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**Technical Note 15**  
**Cycle 7 FFS**  
**April 2016 – December 2016**  
**Comparing benchmark and end data**

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# Technical Note 15

Cycle 7 FFS, Khulna, Satkhira, Patuakhali  
April 2016 – December 2016  
Comparing benchmark and end data

April 2017

Blue Gold Program

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# 1. Introduction

This is a report of data collected in FFS Cycle 7, which took place from April 2016 to December 2016, with 32 FFSs in Khulna, 28 FFSs in Satkhira, and 28 FFSs in Patuakhali. In Khulna and Patuakhali, FFS cycle 7 included the modules fisheries, beef fattening and nutrition. In Satkhira the modules included were fisheries, dairy cows, and nutrition.

This was the first time that the module “dairy cows” was introduced in an FFS. After a curriculum development workshop, the FFS Organizers (FO) of Satkhira received a TOT course on this module.

The collected benchmark data and end data are discussed in this report. Totals and averages of the collected benchmark and end data are presented side by side in Annexes 1 (Khulna), 2 (Satkhira), and 3 (Patuakhali). For 4 FFSs in Khulna the collected data were lost and could not be included. In Satkhira the end data of 4 FFS were not collected as the concerned FO had left.

In Khulna, the FFSs took place in polders 26, 29, and 31-part, in Satkhira the FFSs were in polder 2, and in Patuakhali the FFSs were in polders 55/2A and 55/2C. Annex 4 shows the locations (WMG) of the 88 FFS.

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 fish production), during farmer field days.

Bringing the data of 88 FFS together, creates a dataset with information of over 2,000 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.

## 2. General information FFS participants

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

### 2.1 Gender

The following table shows that most FFS participants are women.

Gender of participants (end data)	Percentage women
<b>Khulna (n=700)</b>	81 %
<b>Satkhira (n=700)</b>	87 %
<b>Patuakhali (n=600)</b>	83 %
<b>TOTAL (n=2,000)</b>	84 %

### 2.2 Age

When selecting participants for the FFS we try to include young dynamic farmers, preferably younger than 50 years old. In cycle 7 the average age was about 35 years.

Age of participants (end data)	Average age	Youngest	Oldest
<b>Khulna (n=700)</b>	34	18	64
<b>Satkhira (n=700)</b>	35	18	55
<b>Patuakhali (n=600)</b>	36	16	68

### 2.3 Education

The majority of farmers are literate, but a significant part (21%) is illiterate or can only sign their name.

Education (end data)	Illiterate or can sign name only	Primary	Secondary or higher
<b>Khulna (n=700)</b>	19%	31%	50%
<b>Satkhira (n=700)</b>	17%	51%	32%
<b>Patuakhali (n=600)</b>	26%	45%	29%
<b>TOTAL (n=2,000)</b>	21%	42%	37%

### 2.4 WMG membership

In each FFS, the WMG executive committee helps selecting FFS participants according to a set of criteria. The following two tables show that at the start of Cycle 7 about 96% of the FFS participants were registered WMG members. By the end of the FFS almost all were registered members.

WMG members (start FFS)	Khulna (number farmers)	Satkhira (number farmers)	Patuakhali (number farmers)	Total farmers	%
<b>WMG member</b>	694	688	629	2,011	95.8%
<b>Not member</b>	6	11	71	88	4.2%
<b>Total</b>	700	699	700	2,099	

WMG members (end FFS)	Khulna (number farmers)	Satkhira (number farmers)	Patuakhali (number farmers)	Total farmers	%
<b>WMG member</b>	699	700	596	1,995	99.8%
<b>Not member</b>	1	-	4	5	0.3%
<b>Total</b>	700	700	600	2,000	



## 2.5 Land for agriculture and homestead area

During participant selection, priority is given to poor and landless households. In Cycle 7, about 46% of the participants belong to landless households (i.e. less than 50 decimal agricultural land).

Agricultural land availability (end data)	No land for agriculture (percentage farmers)	Landless (Less than 50 decimal agricultural land) (percentage farmers)	Farmers (>=50 decimal) (percentage farmers)
<b>Khulna (n=700)</b>	13%	33%	67%
<b>Satkhira (n=700)</b>	34%	66%	34%
<b>Patuakhali (n=600)</b>	11%	38%	62%
<b>TOTAL (n=2,000)</b>	20%	46%	54%

The following table shows the average size of agricultural land and average size of homestead area (Note: 100 decimal = 1 acre = 0.4 ha).

Land area (end data)	Agricultural land area (decimal)	Homestead area (decimal)
<b>Khulna (n=700)</b>	74	18
<b>Satkhira (n=700)</b>	44	15
<b>Patuakhali (n=600)</b>	73	22

### 3. Comparing benchmark data with end data

The calculated averages of data collected at the beginning and end of the FFS can be used to get an idea of the effect of the training. However, this should not be seen as an impact study because some of the differences measured are a direct result of the training.

For example the increase of farmers who have Tilapia in their pond is caused by distribution of Tilapia fingerlings during the FFS. And if all farmers report that they produce UMS, this shows that they did that during the training, but it does not follow that they will keep doing this in future. Adoption of such practices (and other changes in behaviour) should be measured in a follow-up survey at least one or two years after completing the FFS.

In the following chapters we compare some of the benchmark and end data and provide some comments for interpreting the differences. For a complete set of data please see annexes 1, 2 and 3.

## 4. Fisheries module

In FFS Cycle 7, all FFS included the fisheries module. Objective of this module is to improve the efficiency and productivity of household ponds. Technical topics in the module include pond preparation, selection of fingerlings, stocking ratio, stocking density, use of supplementary feed, fertilizing ponds for natural feed, different problems of fish culture, fish diseases, and harvesting. Linkages with input providers and with staff of the department of fisheries are strengthened.

In this chapter, some fisheries related data are presented separately for the 3 districts where the FFSs took place. See also Annexes 1 (Khulna), 2 (Satkhira), and 3 (Patuakhali).

### 4.1 Fish Pond Size

Farmers who participated in this FFS cycle all own or have access to a pond. The average pond size was 11 decimal, which is about 440 square meters.

Pond size (end data)	Average pond size (decimal)	Max pond size (decimal)
<b>Khulna (n=700)</b>	10.0	50
<b>Satkhira (n=700)</b>	9.9	50
<b>Patuakhali (n=600)</b>	13.3	50

### 4.2 Type of pond

Ponds were classified as seasonal ponds (which are dry during the summer season) and perennial ponds which hold water throughout the year.

Type of pond (end data)	Type of pond (percentage of farmers)	
	Seasonal	Year-round
<b>Khulna (n=700)</b>	11%	89%
<b>Satkhira (n=700)</b>	29%	71%
<b>Patuakhali (n=600)</b>	15%	85%

### 4.3 Pond ownership

Most ponds were owned by one household, but about 22% of the ponds had shared ownership.

Pond ownership (end data)	Pond ownership (percentage of farmers)	
	Single ownership	Shared pond
<b>Khulna (n=700)</b>	80%	20%
<b>Satkhira (n=700)</b>	70%	30%
<b>Patuakhali (n=600)</b>	84%	16%

### 4.4 Pond preparation

One of the methods learned in the fisheries module is how to prepare the ponds before stocking fingerlings. We see a big difference between benchmark and end data, but follow up survey after 1 or 2 years should show if this practice is sustained after the FFS.

Pond preparation	Khulna (percentage farmers)	Satkhira (percentage farmers)	Patuakhali (percentage farmers)

	Benchmark	End FFS	Benchmark	End FFS	Benchmark	End FFS
<b>No pond preparation</b>	74%	<1%	80%	<1%	73%	<1%
<b>Partly pond preparation</b>	24%	3%	18%	0%	26%	0%
<b>Practice pond preparation</b>	2%	97%	1%	>99%	1%	>99%

#### 4.5 Type of fish in the pond

Farmers have different types of fish types their ponds. There is a clear difference between benchmark and end data. Probably this is because farmers learned during the FFS to recognize more fish species, which can be used to stock 3 layers of the pond, or made better production observations in their ponds. The increase in farmers having Tilapia is because Tilapia was promoted and some fingerlings were distributed during this FFS cycle.

In the end data we see that after Tilapia, which was promoted in the FFS, the most popular fish species are Silver carp, Katla, Rui, and Rajputi

Type of fish	Khulna (percentage farmers)		Satkhira (percentage farmers)		Patuakhali (percentage farmers)	
	Benchmark (n=700)	End FFS (n=700)	Benchmark (n=699)	End FFS (n=700)	Benchmark (n=700)	End FFS (n=600)
<b>Tilapia</b>	44	94	57	100	43	100
<b>Silver carp</b>	74	89	38	92	84	98
<b>Katla</b>	70	83	39	80	64	93
<b>Rui</b>	68	81	46	73	51	90
<b>Mrigel</b>	54	75	24	49	46	74
<b>Mirror carp</b>	26	51	4	19	25	23
<b>Common carp</b>	14	30	3	17	13	17
<b>Rajputi</b>	34	76	5	71	38	94
<b>Shrimp</b>	26	24	1	10	0	1
<b>Other fish</b>	12	9	12	19	15	7

Number of fish species in pond	Khulna (percentage farmers)		Satkhira (percentage farmers)		Patuakhali (percentage farmers)	
	Benchmark (n=700)	End FFS (n=700)	Benchmark (n=699)	End FFS (n=700)	Benchmark (n=700)	End FFS (n=600)
<b>Reported more than 5 fish species in their pond</b>	25%	73%	5%	49%	10%	76%

#### 4.6 Production of fish

The following tables show the production of fish. The first table is for Tilapia only, the next table for other fish, and the third table for all fish (Tilapia and other fish together). The production per farmer was calculated for all FFS farmers, and the production per decimal was calculated for the total pond area of all farmers together.

The tables show in all cases that fish production per farmer increased and that the production per decimal increased. Part of this increase is explained by the release of fingerlings which were given as an input during the FFS and part by better stocking density, stocking ratio, feeding and management of the ponds.

Comparing the districts shows that production per decimal is lower in Patuakhali, which was caused by heavy rainfall in the monsoon.

Tilapia production	Khulna		Satkhira		Patuakhali	
	Benchmark (n=700)	End FFS (n=700)	Benchmark (n=699)	End FFS (n=700)	Benchmark (n=700)	End FFS (n=600)
<b>Total Tilapia (kg)</b>	3,992	22,745	4,694	22,739	4,264	9,678
<b>Tilapia per farmer (kg)</b>	5.7	32.5	6.7	32.5	6.1	16.1
<b>Tilapia per decimal (kg)</b>	0.6	3.2	0.7	3.3	0.5	1.2

Other fish production (Tilapia excluded)	Khulna		Satkhira		Patuakhali	
	Benchmark (n=700)	End FFS (n=700)	Benchmark (n=699)	End FFS (n=700)	Benchmark (n=700)	End FFS (n=600)
<b>Total other fish (kg)</b>	11,119	68,109	13,021	78,884	32,634	52,667
<b>Other fish per farmer</b>	15.9	97.3	18.6	112.6	46.6	87.8
<b>Other fish per decimal</b>	1.6	9.7	2.0	11.4	3.5	6.6

All fish production (Tilapia + other)	Khulna		Satkhira		Patuakhali	
	Benchmark (n=700)	End FFS (n=700)	Benchmark (n=699)	End FFS (n=700)	Benchmark (n=700)	End FFS (n=600)
<b>All fish (kg)</b>	15,111	90,854	17,715	101,583	36,898	62,345
<b>All fish per farmer (kg)</b>	21.6	129.8	25.3	145.1	52.7	103.9
<b>All fish per decimal</b>	2.1	13.0	2.8	14.7	4.0	7.8

#### 4.7 Increase of fish production

The next table shows the combining of the datasets of all fish for the three districts together. If we compare benchmark with end data we see a 3.8 times increase of production (both kg/farmer and kg/decimal).

On average each farmer produced more than 90 kg extra fish. The value of this (about 18,000 Taka) is much more than the cost of a participant in an FFS (an FFS costs about 3,500 Taka per person). Of course there is some bias in the production data, as both the facilitators and farmers may have overestimated their results. But even if they produced half of what they reported, the increase in fish production has still a higher value than the cost of the training.

All fish production of 3 districts	Benchmark (n=2099)	End FFS (n=2000)
<b>Total fish produced (kg)</b>	69,724	254,782
<b>Kg per farmers</b>	33.2	127.4
<b>Kg per decimal</b>	3.1	11.6
<b>Kg per hectare</b>	757	2,879

#### 4.8 Source of fingerlings

The FFS curriculum pays attention to market orientation and linking farmers with input suppliers. Therefore, the benchmark survey included questions about where the farmers obtain their fingerlings.

During the benchmark survey most farmers reported that they use local vendors, while hatcheries and nurseries were hardly used. Some farmers use different sources (so the total of percentages can exceed 100%).

During the FFS season we see in Satkhira and in Patuakhali that many more farmers have started using nurseries for their fingerling supply. In Khulna this is less obvious, possibly because not many nurseries are available near the FFS locations.

Sources of fingerlings	Khulna (percentage farmers)		Satkhira (percentage farmers)		Patuakhali (percentage farmers)	
	Benchmark (n=700)	End FFS (n=700)	Benchmark (n=699)	End FFS (n=700)	Benchmark (n=700)	End FFS (n=600)
<b>Hatchery</b>	1%	6%	1%	9%	1%	4%
<b>Local vendor</b>	98%	97%	96%	47%	98%	46%
<b>Nursery</b>	2%	26%	5%	89%	3%	93%

#### 4.9 Use of supplementary feed

During the FFS farmers learned to use supplementary feed to increase fish production. Also some feed was distributed to farmers as an input during the FFS. That explains why in the end survey almost all farmers reported using supplementary feed, even though they did this not regularly because of the cost involved. It will have to be seen in a follow up survey after 1 or 2 seasons how many farmers will continue with this practice.

Use of supplementary feed	Khulna (percentage farmers)		Satkhira (percentage farmers)		Patuakhali (percentage farmers)	
	Benchmark (n=700)	End FFS (n=700)	Benchmark (n=699)	End FFS (n=700)	Benchmark (n=700)	End FFS (n=600)
<b>Use supplementary feed</b>	13%	96%	9%	>99%	11%	>99%

#### 4.10 Feed types used

Farmers were asked what types of feed they use in their fish ponds. We see a clear change from using no feed or homemade feed to the use of locally made and commercial feed.

Fish feed types used	Khulna (percentage farmers)		Satkhira (percentage farmers)		Patuakhali (percentage farmers)	
	Benchmark (n=700)	End FFS (n=700)	Benchmark (n=699)	End FFS (n=700)	Benchmark (n=700)	End FFS (n=600)
<b>None</b>	49%	<1%	61%	<1%	63%	0%
<b>Homemade</b>	50%	75%	34%	49%	37%	88%
<b>Locally made feed</b>	1%	69%	6%	79%	<1%	95%
<b>Commercial feed</b>	3%	42%	1%	83%	1%	86%

#### 4.11 Some other questions that relate to the fisheries module

Several other questions are asked in the benchmark survey, such as a question about practicing fish pond preparation 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. More interesting will be to revisit the FFS after 1 or 2 years to see to what extent the practices and knowledge will sustain.

Fish production knowledge	Khulna (percentage farmers)		Satkhira (percentage farmers)		Patuakhali (percentage farmers)	
	Benchmark (n=700)	End FFS (n=700)	Benchmark (n=699)	End FFS (n=700)	Benchmark (n=700)	End FFS (n=600)
<b>Practice fish pond preparation</b>	2%	97%	1%	>99%	1%	>99%
<b>Know how to select good fingerlings</b>	1%	>99%	1%	99%	1%	>99%
<b>Know about stocking density</b>	2%	100%	3%	100%	<1%	100%
<b>Know how to examine natural feed</b>	1%	100%	1%	100%	<1%	100%
<b>Know about sampling</b>	<1%	100%	1%	100%	<1%	100%

## 5. Beef fattening and dairy cow modules

In FFS Cycle 7, the FFSs that took place in Khulna and Patuakhali included the cattle rearing beef fattening module. In Satkhira, instead of beef fattening, the module dairy cows was included.

Objective of the beef fattening module is to improve the efficiency and profitability of beef fattening as an income generating activity. Technical topics in the module include cattle housing, cattle selection, feeding, green fodder crops, use of urea molasses straw (UMS), concentrated feed, vaccination and de-worming.

The dairy cow module has a focus on improving the milk production as an income generating activity. Technical topics include cattle housing, cattle selection, fodder, feeding ratio, dairy technology, vaccination and de-worming.

The FFS livestock modules also emphasize linkages and networking with input providers, service providers (such as animal health workers), markets, and with staff of the department of livestock services (DLS).

In this chapter, some data of the two livestock modules are presented separately for the three districts. The questionnaires used for beef fattening and dairy cows have some questions in common, but also a few questions are different. See also Annexes 1 (Khulna), 2 (Satkhira) and 3 (Patuakhali).

### 5.1 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 2 to 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. In Satkhira, where farmers were selected who want to produce milk, the number of milk producing cows increased during the FFS cycle.

Number of cattle owned	Khulna (Average number of animals)		Satkhira (Average number of animals)		Patuakhali (Average number of animals)	
	Benchmark (n=700)	End FFS (n=700)	Benchmark (n=699)	End FFS (n=700)	Benchmark (n=700)	End FFS (n=600)
<b>Number milk producing cows</b>	0.74	0.76	0.58	1.11	0.45	0.53
<b>Number non milk producing cows</b>	0.44	0.43	0.64	0.42	0.63	0.65
<b>Number male calves</b>	0.87	0.89	0.38	0.64	0.57	0.52
<b>Number female calves</b>	0.72	0.67	0.52	0.70	0.33	0.39
<b>Number bulls</b>	0.51	0.33	0.15	0.09	0.47	0.32
<b>Total cattle</b>	3.28	3.08	2.27	2.97	2.45	2.41
<b>Maximum number of animals per farmer</b>	15	13	13	12	10	12

### 5.2 Dairy breed

Farmers who attended the dairy cow module in Satkhira indicated what type of dairy animals they had. Note that this question was not asked in the beef fattening modules. The data show an increase in number of dairy animals and a shift from local breed to cross breed animals, which generally have a higher milk production.

Dairy breed	Satkhira (Total number of animals)	
	Benchmark (n=699)	End FFS (n=700)
<b>Local breed</b>	509	432
<b>Cross breed</b>	189	341
<b>Holstein Friesian</b>	13	11
<b>Total dairy</b>	711	784

### 5.3 Milk production per household

The average milk production of a farm household increased from 2.2 to 5.0 litres. This result is partly caused by the increased number of milking cows, and partly by better farm management, especially feeding of the animals.

The reported increase in milk production of all FFS farmers together amounts to about 2,000 litres of milk per day, which has a value of about 70,000 Taka (@ 35 Taka/litre). This means that the FFS farmers would have increased their income about 100 Taka per day, but we should of course allow for some bias (over estimating) in the end data.

Milk production	Satkhira (production per farmer)	
	Benchmark (n=699)	End FFS (n=700)
<b>Milk production per farmer (litres per day)</b>	2.16	5.04
<b>Total production of all farmers (litres per day)</b>	1,513	3,526

### 5.4 Use of the milk

The following table shows whether farmers sold the milk or used it in their own household. The increased production resulted in more milk being sold at the end of the FFS. The percentage of farmers selling more than half or all of their milk increased from 29% to 90%.

Use of milk	Satkhira (number of farmers)	
	Benchmark (n=699)	End FFS (n=700)
<b>Sell none</b>	385	42
<b>Sell less than half</b>	68	13
<b>Sell and consume half</b>	40	15
<b>Sell more than half</b>	127	395
<b>Sell all</b>	79	235

### 5.5 Milking frequency

In the FFS the participants learn that milking twice per day is better than once per day. In the end survey many farmers report to have adapted this practice. It will be interesting to see if this sustains in the years after the FFS.

Milking frequency	Satkhira (percentage of farmers)	
	Benchmark (n=699)	End FFS (n=700)
<b>One time per day</b>	91%	18%
<b>Two times per day</b>	9%	81%

### 5.6 Cattle housing

Both the beef fattening and dairy cow modules try to motivate farmers to improve the housing of their animals, both the design (ventilation, gutter for drainage, hard concrete or brick floor) as well as the hygiene (daily cleaning).



The following table shows that in the endline in all districts good progress is reported for ventilation, gutter and cleaning.

For the floor of the cattle shed we see a big difference between the districts. In Patuakhali, only very few farmers use hard materials (bricks, concrete) even at the end of the FFS. In Satkhira and Khulna the situation was already better at the beginning of the FFS and more progress has been made to improve the floor of the sheds.

Cattle shed	Khulna (Percentage farmers)		Satkhira (Percentage farmers)		Patuakhali (Percentage farmers)	
	Benchmark (n=700)	End FFS (n=700)	Benchmark (n=699)	End FFS (n=700)	Benchmark (n=700)	End FFS (n=600)
Cattle shed has ventilation	16%	98%	3%	98%	6%	97%
Cattle shed has gutter for drainage	4%	93%	7%	97%	1%	97%
Cattle shed is cleaned daily	27%	99%	19%	99%	12%	97%
Floor is only sand and/or soil	71%	36%	57%	3%	100%	89%
Floor is partly sand and/or soil and partly bricks and/or concrete	2%	29%	22%	91%	0%	6%
Floor is only brick and/or concrete	26%	35%	21%	6%	0%	6%

### 5.7 Feeding the cattle

Providing balanced feed to cattle will lead to better production, both in beef fattening and dairy cows. 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. We can expect that there is some bias in reporting such good results.

Cattle feed used	Khulna (Percentage farmers)		Satkhira (Percentage farmers)		Patuakhali (Percentage farmers)	
	Benchmark (n=700)	End FFS (n=700)	Benchmark (n=699)	End FFS (n=700)	Benchmark (n=700)	End FFS (n=600)
Only roughage	36%	6%	11%	1%	30%	3%
Only concentrate	<1%	<1%	11%	0%	0%	<1%
Only straw	1%	0%	22%	<1%	15%	<1%
Roughage and concentrate	0%	1%	3%	1%	<1%	<1%
Roughage and straw	49%	4%	44%	<1%	44%	13%
Concentrate and straw	0%	0%	0%	0%	<1%	0%
Roughage, concentrate and straw	14%	90%	18%	98%	10%	83%

### 5.8 Producing 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, the high number of farmers growing Napier in Khulna and Satkhira is because in these districts Napier cuttings were distributed as an input in the FFS, while no Napier was distributed in Patuakhali.

But for the other fodders, the differences between the districts are more difficult to explain. Only in Satkhira the number of farmers who grow different type of fodder seems to have increased, while in Khulna and Patuakhali no such progress was reported.

Green fodder	Khulna (Number of farmers)		Satkhira (Number of farmers)		Patuakhali (Number of farmers)	
	Benchmark (n=700)	End FFS (n=700)	Benchmark (n=699)	End FFS (n=700)	Benchmark (n=700)	End FFS (n=600)
Napier	2	610	30	638	1	10
Lucern	1	9	1	219	1	2

<b>Jambo</b>	1	2	1	103	1	1
<b>Para</b>	1	1	1	62	1	9
<b>Maize</b>	1	26	1	178	1	3
<b>German grass</b>	9	2	1	15	2	2

### 5.9 Urea Molasses Straw (UMS)

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

UMS	Khulna (Number of farmers)		Patuakhali (Number of farmers)	
	Benchmark (n=700)	End FFS (n=700)	Benchmark (n=700)	End FFS (n=600)
<b>Know how to make UMS</b>	<1%	>99%	<1%	99%
<b>Feed UMS to cattle</b>	<1%	84%	<1%	97%

### 5.10 Measure body weight

For beef fattening it is important that farmers can measure the body weight of their animals. The following table shows that almost all farmers learned this in the FFS

Body weight	Khulna (Number of farmers)		Patuakhali (Number of farmers)	
	Benchmark (n=700)	End FFS (n=700)	Benchmark (n=700)	End FFS (n=600)
<b>Know how to measure body weight</b>	0%	99%	<1%	>99%

### 5.11 De-worming

De-worming of cattle was not a common practice at the beginning of the FFS, but in the end survey most farmers report that they de-worm their animals regularly. A follow up survey will be needed after one or two years to see how many farmers sustain this practice.

De-worming	Khulna (Number of farmers)		Satkhira (Number of farmers)		Patuakhali (Number of farmers)	
	Benchmark (n=700)	End FFS (n=700)	Benchmark (n=699)	End FFS (n=700)	Benchmark (n=700)	End FFS (n=600)
<b>De-worm cattle regularly</b>	2%	>99%	2%	>99%	<1%	98%

### 5.12 Receiving animal health services

Farmers were asked if they receive or make use of animal health services, for example from community livestock workers or from staff of DLS. During the FFS the facilitators try to promote the linkages between farmers and these health services. An indicator for this is whether the farmers have a telephone number of these service providers. The following table shows the reported progress in linking with service providers.

Receive animal health services	Khulna (Percentage farmers)		Satkhira (Percentage farmers)		Patuakhali (Percentage farmers)	
	Benchmark (n=700)	End FFS (n=700)	Benchmark (n=699)	End FFS (n=700)	Benchmark (n=700)	End FFS (n=600)
<b>Never</b>	90%	19%	86%	3%	97%	5%
<b>Sometimes</b>	9%	74%	13%	70%	3%	84%
<b>Always</b>	1%	6%	0%	27%	0%	11%
<b>Have telephone number of service provider</b>	4%	77%	4%	100%	2%	95%

## 6. Nutrition module

The nutrition module is included in all FFS. Farmers learn about cooking procedures, hygiene, and about ingredients of balanced food. Emphasis is given on the “thousand day food requirements” which refers to special requirements for mothers during pregnancy and the first 2 years of the child. Farmers also learn about health benefits of Moringa.

To stimulate farmers to think about their own diet, questions are asked in the benchmark survey on what type of food they eat each week.

In this chapter, some data related to the nutrition module are presented separately for the 3 districts where the FFSs took place. See also Annexes 1 (Khulna), 2 (Satkhira), and 3 (Patuakhali).

### 6.1 Cooking procedures

During the nutrition sessions farmers learn about cooking procedures, for example that it is better to wash vegetables before cutting them. The positive reporting at the end of the FFS will have some bias.

Knows correct cooking procedures	Khulna (percentage farmers)		Satkhira (percentage farmers)		Patuakhali (percentage farmers)	
	Benchmark (n=700)	End FFS (n=700)	Benchmark (n=699)	End FFS (n=700)	Benchmark (n=700)	End FFS (n=600)
<b>Does not know</b>	88%	0%	85%	<1%	76%	1%
<b>Knows partly</b>	11%	2%	14%	1%	23%	12%
<b>Knows fully</b>	<1%	98%	0%	98%	<1%	87%

### 6.2 Moringa

At the beginning of the FFS most farmers are not familiar about the health effects of Moringa, but they get exposed to this during the sessions.

Moringa	Khulna (percentage farmers)		Satkhira (percentage farmers)		Patuakhali (percentage farmers)	
	Benchmark (n=700)	End FFS (n=700)	Benchmark (n=699)	End FFS (n=700)	Benchmark (n=700)	End FFS (n=600)
<b>Know Moringa is healthy</b>	7%	>99%	2%	100%	<1%	>99%

### 6.3 Thousand day nutrition requirements

At the benchmark surveys participants have limited knowledge on the food requirements during first thousand days. This improved by the end of the training. Of course there will be some bias in these positive reporting at the end of the FFS.

Know 1000 day nutrient requirement	Khulna (percentage farmers)		Satkhira (percentage farmers)		Patuakhali (percentage farmers)	
	Benchmark (n=700)	End FFS (n=700)	Benchmark (n=699)	End FFS (n=700)	Benchmark (n=700)	End FFS (n=600)
<b>Does not know</b>	83%	<1%	88%	0%	82%	0%
<b>Knows partly</b>	16%	3%	8%	<1%	17%	11%
<b>Knows well</b>	1%	97%	3%	>99%	1%	89%

## 6.4 Food habits

Farmers were asked how many times per week they eat meat, fish, eggs, fruits and milks. Another question was to estimate how much vegetables they eat in a week. Results are presented below in a table.

Explaining the increased consumption at the end of FFS is difficult. Part of it could be an effect of the nutrition training but we expect a very strong bias in the answers given by the participants who want to show that they have improved their food habits. The increase in fish consumption can have been influenced by more fish being produced during the FFS.

While it is difficult to get accurate information with this type of questions, they will be kept in the benchmark and end surveys. By repeatedly asking such questions the nutrition messages on the importance of a balanced diet are emphasized.

The below table shows that on almost all types of food, Khulna and Satkhira score higher than Patuakhali. This suggests that in Patuakhali farmers in general have a poorer diet. The same was observed in previous reports.

Food habits	Khulna		Satkhira		Patuakhali	
	Benchmark (n=700)	End FFS (n=700)	Benchmark (n=699)	End FFS (n=700)	Benchmark (n=700)	End FFS (n=600)
<b>Meat (times per week)</b>	0.9	1.0	1.0	1.3	0.6	1.1
<b>Fish (times per week)</b>	2.9	4.2	2.8	3.9	1.5	2.2
<b>Eggs (times per week)</b>	1.6	2.6	1.3	1.6	1.1	1.7
<b>Fruits (times per week)</b>	2.9	2.5	1.6	1.9	0.9	1.4
<b>Milk (times per week)</b>	2.3	3.1	2.3	3.9	1.7	2.2
<b>Amount vegetables per week (g)</b>	938	1,893	1,029	1,991	1,078	1,848

## 7. Conclusion

The data presented in this report were collected during benchmark and end surveys of cycle 7 and represent the results of about 2,000 farmers. Comparing end data with benchmark data shows some immediate effects of the FFS training, such as an increase of fish and milk production.

We expect some bias in the set of end data, as both the interviewers (FFS facilitators) and the interviewees (farmers) can be tempted to overestimate their progress. But even if we keep this in mind, the FFSs in cycle 7 seem to have been very successful in increasing production and income.

Analysis of the data of FFS cycle 7 shows that the FFS approach is good “value for money”. The increased production and income of the FFS farmers during the FFS season exceeds the cost of the training.

To understand the real, long-term, impact of an FFS, it is recommended that follow-up surveys are organized after one or two years.