purchase (%)

Myself (%)	55.60
Jointly (%)	15.35

Decision making on sell & eat (%)

Myself (%)	47
Jointly (%)	19

Gender issues

Have market actor no. and use (%)

Myself (%)	40
Sometimes (%)	61

Decision on input purchase (%)

Myself (%)	12.37
Jointly (%)	56.08

Decision making on sell & eat (%)

Myself (%)	7
Jointly (%)	80

Appendix B

Appendix B: Beef fattening Module Result

Sample size: Bench Mark: 366, End line: 360, Zones: Patuakhali, Khulna, Satkhira

General information

Age (years)

Average age	36
Youngest	20
Oldest	60

Agricultural land

Average agriculture (decimal)	34.17
Average HG land (decimal)	8.85

Education (%)

Illiterate & can sign	14.44
Primary	44.72
Secondary	35.56
HCC and above	5.28

Technical information - Bench mark

Number of animal (nos.)

Total animals	1084
Average animal	2.96

Receive health service (nos. of farmer)

Never	300
Sometimes	62
Always	4

Have phone number of service providers (nos. of farmer)

Yes	28
No	338

Gender (nos.)

Men	86
Women	274
Total	360

Inclusion of poorest (nos.)

Poorest	178
Others	34

WMG member (nos.)

Member	360
Non member	0

Technical information - End line

Number of animal (nos.)

Total animals	1221
Average animal	3.39

Receive health service (nos. of farmer)

Never	51
Sometimes	223
Always	86

Have phone number of service providers (nos. of farmer)

Yes	360
No	0

Cattle shed improvement (nos. of farmer)

Have ventilation	
Yes	184
No	182
Has Gutter	
Yes	92
No	274
Clean daily	
Yes	192
No	174

Cattle shed floor types (no. of farmer)

Only sand and/or soil	148
Combination with brick and concrete	25
Only brick and/or concrete	193

Feed for beef fattening (nos. farmer)

Roughage and concentrate	3
Roughage and straw	218
Concentrate and straw	107
Roughage, concentrate and straw	76

Green fodder production (No. farmer)

No fodder	356
Napier	9

UMS preparation and use (no. farmer)

Have knowledge on UMS	5
Use of UMS	4

De-worm regularly (No. farmer)

Yes	48
No	318

Cattle shed improvement (nos. of farmer)

Have ventilation	
Yes	356
No	4
Has Gutter	
Yes	358
No	2
Clean daily	
Yes	350
No	10

Cattle shed floor types (no. of farmer)

Only sand and/or soil	116
Combination with brick and concrete	389
Only brick and/or concrete	187

Feed for beef fattening (nos. farmer)

Roughage and concentrate	3
Roughage and straw	218
Concentrate and straw	107
Roughage, concentrate and straw	76

Green fodder production (No. farmer)

No fodder	115
Napier	238

UMS preparation and use (no. farmer)

Have knowledge on UMS	360
Use of UMS	360

De-worm regularly (No. farmer)

Yes	360
No	0

Blue Gold Program

Knowledge on body weight measurements (no. farmer)

Yes	4
No	362

Meat production /animal (kg)

Average body weight	125
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Market orientation issues

Beef fattening is a business (no. of farmer)

Yes	139
No	227

Record keeping (no. of farmer)

Yes	37
No	329

Use of ICT for Beef fattening (no. of farmer)

Never	360
Sometimes	6
Always	0

Collective sell (no. of farmer)

Never	356
Sometimes	10
Always	0

Collective input collection (no. of farmer)

Yes	1
No	365

Resource farmer support (no. of farmer)

Yes	2
No	190
Not applicable	102

Knowledge on body weight measurements (no. farmer)

Yes	360
No	0

Meat production /animal (kg)

Average body weight	173
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Market orientation issues

Beef Fattening is a business (no. of farmer)

Yes	360
No	0

Record keeping (no. of farmer)

Yes	356
No	4

Use of ICT for Beef fattening (no. of farmer)

Never	89
Sometimes	250
Always	21

Collective sell (no. of farmer)

Never	139
Sometimes	199
Always	22

Collective input collection (no. of farmer)

Yes	340
No	20

Resource farmer support (no. of farmer)

Yes	360
No	0
Not applicable	0

Blue Gold Program

Types of support (no. of farmer)

Input purchase Selling	2
Technical	5
Never	36
Not applicable	251

Gender issues

Have market actor no. and use (%)

Myself (%)	7.65
Sometimes (%)	50

Decision on input purchase (%)

Myself (%)	33.33
Jointly (%)	59.02

Decision making on sell & eat (%)

Myself (%)	32.79
Jointly (%)	14.21

Types of support (no. of farmer)

Input purchase Selling	294
Technical	66
Never	0
Not applicable	0

Gender issues

Have market actor no. and use (%)

Myself (%)	70.47
Sometimes (%)	75.89

Decision on input purchase (%)

Myself (%)	20.28
Jointly (%)	77.22

Decision making on sell & eat (%)

Myself (%)	5.56
Jointly (%)	75.28

Appendix C

Appendix C: Fish module Result

Sample size: Bench Mark: 212, End line: 208, Zones: Patuakhali, Khulna

General information

Age (years)

Average age	37
Youngest	22
Oldest	60

Agricultural land pond size

Average agriculture (decimal)	38.44
Average HG land (decimal)	16.26
Average pond (decimal)	8.88

Education (%)

Illiterate & can sign	42.31
Primary	37.92
Secondary	18.27
HCC and above	2.40

Technical information - Bench mark

Number of fish species cultivated

Number of species	3.42
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Fish pond preparation (nos. of farmer)

No	199
Partly	11
Yes	2

Others technical knowledge (no. farmer)

Fingerling selection knowledge	6
Stocking density knowledge	1
Feed testing knowledge	4
Sampling knowledge	10

Gender (nos.)

Men	128
Women	80
Total	

Inclusion of poorest (nos.)

Poorest	153
Others	55

WMG member (nos.)

Member	208
Non member	0

Technical information - End line

Number of fish species cultivated

Number of species	6
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Fish pond preparation (nos. of farmer)

No	0
Partly	0
Yes	208

Others technical knowledge (no. farmer)

Fingerling selection knowledge	208
Stocking density knowledge	208
Feed testing knowledge	208
Sampling knowledge	208

Use and type of supplementary feed (no. farmer)

Use of supplementary feed	
No	199
Yes	13
Feed type	
None	166
Home made	42
Locally made	10
Commercial feed	2

Days per week eat fish

Average days	1.66
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Use of fish produce (no. farmer)

Sell none	197
Sell less than half	2
Sell and eat about half	13
Sell more than half	0

Market orientation issues

Fish production is a business (no. of farmer)

Yes	29
No	183

Record keeping (no. of farmer)

Yes	6
No	206

Use of ICT for fish production (no. of farmer)

Never	209
Sometimes	3
Always	0

Use and type of supplementary feed (no. farmer)

Use of supplementary feed	
No	0
Yes	208
Feed type	
None	0
Home made	36
Locally made	186
Commercial feed	3

Days per week eat fish

Average days	3.23
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Use of fish produce (no. farmer)

Sell none	2
Sell less than half	116
Sell and eat about half	79
Sell more than half	11

Market orientation issues

Fish production is a business (no. of farmer)

Yes	208
No	0

Record keeping (no. of farmer)

Yes	208
No	0

Use of ICT for fish production (no. of farmer)

Never	164
Sometimes	18
Always	26

Collective sell (no. of farmer)

Never	206
Sometimes	6
Always	0

Collective input collection (no. of farmer)

Yes	2
No	210

Resource farmer support (no. of farmer)

Yes	5
No	182
Not applicable	25

Types of support (no. of farmer)

Input purchase Selling	0
Technical	5
Never	179
Not applicable	28

Gender issues

Have market actor no. and use (%)

Myself (%)	5.53
Sometimes (%)	33.33

Decision on input purchase (%)

Myself (%)	90.09
Jointly (%)	8.49

Decision making on sell & eat (%)

Myself (%)	66.51
Jointly (%)	8.96

Collective sell (no. of farmer)

Never	0
Sometimes	184
Always	24

Collective input collection (no. of farmer)

Yes	208
No	0

Resource farmer support (no. of farmer)

Yes	208
No	0
Not applicable	0

Types of support (no. of farmer)

Input purchase Selling	195
Technical	13
Never	0
Not applicable	0

Gender issues

Have market actor no. and use (%)

Myself (%)	100
Sometimes (%)	88

Decision on input purchase (%)

Myself (%)	2.88
Jointly (%)	81.25

Decision making on sell & eat (%)

Myself (%)	2.88
Jointly (%)	91.34