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for sustainable development



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Cycle 12 FFS

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Comparing benchmark and end data

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Summary

This is a progress report of the 12th cycle FFS took place from November 2018 to March 2019. A total of 213 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, 43/1A, 43/2A & 43/2B) and Satkhira (Polder-2). The FFS included Poultry and Homestead vegetable modules with market orientation. The report shows differences in production and household income of the FFS participants based on the analysis of the data collected at the start and end of the FFSs.

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. A semi-structured questionnaire was used for data collection.

Bringing the sampling data of 213 FFS together creates a data set with information over 5325 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 with market orientation

The poultry module is of special interest for women. 98% women participated with 12th cycle Poultry FFS. Almost all participants are registered WMG members. Inclusions of the poorest people were 68%. The majority of farmers are literate and the percentages belong to primary 54% and secondary 27% respectively. Survey reveals that almost all farmers are using *hazals* 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. Regular vaccination followed by 68% farmer for their birds. Result reflected the positive changes on poultry production. It was found from the survey that number of egg production/hen/year increased from 47 to 83 and egg/duck/year increased from 56 to 112 respectively. Number of selling eggs per months increased about 4 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 more than two birds per month. Linkages between the Department of Livestock Services (DLS) and FFS members increased during FFS period.

Homestead vegetable with market orientation

The homestead vegetable activities mainly dominated by women but some percentage of men also attended with this module and the women participation were 86%. Average age of the participants was 35 years. It means that young and dynamic participants included with homestead vegetable module. Inclusions of poorest people were 55%. The majority of farmers are literate and the percentages are 55% and 29% primary and secondary respectively. Technical topics in the module include space planning, preparation of vegetable beds, use of quality seeds and fertilizers, integrated pest management (IPM), and preparation of farm yard manure (FYM). The number of different types of vegetables grown within a homestead increased significantly and the percentages increased from 4% to 7%. Instead of relying mainly on sunny open areas to grow vegetables farmers started growing their vegetables in different locations within their homestead and the used percentages of locations increased from 3% to 7%. 82% percent farmer started following Integrated Pest management for pest management. In the FFS, farmers learn to use Integrated Pest Management (IPM) methods in their 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 24% and 3% respectively. But at the end, vegetables sales percentages less than and or more than half increased from 23% and 26% respectively.

The nutrition messages included with 12th cycle homestead vegetables module. Emphasis is given on the "thousand-day food requirements for mothers during pregnancy and the first 2 years of the child. During the nutrition sessions farmers learn about cooking procedures, for example that it is better to wash Vegetables before cutting them. The FFS farmers became familiar about the health benefits of Moringa leaves. Vegetable eating amount increased (gram/farmers/week) from 794 gram to 1518 grams.

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. Generally, farmer does not think that homestead production could be an agri-business. After attending FFS they have an idea why it would be a business activity. Before FFS farmers hardly understand it. But at the end of FFS all members showed their positive response on it.

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. Moreover, from each of the FFS, one advance farmer trained as a Resource Farmer (RF) on market orientation issues. Result showed that Resource Farmers started providing support to FFS member.

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. At the end of FFS 42% and 58% percentages of Poultry and homestead vegetables farmer started using ICT for information collection. In addition, in the training session, farmers got motivated hearing the benefits of collective action and started to practice it within the FFS community.

Gender Perspective

For poultry rearing and homestead vegetable production with market orientation modules emphasis given to select resource poor women.

With 12th cycle FFS there were some questions set to know about the position of women in decision making process on FFS activities like input purchase, utilization of homestead produces (egg, meat and vegetables etc.). After entering into FFS, participants started giving priority to homestead production activities and decision-making process shifted from individual and joint approach.

To make homestead production profitable, women orientated with use of ICT, networking with market actors, collective actions etc. It showed at end line data that 42% (Homestead module) and 59% (Poultry module) women started keeping mobile number of different market actors, service providers and among them 99% (Homestead vegetables) and 71% (poultry) started using the numbers. That helps them to communicate with different service providers for input and output management.

1. Introduction

Farmer Field School is a good extension approach and Blue Gold Program follows this 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 12, which took place from November 2018-March 2019 in Khulna, Patuakhali and Satkhira. The modules were poultry rearing and homestead vegetable production with market orientation. 73 Farmer Trainers involved as Facilitators under Community Development Facilitator (CDFs) supervision to run cycle 12 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, and Homestead vegetable production. Data on 213 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, 47/4, 43/1A, 43/2A and 43/2B and in Satkhira 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=Kutcha; 3= Semi Pucca; 4= Pucca)

Type of house	Construction
<i>Pucca</i>	Solid, permanent construction with bricks and concrete, possibly corrugated iron roofing.
<i>Semi-Pucca</i>	Concrete floors, walls partially of bricks (e.g., brick foundation), partially of bamboo or iron sheets, corrugated iron roofing.
<i>Kutcha</i>	Earthen floor, walls of mud bricks or woven materials (jute, bamboo), roof of thatch or occasionally corrugated iron.
<i>Jhupri</i>	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 (158)	522	Random	463
2.	Vegetable (55)	418	Random	418

Bringing the sample data of 213 FFS together, creates a dataset with information of over 5325 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 158 Farmer Field School (FFS) implemented at Khulna, Patuakhali and Satkhira 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 (73)	P-25	44
		P-27/1	5
		P-27/2	3
		P-28/1	4
		P-28/2	5
		P-34/2-Part	12
		2	Patuakhali (80)
43/2A	12		
43/2B	9		
P-47/3	8		
P-47/4	12		
P-55/2A	14		
P-55/2C	13		
3	Satkhira (05)	P-2	5
		Total	158

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 Satkhira. 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 12th cycle Poultry FFS. Almost all participants are registered WMG members. The majority of farmers are literate and the percentages belong to primary 54% and secondary 27% respectively. Inclusions of the poorest people were 68%.

Sl no.	Particulars	Result
1	Average age	34
2	Gender	98%
3	WMG member	>99%
4	Education	Primary (54%) , Secondary (27%)
5	Inclusion Poorest people	68%

2.2 Result on Poultry Module

FFS cycle 12 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 *haza*, 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, Satkhira (average per household)	
	Benchmark (463)	End line FFS (464)
Chicken /household	4	9
Chicks /household	7	17
Ducks /household	4	7
Duckling/household	2	6

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 (average per household)	
	Benchmark (463)	End line FFS (464)
Eggs per hen	47	83
Eggs per duck	56	112

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, Satkhira (average per household)	
	Benchmark (463)	End line FFS (464)
Consume own eggs/week	4	8
Consume own birds/monthly	<1	3

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, Satkhira (average per household)	
	Benchmark (463)	End line FFS (464)
Farmers selling eggs/month	7	28

Selling of poultry	Patuakhali, Khulna, Satkhira (average per household)	
	Benchmark (463)	End line FFS (464)
Farmers selling poultry /year	4	20

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, Satkhira (% farmer)	
	Benchmark (463)	End line FFS (464)
Vaccinate always	<1	68
Vaccinate sometimes	6.7	30
Vaccinate never	93	2
Use <i>hazal</i>	7	99
Use candling	2	100
Separate chicks after 1 week	<1	60
Separate chicks after 2 weeks	<1	39
Separate chicks never	99	<1

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. At the end of the FFS all most all farmer (>99%) started keeping record of their poultry activities and considered it is a business.

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 more than 99% considered poultry rearing as a business and started keeping record.

Particulars	Khulna, Patuakhali, Satkhira (% farmer)	
	Benchmark (463)	End line FFS (464)
Poultry rearing is a business	19%	100
Record keeping	<1%	100%

2.3.2 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 43% farmer started using ICT.

Particulars	Patuakhali, Khulna, Satkhira (% farmer)	
	Benchmark (463)	End line FFS (464)
Never	98	36
Sometimes	2	43
always	0	21

2.3.3 Collective action

The below tables show that 96% started collective action for input collection and 72% involved with collective cell. Farmer also linked with resource farmers.

Input collection

Collectively input collection	Patuakhali, Khulna, Satkhira (% farmer)	
	Benchmark (463)	End line FFS (464)
Yes	<1%	96
No	>99%	4

Collective sales

Collective cell	Patuakhali, Khulna, Satkhira (% farmer)	
	Benchmark (463)	End line FFS (464)
Never	99	2.58
Sometimes	1	71.67
always	0	25.75

2.3.4 Resource farmer support

Resource farmer support	Patuakhali, Khulna, Satkhira (% farmer)	
	Benchmark (463)	End line FFS (464)
Input purchase, selling	-	77
Technical information	-	23
None	-	0
Not applicable	100	0

2.4 Gender perspective with poultry module

With 12th 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 59% women have market actors' phone number and among them 71% 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, Satkhira (% farmer)	
	Benchmark (463)	End line FFS (464)
Myself	51	11
My spouse	30	10
Jointly	19	79

2.4.2 Women linkages with market actor

Particulars	Patuakhali, Khulna, Satkhira (% farmer)	
	Benchmark (463)	End line FFS (464)
Women Have market actor phone number		
None	95	<1
Myself	3	59
My spouse	2	40
Use frequency		
Sometimes	0	71%

2.4.3 Women involvement on input management

Particulars	Patuakhali, Khulna, Satkhira (% farmer)	
	Benchmark (463)	End line FFS (464)
Myself	46	19
jointly	28	67
Spouse or other family	5	9
Not applicable	21	5

3. Homestead Vegetable Module with market orientation

A total of 55 Farmer Field School (FFS) implemented at Khulna, Patuakhali and Satkhira 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 (28)	P-25	11
2		P-27/1	2
3		P-28/1	3
4		P-28/2	4
5		P-34/2-Part	4
6		P-31 part	4
7	Patuakhali (19)	P-47/4	8
8		P-55/2A	5
9		P-55/2C	6
10	Satkhira (08)	2	8
		Total	55

3.1 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, Patuakhali and Satkhira. The homestead vegetable activities mainly dominated by women but some percentage of men also attended with this module. It was found that 86% women participated with 12th cycle homestead vegetable module FFS. Average age of the participants was 35 years. It means that young and dynamic participants included with homestead vegetable module. Inclusions of poorest people were 55%. The majority of farmers are literate and the percentages are 55% and 29% primary and secondary respectively.

SI no.	Particulars	Result
1	Average age	35
2	Women	86%
3	WMG member	100%
4	Education	Primary (55%), Secondary (29%)
5	Inclusion Poorest people	55%

3.2 Result on Vegetable Module

FFS Cycle 12 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.

3.2.1 Growing homestead vegetables

About 11% of the farmers did not yet grow homestead vegetables when they started the FFS, but all of them had a homestead vegetable garden at the end of the FFS.

Homestead vegetables	Khulna, Satkhira, Patuakhali (percentage farmers)	
	Benchmark (n=418)	End line FFS (n=417)
Farmers growing homestead vegetables	89	100

3.2.2 Crop diversification

The number of different types of vegetables grown within a homestead increased significantly and the number increased by doubled. 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.

3.2.3 Types of vegetables grown

During FFS, trial established on space planning with different types of vegetables to show the use of potential and underutilized spaces at a homestead

The table shows the average locations and number of vegetables produced within the same homestead areas.

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. Especially leafy vegetables and drumstick came forward as the nutrition value may understand by the members.

Type of vegetables	Khulna, Satkhira, Patuakhali (percentage farmers)	
	Benchmark (n=418)	End line FFS (n=417)
Gourds	89.65	93.27
Brinjal	55.30	90.26
Leafy vegetables	57.32	78.89
Ladies finger	17.93	60.09
Cabbage / Cauliflower	11.36	50.81
Radish	29.80	75.81
Tomato	23.48	72.39
Aroids	40.15	76.10
Drumstick	36.11	66.36
Other vegetables	36.36	64.97

The number of different types of vegetables grown within a homestead increased significantly and the number increased by doubled

Crop diversification	Khulna, Satkhira, Patuakhali	
	Benchmark (n=418)	End line FFS (n=417)
Number of different vegetables grown within the same homestead (Average)	3.62	7.29

3.2.4 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, Satkhira, Patuakhali (percentage farmers)	
	Benchmark (n=418)	End line FFS (n=417)
Sunny open place	86.11	97.68
Shady place	39.96	89.56
Wet marshy land	23.23	78.89
Hedges and fences	16.16	63.81
Roof	38.13	75.17
Pond side	29.55	70.53
Macha	23.23	81.21
Pond side macha	3.54	61.02
Pots	3.54	37.82
Other places	42.42	64.04

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.

Crop diversification	Khulna, Satkhira, Patuakhali	
	Benchmark (n=418)	End line FFS (n=417)
Number of different locations used within the same homestead (Average)	2.86	7.20

3.2.5 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.

Table-D: Utilization of homestead vegetable production between the benchmark and end line in Khulna, Satkhira and Patuakhali

What happens with vegetables produced	Khulna, Patuakhali, Saphira, (percentage farmers)	
	Benchmark (n=418)	End line FFS (n=417)
Sell less than half	23%	23%
Sell more than half	3%	26%

3.2.6 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, Satkhira, Patuakhali (percentage farmers)	
	Benchmark (n=418)	End line FFS (n=417)
Farmers using fertilizers	51%	88

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, Patuakhali, Satkhira (percentage farmers)	
	Benchmark (n=418)	End line FFS (n=417)
Urea	93.67	96
TSP	73.30	94
MOP	42.99	82
Gypsum	4.98	45
Zinc	2.26	35
Cow dung	60.18	85
Chicken manure	14.93	54
FYM	<1	74
Compost	4	44

3.2.7 Follow proper pit and raised bed 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) and to follow raised bed for crop rotation, proper management and year round vegetable production etc . By seeing trial on pit and raised bed, at the end of FFS almost all farmer started using proper pit and raised bed methods for vegetable production.

Table: Follow proper pit methods for vegetables production

Production technologies –Pit methods	Khulna, Satkhira, Patuakhali (percentage farmers)	
	Benchmark (n=418)	End line FFS (n=417)
Yes	<1	95
No	84	0
Partly	16	5

Table: Follow proper raised bed method for vegetables production

Production technologies –Raised bed methods	Khulna, Satkhira, Patuakhali (percentage farmers)	
	Benchmark (n=418)	End line FFS (n=417)
Yes	.48	96.40
No	82.30	<1
Partly	17.22	3.36

3.2.8 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. 82% percent farmer started following Integrated Pest management for pest management. In the FFS farmers learn to use Integrated Pest Management (IPM) methods in their vegetables. The following table also shows the shift in pest management practices.

Pest management	Khulna, Satkhira, Patuakhali (percentage farmers)	
	Benchmark (n=418)	End line FFS (n=417)
Do nothing	53.35	1.92
Use chemicals only	45.45	16.31
Use Integrated Pest Management methods	1.20	81.77

3.2.9 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, Satkhira, Patuakhali (percentage farmers)	
	Benchmark (n=418)	End line FFS (n=417)
No FYM pit	99.76%	11.51
Pit without shade	.24	27.34
Pit with shade	0	61.35

3.2.10 Nutrition

The nutrition messages included with 12th cycle homestead vegetables module. Emphasis is given on the “thousand-day food requirements for mothers during pregnancy and the first 2 years of the child. Other important messages are included on cooking procedures, health benefit of moringa leaves, and ingredients of balanced food etc.

Table: Utilization of homestead vegetable production between the benchmark and end line in Khulna, Satkhira and Patuakhali

Know 1000 days nutrition requirements	Khulna, Satkhira, Patuakhali (percentage farmers)	
	Benchmark (n=418)	End line FFS (n=417)
Does not know	64	0
Knows partly	36	14
Knows well	>1	86

3.2.11 Adaptation of nutrition knowledge

During the nutrition sessions farmers learn about cooking procedures, for example that it is better to wash Vegetables before cutting them. At the beginning of the FFS most farmers are not familiar about the health benefits of Moringa leaves. They learn about this during the nutrition sessions. The below tables show the positive changes of FFS member with cooking procedures and knowledge and use of moringa leaves. Another question was to estimate how much vegetables they eat in a week. Vegetable eating amount increased (gram/farmer/week) from 794 gram to 1518 gram. The below table show an increased consumption of vegetables at the end of FFS and that could be the result of higher homestead production.

Table: Comparison of adaptation of nutrition knowledge between the benchmark and end line in Khulna, Satkhira and Patuakhali.

Nutrition Knowledge	Khulna, Satkhira, Patuakhali (percentage farmers)	
	Benchmark (n=418)	End line FFS (n=417)
Cooking procedures		
Does not know proper cooking procedure	78	1
Proper cooking procedure Knows partly	14	28
Proper cooking procedure Knows fully	8	71
Moringa leaves health benefits		
Does not know health benefit of moringa leaves	73	<1
Knows and eat	9	78
Knows but did not eat	19	23
Amount vegetables per week (g)/person	794	1518

3.3 Trends in market orientation with homestead vegetable module

At the end of FFS, all most all 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 retailers. 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.

3.3.1 Agriculture is a business

Particulars	Khulna, Satkhira, Patuakhali (percentage farmers)	
	Benchmark (n=418)	End line FFS (n=417)
Vegetable production is a business	27.27	99.76
Record keeping	8.37	100

3.3.2 Use of ICT

Number with person	Khulna, Satkhira, Patuakhali (percentage farmers)	
	Benchmark (n=418)	End line FFS (n=417)
Never	84.45	17.46

Number with person	Khulna, Satkhira, Patuakhali (percentage farmers)	
	Benchmark (n=418)	End line FFS (n=417)
Sometimes	15.07	58.37
Always	0.48	24.16

3.3.3 Collectively input collection

Collectively input collection	Khulna, Satkhira, Patuakhali (percentage farmers)	
	Benchmark (n=418)	End line FFS (n=417)
Yes	7.89	95.18
No	92.11	4.82

3.3.4 Collective sales

Collective sales	Khulna, Satkhira, Patuakhali (percentage farmers)	
	Benchmark (n=418)	End line FFS (n=417)
Never	88.52	1.68
Sometimes	11	74.34
always	.48	23.98

3.3.5 Resource farmer support

Resource farmer support	Khulna, Satkhira, Patuakhali (percentage farmers)	
	Benchmark (n=418)	End line FFS (n=417)
Input purchase, selling	7.89	88.01
Technical info	0.00	11.75
None	36.12	.24
Not applicable	55.98	0.00

3.4 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, 57% 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.

3.4.1 Women linkages with market actors

Particulars	Khulna, Satkhira, Patuakhali (percentage farmers)	
	Benchmark (n=418)	End line FFS (n=417)
None	85.17	.24
Myself	4.55	42.45

Particulars	Khulna, Satkhira, Patuakhali (percentage farmers)	
	Benchmark (n=418)	End line FFS (n=417)
Spouse and others	10.29	57.31
Use frequency (if women have number)		
Sometimes	52.63	99.30

3.4.2 Decision making for Selling & Eating vegetables

Decision	Khulna, Satkhira, Patuakhali (percentage farmers)	
	Benchmark (n=418)	End line FFS (n=417)
Myself	28.23	5.52
My spouse	23.68	16.31
Jointly	24.23	78.18
Not applicable	23.92	-

3.4.3 Input collection decision

Collectively input collection	Khulna, Satkhira, Patuakhali (percentage farmers)	
	Benchmark (n=418)	End line FFS (n=417)
Myself	24.16	6
jointly	25.36	82
Spouse or other family	17.70	8.63
Not applicable	31.78	3.36

4. Conclusion

The data presented in this report were collected in the benchmark and end surveys of cycle 12 and represent the results of about 5325 farmers.

Comparing end data with benchmark data shows some immediate effects of the FFS training, such as a considerable increase of eggs, poultry and vegetable production. This has resulted in higher consumption and in selling of surplus produce to generate some extra income.

Some inputs (chicks, vegetable seed) were distributed during the FFS, which explains some of the increases in production.

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 12 have successfully increased production and income of the participants during the FFS season.

To understand the long-term impact of an FFS, it is recommended that follow-up surveys are organized after one or two years. It may also be considered to do an independent impact survey (i.e. not by FFS facilitators), comparing trained and non-trained farmers.

Appendix-1: Poultry module

Age

Average age	33.75
Median age	34
Youngest	18
Oldest	60
Total farmers	463

Education

Illiterate	7
Can sign	59
Primary	248
Secondary	126
HCC and above	23

Number of chickens

Max chicken	45
Min chicken	0
Farmers with chicken	456
Farmers without chicken	6
Total chicken	2070
Average chicken (of farmers with chicken)	4.54
Average chicken (of all farmers)	4.48

Number of chicks

Max chicks	50
Min chicks	0
Farmers with chicks	335
Farmers without chicks	127
Total farmers	462
Total chicks	2586
Average chicks (of farmers with chicks)	7.72
Average chicks (of all farmers)	5.60

Number of ducks

Max ducks	21
Min ducks	0
Farmers with ducks	360
Farmers without ducks	102
Total farmers	462
Total ducks	1656
Average ducks (of farmers with ducks)	4.6

Gender

Men	10
Women	453
Total	463
Percentage women	97.84

WMG member

WMG Member	462
Not member	1
Total	463
WMG member (%)	99.78

Number of chickens

Max chicken	80
Min chicken	0
Farmers with chicken	459
Farmers without chicken	4
Total chicken	3960
Average chicken (of farmers with chicken)	11.59
Average chicken (of all farmers)	8.55

Number of chicks

Max chicks	70
Min chicks	0
Farmers with chicks	434
Farmers without chicks	29
Total farmer	463
Total chicks	7831
Average chicks (of farmers with chicks)	18.044
Average chicks (of all farmers)	16.914

Number of ducks

Max ducks	54
Min ducks	0
Farmers with ducks	407
Farmers without ducks	56
Total farmer	463
Total farmers	3052
Average ducks (of farmers with ducks)	7.50

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Average ducks (of all farmers)	3.58
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Number of ducklings

Max ducklings	120
Min ducklings	0
Farmers with ducklings	115
Farmers without ducklings	347
Total farmers	462
Total ducklings	940
Average ducklings (of farmers with ducklings)	8.17
Average ducklings (of all farmers)	2.03

Eggs per hen per year

Max	160
Min	0
Average	46.97

Eggs per duck/year

Eggs per duck per year	
Max	200
Min	0
Average	55.77

Own egg consumption per week

Max	25
Min	0
Total	1744
Average	3.77
Farmers eat own eggs	371
Total farmers	462

Own poultry consumption per month

Max	12
Min	0
Total	352
Average	0.76
Farmers eat own poultry	195
Farmers not eat own poultry	267
Total farmers	462

Average ducks (of all farmers)	6.59
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Number of ducklings

Max ducklings	43
Min ducklings	0
Farmers with ducklings	242
Farmers without ducklings	221
Total farmers	463
Total duckling	2944
Average ducklings (of farmers with ducklings)	12.17
Average ducklings (of all farmers)	6.36

Eggs per hen per year

Max	220
Min	9
Average	82.54

Eggs per duck/year

Eggs per duck per year	
Max	300
Min	0
Average	111.52

Own egg consumption per week

Max	35
Min	2
Total	3552
Average	7.67
Farmers eat own eggs	463
Total farmers	463

Own poultry consumption per month

Max	30
Min	0
Total	1175
Average	2.54
Farmers eat own poultry	441
Total farmers	441

Eggs sold per month

Max	120
Min	0
Total	3233
Average	7.00

Poultry sold /year

Max	50
Min	0
Total	1961
Average	4.24

Decision making for Sell & Eat

Myself	226
My spouse	134
jointly	87
Total	447
Myself (%)	50.56
My spouse (%)	29.98
jointly (%)	19.46

Poultry vaccinated

Never	430
Sometimes	31
Always	1
Total farmers	462

Use of Hazal

Yes	33
No	429
Total farmers	462

Chick separation

After 1 week	3
After 2 weeks	1
After 3 weeks	1
After 4 weeks	0
Never	457
Total farmers	462

Candling

Yes	13
No	449
Total farmers	462

Eggs sold per month

Max	300
Min	0
Total	13309
Average	28.75

Poultry sold /year

Max	150
Min	0
Total	9463
Average	20.44

Decision making for Sell & Eat

Myself	51
My spouse	45
Jointly	365
Total	461
Myself (%)	11.06
My spouse (%)	9.76
jointly (%)	79.18

Poultry vaccinated

Never	7
Sometimes	140
Always	316
Total farmers	463

Use of Hazal

Yes	460
No	3
Total farmers	463

Chick separation

After 1 week	276
After 2 weeks	179
After 3 weeks	6
After 4 weeks	1
Never	1
Total farmer	463

Candling

Yes	463
No	0
Total farmers	463

Poultry rearing is Business

Yes	90
No	372
Total farmers	462
Yes (%)	19.48
No (%)	80.52

Record keeping

Yes	3
No	459
Total farmers	462
Yes	0.65
No	99.35

Have market actor phone number

None	439
Myself	13
Spouse or other	10
Total	462
Have number	
None (%)	95.02
Myself (%)	2.81
Spouse or other (%)	2.16

Use frequency

Sometimes	0
Always	0
Never	13
Total	13
Use Frequency	
Sometimes (%)	0
Always (%)	0
Never (%)	100

Use of ICT for poultry rearing

Never	452
Sometimes	10
always	0
Total	462
Never (%)	97.84
Sometimes (%)	2.16
Always (%)	0

Poultry rearing is Business

Yes	463
No	0
Total farmers	463
Yes (%)	100
No (%)	0

Record keeping

Yes	463
No	0
Total farmers	463
Yes	100
No	

Have market actor phone number

None	2
Myself	275
Spouse or other	186
Total	463
Have number	
None (%)	0.43
Myself (%)	59.40
Spouse or other (%)	40.17

Use frequency

Sometimes	196
Always	79
Never	0
Total	275
Use Frequency	
Sometimes (%)	71.27
Always (%)	28.73
Never (%)	0

Use of ICT for poultry rearing

Never	165
Sometimes	194
always	98
Total	457
Never (%)	36.11
Sometimes (%)	42.45
Always (%)	21.44

Collectively Input collection

Yes	1
No	461
Total farmers	462
Yes (%)	0.22
No (%)	99.78

Decision on input purchase (who)

Myself	212
Jointly	131
Spouse or other family member	24
Not applicable	95
Total	462
Myself (%)	45.89
Jointly (%)	28.35
Spouse or other family member (%)	5.19
Not applicable (%)	20.56

Collective sell

Never	458
Sometimes	4
always	0
Total	462
Never (%)	99.13
Sometimes (%)	0.87
Always (%)	0

RF support

Yes	0
no	312
Not applicable	150
Total	462
Yes	
no	67.53
Not applicable	

Type of support from RF

Inputs purchase & selling	0
Technical	0
Never	0
Not applicable	462
Total	462
Inputs purchase & selling (%)	0.22

Collectively Input collection

Yes	443
No	17
Total farmers	460
Yes (%)	96.30
No (%)	3.70

Decision on input purchase (who)

Myself	89
Jointly	309
Spouse or other family member	42
Not applicable	23
Total	463
Myself (%)	19.22
Jointly (%)	66.74
Spouse or other family member (%)	9.07
Not applicable (%)	4.97

Collective sell

Never	12
Sometimes	334
always	120
Total	466
Never (%)	2.58
Sometimes (%)	71.67
Always (%)	25.75

RF support

Yes	458
no	5
Not applicable	0
Total	463
Yes	98.92
no	1.08
Not applicable	0

Type of support from RF

Inputs purchase & selling	356
Technical	106
Never	0
Not applicable	1
Total	463
Inputs purchase & selling (%)	76.89

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Technical (%)	0.00
Never (%)	0.00
Not applicable (%)	1.00

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Technical (%)	22.89
Never (%)	0.00
Not applicable (%)	0.22

Appendix-2: Homestead vegetables module

General information

Age

Average age	35
Median age	35
Youngest	19
Oldest	58
Total farmers	417

Education

Illiterate	4
Can sign	42
Primary	229
Secondary	121
HCC and above	21
Total	417

Area agriculture (decimal)

Average	35.05
Median	25
Zero area (0 decimal)	72
Landless (<50 decimal)	305
Not landless (>=50 decimal)	112
Total Farmer	417
Percentage zero area	17.27
Percentage landless	73.14
Percentage not landless	26.86
Min area (decimal)	0
Total area	5446
Households with land (>0 ha)	114
Average area for HH with land	47.77

Homestead Vegetable module

Benchmark

Grows vegetables

Yes	352
No	42
Total	394
Yes (%)	84.41
No (%)	10.07

Gender

Men	57
Women	360
Total	417
Percentage women	86

WMG membership

WMG Member	417
Not member	0
Total	417
WMg member (%)	100

Homestead area (dec.)

Average	13.17
Median	10
Min	0
Max	90
Zero area (num farmers)	2
Total	417

Inclusion of poor people

Poorest	228
Others	187
Total	415
Inclusion of poor people 9%	54.94

Homestead Vegetable module

End line

Grows vegetables

Yes	417
No	0
Total	417
Yes (%)	100
No (%)	0

Vegetables grown

Gourds	338 (89.65)
Brinjal	208 (55.3)
Leafy vegetables	217 (57.32)
Ladies finger	66 (17.93)
Cabbage / Cauliflower	45 (11.36)
Radish	114 (29.8)
Tomato	93 (23.48)
Aroids	155 (40.15)
Drumstick	136 (36.11)
Other vegetables	141 (36.36)

Vegetables grown

Gourds	392 (93.27)
Brinjal	380 (90.26)
Leafy vegetables	335 (78.89)
Ladies finger	247 (60.09)
Cabbage / Cauliflower	281 (50.81)
Radish	324 (75.81)
Tomato	303 (72.39)
Aroids	327 (76.1)
Drumstick	274 (66.36)
Other vegetables	279 (64.97)

Number of vegetables grown

Min	0
Max	10
Average	3.62
Total	418

Number of vegetables grown

Min	1
Max	10
Average	7.38
Total	417

Vegetables places

Sunny open place	325
Shady Place	147
Marshy	85
Hedges & fences	57
Roof	142
Pond	111
Macha	85
Pond side Macha	13
Pots	13
Others	159

Vegetables places

Sunny open place	408
Shady place	375
Wet marshy	333
Hedges & Fences	268
Roof	315
Pond side	298
Macha	345
Pond side macha	256
Pots	163
Other places	275

Number of vegetable locations used

Min	0
Max	8
Average	2.86

Number of vegetable locations used

Min	1
Max	10
Average	7.28

What happens with the vegetables

Sell none	277 (66.26%)
Sell less than half	99 (23.68%)
Sell and eat about half	29 (6.93%)
Sell more than half	13(3.11%)

What happens with the vegetables

Sell none	6 (1.43%)
Sell less than half	95 (22.78%)
Sell and eat about half	206 (49%)
Sell more than half	110 (26%)

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Total	418
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Fertilizer use

Use no fertilizers	155
Use some fertilizers	217
Total	372
Use fertilizer (%)	51.91

Use of different fertilizers

Urea	207 (93.66%)
TSP	162 (73.30%)
MOP	95 (42.98%)
Gypsum	11 (4.97%)
Zinc	5 (2.26%)
Cowdung	133 (60%)
Chicken Manure	33 (14.93%)
FYM	5 (.01%)
Compost	9 (4.07%)

Follwed pit methods

Yes	3 (.71%)
No	350 (83.73%)
Partly	65 (15.55%)
Total	418

Raised bed

Yes	2 (.47%)
No	344 (82.29%)
Partly	72 (17.22%)
Total	418

Pest management

Do nothing	223
Use chemicals	190
Use IPM	5
Total farmers	418
Do nothing (%)	53.35
Use chemicals (%)	45.45
Use IPM (%)	1.20

Farm Yard Manure

No pit	417
Pit without shade	1
Pit with shade	0
Total farmers	418
No pit (%)	99.76
Pit without shade (%)	0.24

Total	417
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Fertilizer use

Use no fertilizers	47
Use some fertilizers	370
Total	417
Use fertilizer (%)	88.73

Use of different fertilizers

Urea	358 (96.75%)
TSP	348 (94.05%)
MOP	304 (82.16%)
Gypsum	165 (44.59%)
Zinc	128 (34.59%)
Cowdung	316 (85.40%)
Chicken manure	200 (54.05%)
Farm Yard Manure	309 (74%)
Compost	163 (44.05%)

Follwed pit methods

Yes	395 (94.72%)
No	3 (.71%)
Partly	19 (4.55%)
Total	417

Raised bed

Yes	402 (96.40%)
No	1 (.23%)
Partly	14 (3.35%)
Total	417

Pest management

Do nothing	8
Use chemicals	68
Use IPM	341
Total farmers	417
Do nothing (%)	1.92
Use chemicals (%)	16.31
Use IPM (%)	81.77

Pest management

Do nothing	8
Use chemicals	68
Use IPM	341
Total farmers	417
Do nothing (%)	1.92
Use chemicals (%)	16.31

Pit with shade (%)	0.00
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Use IPM (%)	81.77
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Nutrition

Know cooking process

Does not know	325
Knows partly	58
Knows fully	35
Total	418
Does not know (%)	77.75
Knows partly (%)	13.88
Knows fully (%)	8.37

Nutrition

Know cooking process

Does not know	3
Knows partly	117
Knows fully	297
Total	417
Does not know (%)	0.72
Knows partly (%)	28.06
Knows fully (%)	71.22

Know Moringa is healthy

Does not know	303
Knows and eat	36
Knows but did not eat	78
Total	417
Does not know (%)	72.66
Knows and eat (%)	8.63
Knows but did not eat (%)	18.71

Know Moringa is healthy

Does not know	2
Knows and eat	324
Knows but did not eat	91
Total	417
Does not know (%)	0.48
Knows and eat (%)	77.70
Knows but did not eat (%)	21.82

Knows thousand-day food requirement

Does not know	267
Knows partly	149
Knows well	2
Total	418
Does not know (%)	63.88
Knows partly (%)	35.65
Knows well (%)	0.48

Knows thousand-day food requirement

Does not know	0
Knows partly	57
Knows well	360
Total	417
Does not know (%)	0
Knows partly (%)	13.67
Knows well (%)	86.33

Gender

Decision on utilizing vegetables

Myself	118
jointly	101
spouse and other family	199
Total	418
Myself (%)	28.23
jointly (%)	24.16
My spouse (%)	47.61

Gender

Decision making for Sell & Eat

Myself	23
My spouse	68
Jointly	326
Total	417
Myself (%)	5.52
jointly (%)	78.18
My spouse (%)	16.31

Have market actor number

None	356
Myself	19
Spouse and or other	43
Total	418
None (%)	85.17

Have market actor phone number

None	1
Myself	177
Spouse and or other	239
Total	417
None (%)	0.24

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Myself (%)	4.55
Spouse and or other (%)	10.29

Myself (%)	42.45
Spouse and or other (%)	57.31

Use Frequency

sometimes	10
always	0
Never	9
Total	19
Use Frequency	
sometimes (%)	52.63
always (%)	0.00
Never (%)	47.37

Use Frequency

sometimes	142
always	0
Never	1
Total	143
Use Frequency	
sometimes (%)	99.30
always (%)	0.00
Never (%)	0.70

Market orientation

Agriculture is a business

Yes	114
No	304
Total farmers	418
Yes (%)	27.27
No (%)	72.73

Agriculture is a business

Yes	416
No	1
Total farmers	417
Yes (%)	99.76
No (%)	0.24

Use of ICT for vegetable production

Never	353
Sometimes	63
always	2
Total	418
Never (%)	84.45
Sometimes (%)	15.07
always (%)	0.48

Use of ICT for vegetable production

Never	73
Sometimes	244
always	101
Total	418
Never (%)	17.46
Sometimes (%)	58.37
always (%)	24.16

Collectively Input collection

Yes	33
No	385
Total farmers	418
Yes (%)	7.89
No (%)	92.11

Collectively Input collection

Yes	395
No	20
Total farmers	415
Yes (%)	95.18
No (%)	4.82

Collective sell

Never	370
Sometimes	46
always	2
Total	418
Never (%)	89
Sometimes (%)	11
always (%)	0

Collective sell

Never	7
Sometimes	310
always	100
Total	417
Never (%)	1.68
Sometimes (%)	74.34
always (%)	23.98