Bangladesh Water Development Board
(BWDB)

Embassy of the Kingdom of the Netherlands
(EKN) Dhaka, Bangladesh

Department of Agricultural Extension
(DAE)

Technical Note 18

Cycle 2 FFS Khulna

Follow up survey 2.5 years after start of FFS

Compared with benchmark and end data

July, 2017

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MOTT MACDONALD

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Follow up survey, 2.5 years after start of FFS compared with benchmark and end data

July 2017

Blue Gold Program

BWDB Office

23/1 Motijheel Commercial Area, Hasan Court, 8th Floor, Dhaka 1000
(T) +88 02 711 15 25; +88 02 956 98 43

Gulshan Office

Karim Manjil, Ground Floor, House 19, Road 118, Gulshan, Dhaka 1212
(T) +88 02 989 45 53

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Issue and revision record

Revision	Date	Originator	Checker	Approver	Description
1	1-7-2017	Hein Bijlmakers Sumona Rani Das	Hein, Munir, Huda, Sumona, Ashraf	Guy Jones	1st version of TN 18

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Annex 1 Benchmark, end line, and follow up survey data of FFS Cycle 2 Khulna
Annex 2 Locations of 18 FFSs

1. Introduction

1.1 Three types of surveys

At the start of a Farmer Field School (FFS), the FFS facilitators interview the participants with a short questionnaire about their farm management and production. This is the "benchmark survey". The objectives of this benchmark survey are:

- To establish benchmarks that can be used by the participants for measuring their progress or changes in behaviour.
- To generate interest and introduce the topics which will be discussed and practiced in the FFS

At the end of the FFS, the same questions are repeated so that participants and facilitators can measure the progress. This is the end line survey. The differences between the end data and the benchmark data (for example an increase of fish production) can be calculated, and this result is shared with other farmers during farmer field days.

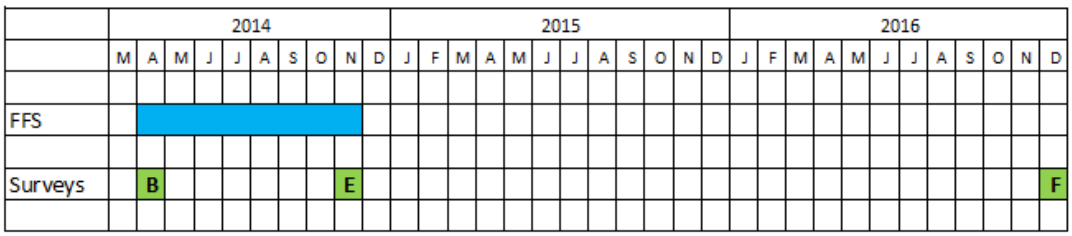
We know that end data are biased for several reasons. Farmers often exaggerate their production to show how well they performed because of the training. Also the fact that some farm inputs are provided in the FFS causes some bias. For example if some fingerlings or fish feed were distributed during the training this will increase the fish production of the household in the end survey. However, this does not mean that the increased production will sustain after the FFS.

If the same survey is be repeated one or more years after the FFS to measure the longer term effect of the training, we call this a follow up survey. A follow up survey can show if production or changes in behaviour have sustained over a longer period.

1.2 FFS Cycle 2

Blue Gold started organizing FFSs in November 2013. The first FFS cycle, from Nov 2013 to March 2014 included the modules poultry, homestead vegetables, and nutrition. A report on FFS cycle 1 is in Blue Gold Technical Note 17.

The second FFS cycle took place from April to November 2014 and included modules fish, beef fattening and nutrition. Cycle 2 included 44 FFS of which 24 took place in Patuakhali and 20 in Khulna. In December 2016, more than 2 years after the end of these FFSs (and 2.5 years after the start of the FFSs), the 20 FFSs in Khulna were revisited for a follow up survey. See Figure 1.



B = Benchmark survey
E = Endline survey
F = Follow up survey

Figure 1 Timeline showing FFS Cycle 2 with benchmark, end line, and follow up survey

Of these 20 FFSs, 8 took place in Polder 22, and 12 were in Polder 30. Benchmark and end data of 2 FFSs were lost, so this report (Blue Gold Technical Note #18) compares benchmark data, end data and follow up data of 18 FFSs (see Annex 2).

1.3 Interpreting the data

While reading this report please keep in mind that the surveys were not conducted by independent interviewers but by the FFS facilitators who also conducted the FFS training. Some bias towards showing good progress may therefore be expected, especially in the end survey.

1.4 Presentation of the results

The collected data are attached in Annex 1, where results of the 3 surveys (benchmark, end line, and follow up) are presented side by side. Each survey involved about 450 farmers. In the following 3 chapters the data are shown in tables, either as percentages (e.g. “percentage of farmers de-worming their cattle”) or as average values (e.g. “average fish production per farmer family”). Some comments are included to help with the interpretation of the results.

The following table gives details of the 3 surveys conducted with Cycle 2 FFS in Khulna.

Surveys details	Benchmark	End	Follow up
Period of data collection	April 2014	November 2014	Dec 2016 – Jan 2017
Number of FFSs in survey	18	18	18
Total farmers involved	450	450	450
Records available	449	445	450
Records missing	1	5	-

2. General information FFS participants

This chapter describes the profile of the FFS participants.

2.1 Polders

In Khulna, the cycle 2 FFSs took place in polders 22 and 30. See also Annex 2.

Number of farmers in surveys	Benchmark	End	Follow up
Polder 22	149	145	150
Polder 30	300	300	300
Total farmers	449	445	450

2.2 Gender

About 56% of the participating farmers were women.

Gender	Benchmark	End	Follow up
Men	200	195	196
Women	249	250	254
Total farmers	449	445	450
Percentage women	55.5	56.2	56.4

2.3 Age

In the FFSs, the average age of farmers was about 38 years.

Age	Benchmark	End	Follow up
Youngest	18	18	21
Oldest	66	66	68
Average	38	38	40
Total farmers	449	445	450

2.4 Literacy of participants

About 10% of the participants was illiterate or could only sign their names. The FFS approach is designed to use life examples and drawings so that also illiterate persons can participate.

Illiterate participants	Benchmark	End	Follow up
Illiterate or can sign only (number farmers)	39	43	43
Illiterate or can sign only (% farmers)	9	10	10

2.5 Main occupation

For more than 90% of the FFS participants their main occupation is in agriculture.

Main occupation (% farmers)	Benchmark	End	Follow up
Agriculture	92	91	95
Day Labor	1	0	1
Service	-	-	-
Fisherman	0	0	-
Small business	1	1	1
Others	6	8	4

2.6 Land area and farm classification

On average the FFS farmers had about 160 decimals land during the benchmark survey. The average land size is calculated over all households (including those with no land). At the time of benchmark survey 18% of the households were landless (i.e. have less than 50 decimals agricultural land).

Note that 100 decimal = 1 acre = 0.4 ha, so 160 decimal corresponds to about 0.65 hectare. A household is considered landless if it has less than 0.2 hectare agricultural land.

In the follow up survey we see that after 2 years the average land area has slightly decreased and the percentage landless households increased.

Land area	Benchmark	End	Follow up
Average agricultural area (decimal)	160	161	153
Average agricultural area (hectare)	0.65	0.65	0.62

Farm classification	Benchmark	End	Follow up
Zero agricultural land (% farmers)	2	2	5
Landless (<50 decimal) (% farmers)	18	18	24
Not landless (>= 50 decimal) (% farmers)	82	82	76

2.7 Family income sources

Participants indicated the main sources of income for their family (household). In most cases (about 98%) the main family income is of agriculture.

Family main income sources (% farmers) *	Benchmark	End	Follow up
Agriculture	97	98	99
Small business	3	4	2
Day labor	2	2	5
Other	10	5	10

* More than one income source could be indicated

2.8 Family size

The average family size was 4.7 persons.

Family size (number persons)	Benchmark	End	Follow up
Average male number	2.5	2.4	2.4
Average female number	2.2	2.2	2.3
Average family size	4.7	4.6	4.7

3. Livestock

FFS cycle 2 included the beef fattening (cattle rearing) module. Objective of this 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.

3.1 Number of animals

Data were collected for the number of animals present in the household, including cattle and small ruminants.

We see 2 years after the FFS a slight reduction in the number of cattle per household, especially a reduction in the number of male animals (bulls and male calves). This is probably the effect of the timing of the surveys, as benchmark and end survey were synchronized with the “beef fattening season” (i.e. the period before the Eid festival), while the follow up survey took place in December, on a moment when no beef fattening takes place.

The number of small ruminants had increased 2 years after the FFS, but as the FFS module was concentrating on cattle, this effect is probably not related to the FFS training.

Average numbers of animals	Benchmark	End	Follow up
Bulls	0.68	0.73	0.26
Cows	1.48	1.66	1.69
Male calves	1.14	1.07	0.77
Female calves	1.15	1.20	1.06
Total cattle	4.45	4.65	3.76
Goats	0.66	0.86	0.82
Sheep	0.18	0.27	0.47
Total small ruminants	0.84	1.13	1.29
Total animals	5.29	5.78	5.06

Number of fattening calves	Benchmark	End	Follow up
Average number of fattening calves	0.81	0.74	0.46

3.2 Cattle housing

Cattle housing improved at the time of the end survey, with a slight increase in improvement of the walls and a very significant increase of improving the floor materials. These improvements sustained 2 years after the FFS.

Cow shed wall material (%)	Benchmark	End	Follow up
Straw and bamboo	91	77	70
Concrete	8	22	28
None	1	0	2

Cow shed floor material (%)	Benchmark	End	Follow up
Mud	84	6	9
Concrete	15	94	89
None	1	0	2

Cowshed measurement (%)	Benchmark	End	Follow up
Correct measurement	8	96	86

3.3 Cattle rearing technology

The surveys include several questions that relate to rearing practices and knowledge about proper cattle rearing methods. In almost all cases we see a big improvement at the end line survey, which sustains also 2 years after the FFS.

In the cases of “providing concentrate feed” and “cultivating HYV fodder”, we see lower percentages during the follow up survey. In these two cases, the end line survey included the effect of distributing some concentrate feed and cuttings of HYV fodder crops to the FFS participants. Compared to the baseline, the results after 2.5 years are still very good.

Cattle rearing technology (% farmers)	Benchmark	End	Follow up
Do de-worming every 3 months	5	99	91
Know how to administer medicines	2	99	96
Know how to measure body weight	1	97	93
Know how to prepare UMS	1	100	96
Provide concentrated feed	3	96	78
Cultivate HYV fodder	0	61	32
Know types of HYV fodder	0	99	94
Vaccinate regularly	1	97	75
Has general knowledge diseases	2	99	95
Has knowledge on balanced animal diet	1	93	96

3.4 Other cattle related questions

In the management of ecto-parasites we see a slight increase of farmers managing this by themselves and needing less veterinary services. This effect has sustained 2 years after the FFS.

Management of ecto-parasites (%)	Benchmark	End	Follow up
Own management	64	74	76
Veterinary	35	27	23

Most cattle are sold in local markets, but there seems to be a slight shift toward selling animals in outer markets.

Cattle selling place (%)	Benchmark	End	Follow up
Local market	94	78	88
Outer market	6	22	12

3.5 Common livestock related problems

In the follow up survey some questions were added to find out which are the livestock related problems experienced by the farmers. Quality of breeding animals and high price of commercial feed were problems experienced by most farmers.

Reported livestock related problems (%) *	Benchmark	End	Follow up
Lack of quality breed animals			80
High price of commercial feed			85
Available of timely vaccination services			66
Disease prevalence			63
Low market selling price of animals			42
Lack of knowledge on cattle rearing			26
Other problems			6

* This question was only asked in the follow-up survey

3.6 Linkages with DLS

In the follow up survey some questions were included about linkages of farmers with the department of Livestock Services (DLS). About 32% of the farmers had the mobile number of DLS officers or poultry workers, while more than 50% of the farmers reported receiving services from DLS.

Linkage with DLS (%) *	Benchmark	End	Follow up
Has mobile number of DLS			32

Received service from DLS (%) *	Benchmark	End	Follow up
Never			46
Sometimes			47
Always			7

* These questions were only asked in the follow-up survey

4. Fish

FFS Cycle 2 included the fish module, which tries to promote and increase the production of fish for home consumption and as an income generating activity. Technical topics in the module include pond preparation, selection of fingerlings, stocking rates and stocking ratio, feed preparation, feeding, disease management, partial harvesting, and growing vegetables on dykes.

4.1 Ponds and ghers

Farmers in Khulna often have a pond and also gher where fish can be cultivated. The FFS module has a focus on fish ponds, but same technologies can also be applied for gher.

The average pond size is about 14 decimal, which corresponds to about 560 m^2. Average gher area was about 23 decimal (i.e. about 920 m^2).

Pond and Gher	Benchmark	End	Follow up
Average pond size (decimal)	14.2	14.2	13.8
Average gher size (decimal)	23.5	23.3	23.6
Average size pond + gher (decimal)	37.7	37.5	37.4
Number farmers with no pond or gher *	7	3	3
Number farmers with pond and/or gher	442	442	447
Total farmers	449	445	450

* For few farmers pond or gher size was missing (in data set this was indicated as zero pond size).

About 85% of the farmers have their own pond, while about 14% have shared ownership.

Pond ownership (% farmers)	Benchmark	End	Follow up
Single owner	84	86	85
Shared ownership	14	13	15
n/a*	2	1	1

* n/a refers to farmers who did not report pond or gher size

The majority of ponds in the FFS area were perennial ponds.

Pond type	Benchmark	End	Follow up
Perennial	80	92	90
Seasonal	18	8	10
n/a	2	1	1

4.2 Fish production

Fish production increased during the end line survey, which can be partly contributed to the distribution of some fingerlings and feed to FFS participants. But in the follow up survey, production had further increased, which shows that improved fish production has well sustained after completing the FFS training. Compared to the benchmark, the production has almost tripled after 2.5 years.

Average fish production (kg per farmer)	Benchmark	End	Follow up
White fish	83	161	194
Golda	18	28	80
Other fish	9	6	48
Total production	110	195	322

From the data on pond and gher size and the data on fish production we can estimate the production per decimal.

Production per decimal (kg)*	Benchmark	End	Follow up
Total production per farmer	110	195	322
Pond + gher size per farmer (decimal)	37.7	37.5	37.4
Production per decimal (kg)	2.9	5.2	8.6
Production per hectare (kg)	719	1,284	2,129

* calculated from production per farmer (kg) and size of pond + gher (decimal)

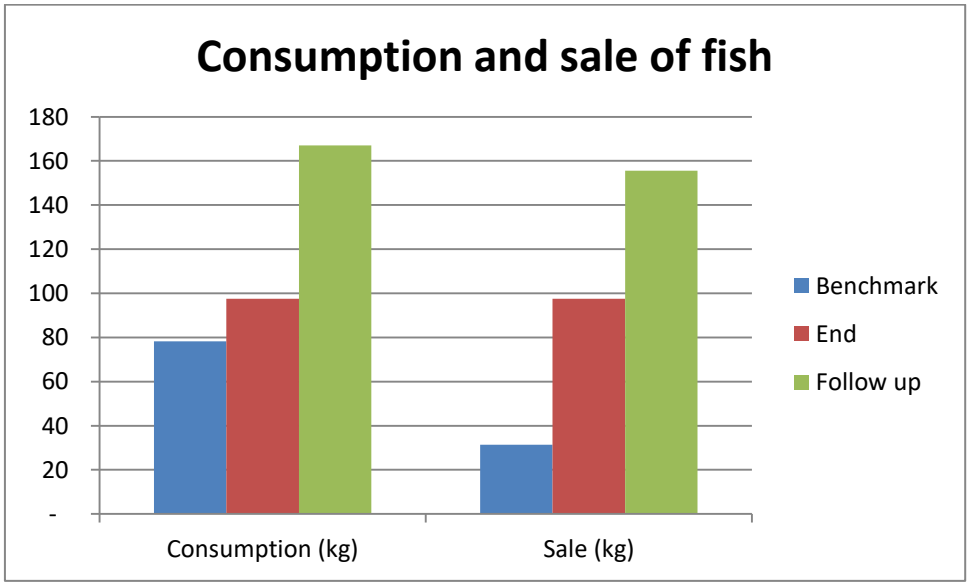
The increased production has resulted in a higher percentage of fish being sold. About 50% of the fish is consumed and 50% sold.

Fish consumption and sale (%)	Benchmark	End	Follow up
Average consumption (%)	71	50	52
Average sale (%)	29	50	48

From the total production and from the reported percentages of consumption and sale we can calculate a rough estimate of how many kg of fish are consumed in the household and how many kg are sold. This shows that 2.5 years after the start of the FFS, fish consumption has more than doubled, and fish sale has increased by a factor 5.

Fish consumption and sale (kg) *	Benchmark	End	Follow up
Consumption (kg)	78	98	167
Sale (kg)	31	97	156

* calculated from total production and percentages consumption and sale



4.3 Fish rearing technology

The surveys include several questions that relate to rearing practices and knowledge about fish rearing methods. In almost all cases we see a big improvement at the end line survey, which sustains also 2 years after the FFS.

Only in the cases of “applying oil cake” and “applying commercial feed”, we see lower percentages during the follow up survey. In these cases, the end line survey included the effect of distributing some of these inputs to the FFS participants. It is probably because of the cost involved that some farmers have stopped these practices, but compared to the baseline, the results after 2.5 years have improved, with about 50% of the farmers applying commercial feed.

Fish rearing technology (% farmers)	Benchmark	End	Follow up
Apply lime	11	98	97
Control unwanted fish	7	95	92
Knows about fish occupying different layers of the pond	2	96	92
Knows stocking density according to pond size	2	95	90
Knows about proper fingerling transportation	6	99	98
Knows about fingerling adaptation	5	99	96
Apply supplementary feed	13	99	82
Apply rice bran or wheat bran	27	95	88
Apply oil cake	16	87	50
Apply commercial feed	27	70	49
Knows how to test natural feed	4	99	97
Knows proper release method fingerlings	1	99	98
Knows how to prepare feed	2	99	98
Knows feed application method	1	99	99
Knows how to do partial harvesting	12	99	95

4.4 Common problems in fish production

In the follow up survey some questions were added to find out which are the fish related problems experienced by the farmers. The most reported problems are related to the quality of fingerlings and the high price of commercial feed.

Reported fish related problems (%) *	Benchmark	End	Follow up
Lack of quality fingerlings			82
High price commercial feed			84
Different fish diseases			67
Water crisis			48
Low market selling price of fish			44
Lack of knowledge on fish production			27
Other problems			1

* This was only included in the follow-up survey

4.5 Linkages with DOF

In the follow up survey some questions were included about linkages of farmers with the Department of Fisheries (DOF). About 35% of the farmers had the mobile number of a DOF officer, while about 50% of the farmers reported receiving services from DOF.

Linkage with DOF (%) *	Benchmark	End	Follow up
Has mobile number of DOF			35

Received service from DOF (%) *	Benchmark	End	Follow up
Never			50
Sometimes			41
Always			8

* These questions were only asked in the follow-up survey

5. Nutrition

The nutrition module is included in all FFSs. The module includes cooking procedures, hygiene, ingredients of balanced food, and special food and care required for pregnant and lactating women.

5.1 Nutrition module

The surveys contained several questions related to the topics covered in the nutrition module. Most of these questions are about behaviour or are knowledge questions.

It appears that at 2.5 years after completing the FFS the results are still very good when compared with the benchmark data.

Questions nutrition module (% farmers)	Benchmark	End	Follow up
Wash before cutting	9	98	98
Wash hand before meals	28	100	99
Cook immediately after cutting vegetables	12	100	96
Knowledge on extra food for pregnant and lactating mother *	n/a	100	99
Knowledge on extra food for infant and adolescent	11	100	98
Know importance of vaccination for children	58	87	84
Prevalence of water borne disease	60	37	58
Maintain personal hygiene	37	99	96
Knowledge on different food category	2	99	96
Knowledge on special health care for pregnant mother	6	100	97
Knowledge on special health care for lactating mother	5	100	99
Knowledge on nutrient deficiency diseases	1	99	97

* Question missing in benchmark survey

5.2 Some other questions asked

Even though Blue Gold does not cover these topics, the surveys of cycle 2 contained some questions about drinking water and latrines.

Some small improvements are visible, which could have several reasons (e.g. effect of other projects such as Max Foundation, improved income of farmers).

Source of drinking water (% farmers)	Benchmark	End	Follow up
Tube well	73	89	86
Pond	10	1	4
Others	18	10	10

Type of latrine used	Benchmark	End	Follow up
Ring slab	91	99	96
Open	9	1	4

5.3 Role of contact farmers

In 2015, about a year after FFS cycle 2, some workshops were organized to develop contact farmers (CF) in each FFS group. These contact farmers are supported to take a leadership role in keeping the FFS groups together, and to take the lead in organizing collective action. Even though for cycle 2, only little support has been given to these contact farmers, a few questions were included in the follow up survey to evaluate their role.

The results show that many FFS farmers keep in touch with their contact farmer, but as expected, the role of the CF is still rather weak in organizing group activities or organizing collective actions. This confirms the need for more support to CFs so that they can play a bigger role in collective action, such as organizing vaccination campaigns for cattle, or collective purchasing of fingerlings or other inputs.

Role of contact farmers (% farmers) *	Benchmark	End	Follow up
Contact farmer organizes group activity			23
Collective fish selling			22
Collective vaccination services			34
Communicate with contact farmer			72
Contact farmer organizes demos			45
Contact farmer no communication			29

* These questions only asked in Follow-up survey

5.4 Mati-o-manush

Another question added in the follow up survey was about the TV program Mati-o-manush. This program reports on agricultural practices and has regularly reported on Blue Gold activities, including the modules fish. The program seems to be popular in Khulna area, where more than half the households are reached.

Watch Mati-0-manush *	Benchmark	End	Follow up
Never			48
Sometimes			45
Always			7

* This question was only asked in follow-up survey

6. Conclusions and Recommendations

6.1 Conclusions

A follow up survey was conducted in December 2016 with about 450 farmers of 18 FFSs of cycle 2 in Khulna. FFS cycle 2 took place from April to November 2014. The results of the follow up survey were compared with the benchmark data (collected in April 2014), which represent the situation before the training, and with the end data (collected in November 2014).

The data show that, 2 years after the end of the FFS, the farmers still perform much better than before the training. Livestock production data were not included in the surveys, but the data show that cattle rearing practices have improved and that this has sustained 2 years after the FFS. Production, consumption and sale of fish are considerable higher than during the benchmark survey. This shows that the FFSs have sustainably contributed to better household nutrition and to generating additional income for the FFS farmers.

6.2 Recommendations

Comparing the follow up data with benchmark and end data has also highlighted some areas where improvements could be made.

For the livestock module the questions that were asked in the surveys did not provide information on increased production (i.e. weight gain of animals) or income.

Recommendation:

- For future FFS surveys attempts should be made to measure weight gain of animals and/or to measure income generated from beef fattening.

Timely availability of vaccination services for cattle is a problem reported by many farmers. Even though Blue Gold has (in January 2015) already developed several livestock workers for polders 22 and 30, we see that in the end of 2016 many farmers have still difficulties vaccinating their animals.

Recommendations:

- Update the mapping of available livestock workers in Blue Gold polders.
- Develop more community livestock workers in polders where there is a shortage.
- Provide the Blue Gold Farmer Trainers with training as livestock workers.

The agricultural TV program Mati-o-manush seems to be well known by a large part of the FFS farmers. The program can help FFS related messages reaching a large audience, which can contribute to horizontal spreading of information.

Recommendation:

- Continue making use of Mati-o-manush to spread FFS messages.

Common problems reported by farmers include the high price of concentrated feed for cattle and high cost of commercial fish feed. They also report the difficulties in obtaining quality breeding animals and fingerlings. These are all problems where collective action can help and where CFs should play a role.

Until now, not enough attention has been given to contact farmers of cycle 2 and improvements could be made in the way they provide services to their community. If manpower and financial resources are available, additional training and support could be provided to the contact farmers of cycle 2 (and to contact farmers of other FFS cycles).

Recommendation:

- If possible (manpower, finances) provide additional training to contact farmers.

Annex 1 - Cycle 2

FFS modules: Beef fattening, Fish, Nutrition
Data collected in benchmark survey, end survey, and follow up survey

	Benchmark	End	Follow up
Surveys details			
Period of data collection	April 2014	November 2014	Dec 2016 – Jan 2017
Number of FFSs in survey	18	18	18
Total farmers involved	450	450	450
Records available	449	445	450
Records missing	1	5	-
GENERAL INFO PARTICIPANTS			
Polder			
Polder 22	149	145	150
Polder 30	300	300	300
Total farmers	449	445	450
Gender			
Men	200	195	196
Women	249	250	254
Total farmers	449	445	450
Percentage women	55.5	56.2	56.4
Age			
Youngest	18	18	21
Oldest	66	66	68
Average	38	38	40
Total farmers	449	445	450
Education			
Illiterate	16	15	11
Can sign	23	28	32
Primary	93	97	150
Secondary	248	232	198
Hcc and above	69	73	59
Total farmers	449	445	450

Main occupation

Agriculture	415	405	427
Day Labour	4	2	3
Service	-	-	-
Fisherman	1	1	-
Small business	3	3	4
Others	26	34	16
Total	449	445	450

Area agriculture (decimal)

Average	160	161	153
Median	120	120	100
Zero area	9	7	21
Landless (<50 decimal)	79	79	106
Not landless (=>50 decimal)	370	366	344
Total farmers	449	445	450
Percentage landless	18	18	24
Min area (decimal)	-	-	-
Max area (decimal)	825	825	1,000

Family main income sources

Agriculture	435	437	446
Small business	13	19	9
Day labour	10	7	24
Other	44	23	47
Total farmers	449	445	450

Male family members

Average male number	2.5	2.4	2.4
Min male number	-	-	-
Max male number	22	10	20
Total male	1,112	1,082	1,091
Total families	449	445	450

Female family members

Average female number	2.2	2.2	2.3
Min female number	1	1	-
Max female number	9	9	15
Total female	997	971	1,019
Total families	449	445	450

Family size (number family members)

Average family size	4.7	4.6	4.7
Min family size	1	2	2
Max family size	24	17	35
Total persons	2,109	2,053	2,110
Total families	449	445	450

LIVESTOCK

Number of bulls

Average	0.68	0.73	0.26
Total	304	324	110
Max	12	8	10

Number of cows

Average	1.48	1.66	1.69
Total	663	737	762
Max	11	31	6

Number male calves

Average	1.14	1.07	0.77
Total	513	474	346
Max	6	5	5

Number female calves

Average	1.15	1.20	1.06
Total	517	535	476
Max	6	8	6

Number of animals (cattle)

Average	4.45	4.65	3.76
Total	1,997	2,070	1,694
Max	23	33	18

Number of goats

Average	0.66	0.86	0.82
Total	295	381	369
Max	11	11	15

Number of sheep

Average	0.18	0.27	0.47
Total	82	122	213
Max	13	13	12

Number of animals (small ruminants)

Average	0.84	1.13	1.29
Total	377	503	582
Max	13	15	18

Number of animals (all)

Average	5.29	5.78	5.06
Total	2,374	2,573	2,276
Max	26	33	29
Num farmers without animals	21	12	39
Num farmers with animals	428	433	411
Total farmers	449	445	450

Cow shed wall material

Straw and bamboo	409	343	314
Concrete	36	100	127
No cow shed	4	2	9
Total farmers	449	445	450

Cow shed floor material

Mud	378	25	39
Concrete	67	418	402
None	4	2	9
Total farmers	449	445	450

Cowshed has correct measurement

Yes	36	427	385
No	409	16	56
None	4	2	9
Total farmers	449	445	450

Number of fattening calves

None	178	170	282
1 calf	189	227	137
2 calves	73	40	25
3 calves	6	8	6
4 calves	3	-	-
Total farmers	449	445	450
Average	0.81	0.74	0.46

Do de-worming every 3 months

Yes	22	441	409
No	427	4	41
Total farmers	449	445	450

Know how to administer medicines

Yes	9	439	433
No	440	6	17
Total farmers	449	445	450

Know how to measure body weight

Yes	3	432	418
No	446	13	32
Total farmers	449	445	450

Know how to prepare UMS

Yes	3	444	430
No	446	1	20
Total farmers	449	445	450

Provide concentrated feed

Yes	14	429	353
No	435	16	97
Total farmers	449	445	450

Cultivate HYV fodder

Yes	1	270	144
No	448	175	306
Total farmers	449	445	450

Know types of HYV fodder

Yes	1	440	424
No	448	5	26
Total farmers	449	445	450

Vaccinate regularly

Yes	4	433	336
No	445	12	114
Total farmers	449	445	450

Has general knowledge on diseases

Yes	10	441	427
No	439	4	23
Total farmers	449	445	450

Management of ecto-parasites *

Own management	288	331	343
Veterinary	159	120	104
na	2	1	3
Total farmers	449	445	450

* Some farmers do own management + vet

Has knowledge on balanced animal diet

Yes	5	416	433
No	444	29	17
Total farmers	449	445	450

Cattle selling place

Local market	420	345	394
Outer market	29	100	55
na	-	-	1
Total farmers	449	445	450

Reported livestock related problems

Only included in follow up survey

Lack of quality breed animals

Yes			360
No			90
Total farmers			450

High price of commercial feed

Yes			384
No			66
Total farmers			450

Available of timely vaccination services

Yes			296
No			154
Total farmers			450

Disease prevelance

Yes			283
No			167
Total farmers			450

Low market selling price of animals

Yes			191
No			259
Total farmers			450

Lack of knowledge on cattle rearing

Yes			119
No			331
Total farmers			450

Other problems

Yes			27
No			423
Total farmers			450

Has mobile number of DLS

Yes			144
No			306
Total farmers			450

Received service from DLS

Never			207
Sometimes			213
Always			30
Total farmers			450

FISH

Pond size (decimal)

Average size (decimal)	14.2	14.2	13.8
Max	120	163	100
Count with no pond	33	33	37
Count with pond	416	412	413
Total farmers	449	445	450

Gher size (decimal)

Average size (decimal)	23.5	23.3	23.6
Max	264	264	250
Count with no gher	235	237	208
Count with gher	214	208	242
Total farmers	449	445	450

Pond + Gher (decimal)

Average size (decimal)	37.7	37.5	37.4
Max	274	274	270
Count with no pond or gher	7	3	3
Count with pond and/or gher	442	442	447
Total farmers	449	445	450

Pond ownership

Single owner	378	383	381
Shared ownership	64	59	66
na	7	3	3
Total farmers	449	445	450

Pond type

Perennial	361	408	404
Seasonal	81	34	43
na	7	3	3
Total farmers	449	445	450

Production white fish (kg)

Average	83	161	194
Min	-	-	-
Max	750	1,000	2,000
Total production	36,722	71,161	86,862
Number farmers	442	442	447
na	7	3	3
Num farmers 0 kg	2	1	4
Num farmers > 0 kg	440	441	443
Total farmers	449	445	450

Production Golda (kg)

Average	18	28	80
Min	-	-	-
Max	1,000	400	2,000
Total production	7,923	12,275	35,836
Number farmers	442	441	447
na	7	3	3
Num farmers 0 kg	239	255	158
Num farmers > 0 kg	203	186	289
Total farmers	449	444	450

Production other fish (kg)

Average	9	6	48
Min	-	-	-
Max	500	300	730
Total production	3,797	2,775	21,455
Number farmers	442	441	447
na	7	3	3
Num farmers 0 kg	249	281	223
Num farmers > 0 kg	193	160	224
Total farmers	449	444	450

Total production (kg)

Average	110	195	322
Min	5	5	20
Max	1,700	1,025	2,270
Total production	48,442	86,211	144,153
Number farmers	442	442	447
na	7	3	3
Num farmers 0 kg	-	-	-
Num farmers > 0 kg	442	442	447
Total farmers	449	445	450

Own fish consumption (% of production)

Average consumption (%)	71	50	52
Zero consumption (%)	2	-	-
Consumption (<50)	68	230	204
Consumption (=>50)	374	212	243
na	7	3	3
Total	449	445	450

Fish sale (% of production)

Average sale (%)	29	50	48
Zero sale (%)	158	54	64
Sale (<50)	273	159	160
Sale (=>50)	169	283	287
na	7	3	3
Total farmers	449	445	450

Apply lime

Yes	48	435	438
No	394	7	9
na	7	3	3
Total farmers	449	445	450

Control unwanted fish

Yes	30	422	415
No	412	20	32
na	7	3	3
Total farmers	449	445	450

Knows about fish in different layers of pond

Yes	8	426	416
No	434	16	31
na	7	3	3
Total farmers	449	445	450

Knows stocking density according pond size

Yes	7	423	403
No	435	19	44
na	7	3	3
Total farmers	449	445	450

Main source of fingerlings

Patilwala	399	290	377
Local nursery	22	86	58
Government nursery	1	66	12
Others	20	-	-
na	7	3	3
Total farmers	449	445	450

Knowledge on proper fingerling transportation

Yes	25	442	442
No	417	-	5
na	7	3	3
Total farmers	449	445	450

Knowledge fingerling adaptation ?

Yes	21	441	430
No	421	1	17
na	7	3	3
Total farmers	449	445	450

Apply supplementary feed

Yes	57	440	367
No	385	2	80
na	7	3	3
Total farmers	449	445	450

Apply rice or wheat bran

Yes	119	424	396
No	323	18	51
na	7	3	3
Total farmers	449	445	450

Apply oil cake

Yes	70	385	226
No	372	57	221
na	7	3	3
Total farmers	449	445	450

Apply commercial feed

Yes	122	311	222
No	320	131	225
na	7	3	3
Total farmers	449	445	450

Has knowledge on testing natural feed

Yes	17	442	438
No	425	-	9
na	7	3	3
Total farmers	449	445	450

Has knowledge on proper release method

Yes	4	442	442
No	438	-	5
na	7	3	3
Total farmers	449	445	450

Has knowledge on feed preparation

Yes	8	441	439
No	434	1	8
na	7	3	3
Total farmers	449	445	450

Has knowledge on feeding method

Yes	6	442	444
No	436	-	3
na	7	3	3
Total farmers	449	445	450

Has knowledge on partial harvesting

Yes	56	440	428
No	386	2	19
na	7	3	3
Total farmers	449	445	450

Has knowledge on fish diseases*

Yes	5		
No	437		
na	7		
Total farmers	449		

* This question was only asked in benchmark survey

Reported fish related problems

Only included in follow up survey

Lack of quality fingerlings

Yes			367
No			80
na			3
Total farmers			450

High price commercial feed

Yes			379
No			68
na			3
Total farmers			450

Different diseases

Yes			302
No			145
na			3
Total farmers			450

Water crisis

Yes			217
No			230
na			3
Total farmers			450

Low market selling price of fish

Yes			199
No			248
na			3
Total farmers			450

Lack of knowledge on fish production

Yes			121
No			326
na			3
Total farmers			450

Other problems

Yes			3
No			444
na			3
Total farmers			450

Has mobile number of DOF

Yes			157
No			290
na			3
Total farmers			450

Receives service from DOF

Never			224
Sometimes			185
Always			38
na			3
Total farmers			450

NUTRITION

Do you wash your vegetables before cutting or after cutting?

Wash before	40	437	439
Wash after	409	8	11
Total farmers	449	445	450

Do you wash your hand properly before having meal

Yes	127	443	444
No	322	2	6
Total farmers	449	445	450

Do you cook vegetable immediately after cutting?

Yes	55	444	433
No	394	1	17
Total farmers	449	445	450

Has knowledge on extra food for pregnant and lactating mother

Yes		444	444
No		1	6
Total farmers		445	450

Has knowledge on extra food for infant and adolescent

Yes	49	444	441
No	400	1	9
Total farmers	449	445	450

Vaccination for children

Yes	261	389	379
No	188	56	71
Total farmers	449	445	450

Prevalence of water borne disease

Yes	270	166	259
No	179	279	191
Total farmers	449	445	450

Source of drinking water

Tubewell	327	397	387
Pond	43	3	16
Others	79	45	47
Total farmers	449	445	450

Maintain personal hygiene

Yes	165	440	432
No	284	5	18
Total farmers	449	445	450

Has knowledge on different food category

Yes	7	442	430
No	442	3	20
Total farmers	449	445	450

Has knowledge on special health care for pregnant mother

Yes	27	443	435
No	422	2	15
Total farmers	449	445	450

Has knowledge on special health care for lactating mother

Yes	22	443	444
No	427	2	6
Total farmers	449	445	450

Has knowledge on nutrient deficiency diseases

Yes	5	442	438
No	444	3	12
Total farmers	449	445	450

Type of latrine used

Ring slab	410	440	431
Open	39	5	19
Total farmers	449	445	450

Received nutrition training

Yes	-	445	441
No	449	-	9
Total farmers	449	445	450

Watch Mati-0-manush *

Never			218
Sometimes			201
Always			31
Total farmers			450

Other questions *

Contact farmer organizes group activity			105
Collective fish selling			97
Collective vaccination services			154
Communicate with contact farmer			323
Contact farmer organizes demos			201
Contact farmer no communication			132
Total farmers			450

* These questions only asked in Follow-up survey

Annex 2 – List of FFS in Cycle 2, Khulna

ID	WMG name	Polder	Union name	Upazila name	Facilitator 1	Facilitator 2
45	Darun Mallik	22	Deluti	Paikgachha	Waliullah	Hafsa
46	Noai	22	Deluti	Paikgachha	Waliullah	Hafsa
47	Fulbari	22	Deluti	Paikgachha	Waliullah	Hafsa
48	Harinkhola	22	Deluti	Paikgachha	Waliullah	Hafsa
49	Gopepagla *	22	Deluti	Paikgachha	Shahidul	Zahida
50	Saidkhali *	22	Deluti	Paikgachha	Shahidul	Zahida
51	Telikhali (P22)	22	Deluti	Paikgachha	Shahidul	Zahida
52	Kalinagar	22	Deluti	Paikgachha	Shahidul	Zahida
53	Chak Solemari	30	Batiaghata	Batiaghata	Salam	Nargis
54	Bajeafti Debitala	30	Gangarampur	Batiaghata	Salam	Nargis
55	Kismat Phultala	30	Batiaghata	Batiaghata	Salam	Nargis
56	Khalsibunia	30	Batiaghata	Batiaghata	Salam	Nargis
57	Hetalbunia	30	Batiaghata	Batiaghata	Rasel	Aklima
58	Maitbhanga-Bhennabunia	30	Batiaghata	Batiaghata	Rasel	Aklima
59	Hatbati Dakshin	30	Batiaghata	Batiaghata	Rasel	Aklima
60	Basurabad	30	Batiaghata	Batiaghata	Rasel	Aklima
61	Andharia Khejurtala	30	Gangarampur	Batiaghata	Zakir	Nasima
62	Masiar Danga	30	Gangarampur	Batiaghata	Zakir	Nasima
63	Phultala	30	Batiaghata	Batiaghata	Zakir	Nasima
64	Boyarbhanga Madhya	30	Gangarampur	Batiaghata	Zakir	Nasima

* The FFS marked with * were note included in the report (Technical note #18)