Welcome

Impact Assessment on Fisheries Development Activities under Blue Gold Program

Presented by:

Md. Monwar Hossain

Independent Consultant

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Objectives of the Blue Gold Program

The overall objective of the Blue Gold Program (BGP) is to reduce poverty in the coastal area by enhancing the livelihood of the rural population, through more efficient water resources management and increase productivity of mainly crops, fishery and livestock in the polders and by empowering the communities to be the driving force.

The specific objectives of the Program are to:

- Increase sustainability of the development of the polders through effective community participation;
- Protect floods and use water resources effectively;
- Increase farmers' income and strength livelihood through improved productivity; and
- Improve environment, drinking water and sanitation. The living environment will be realized, balanced nutrition, and good governance issues are well understood and applied.

Objectives of the Assessment

To prepare an impact assessment report comprising summary of all kinds of fisheries development activities and outcome/impact in project area.

- To find out **percentage of farmers** are continuing with improved technology and learning;
- To explore **adoption of improved technology** and learning among non-direct participating farmers;
- To assess **level of fish intake** before and after BGP intervention;
- To estimate **production situation** of direct beneficiaries.

Activities

Data collected from primary as well as secondary sources:

- **Primary sources include:**
  - Questionnaire for participants of FFS/CLF/CFWM;
  - Focus Group Discussion (FGD);
  - Household (HH) visit;
  - Field visit/observation;
  - Key persons interview related to IF activities;
  - KII with other key informants:
    - District Fisheries Officers; Farm Managers of DoF, Fingerling Traders.
- **Secondary data collected from available reports of Blue Gold Program. Both qualitative and quantitative methods were used to conclude the assessment.**

Activities (contd.)

Table-1A: FFS Selected Sites:

Date	Time	District	Location	FFS Farmers			Non-FFS Farmers		
				Male	Female	Total	Male	Female	Total
03.11.2019	10.30 am	Dumuria Khulna	Polder 34/2 Bujbunia FFS	01	09	10	04	03	07
05.11.2019	11.30 am	Dumuria Khulna	Polder 25 Gonali FFS	08	05	13	05	03	08
06.11.2019	09.30 am	Batiaghata Khulna	Polder 28/1 Raj Bundh Dakshin FFS	04	10	14	03	02	05
Sub-total Khulna				**13**	**24**	**37**	**12**	**08**	**20**
07.11.2019	10.00 am	Kalapara Patuakhali	Polder 47/4 Haripara Swanirvar Khal FFS	04	05	09	03	04	07
07.11.2019	11.45 am	Kalapara Patuakhali	Polder 47/4 Shapla Dogir Khal FFS	03	09	12	05	01	06
08.11.2019	10.30 am	Sadar Patuakhali	Polder 43/2B South-East Badura FFS	08	01	09	05	01	06
Sub-total Patuakhali				**15**	**15**	**30**	**13**	**06**	**19**
Total				**28**	**39**	**67**	**25**	**14**	**39**

Activities (contd.)

Table-1B: No. of CLF/CFWM Farmers Interviewed through FGD/KII/Visit

Date	Time	District	Location	CLF/CFWM Farmers			Non- CLF/CFWM Farmers		
				Male	Female	Total	Male	Female	Total
04.11.2019	10.00 am	Satkhira	Polder 2 Jhiar Khal CLF	12	05	17	05	03	08
04.11.2019	01.00 pm	Satkhira	Polder 2, Shalle West & Beradangi WMG (CFWM)	15	02	17	04	05	09
Sub-total Satkhira				**27**	**07**	**34**	**09**	**08**	**17**
05.11.2019	03.00 pm	Dumuria Khulna	Polder 27/1 Beel Patiala WMG (CLF)	06	02	08	03	01	04
07.11.2019	01.30 pm	Kalapara Patuakhali	Polder 47/4 Dhulasar WMG (CLF)	05	-	05	02	-	02
Total				**38**	**09**	**47**	**14**	**09**	**23**

Activities (contd.)

Table-1C: Selected Innovation Fund (IF) Fisheries Program Sites

Zone	Polder	Name of the Project	Implementing Organization	Year of implement ation
Khulna and Patuakhali	P 29,30 43/1A, 43/2F	Ecopond and empowerment of women for the Blue Gold Polders	WorldFish	2016-17
Satkhira	P 2	Aquaculture intervention in seasonal waterlogged areas	Bangabandhu Sheikh Mujibur Rahman Agricultural University	2017-18
Patuakhali	P43/1A 43/2F, 55/2A, 55/2C, 47/3, 47/4	Augmenting Homestead Pangasius, *Pangasianodon hypophthalmus* Aquaculture Productivity in three Upazilas of Patuakhali Region through Community Participation	Innovision Agro Service Ltd.	2018-19

Information of Participants

Table-1D.1: Basic Information of FFS Members Participated in FGD/KII

Districts	Gender		Pond size		Pond Type		Ownership		Occupation	
	Male	Female	Average (decimal)	Max (decimal)	Seasonal	Perennial	Single	Shared	Agriculture	Other
Khulna (n=37)	13	24	12	85	11%	89%	86%	14%	97%	03%
Patuakhali (n=30)	15	15	10	50	10%	90%	93%	07%	80%	20%

Table-1D.2: Basic Information of non-FFS Members Participated in FGD/KII

Districts	Gender		Pond size		Pond Type		Ownership		Occupation	
	Male	Female	Average (decimal)	Max (decimal)	Seasonal	Perennial	Single	Shared	Agriculture	Other
Khulna (n=20)	12	08	10	50	10%	90%	95%	05%	95%	05%
Patuakhali (n=19)	13	06	09	45	16%	84%	89%	11%	74%	26%

Information of Participants

Table-1E: Basic Information of FFS Farmers Participated in FGD/KII

Date	Time	District	Location	FFS Farmers		
				Male	Female	Total
03.11.2019	10.30 am	Dumuria Khulna	Polder 34/2 Bujbunia FFS	01	09	10
05.11.2019	11.30 am	Dumuria Khulna	Polder 25 Gonali FFS	08	05	13
06.11.2019	09.30 am	Batiaghata Khulna	Polder 28/1 Raj Bundh Dakshin FFS	04	10	14
			Sub-total Khulna	**13**	**24**	**37**
07.11.2019	10.00 am	Kalapara Patuakhali	Polder 47/4 Haripara Swanirvar Khal FFS	04	05	09
07.11.2019	11.45 am	Kalapara Patuakhali	Polder 47/4 Shapla Dogir Khal FFS	03	09	12
08.11.2019	10.30 am	Sadar Patuakhali	Polder 43/2B South-East Badura FFS	08	01	09
			Sub-total Patuakhali	**15**	**15**	**30**
			Total	**28**	**39**	**67**

Information of Participants

Table-1F: Basic Information of CLF/CFWM Members Participated in FGD/KII

Date	Time	District	Location	CLF/CFWM Farmers			Non- CLF/CFWM Farmers		
				Male	Female	Total	Male	Female	Total
04.11.2019	10.00 am	Satkhira	Polder 2 Jhiar Khal CLF	12	05	17	05	03	08
04.11.2019	01.00 pm	Satkhira	Polder 2, Shalle West & Beradangi WMG (CFWM)	15	02	17	04	05	09
Sub-total Satkhira				**27**	**07**	**34**	**09**	**08**	**17**
05.11.2019	03.00 pm	Dumuria Khulna	Polder 27/1 Beel Patiala WMG (CLF)	06	02	08	03	01	04
07.11.2019	01.30 pm	Patuakhali Kalapara	Polder 47/4 Dhulasar WMG (CLF)	05	-	05	02	-	02
Total				**38**	**09**	**47**	**14**	**09**	**23**

Findings/Outcome

Table-2A: Technology Adoption by FFS Farmers

Sl No.	Subject	Khulna (% of farmers)						Patuakhali (% of farmers)					
		Benchmark*			End line			Benchmark*			End line		
		Not done	Partial	Practiced	Not done	Partial	Practiced	Not done	Partial	Practiced	Not done	Partial	Practiced
1	Pond Preparation	74	24	**2**	0	3	**97**	72	22	**1**	0	0	**100**
2	Selection of fingerlings	92	7	**1**	0	3	**97**	90	9	**1**	1	5	**95**
3	Stocking ratio	90	8	**2**	0	0	**100**	97	2	**1**	0	0	**100**
4	Ponds fertilization	0	0	**0**	0	3	**97**	0	0	**0**	0	5	**95**
5	Testing natural feed	98	1	**1**	0	0	**100**	99	0	**1**	0	0	**100**
6	Use of supplementary feed	49	50	**13**	0	0	**100**	89	11	**1**	0	0	**100**
7	Fish Sampling	98	1	**1**	0	0	**100**	99	1	**0**	0	0	**100**

Technology Adoption by FFS Farmers of Khulna District

Figure 1: Technology Adoption by FFS Farmers of Khulna District

Findings/Outcome (contd.)

Table-2B: Technology Adoption by non-FFS Farmers

Sl No.	Subject	Khulna (% of farmers)						Patuakhali (% of farmers)					
		Benchmark			End line			Benchmark			End line		
		Not done	Partial	Practiced	Not done	Partial	Practiced	Not done	Partial	Practiced	Not done	Partial	Practiced
1	Pond Preparation	74	24	**2**	9	26	**65**	72	22	**1**	6	25	**69**
2	Selection of fingerlings	92	7	**1**	4	10	**86**	90	9	**1**	2	10	**88**
3	Stocking ratio	90	8	**2**	16	6	**78**	97	2	**1**	9	5	**86**
4	Ponds fertilization	0	0	**0**	16	26	**58**	0	0	**0**	29	10	**61**
5	Testing natural feed	98	1	**1**	14	13	**73**	99	0	**1**	9	15	**76**
6	Use of supplementary feed	49	50	**13**	8	12	**80**	89	11	**1**	8	10	**82**
7	Fish Sampling	98	1	**1**	10	12	**78**	99	1	**0**	3	14	**83**
8	Average			**3**			**74**			**1**			**78**

Technology Adoption by non-FFS Farmers (contd.)

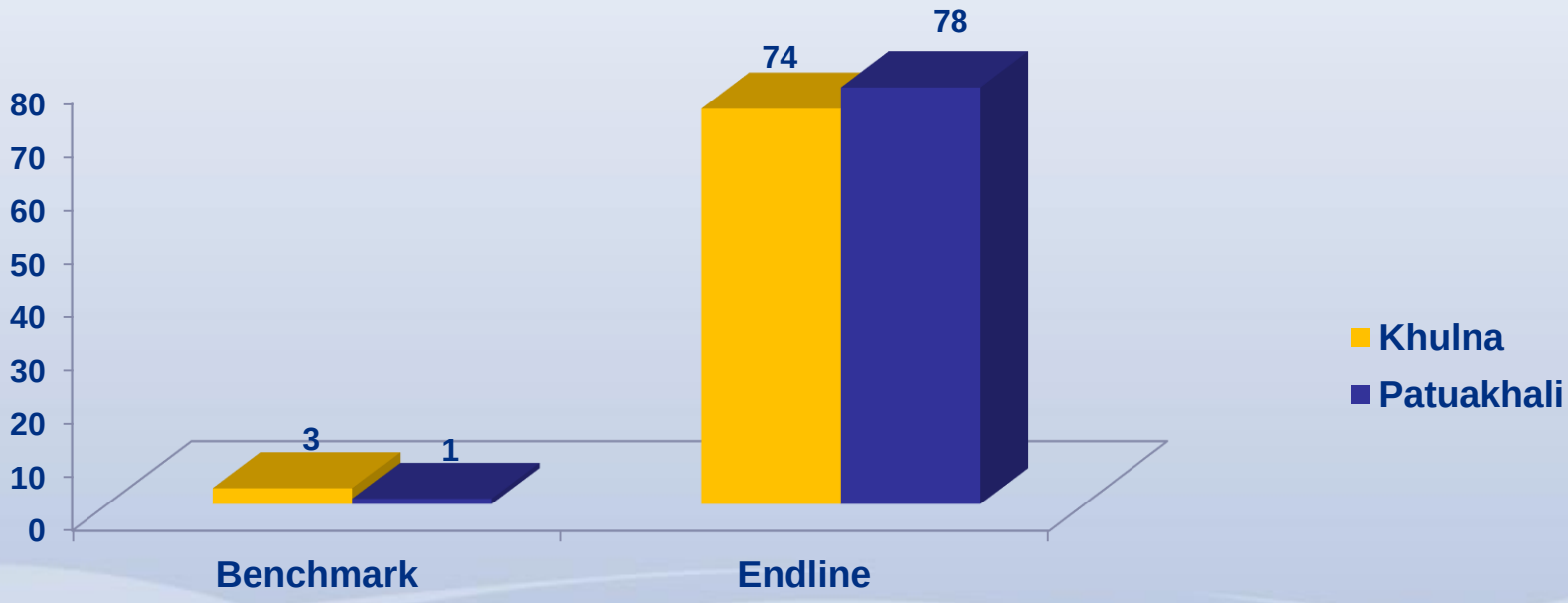

Figure 2: Technology Adoption by non-FFS Farmers (Average of major fish culture activities)

Increase of Fish Production

Table-3A: Increase of fish production (FFS Farmers)

Sl. No.	Districts	Pond Size (average) (decimal)	Total Area (decimal)	Total Area (hectare)	Baseline Production per hectare (kg)	Total Baseline Production (kg)	Gross End Production (kg)	Increase (kg)	Increase per Farmer (kg)	Average Increase per Farmer (kg)
1	2	3	4	5	6	7	8	9	10	11
1	Khulna (n=37)	12	444	1.80	519	933	6216	5283	143	115
2	Patuakhali (n=30)	10	300	1.21	988	1200	3600	2400	80	

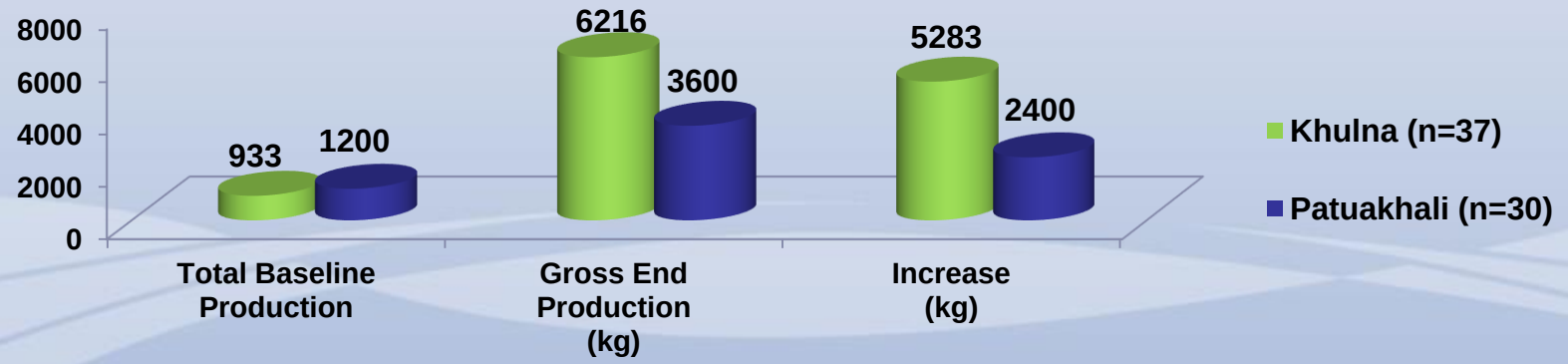

Figure 3: Increase of fish production (FFS Farmers)

Increase of Fish Production (contd.)

Table-3B: Increase of fish production (non-FFS Farmers)

Sl. No.	Districts	Pond Size (average) (decimal)	Total Area (decimal)	Total Area (hectare)	Baseline Production per hectare (kg)	Total Baseline Production (kg)	Gross End Production (kg)	Increase (kg)	Increase per Farmer (kg)	Average Increase per Farmer (kg)
1	2	3	4	5	6	7	8	9	10	11
1	Khulna (n=20)	12	240	0.97	519	504	2400	1896	95	63
2	Patuakhali (n=19)	10	190	0.77	988	760	1330	570	30	

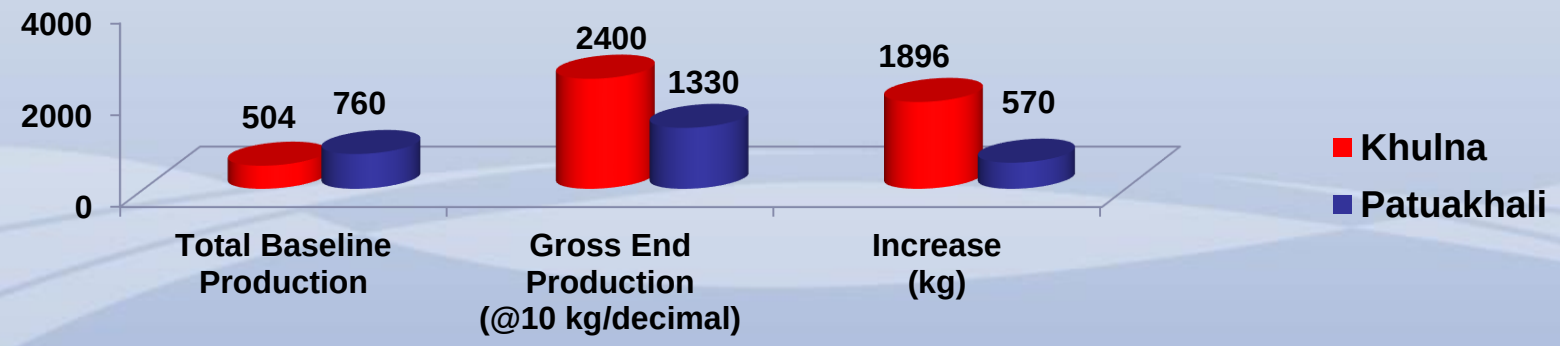

Figure 4: Increase of fish production (non-FFS Farmers)

Increase of Fish Production (contd.)

Table-3C: Increase of fish production by CLF/CFWM

Sl. No.	Districts	Polder No.	Number of Canals	Total Area (decimal)	Total Area (hectares)	Baseline Production per hectare	Total Baseline Production	Gross End Production (kg)	Increase (kg)
1	Khulna CLF (n=08)	**27/1**	**1**	**200**	**0.81**	**519**	**420**	**2000**	**1580**
2	Patuakhali CLF (n=05)	**47/4**	**1**	**125**	**0.51**	**988**	**500**	**1250**	**750**
3	Satkhira CLF (n=34)	**2**	**2**	**1118**	**4.53**	**692**	**3133**	**7832**	**4699**

Increase of Fish Production (contd.)

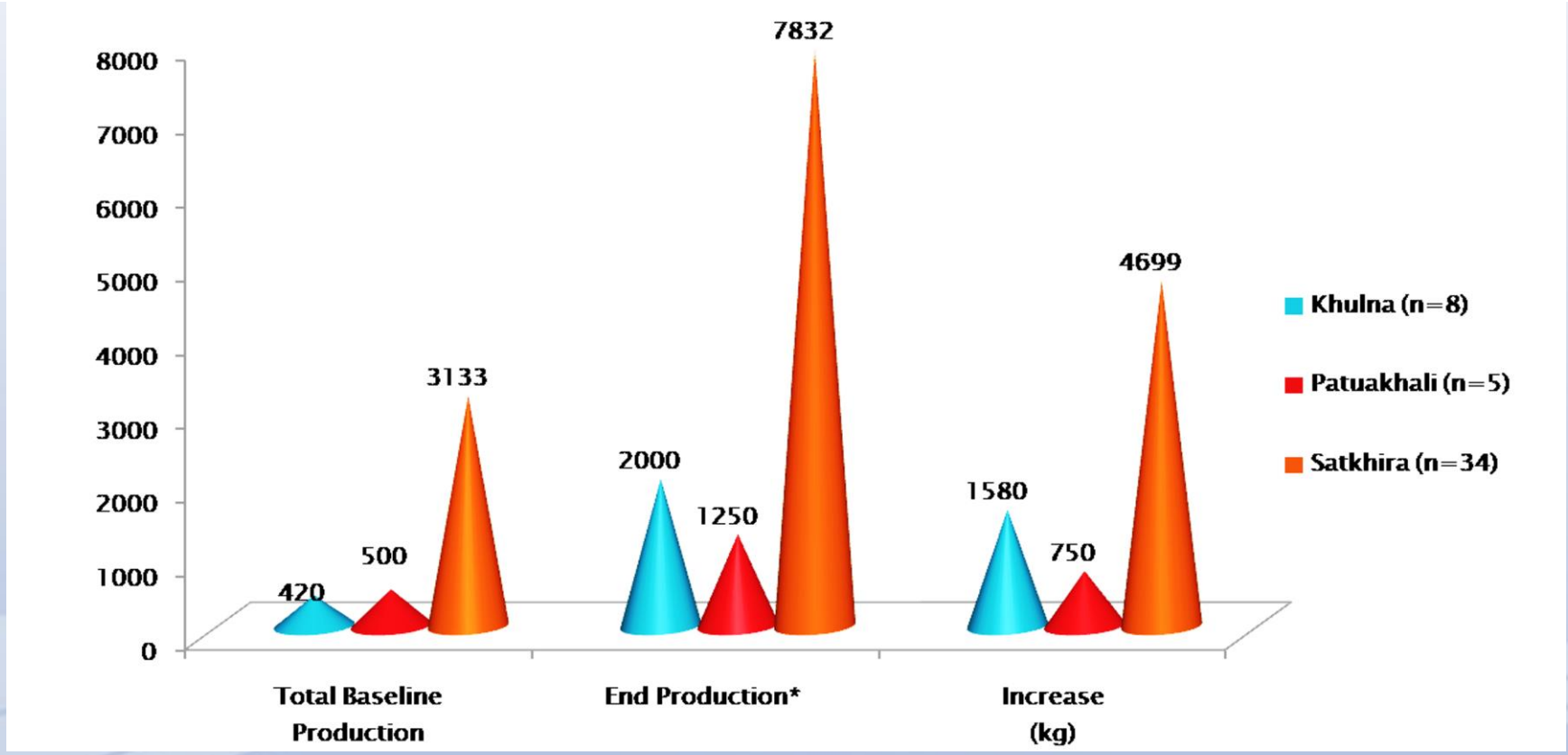

Figure 5: Increase of fish production by CLF/CFWM

Comparative Study with BGP Surveys (FFS Farmers)

Table-4A: Pond Preparation Practices by FFS Farmers

Sl No.	Pond Preparation Practices by FFS Farmers	Benchmark (%)	Cycle 5 to Cycle 9 (November 2015 to November 2017)	Practiced during Impact Assessment on November 2019
1	2	3	4	5
	Practiced Pond Preparation	1	99	99
	Partly Pond Preparation	17	1	1
	No Pond Preparation	81	0	0

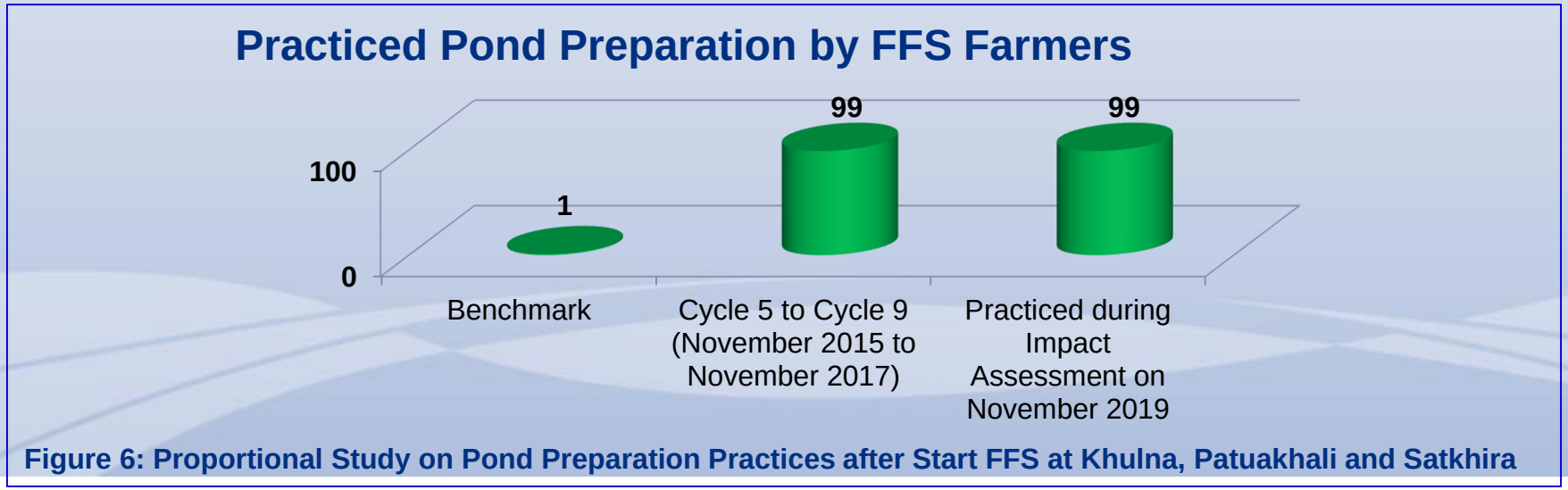

Figure 6: Proportional Study on Pond Preparation Practices after Start FFS at Khulna, Patuakhali and Satkhira

Comparative Study with BGP Surveys (non-FFS Farmers)

Table-4B: Pond Preparation Practices by non-FFS Farmers

Sl No.	Pond Preparation Practices by non-FFS Farmers	Benchmark (%)	Cycle 5 to Cycle 9 (November 2015 to November 2017)	Practiced during Impact Assessment on November 2019
1	2	3	4	5
	Practiced Pond Preparation	1	78	99
	Partly Pond Preparation	17	12	1
	No Pond Preparation	81	10	0

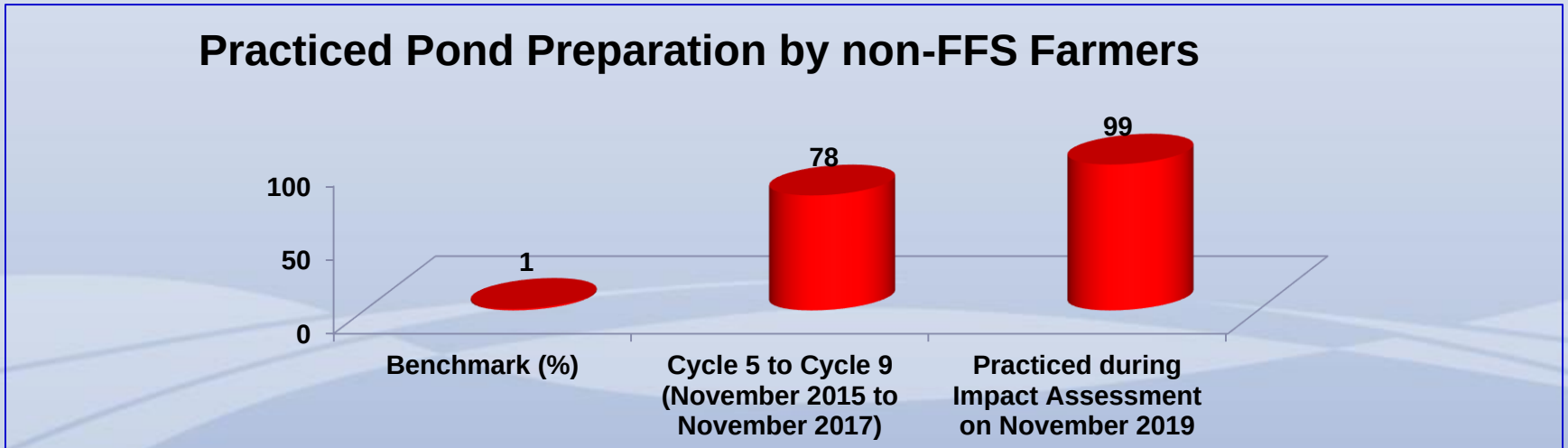

Figure 7: Proportional Study on Pond Preparation Practices after Start FFS at Khulna, Patuakhali and Satkhira by non-FFS Farmers

Comparative Study with BGP Surveys (Fish Production)

Table 4C: Proportional Study on Gradual Increment of Fish Production after Start FFS at Khulna, Patuakhali and Satkhira

Sl No.	Production	Benchmark (kg/hec)	Cycle 5 to Cycle 9 (November 2015 to November 2017)	Production during Impact Assessment on November 2019 (End line 2019)
1	2	3	4	5
	Total fish per farmer (kg)	33.2	110	155.5
	Total fish per decimal (kg)	3.1	10.3	13.2
	Total fish per hectare (kg)	757	2544.10	3258.8

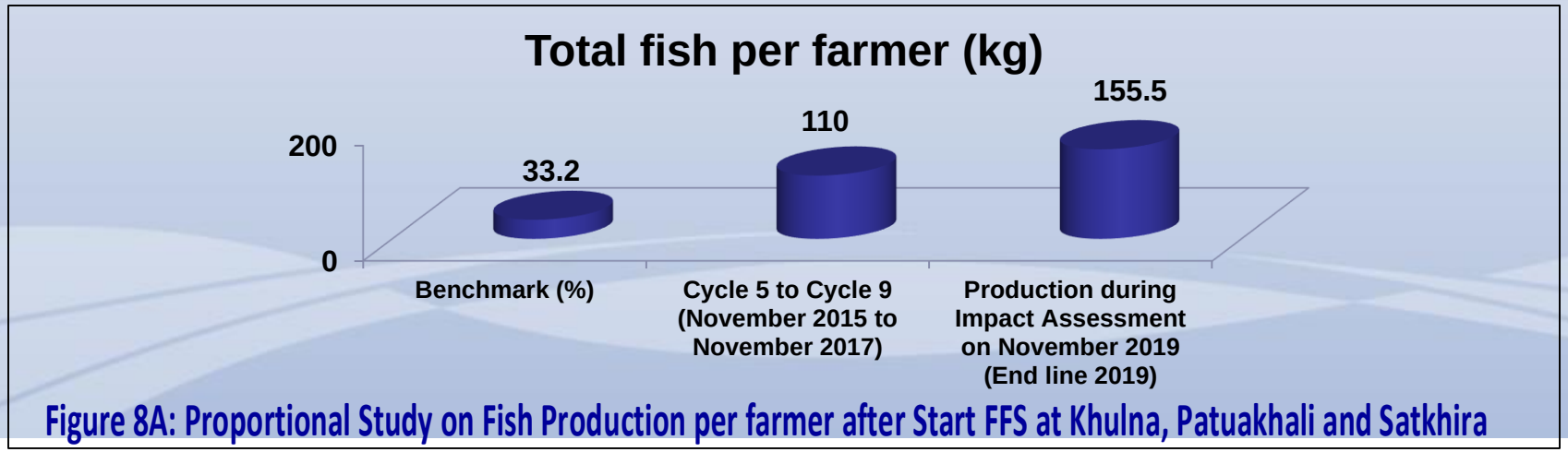

Figure 8A: Proportional Study on Fish Production per farmer after Start FFS at Khulna, Patuakhali and Satkhira

Comparative Study with BGP Surveys (Fish Production) (contd.)

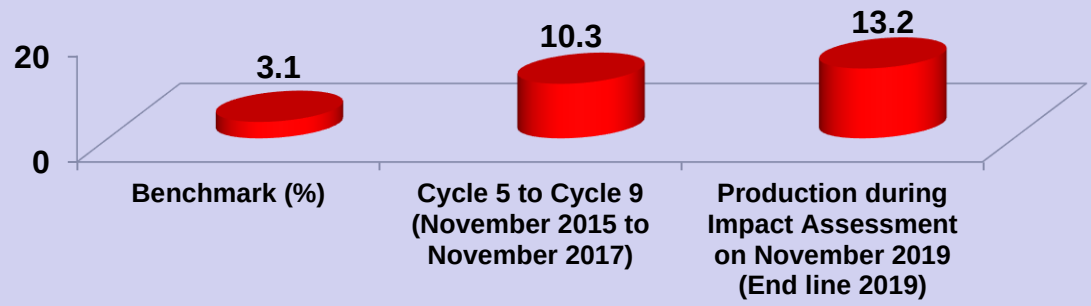

Figure 8B: Proportional Study on Fish Production per decimal after Start FFS at Khulna, Patuakhali and Satkhira

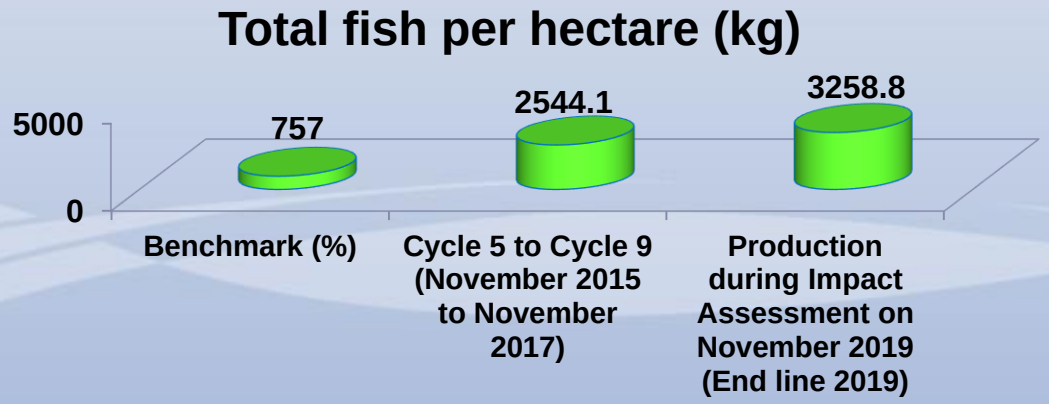

Figure 8C: Proportional Study on Fish Production per hectare after Start FFS at Khulna, Patuakhali and Satkhira

Fish Intake

Table 5: Level of fish intake (FFS Farmers)

Sl No.	District	Number of Farmers	Total Pond Area (hec)	Total Baseline Production (kg)	Gross End Production (kg)	Family Members (@5 per family)	Baseline Consumption (@ 3.0 kg/year)	End line Consumption (@12.0 kg/year)	Consumption Increase (kg/year)
1	Khulna	45	2.19	1135	7560	225	675	2700	2025
2	Patuakhali	35	1.42	1400	4900	175	525	2100	1575
3	Satkhira	34	1.38	1310	4760	170	510	2040	1530
	Total	**114**	**4.98**	**3845**	**17220**	**570**	**1710**	**6840**	**5130**

Fish Intake (contd.)

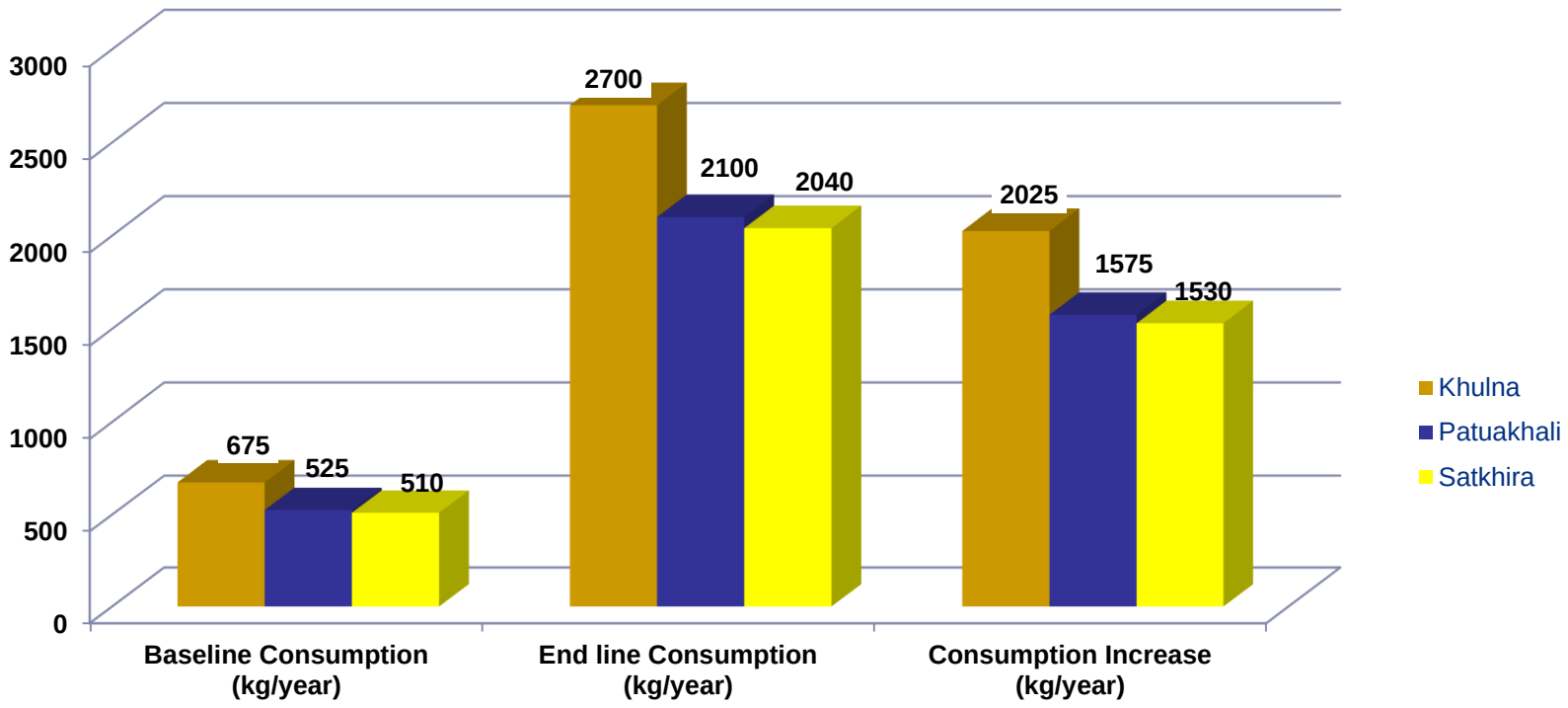

Figure 9: Level of fish intake (FFS Farmers)

Subsistence to Surplus Shift

Table 6: Subsistence to Surplus Shift

Sl No.	District	Number of Farmers	Total Pond Area (hectares)	Baseline Production (kg)	Total Baseline Production (kg)	Gross End Production (kg)	Family Members (@5 per family)	Baseline Consumption (kg/year)	End line Consumption (kg/year)	Distribution to Others (kg/year)	Consumption Increase (kg/year)	Surplus Production (kg/year)
1	Khulna	37	1.80	519	933	6216	185	555	2220	740	2960	3256
2	Patuakhali	30	1.21	988	1200	3600	150	450	1800	600	2400	1200
	Total	67	3.01		2133	9816	335	1005	4020	1340	5360	4456

Subsistence to Surplus Shift (contd.)

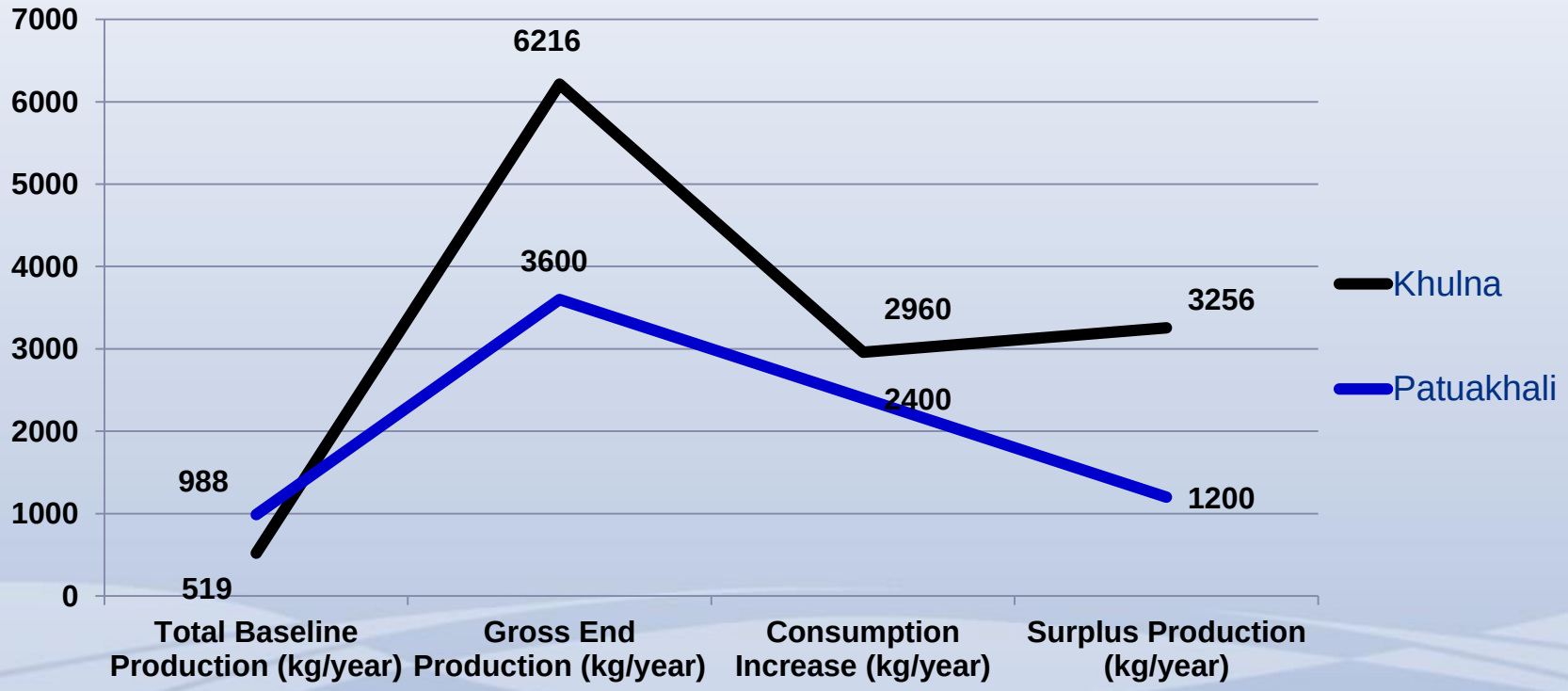

Figure 10: Subsistence to Surplus Shift

Efficiency of BGP Investment in Fisheries Development Activities

(Cost-Benefit Analysis of FFS)

Table 7A: Cost-Benefit Analysis of FFS Participants for the Polder 47/4

Number of FFS Conducted in Polder 47/4	Cost			Production					Gross Production Increase (metric tonnes) (Col 9* Col 6)	Gross Return (Production Increase*** 100000 BDT)	Gross Return per farmer (Col 11/ Col 3) (BDT)	Cost Benefit Ratio (Col 12/ Col 4) (Return/ Costs
	Total Cost (Col 1* 51553) (BDT)	Total Farmers Involved (Col 1* 25)	Cost per Farmer (Col 2/ Col 3) (BDT)	Pond Area (average) (hectares)	Total Pond Area (Col 3* Col 5) (hectares)	Baseline Production per Hectare (metric tonnes)	End line Production per Hectare (m.ton)	Production Increase per Hectare (m. ton)				
1	2	3	4	5	6	7	8	9	10	11	12	13
13	670189	325	2062.12	0.0405	13.158	0.988	2.717	1.729	22.75	2275000	7000	3.39

Efficiency of BGP Investment in Fisheries Development Activities
(Cost-Benefit Analysis of FFS) (contd.)

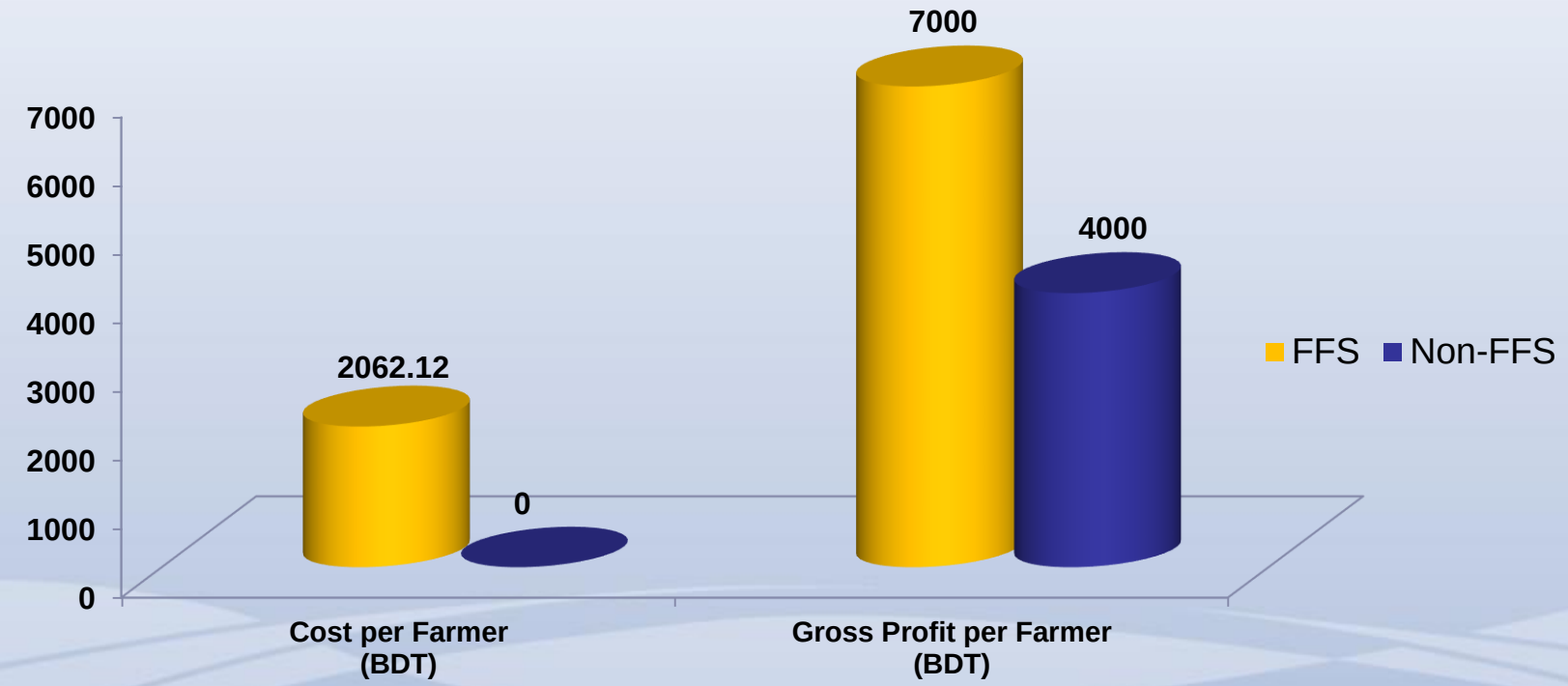

Figure- 11: Cost-Benefit Analysis of FFS Participants for the Polder 47/4

Employment Impacts

Year / Activities	2014		2015		2016		2017		2018		2019		Activity Total	Total beneficiaries
	Activity Nos.	Beneficiaries	Activity Nos.	Beneficiaries	Activity Nos.	Beneficiaries	Activity Nos.	Beneficiaries	Activity Nos.	Beneficiaries	Activity Nos.	Beneficiaries		
Fish FFS	44	1100	48	1200	88	2200	57	1425	38	950	13	325	**288**	**7200**
Tilapia MFS	-	-	20	500	-	-	-	-	-	-	-	-	**20**	**500**
CLF	-	-	-	-	-	-	23	161	13	91	-	-	**36**	**252**
CFWM	-	-	-	-	-	-	-	-	1	7	2	14	**3**	**21**
Total	**44**	**1100**	**68**	**1700**	**88**	**2200**	**80**	**1586**	**52**	**1048**	**15**	**339**	**347**	**7973**
Cumulative Total	**44**	**1100**	**112**	**2800**	**200**	**5000**	**280**	**6586**	**332**	**7634**	**347**	**7973**	-	-
Indirect Cumulative		**550**		**1400**		**2500**		**3293**		**3817**		**3987**	-	-

Employment Impacts (contd.)

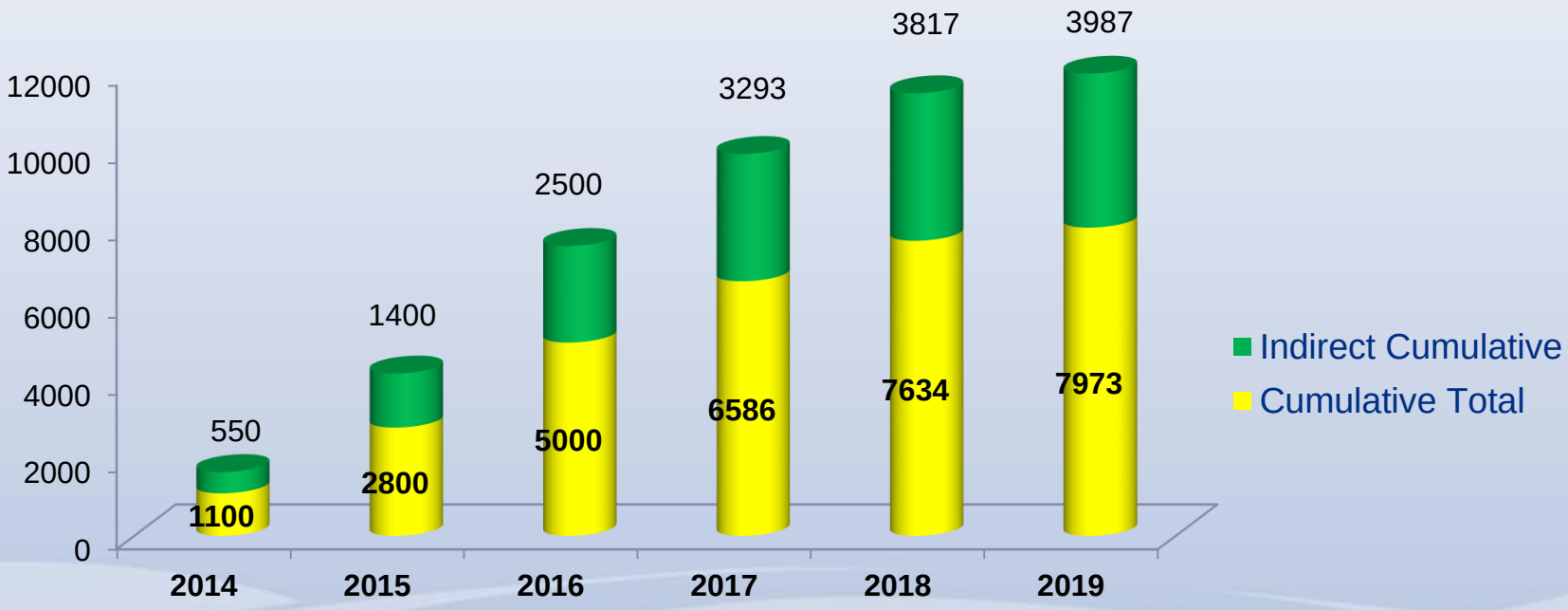

Figure- 12: Employment Impacts of FFS Activities by BGP

Impact Analysis on Employment

Table 7C: Impact Analysis on Employment by BGP Activities:

Total farmers trained (288 FFSs)	Approximation for a single farmer			Total man days (7200 farmers) (26.25 X 7200)	Wages per day (BDT)	Additional income generated from fish culture (column 5 X column 6) (BDT)
	Total days engaged for fish culture (7 months X 30)	Total hours spent for fish culture (1 hour per day)	Total man days (8 working hours for one day) (column 3÷8)			
1	2	3	4	5	6	7
7200	210	210	26.25	1,89,000	300	5,67,00,000

Framer Trainers (FTs)

FTs were trained to run FFS sessions, ensuring sustainability of this training process.

FTs are members of the local community or Water Management Groups (WMGs)

- 95 FTs trained under the program of which 41% are women
- FTs continue home visits to support farmers

Strength

1. “Agriculture is a business”- Now farmers have access/linkage to backward and forward market actors.
2. Farmers are producing as per market demand for additional income
3. Apart from fisheries, knowledge about agriculture and livestock has been increased
4. Boosts up confidence of participants and farmer to farmer extension
5. The social network expanded; get in touch with people from different professions related to fisheries has been made
6. By hands on learning, training on pond sites, and developing the skills of farmers in eco-friendly fisheries activities
7. Fish FFS rely on farmers' own inventions and experiences.
8. Expected fish are also being produced in unused waterbodies through the formation of CLF and CFWM.

Weakness

1. When the farmers are busy with their agricultural activities, could not attend all the sessions

2. Disruption of training by non-farmer members

3. Facilitation could convey only a basic idea of technical issues, it is often not possible to look into deeper into the subject

4. FFS is a little more expensive than other training.

5. Group chaos among CLF & CFWM often arises.

Opportunity

1. Fish FFS is a suitable platform for the exchange of ideas/ knowledge/experiences on fish culture that farmers have acquired
2. Most of the Fish FFS participants are illiterate/less-educated, FFS might be a good platform for them.
3. FFS is very useful in meeting-up the short-term needs of the farmers
4. Production from unused waterbodies in water-logged areas
5. The innovator, early adaptor farmers of the society, more than ever women could directly engage in production activities
6. A successful farmer is also exemplary to others in society.

Threats

1. Difficulty in conducting sessions if there are participants of different educational qualifications in the same group;
2. The behavior of participants of different ages varies;
3. In mixed groups (male and female), dominance of male members;
4. Influencers of the society entered into the group during the formation of Community Led Fisheries (CLF) and Community Led Fisheries and Water Management (CFWM).

ক্রমিক নং	মাছের নাম	সংখ্যা
১	রুই	৬০
২	কাতলা	৩০
৩	মৃগেল	৬০
৪	সিলভার কার্প	৪৮
৫	কমন কার্প	১৮
৬	গ্রাস কার্প	৩০
৭	সরপুঁটি	৯০