

Blue Gold Program

Communication interventions and extension methods



Agro-Insight

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A study of sharing information with farmers in Bangladesh

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Acronyms and glossary

BADC	Bangladesh Agricultural Development Corporation
BGP (or BG)	Blue Gold Program
bigha	One third of one acre (i.e. 1333 square meters)
bil	Seasonally flooded lowland. Also spelled “beel”
BR52	BRRRI-dhan-52, a new HYV of rice
BWDB	Bangladesh Water Development Board
CAHW	Community animal health worker
CAWM	Community-led agricultural water management
CDF	Community development facilitator
CII	Cropping intensity initiative
CIMMYT	International Maize and Wheat Improvement Centre
DAE	Department of Agricultural Extension
DLS	Department of Livestock Services
DOF	Department of Fisheries
EC	Executive committee (e.g. of WMG)
FFS	Farmer field school
FT	Farmer trainer
hazol	A type of improved hen nest with an earthen base and space for food and water. Also spelled “hazal.”
HL	Horizontal learning
HYV	High yielding variety
IPSWAM	Integrated Planning for Sustainable Water Management (a precursor to BGP)
LGED	Local government engineering department
MFS	Market-oriented field school
O&M	Operation and maintenance
Q&A	Question and answer
SAAO	sub-assistant agricultural officer
TA	Technical Assistance
UAO	Upozila Agriculture Officer
UP	Union Parishod(also spelled “parishad”)
upozila	Sub-district (also spelled “upazila”)
WMA	Water management association (a group of WMGs)
WMG	Water management group
WMO	Water management organisation (e.g. WMA, WMG)

Summary

The Blue Gold Program is implemented by BWDB and DAE (with support from the Netherlands) to provide local communities with additional security against floods and to pursue sustainable socio-economic development through participatory water management and diversified farming practices with an orientation on markets. By developing the institutional framework; investing in water resources infrastructure and strengthening production services, Blue Gold aspires to help reduce poverty and enhance food security.

The Blue Gold Program addresses poverty and vulnerability in 22 polders in the south-west coastal zone by developing the capabilities of 500+ water management groups (WMGs) to cooperate in managing water resources to obtain increased agricultural productivity and surplus for the economic development of the communities. WMGs are stimulated to build partnerships with private sector services and suppliers, and with local government and technical agencies such as DAE and BWDB. There are an estimated 200,000 households represented in the WMGs.

Of the 200,000 households that Blue Gold has set out to reach, only about 20,400 have been reached directly through Farmer Field Schools (FFSs) and Market-Oriented Farmer Field Schools (MFSs). By 2020, Blue Gold aims to reach more households with the core messages through a variety of training and extension methods. There is a need to share information with many more households, than Farmer Field School can reach. Furthermore, even those WMG members who do take a Blue Gold FFS only receive training on one or a few topics, not on the full range of information that BGP has to offer.

The Program uses a large set of extension methods. In order to improve the effectiveness of these methods, Blue Gold asked Agro-Insight to support the BGP team in taking stock of its extension methods, to identify the practical improvements of these approaches and suggest additional extension methods that will help Blue Gold scale up in an efficient and cost-effective way while safeguarding the quality of local capacity building efforts.

The scope of work (Annex 1) directed the team of Agro-Insight and Blue Gold professionals to fine-tune the mix of extension methods used by Blue Gold's Technical Assistance (TA) team. "Fine tune" is a well-chosen metaphor. TA is doing a good job sharing much information with farmers living in the polders. However, some small

changes could improve TA's performance, and to help them go to scale more efficiently.

Blue Gold uses a mix of well-tried methods (e.g. FFS and conventional extension through CDFs) with more innovative approaches (e.g. crop cutting field days and fact sheets describing village success stories). The staff are encouraged to innovate methods as they go along, leading to new extension methods such as notice boards or low-cost written material photocopied onto different colours of paper.

Most extension programs rely on a handful of methods, while Blue Gold has a more creative, or exploratory philosophy that encourages new methods. However, this often involves splintering older approaches, so that there are three types of field schools (for field crops, for other crops and market oriented field schools). Several methods use field days and there are three styles of agricultural fairs, various types of coordination meetings and workshops and at least five types of written material. Similar methods with different names often share the same broad strengths and weaknesses.

Drama can engage a community and introduce the Program to new areas. Drama demands a lot of staff time to produce. Blue Gold is doing such interesting work that several TV journalists have made videos on Blue Gold topics. The TV program *Mati-o-Manush* has made twenty-two programs featuring WMGs and Blue Gold staff about field crops (watermelon, sesame, different vegetables, sugar beet etc.), poultry, livestock, fish, homestead gardens, CAWM and agricultural fairs. These and other videos could be screened in communities by CDFs or others using smart projectors. The smart projectors can be loaded with any videos, and can connect to the Internet to access more material. Leaflets, posters, newsletters, one-pagers and other written material are low-cost and provide a permanent record of the Program's work. Written material could be more effective if more copies were printed. Sign boards at Blue Gold sites are useful, but could say a bit more, to share more information with the public. Notice boards are apparently a local innovation, in at least two communities. These signs show that at least some WMGs now feel empowered enough to state the rules of water management, in public, in writing.

Coordination meetings and workshops seem to have been effective, judging by the level of engagement between Blue Gold and local officials. Making catchment area maps is an innovating way to learn about the landscape with local people.

Community facilitation by CDFs is the backbone of Blue Gold. Each CDF has about five WMGs and visits them frequently to teach,

mentor and organise. The WMG annual action plans are a unique approach, helping to document and schedule the work with the groups, but the plans could be written in a more farmer-friendly style.

Fact sheets document village success stories and have been distributed as a book to CDFs and WMGs. More could be done to encourage their use. CAWM, crop cutting field days, cropping intensity initiatives and exchange visits between water management organisations are effective; more could be done with this (e.g. a demo could have more than one exchange visit).

Farmer field schools (three types) are generally high in quality, but reach relatively small audiences. Farmer field schools could be scaled up by filming learning videos with FFS graduates, and screening them in communities, as well as by equipping FFS facilitators with video screening equipment.

Social media (including those that are already being used in the Program area, along with video sharing platform agtube) could be used to further support horizontal learning in a self-evolving, self-perpetuating way.

CDFs and farmer trainers (FTs) trained by TA should be incorporated into the extension system in some way after 2020. The DAE extensionists (SAAOs) will continue to work for DAE, along with 150 FTs trained by DAE. BWDB extension overseers will remain in place after 2020, although each one is responsible for 100s of WMGs, which limits their interaction.

The various water management organizations (WMGs, WMAs and sluice catchment area committees) want to continue to work after 2020 and they will have some support from DAE and local elected officials. These civic organisations will need continued facilitation to keep functioning; they will especially need facilitation in the future if they are to continue to share information with other WMOs.

Blue Gold extension methods: pros, cons and future opportunities

<i>Method</i>	<i>Pros</i>	<i>Cons</i>	<i>Future opportunities</i>
Drama	These are exciting events that raise interest in Blue Gold activities in areas where the Program is just starting	They demand much staff time	Could be used to introduce Blue Gold as new areas are opened. Make videos on the dramas and share them through video shows
Videos	Many of the Mati-o-Manush videos made with Blue Gold on field crops, fish, poultry, & livestock could reach a mass audience. There are also videos showing farming successes	Blue Gold makes does not make much use of the videos it already has	CDFs can screen videos in communities, as a way of reaching a large audience with a high-quality message. More videos could be made
Written material	Provide a permanent record of Blue Gold activities. An excellent way to present numbers (such as production costs). They help people remember information	Relatively few copies are printed	More copies could be printed and distributed. This would enhance the impact at a relatively small cost
Sign boards	These signs are attractively lettered and nicely laid out, indicating what Program activity is conducted at a given site	Sign boards contain relatively slight information, often little more than a title	A bit more information could be added, such as a number to ring for more details. The sign board on fish species in a pond (pictured in Chapter 1) is a positive example of a sign board that says more
Notice boards	Allow WMGs to post a list of rules for water management. It informs the public about activities that damage sluice gates and other infrastructure	The boards don't tell the readers why the listed activities are damaging	Notice boards could briefly state the reasons for the rules. E.g. "Do not use fishing nets because they cause the canal to silt up." This method has been piloted, and should be scaled up
Coordination meetings and workshops	An excellent way of meeting with key stakeholders and encouraging two-way communication	Cannot be used for a mass audience. Most effective for planning activities	These are probably being used appropriately and can be continued in the future

Method	Pros	Cons	Future opportunities
Facilitation by CDFs	A personalised service that can rapidly and creatively adapt to changing circumstances and local conditions	Is expensive, depends on a staff that must be hired, led, administered and supported	This cross-cuts with the other suggestions, since most activities are implemented by CDFs. E.g. CDFs could show videos, share fact sheets, share written material more widely, help communities establish notice boards etc.
Action plans	They provide a reference that the CDF can use with local people later to check their progress against certain goals	They are too formal. Many community members are not comfortable writing	Could be personalised more for each event and each community, stressing what the WMG will do, specifically. Could be simplified
Fact sheets for success stories	Document Program achievements and successful local innovations in an engaging manner. They form part of Blue Gold's permanent record	They require some work to write. They are not being widely shared	CDFs may need more encouragement to share the stories with the WMGs. More copies could be printed
Horizontal learning (CAWM, crop cutting field days, crop cutting festivals, cropping intensity initiative, exchange visits)	Effective means of bringing people together from within the community and from other villages so farmer innovators can share their ideas with others. Networks are established e.g. to buy and sell seed	All of these events require expert facilitation and often some operational funds	More visits could be added to each demonstration (e.g. on Wednesday WMG A could visit and on Thursday WMG B could come see the same demonstration)
Farmer field school	A high quality way to convey information and stimulate experimentation	Reaches a small audience	Make videos with FFS graduates and share them widely with target communities

Introduction

The Blue Gold Program (BGP) is a seven-year project (started in 2013, slated to end in June 2020) funded by the Governments of Bangladesh and the Netherlands. Blue Gold is implemented by agencies of the Government of Bangladesh, the Bangladesh Water Development Board (BWDB) which constructs and maintains water infrastructure (e.g. embankments, drainage canals) in the polders, and the Department of Agricultural Extension (DAE) which is responsible for training, mainly through FFS for field crops (rice, watermelon, mung beans). The TA (Technical Assistance) leads to development of participatory water management practices, under the purview of BWDB Office of Chief Water Management (OCWM), by facilitating an active role of Water Management Organisations in water management for development. Further farmer training is conducted by TA using various extension methods, primarily focussing on poultry, livestock, fisheries, homestead gardens and market-oriented elements, along with market-focused facilitation for other actors as well.

Since the 1960s, the Bangladesh Water Development Board (BWDB) has developed a coastal embankment system, constructing a total of 139 polders in 14 coastal districts of Bangladesh comprising about 3430 km embankments for protecting low-lying areas against flooding and salinity (BWDB 2013, GED (2015)). The embankments are low, often just two meters high, but enclose large areas. Each polder was drained by several canals, often several kilometres long each. The polders have been a general success; they were thinly populated before the embankments were built, but have attracted settlers and allowed for natural population increase. The polders are now densely inhabited, with towns and villages built inside them. However, many polders are in need of maintenance (e.g. the sluice gates need to be repaired and various canals have silted up and should be re-excavated). The Blue Gold project is undertaking some infrastructural improvement, and trains farmers in water management, agricultural productivity and profitability, along with market development for a broader range of actors, seeking systemic change and income generation, mostly through water management groups (WMGs).

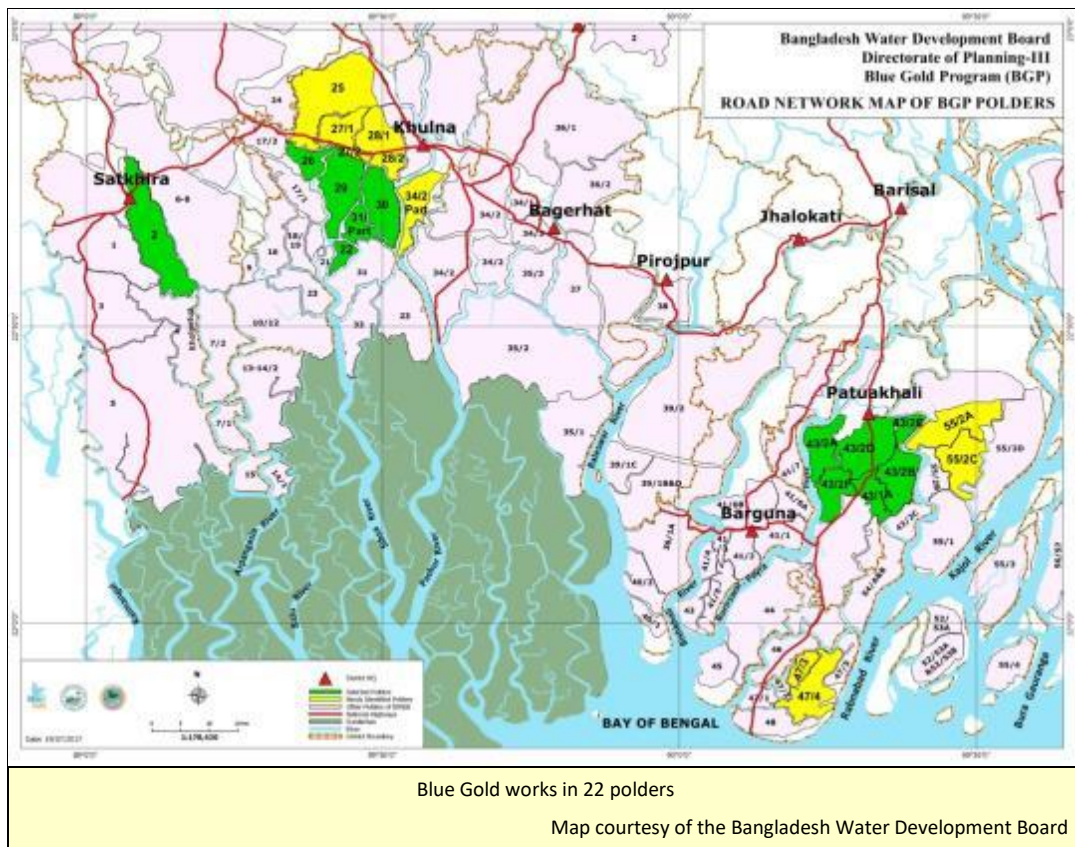
WMGs existed before Blue Gold, e.g. the IPSWAM (Integrated Planning for Sustainable Water Management) project formed some of these groups. Now Blue Gold is establishing more WMGs, through BWDB, which registers the groups so that they are formal, legally-recognised entities. All adults may (and should) join the WMG established in their village. Every group is led by a 12-member executive committee; at least five members must be women.

The WMGs help water users find common ground on the optimum way to manage water. WMGs help water users take initiatives to improve water management for better production and profitability, where applicable in cooperation with other actors. The farmers generally want to use the canals for

drainage (in the rainy season) and for irrigation (in the dry season). There are potential conflicts with other uses, e.g. some fish and shrimp cultivators block the canals to use them to rear fish. Loggers pass logs through the sluice gates, to get the timber to the river, but this damages the sluice gate.

The WMGs receive technical assistance from all three partners of Blue Gold: BWDB advises the groups on maintenance and operation, while DAE trains the groups on agriculture (especially field crops such as rice, watermelon and mung beans), and TA helps the groups with organisation, management and income generation (e.g. poultry rearing and homestead gardening). Blue Gold encourages members of WMGs to collaborate with each other for water management and agriculture. Such collaboration is called “collective action,” and may include buying agricultural inputs together, cleaning water hyacinth from a canal or synchronizing the sowing of watermelon (see Annexes 19 and 25). Crop synchronisation is a water resource management requirement for transplanted amon rice, but synchronised sowing also allows farmers to buy inputs together, receive technical assistance, and sell their harvest as a group; as well as to drain or retain water.

The Blue Gold Program works in 22 polders in southwest Bangladesh, with about 500 WMGs. The Program aims to improve the livelihoods of 200,000 households.



Blue Gold is divided into three working zones, of which Khulna is the largest and Satkhira is by far the smallest. See map above and the following table.

Table: Basic geographical information of polders in Blue Gold Program area

Item	Satkhira	Khulna	Patuakhali	Total
District	Satkhira	Khulna	Patuakhali & Barguna	4
Polders	1	11	10	22
Gross area (ha)	12,600	58,535	48,136	119,271
WMGs	58	261	188	507
WMAs	3	13	22	38
Length of embankment (km)	58.99	376.84	369.09	805
Length of Canals (km)	100	972.01	947.00	2019
Total households	27,795	84,241	75,931	187,967
Sluices (Functioning & non-functioning)	23	98	110	231

Source: data provided by each zone as “at a glance polder information”

The present study was designed to review how Blue Gold shares information with WMOs, to analyse the different extension methods used, to assess the roles of key actors, sustainability of the water management organisations(WMOs) as self-evolving groups, and to make suggestions for improvement. Blue Gold encourages several types of information sharing, including:

1. Farmer to farmer
2. DAE to farmer
3. Blue Gold/CDF to farmer
4. Private sector company to farmer
5. CDF to CDF (Facebook group)
6. CDF to other agents
7. Stimulation of networking for farmer information seeking behaviour

Method. The team reviewed project literature and was briefed by project leadership in Dhaka (10-11 Feb 2018). The study team (Bentley and Harun-Ar-Rashid) visited field sites in Satkhira (12-15 Feb), Khulna (16-22 Feb) and Patuakhali (23 Feb-1 Mar). See Annex 2.

At each site, the study team worked closely with Blue Gold staff, including Md. Joyнал Abedin, SK. Mohibullah and Shahadat Hossain (Satkhira), Md. Matior Rahman, Ms. Tahmina, Dr. MM Anowar Hossain, Md. Zahangir Alam, Shusanto

Roy, AFM Nurur Rahman, Md. Rayhan Ali (Khulna), Md. Shaifullah, Md. Rabiul Amin, Md. Shamim Ahamed, A.B.M Arman Hossain, Monayem Hossain, Md. Zakir Hossain Lucky, Nazrul Islam, G.M. Khairul Islam, Guy Jones (Patuakhali), F.M. Shorab Hossain (Khulna & Patuakhali), Aowlad Hossain (Khulna & Patuakhali) and more in joint analysis in three zones.

In Satkhira the Blue Gold team gave Bentley and Harun a PowerPoint briefing which was so useful that we decided to follow up on it. The terms of reference stipulated doing a “joint analysis” of the results with Blue Gold during the field work. To do the joint analysis, we drafted conclusions and discussion about the program and shared sections of it as a Word document, projected onto a screen with Blue Gold staff. The prose was edited in real time, with those present. These joint analysis sessions lasted for about two hours each and were held once in Satkhira, twice in Khulna and twice in Patuakhali. This was important for reflection, correction and for including the Blue Gold team in the study.

The fieldwork included visits to regularly scheduled Blue Gold activities; this was particularly helpful, to see Blue Gold at work, sharing ideas with farmers. Blue Gold also introduced the study team to communities (e.g. WMGs) where we interviewed community members and in saw some of their work in the field (such as a recently cleaned canal, or a fish rearing project). CDFs were always present, providing a valuable entrée to the community. DAE staff (especially SAAOs) were present at several field activities and visits. The team also interviewed selected staff of the DAE, BWDB, DOF (Department of Fisheries) and DLS (Department of Livestock Services).

The first week of March, the study team briefed the Blue Gold team leadership, representatives of the Dutch Embassy and DAE/Dhaka. The team presented the study findings to most of the program staff at the Blue Gold Retreat on 7 March.

Acknowledgements

Thanks to all of the staff of Blue Gold, who gave us their time to take us to the field, see their work and meet with the communities. Your unfailing hospitality and kindness made it a great pleasure to do this work.

Thanks to the BWDB and DAE for their support during this study. Thanks to everyone who agreed to be interviewed, and who answered our questions and received us in their homes, offices and fields.

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Cover Photo: During an FFS session in Chhoybariya, their CDF, Hafsa Khanom, shows how to make non-toxic pesticides from locally available materials at the FFS session. Facilitation by CDFs is Blue Gold's most effective extension method.

All photos are by Jeff Bentley, unless otherwise indicated.

1. Review of extension methods

This section organises Blue Gold extension methods into categories (mass communication, FFS, horizontal learning, and others) and describes each method. Most of these extension methods were suggested by Blue Gold, but the study team identified some in the field.

Definition: for this report, a “communication intervention, or extension method” includes any activity in which people learn something, and may include experience-sharing workshops, training and capacity building.

Mass communication

(a) **Mass communication** methods such as drama, videos, posters and leaflets, which aim to convince stakeholders of the need for engaging in participatory water management agricultural production and market improvement.

Method	Description	Reach	Topic
Dramas	Live actors, sing and act out a drama about water resource management in a community. Attendance is open. About 600 usually people come. With an intro session and Q&A session, each drama lasts about 1 hour	7 times in 2017, 24 times in 2018. Held to sensitise local people about Blue Gold in areas where BGP is just starting to work	Promotional, introduction to BG, used in new areas
Videos	Produced by Mati-o-Manush TV show: half hour story, of which 5 to 10 minutes is of Blue Gold activities. BG has also produced various videos to use for extension	BG has copies of these, uses them more for promotion e.g. with policy makers, but can be used for extension	Pen culture of tilapia and other species. Summer tomato in Satkhira. Milk cows. Watermelon, beef fattening, & poultry rearing in Khulna, Introduction of BG,CAWM, WM, O&M, WMG election, Experience sharing visits in Patuakhali
TV news	Short news filmed by journalists and shown on TV	BG has copies of some (not in Khulna)	Amodkhali canal and others, pen culture

Method	Description	Reach	Topic
Leaflet	Small printed material for awareness raising, to let polder residents know about BG	Two or three types. Distributed at the beginning of the project and later	Functional WMG. Introducing BG Program. There were some on technical topics
Posters and banners	Large printed material put up in public	Various posters have been put up in project areas	Banners to announce workshops, training, HL events. Hung up at BG fairs. Posters on operation and maintenance(O&M), cropping patterns, water management etc.
Newsletter (barta)	Is partly promotional, documents experiences. There have been 10 issues	4000 copies published quarterly. Each WMG, WMA, BWDB, DAE get copies. The good WMGs use it for discussion. Satkhira got 600 copies. Khulna has received 1500	All relevant topics
One-pager	Written on both sides of an A4 sheet of paper, full colour on a white background	6 issues have been made, 10,000 copies total	6 topics. E.g. disaster preparedness, how to act before during and after a disaster
Low cost written material	Based on the one pager, printed in black ink on blue, yellow, red or green paper for different audiences (WMG, UP, schools, religious institutions). Each colour has slightly different text	10,000 copies of each version (total 40,000) in Satkhira, also in Khulna	See above
Sign boards	Signs announce FFS sites, office, CAWM,WMG and other Program sites	Widespread. Reaches many people with some information	FFS and other topics
Notice boards	Signs in public with a list of rules	Is used in some villages. Reaches people with specific, key information to manage water, at strategic sites. BG promoted, facilitated and supported notice boards & sign boards	e.g. no fishing in canal, do not build or plant crops on the embankment

These methods do seem to have helped Blue Gold engage with stakeholders.

A.1 Dramas can reach a large audience and generate interest in new topics (Annex 28). They do take a lot of staff time, writing the scripts, reviewing them with actors, preparing the venue etc. After the drama has been rehearsed and is ready to present in the project area, a CDF spends about a day and a half organising the event: i.e. involving the WMG/ad-hoc committee, miking (announcing through a travelling microphone), arranging the venue, inviting people to attend etc. Two CDFs also attend the drama during the one-hour session (to managing and document the gathering). In part because of these time demands, staff have not used dramas with other topics.

After the dramas there is usually a very good interaction with the community, as local people ask questions of BGP and of the actors. Drama adds a good local flavour, especially if local actors speak the local dialect. The drama is culturally sensitive. Dramas have also been used for market orientation and conflict resolution.

A.2 and A.3 Videos and TV shows. Blue Gold produced videos on introduction of BGP, CAWM, water management, O&M, WMG elections and experience sharing visits in Patuakhali. Some videos were actively made by journalists, to broadcast on television. BG had the inspiration to collect several videos, including news clips on the Amodkhali canal (Annex 3) and some programs for Mati-o-Manush. BGP does not screen these shows often, but could show them more.

A.4 Leaflets are glossy pamphlets for promoting the program at the start. They are temporary, and not sustained. Some staff said that leaflets get lost and forgotten and people don't keep them.

A.5 Posters. The main limitation of these is that there are never enough copies printed. The target audience has relatively low literacy. Posters are useful for meetings if they are well written, nicely illustrated, and well laid out.

This poster on the costs and benefits of rearing chickens (translation below) shows that poultry can be profitable (and outlines the main activities for rearing them) – and is typically used as a training aid during FFS sessions and field days



A poster can carry a lot of information, and is better suited for numbers than many other formats

		Unit/No.	Cost/unit (Tk.)	Total Cost (Tk.)
Original cost (One time Investment)	Cock	1	350	350
	Chicken	10	300	3000
	Feed and water pot	6	50	300
	Case /chicken house	1	5000	5000
	Other			500
Raw material cost (step by step cost)	Commercial feed (Kg)	120	55	6600
	Vaccine	1	192	192
	Treatment/Medicine			200
Marketing cost	Transportation cost			200
Total Changeable cost (Tk.)				7192
Grand total cost (Tk.)				16342
Table 4.2: 1 st cycle (4 months) Income				
Item	Sale unit number	Sale price per unit (Tk.)		Income (Tk.)
Egg	515	8		4,120
Chicks (700 gm/chick)	85	250		21,250
Total Income (1 st cycle)				25,370
Total changeable cost (1 st cycle)				7,192
1 st cycle (4 cycles per year) unchangeable cost				1,450
1 st cycle grand total cost				8,642
1 st cycle income/profit				16,728
1 Year total income/profit (4 cycles)				66,912

A.6 Newsletter or Barta. The newsletter features many articles from the polder team about important things that happened with Blue Gold. The main target group of Barta are the WMGs and WMAs. Success stories, good practices and innovative activities of WMGs are documented and shared with WMGs to inspire them to replicate in their own areas according to their needs and ability. CDFs also discuss Barta articles during WMG meetings to inspire the members. The newsletter documents Blue Gold’s work and shares it with officials, and partners. The Barta is published every three months and is distributed to WMGs.

Newsletters have the same limitations as other printed material, e.g. more copies could be printed. Many people who receive them do read them. E.g. one UP chairman who had the newsletter in pride of place under the glass on his desk, so people could read it.

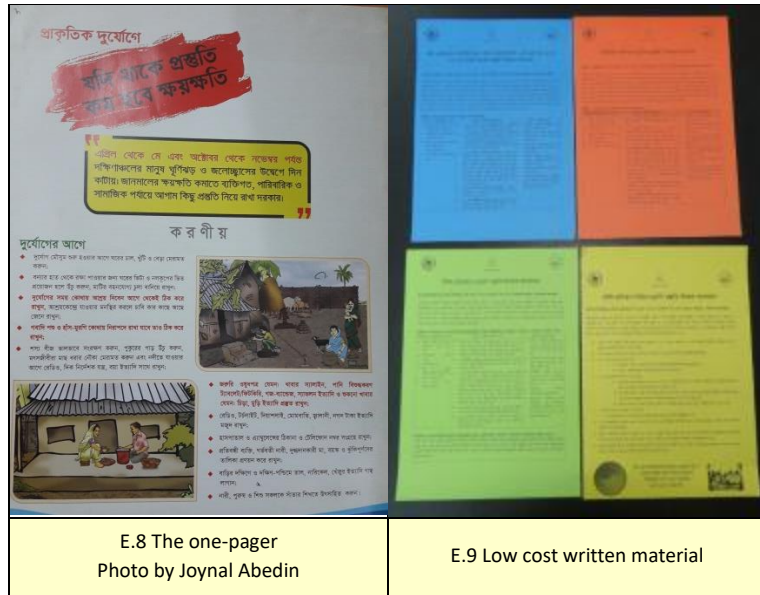


This signboard tells passers-by which species of fish were stocked in this pond



At least one UP chairman has the newsletter under the glass cover on his desk for visitors to read

A.7 and A.8 The one-pager and the low-cost written material were designed to address the common problems with written material. These were made for disaster preparation. There are two types of materials i) the one-pager is printed on a printing press in Dhaka and ii) the low cost written material is photocopied locally on four colours of paper. The printed one is illustrated with



E.8 The one-pager
Photo by Joyнал Abedin

E.9 Low cost written material

different pictures and had a print run of about 10,000 copies each year. About 30,000 copies were made of the low-cost written material to reach many people.

It is cost-effective, but some staff feel that it is not well accepted by the community, because it is black and white, with no pictures. Others feel that it is effective and that it is used and displayed in the UP office.

A.9 Signboards. Most signboards simply tell people where a project site is, like an FFS. They do what they are supposed to do, but Blue Gold could add more information to them, and communicate more with this public, site-specific, low-cost method (Annexes 15 and 21).

A.10 Notice boards. This was an innovation in one community (Annex 19). It is a list of rules, mainly things that people should not do. It has the advantage that it can be delivered as a command. “No fishing.” The notice board is permanent and highly visible. It is placed at key sites, like canals and sluice gates. It is low cost and should be scaled up. The WMG that erected this notice board also signed it at the bottom, suggesting that these groups are starting to feel empowered.

বিশেষ বিজ্ঞপ্তি

- * খালে পানি অবাধ চলাচলে কোন প্রকার বাঁধার সৃষ্টি করা থেকে বিরত থাকুন।
- * খালে যে কোনো প্রকার জাল পাতা নিষেধ।
- * খালে ঝাইল/ঝাউ দেয়া নিষেধ।
- * খালে পাটা দিয়ে মাছ ধরা নিষেধ।
- * খাল থেকে মাটি উঠানো যাবে না।
- * সুইসের কপাট বন্ধ করে মাছ ধরা যাবে না।
- * বেড়িবাঁধ কেটে মাটি নেয়া সম্পূর্ণ নিষেধ।
- * বেড়িবাঁধের ঢালে কলা গাছ ও অন্যান্য ক্ষতিকর গাছ রোপণ করা নিষেধ।
- * বেড়িবাঁধের ঢালে শাক-সবজি চাষ করা নিষেধ।
- * বেড়িবাঁধে কোন প্রকার বাড়ি ঘর/দোকান পাট তৈরী করা যাবে না।
- * সুইস গেটের ভিতর দিয়ে গাছের লগ/গুড়ি পারা পার করা যাবে না।
- * সুইস এবং বাঁধের ক্ষতি হয় এমন কোন কাজ থেকে বিরত থাকুন।

মনে রাখবেন, পানি ব্যবস্থাপনা অবকাঠামো, যেমন-সুইস, বেড়িবাঁধ এবং খাল জনগণের সম্পদ এবং এগুলোর সুফল ভোগ করবার অধিকার এলাকার সবার। অতএব, এগুলো রক্ষা করা আমাদের সবার নৈতিক দায়িত্ব।

অনুরোধক্রমে
রুদাঘরা পানি ব্যবস্থাপনা দল
পোস্তার ২৬

Notice boards can convey specific information, especially to prohibit behaviours that damage sluice gates and embankments.
For an English translation see Annex 19

A similar notice in Kalyankalash Prodhan Khal reads:

Notice

- Refrain from creating any obstacle for free movement of water in the canal
- Do not set any fishing net in the canal
- Do not use jhail/jhau for fishing
- Gora cannot be used in the canal for fishing
- Dams cannot be established on the canal
- Do not remove soil from the canal
- Closing the door to fish is not allowed.
- Taking soil from embankment is totally prohibited
- Planting bananas and other damaging trees on the slope of the embankment is prohibited
- Cultivation of vegetables on the slope of the embankment is prohibited
- No houses or shops may be built on the embankment.
- Logs or trees cannot be passed through the sluice gate
- Refrain from any works which can damage the sluice and embankment

Remember that all people in this area have the right to enjoy the benefit from water management infrastructure such as sluice gates, embankment and canal and those belong to the people. Therefore, we all need to ensure their protection

Coordination meetings

(b) **Coordination meetings** with Local Government Institutions (LGIs) in order to establish an actor network and a joint agenda for participatory water management.

Method	Description	Reach	Topic
Blue Gold sharing meeting	An orientation meeting with union members, chairman. For new Program areas	For each union and upozila in Satkhira. Used in Khulna 24 times. Also organised in Patuakhali	Introduces Blue Gold to new areas
Consultation meeting in new polders (i.e. where the Program is just starting)	Meet with union parishod (UP), farmers, DAE, key community members, and the BWDB	Used in Khulna in 16 UPs. Also used in Patuakhali	Introduce Blue Gold, role of BWDB, DAE, UP, WMOs, identify & prioritise needs for water management infrastructure etc.
Community needs assessment	Meeting with UP, WMA, WMG, DAE and BWDB representatives	8 UPs in Khulna. Also used in Patuakhali	To learn the community's felt needs
Coordination meetings	Held at union level upozila and district levels. There is a monthly meeting with Blue Gold, union parishod members, chairman, DAE and other government officials, sometimes NGOs. Information can be shared with CDFs who will communicate with farmers	All CDFs	All or most topics
Making maps of sluice catchment areas	Members of the catchment committee make a map of their area with the staff	Starting in Satkhira. Completed in 4 polders in Khulna. Is on-going and will continue to work with sluice catchment committees for corrections. Also used in Patuakhali	Sluice catchment area. Internal catchment water management, O&M & crop planning etc.

B.1 through B.4 Blue Gold sharing meeting, Consultation meeting in new polders, Community needs assessment, coordination meetings

Meetings are a logical choice of method for this purpose. Any work with local authorities would have to be coordinated with them in meetings. See Annex 22, 30 and 32.

It is a continuous process. It may have to be done monthly. It is done as needed. The local authorities certainly seem to have the message, as the following examples suggest:

The WMA president of Amodkhali was invited to the neighbouring WMA meeting to share his experience, as part of informal HL among WMOs (Annex 7).

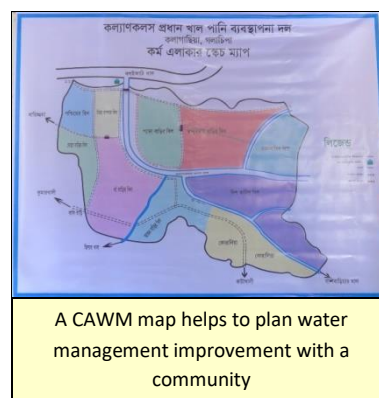
The chairman of UP Dhamilia was keen to work with the project, and had brought his union parishod members and the WMG to meet with us (Annex 18).

The local people themselves really want some of these public works, especially canal excavation. So local elected officials may put water management on the agenda as an appropriate way of earning votes (Annex 27, 30, 32, and 33).

The farmers in Jaela Badhandanga WMG in Satkhira said that if they had any problems with influential users they would manage them through the UP (Annex 9). This suggests that local people do trust their UP to help manage water.

B.5 Sluice catchment area maps. BG makes a map with local leaders. At first glance this may not look like an extension method. Of course it is mainly a way to generate special information in a participatory way. Besides building esprit de corps, the participants learn where the watershed (sluice catchment area) is, i.e. they learn the lay of the land.

Local people also make maps at the beginning of the community-led agricultural water management (CAWM). They identify catchment and infrastructure problems and possible solutions. Then the map can be used “as a picture of your community”. It is important for planning.



Community facilitation by CDFs

(c) Community development facilitators (CDFs) are community workers who provide guidance to the establishment of, planning by and activities of water management organisations.

There was some training by contractors for CDFs on accounts keeping and audit system and follow up of action plans. This training had room for improvement, but TA continues training the CDFs on the job in the communities.

Method	Description	Reach	Topic
CDFs facilitate training in communities	98 CDFs organise and develop WMGs. They hold weekly discussions of good practices	All 513 WMGs	All BGP topics
WMG action plan	WMG annual plan	All WMGs do it	Agricultural production, water management, O&M

Method	Description	Reach	Topic
Participatory Water Management Field Manual	Published in English and Bangla versions. Also called the “unified approach.” It was designed to solve some of the problems noted with the training	It is for the CDFs, and field staff of DAE and BWDB	WMG formation should follow the contents of the Field Manual
Out sourced training of executive committee members of WMG	Contracted out to local firms and organisations, from 2013-2016. BGP adapted the syllabus from IPSWAM, but it didn’t respond to community needs. There were garbled messages	Systematically with all 12 executive committee members of each WMG. The target was all 513 WMGs, but not all were reached	Topics included organizational management, gender and leadership.

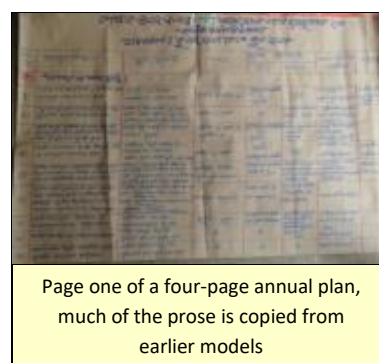
C.1 facilitation by CDF. This is basically conventional extension, in the best sense of the word. Extensionists live in the polders and work in the communities. In theory, each one is assigned a set of WMGs. In practice, the CDFs share responsibilities and cooperate with each other. CDFs attend monthly meetings of executive committees of WMGs and visit the community for other events. During this study, the CDFs were always there at each visit, engaging with the local people (see Annex 5). The CDF has a wide range of formal responsibilities (Annex34).

Some CDFs may have five WMGs, each of which may have hundreds of members. So there are not enough CDFs to work with all the farmers, but there are enough CDFs to work with all of the executive committees of the WMGs.

However, the main issue with the CDFs is not how few there are, but how little time they have left, just two more years. After 2020 the BWDB has the responsibility for managing WMGs, but BWDB has hundreds of WMGs for each extensionist (called an “extension overseer”).

C.2 The WMG annual action plans are written by the CDFs with the communities. These documents are dense and abstract, bureaucratic writing.

However, on the positive side, the action plan is a tool for the CDF to work with the community. The WMG and the CDF can compare their activities with their action plan every month. The action plan is a unique approach which helps to document the work done in each community. Many projects leave no written record of their work in the local community.



Workshops and training events

(d) Workshops and training events which help structure some of the responsibilities of water management organisations (e.g., market development and market orientation aspects, catchment management)

Method	Description	Reach	Topic
Crop planning workshops	For DAE, WMGs, BARI, and IRRI	Once in Satkhira in 2017. Not in Khulna	Crop planning
Workshop with WMO to promote collective action and private company linkage	Workshop to link with service providers (e.g. seed company, fertiliser dealer, DAE person) with the WMG and WMA	Twice in Satkhira, 16 in Khulna	One was for curriculum development with value chain actors. Another was held with DAE, DOF and DOL
Group leader, contact farmer, resource farmer, CDF, farmer trainer linkage workshop	Workshop for networking and linkages	Twice in Satkhira, 12 times in Khulna	To build linkages between input traders and farmers
Linkage meeting with value chain actor	Only with value chain actors (dealers, company people and farmers), not with WMOs	Once in Satkhira, four times in Khulna	To link people for buying and selling inputs
Business planning training for resource farmer(a contact farmer for a producer group) and business focal point	They come together in the workshop and the expert shares what the business is like. They do cost benefit analysis, and plan the business	Twice in Satkhira, twice in Khulna	Farming as a business with a market orientation

There are various types of workshops and trainings for WMO committees, designed to make up for gaps in the original training. Some link with other actors or with UPs and some groups get grants from the UP, e.g. for infrastructure that is damaged or blocked by water hyacinth (see Annex 18, 33).

As a result of such training many WMGs manage their own funds, in bank accounts. However, a better way to do it would be for people to collect money, labour or rice as needed. They do not like to deposit money.

Horizontal learning

(e) **Horizontal learning** is an outcome-based peer-to-peer learning process which assists WMOs to identify, learn and replicate good practices from their peers with the assistance of BWDB, DAE, DoF, DLS and LGIs. In the following table, an inventory of successful WMO activities is provided as the starting point for exchange visits aiming for rapid replication of these successes. This vehicle was first applied to the Community Agricultural Water Management (CAWM) demonstrations; and its use is now expanded to all WMG successes. During peer visits between farmer groups it is easy to share information.

Method	Description	Reach	Topic
Fact sheets	Of good practices. All were written with CDFs, with help from community people	Printed 600 copies as a book. Distributed to the CDFs, to share with WMGs to inspire them for learning and replication, also distributed to UP, Upozilas, WMAs, BWDB, DAE, DoF, DLS and others	Various. See book of fact sheets
CAWM (community-led agricultural water management)	Includes demonstrations of about 30 or 50 or 100 acres (12 to 40 ha) at the polder level, growing and distributing HYV seed for short duration rice. Led by WMG	According to BGP (2017) discussion note, CAWM was tried in a pilot project led by IRRI and co-supported by BGP, and others in polder 30, Fultala village 2015-16. Since June 2016 the BGP has up-scaled to 10 demonstration schemes with 65 WMGs. In 2017/18, the aim is to expand CAWM coverage to a further 35 demonstration schemes	Includes organising community, water management, crops, e.g. improving outlets, synchronising crops
Crop cutting field day	A field day at the end of a demo, when the crop is harvested. A host WMG meets with neighbouring WMG. Explanation is by host farmers, not technical staff, and BGP staff then follow-up to support action plans prepared by visitors during the visit	Once in Satkhira and will have more. They also have them in Khulna	Mustard, rice

Method	Description	Reach	Topic
Crop cutting festival	Yearly, in 2 locations with farmers and officials, to highlight successes, includes drama, song and HL experience sharing visit. BG/TA management attends. Photos are taken and a video is made	Just two or three places a year – preferably in all three BGP zones.	1 on CAWM 1 on cropping intensity initiative
Exchange visits between WMOs	One WMG visits another, especially one of the more successful ones. DAE officers and UP members attend and see the importance of the work. Members of the WMGs meet DAE officers & exchange phone numbers with them to consult them in the future. 30 to 35 visitors is ideal	Many have been organised, for about 200 WMGs. Many are documented in a paper called “experience sharing visits”. 7 visits in Satkhira. Also held in Khulna (25 visits)	2 were held with CAWM, one with poultry, two with mustard, two with summer tomato (Satkhira)
Preparing an action plan for replication of good practices	The visiting WMG members prepare one at the end of an exchange visit (what they will do, who and when) and training and workshops	The WMGs all do it	During exchange visit
DAE organises demonstrations	For showing new rice varieties, or tomato, they have many types of demos. Some involve fertiliser. Some are large, e.g. boro rice in 30 acres (12 hectares). Others are small, like the two summer tomato demos in Satkhira; 9 farmers later set up their own tomato plots based on those	27 demos held by DAE in Satkhira. About 150 in Khulna	Rice, summer tomato, fertiliser, vegetable
Upazila level agricultural fair by DAE	Farmers visit, tour the stalls and discuss them with the people tending the stalls. Good farmers manage stalls at the fair	Held by DAE once in Satkhira, 3 times in Khulna	All the modern practices, cropping patterns

Method	Description	Reach	Topic
Rural agricultural fair at the village level (poli krishi mela)	Led by innovative farmers. Local representatives, DAE, TA participate. Songs, video show and amusement. There was some financial support from UP chairman. BG staff think these are effective	1 in Satkhira by TA. 4 in Khulna (one conducted by TA and 3 by DAE). They don't do them in Patuakhali. Most people who attended were farmers	WMG motivation, water management infrastructure, value chain, catchment, sluice gate, crop production, poultry, pumpkin
Cropping intensity initiative	Demonstration of five to 15 farmers of several crops over a whole year	10 in Satkhira. 14 in Khulna	Increasing the number of crops per year
Informal HL	Farmers share information with their neighbours and friends, they discuss innovations and visit each other's fields, gardens, animals. WMAs also share their experiences with other WMAs, e.g. the Moheswarkati WMA meeting attended by president of Amodkhali WMA (Annex 7).	Spontaneously, widespread (mitigation of conflicts) and adopting best practices	All topics

E.1 Fact sheets. This is a new effort and an innovative approach where a functional practice innovated by a community is written up like a short magazine article, and printed in a book.

There are the same limitations as with other written material. Not enough were printed. Everyone does not have a copy. Many of the farmers are not highly literate. The fact sheets are not being distributed in the communities because of limited print run. They are not in the annual plan. See Annexes 11 and 13.

E.2 CAWM demos. Select land, 20 to 30 hectares, all of the farmers together identify a problem and synchronise the sowing. DAE conducts a FFS. They start with a monsoon season and as water management is improved (e.g. better drainage during the rainy season) the community can often add a new, high value crop.

CAWM is a composite method of FFS with HYV rice and various water management initiatives, such as clearing out water hyacinth and repairing canals. Adding a shorter duration rice like BRRI dhan 52 allows one to add another crop like mustard or mung beans or other winter crops such as sunflower, boro rice, sesame or watermelon. (This is shown in the video [Grow more, earn more](#)). As you drain the land you have the opportunity to add more crops, e.g. to add a monsoon rice in previously waterlogged areas. CAWM would have the same limitations as FFS. See Annex 30.

E.3 Crop cutting field day can be excellent (Annex 4) if they are well planned and carefully conducted, otherwise they may be less convincing (see Annex 16).

E.4 Horizontal learning exchange visits between WMOs. Farmers learn about an innovation, e.g. through an FFS. Later their WMG hosts visitors from other WMGs. The host farmers describe and show their innovative practices. Writing an action plan for experience sharing, is done at the end of the day (Annex 31).

E.6 DAE demos. These include mung bean, amon rice. They are linked with FFS taught by DAE.

E.7 The agricultural fairs. There are two types. There was a district fair in Patuakhali in 2016 in Polder 55/2C and in 2017 at Bolajpali for Polder 45/2-1. Such fairs are usually a lot of work for staff to set up and may not be cost-effective.

E.8. Crop intensity initiative (CII) is a cropping system demo of more than one season. There were 28 in Patuakhali. They are one to five acres (4000 square meters to 2 ha) and involve one to eight farmers. It is done to introduce a new crop into the system. Reaches a small audience with a valuable experience. See Annex 24.

E.9. Informal horizontal learning can be highly effective, spontaneously, by word of mouth between farmers. A new practice will only become widespread if there is at least some spontaneous horizontal learning, e.g. if watermelon is to be planted over a set of 10 communities, or if farmers start planting boro, mustard. These topics have to be highly attractive and work best if easily packed for word of mouth transmission. Watermelon is easy to spread by horizontal learning, because this vigorously growing crop with its uniquely crenulated leaves is visible in the field, so neighbours can ask about it (Annexes 6, 13, and 14).

Farmer field school

(f) **Farmer Field Schools** (FFSs) where curricula for home gardens, backyard livestock and fish culture are applied by BGP TA staff, and curricula for field crops are applied by DAE in response to target group priorities.

Method/approach	Description	Reach	Topic
FFS run by DAE	Crop production and marketing. Include departmental trainers and 150 FTs. Mostly on field crops	By DAE with selected groups. As of 31December 2017, 570 DAE FFSs had been conducted in the three BGP zones	Boro rice, vegetables, fruits, other field crops, marketing
FFS and market oriented FFS (MFS) run by TA	Include 70 FTs. Mostly on poultry, livestock, fish, vegetables, & income generation	By 31 December 2017, 567 TA FFSs had been conducted in the three BGP zones	56 on poultry, homestead gardening and nutrition 28 on fish, dairy and nutrition (Satkhira)
Field days	Part of both types of field schools	All field schools	See FFS above for topics

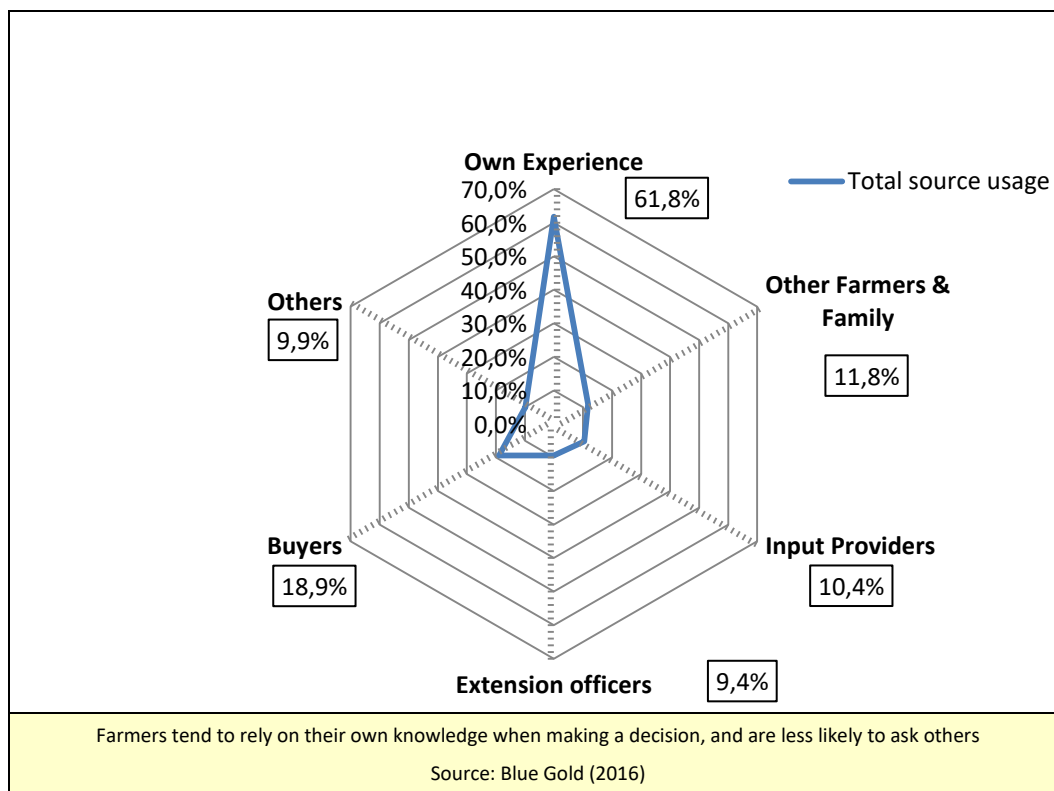
Method/approach	Description	Reach	Topic
Distribution of chickens and ducks	At the end of a poultry FFS, each participant receives about 10 birds	18,000 (15,800 chickens and 2,200 ducks). 1400 farmers benefited. Also in Khulna	Poultry

DAE works with field crops, while TA teaches FFS on poultry, livestock and other income generating activities.

The sessions we saw were excellent and the CDFs enjoyed them. People learn. The limitation as always with FFS is that farmers don't share the information with their neighbours¹ (Tripp et al. 2005; Bentley 2009). Farmers who have taken cattle fattening FFS have not shared with their neighbours (Annex 23). However, farmers may share information with others, as part of experience sharing, facilitated by the CDF (Annexes 5, and 31), suggesting that a little encouragement and facilitation helps farmers to share with their peers. Field days are conventional part of FFS and BGP is using them to share information. One young man in Syed Khali, Khulna did not attend the FFS, but did go to the field day. He said that if you pay attention at the field day, on that one day you can learn half of what the others learned in the FFS. In the case of Horizontal Learning events most of the participants are interested farmers and rate of replication is encouraging.

No program can train a few farmers with FFS and expect the trained farmers to teach all of the others. Farmer-to-farmer experience sharing is often limited. A separate study for Blue Gold found that farmers rely on their own experience (for 62% of the cases) when they have to make a decision during the cropping season rather than seeking information elsewhere. Those farmers who do seek information elsewhere look to other farmers (12%), input provider (11%), buyers (19%), SAAOs (9%) and others at much lower rates (Blue Gold 2016). Our point here is that if Blue Gold, or any other program, wants farmers to know about Topic X, that information must be shared massively with the target audience, not entrusted to just a few community members. However, farmer to farmer knowledge transfer depends on the type of technologies or practices (e.g. existing crops vs. new ones), locations (e.g. high vs. low value cropping areas), type of farmers and so on.

¹ Despite the fact that TA FFSs are encouraged to share their learning with a minimum of three neighbours.



MFS, or market oriented field school is interesting in that farmers are taught specifically to join together to buy inputs as a group, and they may stay organised to do that after the FFS training ends (Annexes 27 and 29).

Local people are selected for an FFS through the executive committee of the WMG. There may be a tendency for executive committee members to participate in the FFS, but the participants are chosen in public at a general meeting of the WMG, held quarterly or as needed. The executive committee proposes 30 or 35 people and Blue Gold staff visits them to see if they meet the criteria for this field school (Annexes 17 and 32).

Blue Gold is now finalising a manual for trainings of FFS with market orientation, for all potential facilitators, including DAE and FTs. Blue Gold will print 5000 copies. The DAE is also in the final editing stages of a 500 page trainers' manual for FFS. To provide coverage in polders where there are few or no TA FTs, DAE FTs will be provided with training in topics such as poultry and fish.

Other methods

Method/approach	Description	Reach	Topic
CAHW (community animal health workers)	Local people, about half women, trained by DLS. Women work with poultry, men with larger animals	Almost 40 CAHW in Khulna and 12 in Patuakhali who will keep working after the project leaves their area. Training will be held in Feb 2018 in Satkhira.	Mainly vaccinations and primary treatments

Community led fisheries	An experience in a community, with community members who manage a water body with fish. The community does it collectively	4 in Satkhira. 8 in Khulna	Fish culture
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G.1 Community-led fisheries. A group, not the community, is assigned a “blind” canal (which has partially silted up and has no outlet) or some other water way. This body of water is a valuable public resource being used by a relatively small group, who may already be influential local people. They may already be using the water body. The group receives training from DoF and they receive some capital from BG. They also use their own money to invest in fish rearing and they get on the job training from CDF. This is as much an investment as training. Limitations: money to invest, depends on valuable training from DoF, and access to a suitable water body. Some community-led fisheries involve more villagers than others (Annexes 6, 12, 15 and 21). More could be done to ensure that all community members benefit from local bodies of water.

G.2 CAHW (community animal health worker). The CAHW charges for the medicines and vaccinations and is able to buy replacements with the money charged (Annexes 20, 26, and 30).

2. Reflection

This section reflects on some of the most successful and least successful extension methods used.

Most successful

(a) Which extension methods have been the most successful, e.g. should be scaled up with other topics, in other places?

Facilitation by CDFs reach all the WMGs, on many topics. It's the backbone of Blue Gold. See Annexes 4, 5, 17, 21, 22, 24, 25, 28, 31, 33 and 34. **Disadvantage:** labour intensive and expensive (salary, operation costs and allowances).

Relative strength: the CDFs are extensionists with university and/or technical education who are highly literate. As sympathetic outsiders they can help WMGs to organise, especially preparing their paper work to register with the BWDB. As individuals, each CDF comes with different technical skills (e.g. some have experience with fisheries, others with cattle or rice). They help each other, collaborating to provide communities with training on the various topics that Blue Gold promotes. The CDFs are conventional extensionists in the finest sense of the word, who can work creatively with individual community members and groups.

The success of the CDFs: they facilitate FFSs, mentor farmer trainers to take over the field schools. The CDFs organise ad hoc committees, nurture them as they create WMGs, advise those groups, help them form WMAs, and sluice area catchment committees. Few or no WMOs would exist without the CDFs who attend all their meetings, all the training events, and help link WMOs to local government.

Formal WMG action plans are a relatively minor detail, but they could be improved (i.e. they be more concrete, shorter, and more specific), but even in their present state the action plans do help the CDF to monitor progress with the WMOs and their members. The CDFs write these plans because the Program asks them to do so.

Improvements needed for CDFs: the CDFs are conventional extensionists, a model which is well known and is widely used for agricultural outreach. The most difficult part of the CDFs' job is motivating busy community members to accept unpaid work within the WMOs. However, many WMO members do donate their time to making the WMOs work, which suggests that the CDFs are functioning. No doubt there are CDFs who make mistakes, perhaps some who need to be replaced, but this is inevitable in a corps of 98 people.

FFS provides high-quality coverage of some topics. FFS can be used with any agricultural topic (even MFS—for marketing) and CAWM which uses FFS over a whole year. FFSs use participatory and needs-based approaches during which the opinion and experience of the

farmers are shared among themselves to increase their decision making ability. Although experiments are intended to be planned by the farmers, observed regularly and lessons drawn by farmers from them, there are examples where these experiments are—for reasons of expedience—designed and monitored by the extensionists.

Blue Gold has an innovation, working with three topics in a single field school (e.g. poultry rearing, homestead gardening and human nutrition or beef fattening, fish and nutrition), over one season, although they are changing that and in the future will cover only one topic. This is being done to reach more people with FFS. **Disadvantage:** whether you offer one topic or three, FFS reaches a small group, typically 25 farmers in a village, while the village may have 500 households. FFS reaches more people by horizontal learning (e.g. field days, see below). BG needs a process to reach larger numbers of farmers.

FFS were taught by CDFs. They are being turned over to FTs, who could do more to scale up the information from FFS if they were given salary and institutional support. See Annexes 14, 15 and 17). More could be done to mobilise more farmers (through field days, demos, exchange visits etc.)

Field days at the end of an FFS may be done within the community, reaching large audiences with fairly good information. A technology can be shared within a short time with many people. Field days could be scaled up. **Advantage:** host farmers do most of the speaking. It reaches a large audience.

Demonstrations, e.g. of CAWM, crop cutting field days, crop intensity initiative, crop demonstrations. More field days could be held, e.g. several instead of one. The demonstration plot could share more information during the season with large signs, explaining the purpose, so people could read them.

Exchange visits for horizontal learning (between farm communities), are useful for motivating farmers and learning. Technical staff from DAE, DoF, DLS etc. attend exchange visits, and demos which helps to make them more effective. **Advantages:** much like demonstrations. The farmers exchange mobile numbers which allows more information to be shared later.

Orientation or coordination meetings, most of the UP chairmen are on board (support WMGs, project goals). **Advantage:** This communication strategy does what it is supposed to do, i.e. coordinating with these local leaders. In addition, the resources of the Union Information Centre should be used by Blue Gold.

Workshops are successful. E.g. at a curriculum development workshop, the group is able to develop a curriculum. At a linkage building workshop, linkages are established. (Workshops do what they are intended to do).

Less successful

(b) What are some of the challenges with some of the least successful methods?

Newsletters, not enough are printed. Some farmers have low literacy. **Advantages:** permanent, low-cost.

Leaflets, posters. Few are printed. More could be done.

Notice boards are useful for listing rules (e.g. no fishing in the canal). These could be more successful if they were more widely used.

Include signboards on demonstrations that explain the key message of the demonstration, so that passing farmers could read it. (E.g. date of sowing, variety name, include the details on cropping intensity initiative so that passing farmers can read about it).

Drama, is attractive and is used for motivation. A drama (or song) can really capture the audience's attention (Bentley et al. 2005). Drama is memorable and can reach a mass audience. **Disadvantage.** It takes a lot of staff energy making the first concept, reviewing rehearsals and improving the content. However, to overcome that you can do it once; the first one takes time and then you can take it to many communities. Drama can be filmed and used as a video show.

Videos and TV news not used effectively, e.g. systematically. Blue Gold could organise shows and take videos around to communities and show them on the big screen. Add a question-and-answer session, discussion with local people. Videos could also be made available at the Union Information Centres which are equipped with computers and multimedia. Blue Gold could also develop videos for training. Videos and drama are not mutually exclusive. Videos can also effectively support the CDFs and FTs when running FFS, and beyond.

Fact sheets (book on success stories on good practices). The CDFs are not using the book very much for sharing with the WMGs. (They do use it more to share the story that they wrote themselves). It may be too soon to tell, since it has only been three months. It may be useful to stimulate field staff to use them. It may be more practical and scalable to organise horizontal learnings based on short video clips of farmer innovations captured by CDFs and shared through specialised video platforms, such as www.agtube.org.

Improvements

(c) How can individual extension methods be improved?

With any print media, run off more copies.

Make more sign boards, notice boards.

Additional extension methods

(d) Are there additional extension methods that could be of benefit to BGP and the communities it serves?

With FFS, complement training with videos. E.g. invest in translating existing relevant videos from the Access Agriculture video platform (www.accessagriculture.org).

With videos, to develop new training video modules it would be good to draw on experiences from the FFS and MFS.

See Chapter 6, Conclusions and Recommendations.

Conditions for change

(e) Which conditions are needed to support behavioural change towards adaptive farming systems and collective action?

Even the most ambitious extension effort will fail to move farmers unless the conditions for change exist. An extension program should anticipate these. Fortunately, in the case of Blue Gold, various conditions in the project area favour change (e.g. farmers want to manage water, and make a profit). In other cases, one action by Blue Gold creates the conditions for further change, like a chain reaction, e.g. draining a canal allows an additional rice crop.

The farmers must feel a need to change. In this case, the farmers very much want to see the canals re-excavated. They see the water management as important (Annexes 3, 7, 8, 10 and 19).

Any change in behaviour has to be profitable. Most project changes require more inputs, which may be profitable most of the time, but not all of the time. (Traditional poultry is low-input, low output, so may be more profitable than BG thinks). However, many of the other topics do seem to be profitable, e.g. rice in any season (aman or boro) when made possible by improved water management. Watermelon, mustard and many other target crops also seem to be profitable, and farmers are keen to know more about them.

Input and output markets must be in place before certain extension activities are conducted. For example, in the case of watermelon, the seed must be in shops and there has to be a market for the harvested crop. In the case of Blue Gold, produce markets and input dealers are more or less in place, and the Program is engaging with them.

Some initiatives, especially those that involve canals or other infrastructure, can only be done in cooperation with local government. In the case of Blue Gold, the local governments (UP) is receptive to community's felt needs for water management.

Blue Gold has encouraged and strengthened various WMOs which is a condition for certain other kinds of change. For example a community cannot clean water hyacinth from a canal unless the people are organised to do so. WMG and WMA are geographical units, but not necessarily hydrological. The sluice catchment committee is a more logical unit for working with water. The WMG is formally registered with the BWDB and is a small-scale (village level) organisation, while the sluice catchment committee is informal and covers a large area (several WMGs), so it may be useful to continue to work with WMGs as well as sluice catchment committees (Annex 10). See Annexes 8 and 25 for an example of collective action.

3. Alternative Extension Methods

This section includes recommendations for alternative extension methods and approaches.

Alternative extension methods

(a) Suggest alternative extension methods and approaches, as well as within method alternatives based on Agro-Insight's experience in Bangladesh and elsewhere.

Use video-based training and motivation and awareness-raising. Make farmer learning videos with FFS graduates. Translate relevant existing videos hosted on www.accessagriculture.org into Bangla. BG can distribute the Bangla versions to CDFs and other relevant stakeholders on USB memory sticks, DVDs, tablets and other off-line devices, to share with WMOs.

For all written methods, have more copies printed. Make a bulletin board in the community, WMG office, WMA and union parishod to pin up barta and other written material.

Key methods should be training, with a demonstration, followed by field day/exchange visit and a video. Link farmers with the source of inputs (e.g. using a new crop variety depends on access to the seed).

For farmer-to-farmer horizontal learning (see Annex 13), do more with innovative farmers (including FFS graduates) e.g. pay their travel expenses, give them the mandate to work with more farmers. Identify champions and have meetings with them to teach specific topics (e.g. invite Lochon to come share his experiences on watermelon with local farmers—Annex 14). It would not be costly.

Some FTs could be encouraged to work as CAHWs after the end of BGP. FTs could be encouraged to go into other agricultural businesses, e.g. selling inputs, so that their expertise stays in the area. Some can be a resource to WMGs.

Capitalise more on FFS graduates. Have more field days, enable more graduates to do farmer-to-farmer training, make videos with them.

Farmers from the program area could make cross visits with Natore and other areas to learn about fisheries and zero tillage garlic cultivation and summer tomato in Jessore.

Make use of mobile phones to share information. Many farmers, especially younger ones, now have and use smart phones. Videos and other information can now be shared with farmers via smart phones.

Channel more information through the private sector. Blue Gold is already interacting with the private sector in innovative ways, e.g. introducing input dealers to farmers during FFS (Annexes 27 and 29) to encourage group buying. Written material, videos (on DVDs) and other mass media could also be distributed through Blue Gold's large network of collaborating input dealers.

Coherence and effectiveness of extension methods

(b) Reflect on key issues affecting the coherence and effectiveness of extension methods employed in BGP.

FFS is a favoured method, because of the quality of the learning, even though it is not effective at reaching large numbers.

CAWM could be improved: adding more topics, adding more farmers. Its main topic is water management. The big success so far has been with early maturing HYVs. Early harvest allows other crops to be added. Farmers need training on okra, mustard and other non-rice crops, plant health, other rice varieties, in field irrigation, harvesting and post-harvest of rice and non-rice crops. Most of the members of WMG should be trained, not just 25 people. More horizontal learning could share the results of CAWM beyond the host community.

Cropping intensity initiative is similar, but on higher land water logging is not a problem, and you can intensify cropping without changing water management. New crops may require changes in marketing. Change agents must understand risk, e.g. do you want to grow watermelon and run the risk of losing the whole crop to pests or market failure or crop loss due to weather.

Integrate methods, so for each key topic you have a technical note, demonstration and field day. Blue Gold already does this in many instances, but it could be made more systematic. For any topic, e.g. growing mustard, whether taught as part of an FFS or some other method, a technical note would summarise information for farmers, and a demonstration would prove the concept. A field day (which could be a crop cutting day would scale up the information with other community members).

4. Review and develop roles in horizontal learning activities

Roles of field staff

Review the roles in horizontal learning activities of key field staff and water management organisations (WMOs):

(a) Review roles of field staff in HL activities

TA community development facilitators (CDFs). The CDFs gathered the success stories to be documented in the fact sheets and helped to write them. The CDFs are charged with sharing the fact sheets in the WMGs and replicating selected success stories. Blue Gold could give more guidance to the CDFs as to how to do this. There may need to be some sort of reward for performing this additional work.

The CDFs facilitate the CAWM and the demonstrations. The CAWM probably needs continued facilitation by CDFs (or other extensionists) to continue to work. The CAWM are rather large, formal events and it is unlikely that communities will organise them if left to their own devices.

The CDFs play a crucial behind-the-scenes role in the crop cutting field days. While farmers conduct the trials and speak at the events, the field day itself is organised by the CDFs (e.g. buying snacks and other materials, selecting and inviting participants, and planning the day's schedule). Such valuable events would not occur without the facilitation of a CDF or similar extensionist.

The crop cutting festival is like a crop cutting field day, only more complex, and the contributions of the CDFs are similar to those of a crop cutting field day. Exchange visits between WMOs are organised by CDFs. Like the other events described above, the CDFs invite participants, plan the event and provide the materials. The CDFs are essential for the exchange visits.

Preparing an action plan. The CDFs write out a blank action plan before meeting with farmers at the event. The CDF neatly divides the large sheet of paper into rows and columns and carefully writes the titles for each row and column, using an ink marker. At the event, the farmers dictate the content of the cells to the CDFs, who fill in the cells, editing the farmers' remarks to ensure that the cells are written in a similar style and rhetoric as other action plans.

The cropping intensity initiative is facilitated by the CDFs, who help to select the new crop to add to the farming system, while mentoring the farmer-innovators as they grow the crop. The CDFs help to invite other farmers to see and replicate the successful experience with the crop.

TA/DAE Farmer Trainers (FT). Some of them do excellent work, e.g. Annexes 14 and 15. Every FT has their homestead. They are paid. They probably won't continue to work after the program ends unless they are paid or supported in some way. However, DAE has trained 150

FTs and will include their FTs in other projects after BG ends. BG needs to develop more farmer trainers. Perhaps FTs trained by TA could be incorporated into DAE. The farmer trainers are mostly involved in FFS. They could be incorporated into horizontal learning events and CAWM.

BWDB Extension Overseers. There are few of them for a vast area. An overseer may have hundreds of groups and be situated far from the farmers. They help register WMGs with the BWDB. The overseer knows the registration process, receives the paperwork, and vouches for the process of group formation. When they visit the WMG they offer advice. They provide motivational activities for operation and maintenance of infrastructure, collective action, HL and others. The WMGs have the phone numbers of their BWDB extension overseer, and may ring if they need help with sluice gate or embankment breakdowns, for example. The BWDB extension overseers are not key actors in most horizontal learning events, largely because they are busy with other responsibilities, and have many communities to attend to.



A sign on the house used by a WMG reads:
Registered by Bangladesh Water Development Board, Kallayan Kolos Prodhan Khal WMG
Registration No.:208617, Date: 12/02/2017
Upozila: Golachipa, District: Patuakhali
Polder No. 55/2C

DAE (Sub-Assistant Agricultural Officers and other DAE functionaries). The DAE is closely identified with FFS as a preferred extension method, but the SAAOs attend all or most other program activities as well and they know about the work by TA. The DAE has expressed the intention to continue with program goals (e.g. working with WMOs) after 2020.

The DAE extensionists (SAAO) play a role similar to that described earlier in this section for the CDFs to organise and facilitate certain kinds of horizontal learning events, such as DAE organised demonstrations, upozila-level agricultural fairs and rural agricultural fairs at the village level (poli krishi mela).

Self-evolving WMOs

(b) Consider and map out the potential role for WMO-to-WMO support for the development of self-evolving organisations

There is evidence that at least some of the WMOs are sustainable, i.e. will continue to work after the program ends. They say they will keep working, and they are well motivated. See Annexes 3, 6, 8, 9, 10, 11, 18, 19, 32 and 33).

However, some WMGs went inactive after IPSWAM left—Annexes 11 and 12.

UP and DAE have expressed interest in continuing to support WMOs. (The lack of integration with UP and DAE may have been one reason that WMOs went inactive after the end of IPSWAM).

WMO-to-WMO support will depend on the interest of the UP and the DAE. If UP is not interested, it will be difficult for the WMOs to survive. UP is important as an honest broker, and source of funds.

WMOs will continue to need facilitation for many of their operations. The horizontal learning events themselves are complex and demand much facilitation. It is unlikely that the WMOs will self-organise formal horizontal learning events, such as field days, without help from extensionists.

WMOs are more likely to link with each other for operations and maintenance, e.g. for downstream-upstream issues. For the exchange of their experiences, they can share with each other; there is informal exchange of information between them. (Inviting the chairman of Amodkhali to speak at a neighbouring WMA, Annex 7).

WMAs have been formed to support WMGs, but most WMAs will continue to require support themselves (from DAE, UP, BWDB) in order to continue. WMOs will be active in the future to the degree that they perceive water management to be important. Rural communities have self-organised since prehistoric times to manage irrigation, and continue to do so (Tingor 2010, Van Schendel 2009, Lansing 1987, Trawick 2001). However, in this specific case, many of the polders, canals and associated infrastructure were not built by peasant communities, and are too large and complex to be managed by rural water management organisations without the support of the BWDB. The WMOs may self-organise to manage water, but will need continued facilitation to keep sharing information with others.

Capacity development for field staff and WMOs

(c) Suggest approaches to develop the capacity of field staff and WMOs to facilitate HL activities.

Some CDFs need FFS training. CDFs could also receive short trainings on the use of video and open access video-sharing platforms.

They have had training on horizontal learning. The staff should be encouraged to have more field experience with horizontal learning.

CDFs and WMOs are working fairly well. Members of WMOs may not have much more time to devote to unpaid community service.

5. Framework and Reporting

Develop a framework to map present and proposed future HL activities, and a reporting format to capture inter alia the reach of HL activities – both directly and indirectly.

Framework to map present and proposed future horizontal learning activities

With each FFS or with each similar activity, plan HL activities that share the information with a larger audience, especially demonstrations, and field days. So far there is a tendency to only have one field day per demonstration. There could be many more. Arrange field days so that the community members can come and learn quickly.

They invite farmers to come to demonstrations with “important” people. Then the farmers wait for hours for the guests to arrive. This wastes farmers’ time. Either don’t invite dignitaries, or start without them.

The field day should be more informal and low-cost.

Invite more people and use a loudspeaker.

Reporting format for direct HL

This table was inspired by an earlier effort by Aowlad Hossain.

Date (when it happened)	Place (where)	Type of HL event	Topic and description	Number of women	Number of men	Attended by (visiting WMOs)	CDFs	Notes
2018 02 17	Satkhira	Demonstration on mustard	Host farmers showed visitors a new mustard variety (BR14) and explained how to fertilise it	45	8	WMO A, WMO B	Atiqul	
2018 02 20	Dhamilia	FFS session	CDF taught farmers how to make non-toxic pesticides from local materials	25	3	WMO C, WMO D	Hafsa Khanom	

Reporting for indirect HL

Innovation study. Take a random sample of farmers from the project area. For each one ask them which innovations they have tried and the result. For example they may adopt, reject, modify the recommendation or disadopt (try it and abandon it).

Farmer innovation survey		
Date	Village	
Farmers' name	Gender	
Rice		
Innovation	When did you try it?	Adopted, modified, or disadopted
BR52		
Other varieties		
Relay cropping		
Added a new season		
other		
Mustard		
Innovation	When did you try it?	Adopted, modified, or disadopted
BR14		
Tried crop for first time		
Gypsum fertiliser		
Other fertiliser		
Watermelon		
Innovation	When did you try it?	Adopted, modified, or disadopted
Chickens		
Innovation	When did you try it?	Adopted, modified, or disadopted
Hazol		
Vaccination		
Rearing house		
Supplementary feed		
Etc. Water management issues Cleaning water hyacinth Making small dams		

The study would be done in various steps.

1. Select key innovations to study (e.g. hazol, cattle fattening, BRR1 dhan 52, mustard, watermelon).
2. Write a draft survey instrument.
3. Validate the survey instrument in the field.
4. Edit the survey instrument.
5. Select a random, stratified sample of farmers from A) Blue Gold farmers. This would give you an idea of the maximum level of impact to expect B) non-Blue Gold farmers in Blue Gold polders. To estimate the degree of HL between Blue Gold farmers and their neighbours. C) Farmers in other polders. The control group.
6. Conduct the survey.
7. Analyse and write up the results.

6. Conclusions and Recommendations

Conclusions

The suite of Blue Gold extension methods were designed to achieve different purposes, which in general has been successfully carried out.

The mass communication methods, from drama to written materials, have contributed to convincing stakeholders of the need to participate in water management as attested by various cases where local people were assuming management for their own water resources, e.g. cleaning water hyacinth from canals (Annex 9), taking ownership of canals and sluice gates (Annex 19), irrigating from canals (Annex 25), building dams to manage water (Annex 33), and cooperating as a group to face down powerful local people (Annex 28).

Coordination meetings with local government really have resulted in local government committed to water management, including the successful re-excavation of the Amodkhali Canal (Annex 3), local officials meeting on their own initiative to discuss the lessons from that experience (Annex 7), and union parishod leaders who are serious about working with water management organisations (Annex 18).

Community development facilitators (CDFs) have gone far beyond establishing and nurturing water management organisations. They are crucial for facilitating horizontal learning events (Annex 4) and for teaching farmer field schools (Annex 17) and for conducting most Program activities.

The workshops and training events helped the water management organisations to learn the skills they needed. E.g. some groups were able to conduct successful fisheries projects (Annex 15), organise with other groups to build a dam over the mouth of a large canal (Annex 8), and to organise local people to operate the sluice gate (Annex 10).

Horizontal learning is a valuable way to communicate a successful innovation to a larger audience, e.g. digging shallow wells to irrigate watermelon (Annex 13), learning about tomato growing (Annex 6) and in one dramatic event, inspiring 25 couples to start small-scale commercial hen rearing (Annex 31). The CAWM (community-led agricultural water management) variant of horizontal learning has helped local communities to engage with authorities to repair or build canals (Annex 30) and new, modern sluice gates (Annex 27). Cropping intensity initiative (CII) convinces farmers of practical ways to add a new crop to the annual cycle (Annex 24).

Blue Gold has used farmer field schools (FFS) competently, even creatively, including FFS for women (Annex 17), and market-oriented FFS where farmers organise for group input buying (Annexes 26 and 29). Farmer trainers are being mentored to assume responsibility for future FFS (Annex 15). Field schools are conducted on field crops such as rice and watermelon, sometimes inspiring whole communities to adopt new crops (Annex 16) or adopt modern high yielding rice varieties (Annexes 9, 12 and 30), and FFS on income generation activities are

encouraging farmers to raise fatter cattle (Annex 23), to improve their chicken production (Annex 5) and to produce sesame (Annex 11).

However, FFS is not a mass extension method. This is not the fault of Blue Gold, but is a structural limitation of FFS, which is designed to strengthen human and social capital of a limited number of people through intensive, season-long interactions and learning sessions. FFS not only explains a technology but also shares ecological and biological principles behind the innovation. Because of the small audience sizes, about 25 people (built into the FFS concept) relatively few people can take a Blue Gold field school. Each of those fortunate people will learn about one or a few specific topics. No community members will receive all of the FFS training that Blue Gold has to offer.

Recommendations

To get the most from farmer field school, make quality farmer-to-farmer videos with selected FFS graduates, especially those who completed their training at least two years before making the videos. These women and men will have had time to adapt their new knowledge to their own conditions and to verify the technologies they learned in the field school. The videos will convey farmers' advice to their peers, while the images will show the innovations to the audience. The videos can be filmed to show all major Blue Gold topics (e.g. water management, cattle, fish, rice, watermelon, poultry, marketing and others). If each CDF shows the videos to about 400 farmers in five communities, 200,000 participants can be reached with all of Blue Gold's core messages.

We recommend using a quality farmer-to-farmer video format, as promoted by the international NGO Access Agriculture, because of four main reasons. First, their format embraces the key principles of FFS, resulting in a quality learning experience. Second, the videos can be left in communities where Blue Gold intervenes and allow for non-facilitated learning (see Zoundji et al. 2016, 2018). So learning can be scaled up without having to recruit and train many more CDFs. Third, the video approach stimulates horizontal learning within communities. And last but not least, using a quality video format allows the videos to be broadcast via cable TV and other channels, which are all key to going to scale.

On quite a few topics, quality farmer-to-farmer training videos already exist. Farmers like to learn from their peers, including from farmers in other countries, but for optimal learning, videos need to be in the farmers' own language. Translating selected videos hosted on www.accessagriculture.org into Bangla would be an effective way of sharing information farmers in Bangladesh.

Videos can be loaded onto smart projectors, which are compact and easy to take to the field.

These videos can include a version in 3gp format, which can be loaded onto the mobile phones of local people. This will be a permanent resource, left in the community, which WMO members can watch again and share with others.

Start events on time, to show respect to farmers and to acknowledge the value of their time. If the dignitaries do not arrive on time, start without them. If the dignitaries arrive late, it is more

impressive to see an extension event in full swing than to see bored farmers fidgeting in their seats. During training events, give out the boxed lunches at noon, not at the end of the event.

Instead of obliging low-literate people to write an action plan, give them a simple note describing the steps needed to conduct the activity. E.g. for poultry rearing, include a line drawing of the hen house with a list of materials they need to buy at the hardware store. Content of the action plan can be typed on A4 paper for better use and preservation.

Print more copies of written material.

Project signs may include more information, including contact details and some technical information.

Scale up the notice boards with rules on proper care of water management infrastructure. The notice boards could tell readers why a rule is important (e.g. “Do not build houses on the embankment, because building houses weakens the embankment.”)

Have more than one field day or farmer cross visits associated with a demo or a farmer field school, to share information with more farmers.

Besides FFS training, short and long term training on relevant issues including profitable agricultural issues on crops, livestock and fisheries can be provided to the FTs by Blue Gold.

CDFs may need more encouragement to use fact sheets in WMGs. CDFs could make short video clips of successful experiences, and share them on social media.

BG needs to prepare fact sheets for the relevant issues including technical issues for distribution among the WMGs, WMAs and progressive farmers.

Find ways to share the benefits of fisheries more widely, beyond the relatively small groups that benefit from using these public bodies of water. E.g. form larger fisheries groups (30 WMG members instead of seven), offer training to more community members, and work in more than one body of water as part of a single intervention.

Annex 1

Scope of work

Joint analysis of extension methods employed in BGP

Agro-Insight Technical Proposal (November 2017)

Scope of Assignment

1 Background

The Blue Gold Program is implemented by BWDB and DAE (with support from the Netherlands) to provide local communities with additional security against floods and to pursue sustainable socio-economic development through participatory water management and diversified farming practices with an orientation on markets. By developing the institutional framework; investing in water resources infrastructure and strengthening production services, Blue Gold aspires to help reduce poverty and enhance food security.

The Blue Gold Program addresses poverty and vulnerability in 22 polders in the south-west coastal zone by developing the capabilities of 500+ water management groups (WMGs) to cooperate in managing water resources to obtain increased agricultural productivity and surplus for the economic development of the communities. WMGs are stimulated to build partnerships with private sector services and suppliers, and with local government and technical agencies such as DAE and BWDB. There are an estimated 200,000 households represented in the WMGs. The socio-economic status of a sample of some 3,600 households in seven polders is presented below in Figure 1.

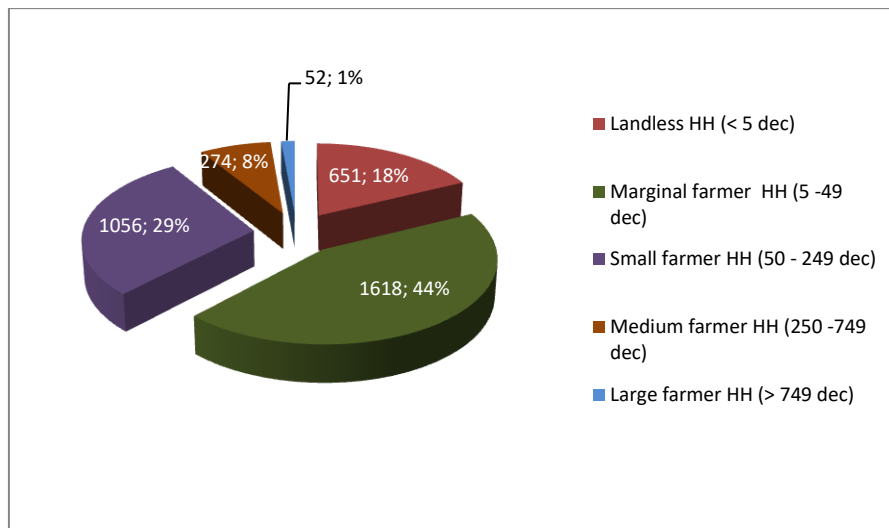


Figure 1 Socio-Economic Status of Blue Gold Households
(based on a survey of 7 polders)

Of the 200,000 households, an estimated 20,400 have been reached directly through Farmer Field Schools (FFSs) and Market-Oriented Farmer Field Schools (MFSs). In the next 2½ years, Blue Gold aims to reach more households with the core messages through a variety of training and extension methods.

The program employs an array of methods to inspire behavioural changes in its target group. In order to improve the effectiveness of the present mix of methods, Agro-Insight has been asked to support the BGP team in taking stock of the mix of methods being employed; and in identifying practical improvements of the same. This note provides further context and structure for this exercise.

2 Scope of Assignment

2.1 Context

The Blue Gold Program (BGP) technical assistance (TA) team comprises professionals with experience in the use of communication, training and extension methods within their realms of responsibility. A TA Training & Communications (T&C) team is responsible for supporting and/or implementing training and extension activities. Routine training, extension and communication interventions are, however, carried out by staff units at polder, zonal and national level; with an increasing emphasis on decentralised implementation.

2.2 Aim of assignment

The aim of Agro-Insight's assignment is to assist BGP professionals to fine-tune the mix of methods and in calibrating the individual methods for better effectiveness. This requires Agro-Insight to lead a process of co-creation or joint analysis with a core team of BGP professionals.

The process should set out to strengthen conceptual leadership by the T&C team and should enhance team work among BGP professionals in different extension methods.

Agro-Insight is expected to provide the following inputs to the joint analysis.

2.2.1 Stock take

Review the array of communication interventions currently used by Blue Gold to achieve its objectives, including:

- (a) Mass communication methods such as drama, videos, posters and leaflets, which aim to convince stakeholders of the need for engaging in participatory water management;
- (b) Coordination meetings with Local Government Institutions (LGIs) in order to establish an actor network and a joint agenda for participatory water management;
- (c) Community facilitation whereby community workers (CDFs) provide guidance to the establishment of, planning by and activities of water management organisations;
- (d) Workshops and training events which help structure some of the responsibilities of water management organisations (e.g. banking and bookkeeping, catchment management);
- (e) Horizontal learning whereby an inventory of successful WMO activities is the starting point for exchange visits aiming for rapid replication of these successes. This 'vehicle' was first applied to the Community Agricultural Water Management demonstrations; and its use is now expanded to all WMG successes;
- (f) Farmer Field Schools (FFSs) where curricula for home gardens, backyard livestock and fish culture are applied by BGP TA staff, and curricula for field crops are applied by DAE in response to target group priorities.

A range of TA staff are responsible for implementing Blue Gold training and extension activities:

- The T&C team has hands-on involvement in mass communication, LGI coordination and training workshops;
- Community facilitation is fully decentralised to the polder teams;
- Horizontal learning is carried out by polder and zonal teams and driven by central initiative;
- Farmer field schools are either carried out by agricultural specialists at national and zonal level or by DAE (with involvement of BGP agricultural specialists)

2.2.2 Reflection

Reflect and report on Blue Gold HL activities and extension methods with the following line of questioning:

- (a) Which extension methods have been the most successful, e.g. should be scaled up with other topics, in other places?
- (b) What are some of the challenges with some of the least successful methods?
- (c) How can individual extension methods be improved?
- (d) Are there additional extension methods that could be of benefit to BGP and the communities it serves?

- (e) Which conditions are needed to support behavioural change towards adaptive farming systems and collective action?

2.2.3 Alternative Extension Methods and Approaches

BGP covers a large population over a large geographical area and field manual (a.k.a. 'Unified Approach') structures the program ambition, but within the program's overall drive to enhance economic development, the objective to alleviate poverty continues to inspire activities of its own (e.g. homestead FFSs, LCSs).

- (a) Suggest alternative extension methods and approaches, as well as within-method alternatives based on Agro-Insight's experience in Bangladesh and elsewhere.
- (b) Reflect on key issues affecting the coherence and effectiveness of extension methods employed in BGP.

2.2.4 Review and develop roles in HL activities

Review and develop the roles in HL activities of key field staff and water management organisations (WMOs):

- (a) Review roles of field staff in HL activities (TA community development facilitators (CDFs), TA/DAE Farmer Trainers, BWDB Extension Overseers, DAE Sub-Assistant Agricultural Officers etc.)
- (b) Consider and map out the potential role for WMO-to-WMO support for the development of self-evolving organisations
- (c) Suggest approaches to develop the capacity of field staff and WMOs to facilitate HL activities.

2.2.5 Framework and Reporting

Develop a framework to map present and proposed future HL activities, and a reporting format to capture inter alia the reach of HL activities – both directly and indirectly.

2.3 Outline Activities

The following suggestions are made to structure activities during the assignment:

- (a) Inception workshop² – with main TA actors: Abul Kashem (training), Khairul Islam (communications), Aowlad Hossain (institutions, CAWM), and Shorab Hossain (community mobilisation, CAWM)
- (b) Field visits – HL methodologies (exchange visits, melas, videos etc.), HL activities (CAWM, CII, exchanges), FFS (TA, DAE), staff³ (CDFs, FTs, XOs, SAAOs), WMGs
- (c) Planning for results workshop – with main TA actors
- (d) Results workshop, Dhaka – attended by EKN, BWDB, DAE, TA team (say 20 max)
- (e) Reporting - The report should reflect the conclusions drawn by the core group, with possible observations by Agro-Insight on these outcomes. Draft to be delivered by Agro-Insight within 10 days of completion of the results workshop; comments on draft to be provided by TA within 10 days of receipt of draft; final report to be provided by Agro-Insight within 10 days of receipt of TA comments.

² The process of developing conceptual leadership within the TA T&C team will involve close interaction with the core group of TA actors from the start of the assignment.

³ Agreement should be reached with the main TA actors about the scope of involvement of DAE staff, and how agricultural specialists and other zonal and polder staff should be involved in the exercise.

Annex 2

Diary of field visit for Jeffery W. Bentley and Harun-Ar-Rashid, 11 February to 2 March 2018

Date	Location	Worked with	Activities/Tasks Performed
11.02.2018/ 12.02.2018	Dhaka-Satkhira	-	Travelled to Satkhira
12.02.2018 (Afternoon)	Zonal Office, BGP, Satkhira	Zonal team, BGP, Satkhira	Presentation by zonal coordinator. Discussion and field visit planning
13.02.2018 (Morning)	Zonal Office, BGP, Satkhira	Zonal team, BGP, Satkhira	Meeting with zonal team
	Dhekur Beel, Dhekur Beel Khal WMG, Sadar, Satkhira (Polder # 2)	Members of WMGs, SAAOs, FTs etc.	Attended field day on CII with mustard & interviewed farmers & EC members
13.02.2018 (Afternoon)	UAO office, DAE, Sadar, Satkhira	Mr. Amjad Hossain, UAO, DAE, Sadar, Satkhira & SAAOs	Meeting with UAO & SAAOs
	Re-excavated Amodkhali Khal, Sadar, Satkhira (Polder # 2)	Farmers & EC member of WMG etc.	Interviewed farmers
	Koikhali WMG, Sadar, Satkhira (Polder # 2)	Farmers & members of EC, WMG etc.	Discussed & observed FFS activities, CII and results of HL
14.02.2018 (Morning)	Morichap WMG, Sadar, Satkhira (Polder # 2)	Members of EC, WMG & farmers	Observed the meeting of WMG, Action plan & results of HL
	Zonal Office, BGP, Satkhira	Zonal team, BGP, Satkhira	Conducted joint analysis
14.02.2018 (Afternoon)	Budhata UP office, Sadar, Satkhira(Polder # 2)	Two UP Chairmen, Members of WMAs & WMGs	Observed the meeting of WMAs & WMGs
15.02.2018 (Morning)	Sagla Sluice gate, Sadar, Satkhira (Polder # 2)	Members of WMAs & WMGs	Observed the cross dam, canal & sluice gate and discussed with members of WMAs & WMGs
	Jealla Badhondanga WMG, Sadar, Satkhira (Polder # 2)	WMG & farmers	Discussed the performance of BRRI dhan52, 42, canal cleaning, HL learning etc.
	Zonal office, BGP, & Satkhira	Zonal team, BGP, Satkhira	Discussed various issues
	Travel Satkhira to Khulna		
15.02.2018 (Afternoon)	Zonal office, BGP, Khulna	Zonal team, BGP, Khulna	Meeting & field visit planning
16.02.2018	Khulna City	-	Worked together on draft report preparation etc.
17.02.2018 (Morning)	Bakultola WMG office, Dumuria, Khulna (Polder # 29)	EC members of Bakultola WMG & members of Bakultola sluice catchment area committee	Discussion with EC members of Bakultola WMG & members of sluice catchment area committee & visited sluice gate
	Kanchannagar WMG office, Dumuria, Khulna	EC members of Kanchannagar WMG &	Discussed collective action, FFS, MFS, marketing and success

Date	Location	Worked with	Activities/Tasks Performed
	(Polder # 29)	farmers	stories etc. with EC members and farmers
17.02.2018 (Afternoon)	Dakshin Dumuria WMG, Dumuria, Khulna (Polder # 29)	EC members of Dakshin Dumuria WMG and farmers	Discussed partnership, HL, reflection, FFS etc. with EC members of WMG & farmers
18.02.2018 (Morning)	Hatbari WMG, Paikgacha, Khulna (Polder # 22)	EC members & farmers of Hatbari WMG	Discussed watermelon, pond irrigation,, collective action, CA, HL etc. with farmers and EC members
	Syed Khali WMG, Paikgacha, Khulna (Polder # 22)	EC members & farmers of Hatbari WMG	Discussed watermelon, FFS, MFS, FT,HL etc.
18.02.2018 (Afternoon)	Bashurabad WMG, Batiaghata, Khulna (Polder # 30)	EC members & farmers of Bashurabad WMG	Discussed FFS, FTs, CII, fish culture, watermelon, mustard & aman rice etc.
19.02.2018 (Morning)	Uttar Gojendrapur WMG, Gojendrapur School field, Dumuria, Khulna (Polder # 29)	Representatives of six WMGs from 3 polders (Polder # 27/1, 27/2 & 25) & EC members of Uttar Gojendrapur WMG, SAAO, DAE	Attended & observed the experience sharing half day meeting and preparation of action plan. Visited & discussed mustard, amam rice relay cropping demo plot of CII.
	Gojendrapur, Dumuria, Khulna (Polder # 29)	Mr. Nazrul Islam, UAO, DAE, Dumuria, Khulna	Discussed FFS, crop demo, exposure visit, sustainability of WMOs, FTs, technology transfer approaches, video based motivation & training etc.
19.02.2018 (Afternoon Evening)	DD, DAE office, Khulna	DD, DAE, Khulna	No meeting
	BWDB office, Khulna	Executive engineer of BWDB, Khulna	Discussed the sustainability of WMG, BWDB role on extension, DAE's role, Extension wing of BWDB
20.02.2018 (Morning)	Choybaria WMG, Dumuria, Khulna (Polder # 25)	Farmers, President & GS of WMG, FT, CDFs	Observed FFS training on IPM & discussed with EC members & farmers
	UP office, Dhamalia, Dumuria, Khulna (Polder # 25)	UP Chairman, Dhamalia, Members of WMG, CAHW etc.	Discussed with chairman on his role with WMG and its activities, impression about BG activities, sustainability of WMG and polder management etc. Discussed with a CAHW.
	Rudagora WMG, Dumuria, Khulna (Polder # 25)	EC members and farmers of the WMG	Discussed FFS, sustainability of WMG etc.
	Keoratola Sluice Gate, Dumuria, Khulna (Polder # 25)	EC members of the WMG	Discussed sluice gate management, canal excavation and use of notice board.
20.02.2018 (Afternoon)	Zonal office, BGP Khulna	Two CAHWs (Sachindra Nath Golder & Noorjahan Begum)	Discussed with CAHWs on their current on payment basis activities and future

Date	Location	Worked with	Activities/Tasks Performed
			sustainability on payment
	Training room, zonal office, BGP, Khulna	Zonal team, BGP, Khulna & central staff	Conducted joint analysis
21.02.2018	Khulna City	-	Worked together on draft report preparation
22.02.2018 (Morning)	Bellpatila WMG, Dumuria, Khulna (Polder # 27/1)	Members WMG & farmers & fish farmers	Observed FFS training session, discussed with CLF groups visited fish harvesting, cow fattening, observed HL Interviewed a CDF etc.
22.02.2018 (Afternoon)	Zonal office, BGP, Khulna	Zonal team, BGP, Khulna & central staff	Conducted joint analysis
23.02.2018 (Morning)	Travelled from Khulna to Patuakhali	-	-
23.02.2018 (Afternoon)	SDA guesthouse, Patuakhali	Mr. Shaifullah, BDC, BGP, Patuakhali	Discussed BGP activities in Patuakhali and Barguna districts and planned field visits
24.02.2018 (Morning)	Madhya Amkhola WMG, Sadar, Patuakhali, (Polder # 43/2B)	EC members & farmers of WMG and SAAO, DAE	Discussed WMG activities, FFS, CII, collective action on boro rice cultivation, fruit trees sampling distribution, etc.
	Mashurikathi WMG Sadar, Patuakhali, (Polder # 43/2B)	EC members & farmers of WMG	Discussed with WWG and observed re-excavated canal, collective action on watermelon cultivation, irrigation & sluice gate
24.02.2018 (Afternoon)	Dakshin Purbo Golbasbunia WMG, Sadar, Patuakhali	EC members of WMG and farmers	Discussed MFS activities, collective action on mechanised mung bean seeding and discussions with CAHW
25.02.2018 (Morning)	Zonal Office, BGP, Patuakhali	Zonal & central staffs	Attended & shared at the zonal coordination meeting
25.02.2018 (Afternoon)	Zonal Office, BGP, Patuakhali	4 CDFs, BGP, Patuakhali	Talked with CDFs about their responsibilities
	DD, office, Patuakhali	DD, DAE, Patuakhali & AEO, Sadar, Patuakhali	Discussed FFS implementation & sustainability of activities of DAE within the polders, farmers' cross visit etc.
	Zonal Office, BGP, Patuakhali	Mamun-Or-Rashid, extension overseer, BWDB, Patuakhali	Discussed extension work, WMG registration etc.
	Zonal Office, BGP, Patuakhali	G.M Khairul Islam C.S, BGP, Dhaka	Discussed communication activities and watched a video.
	Zonal Office, BGP, Patuakhali	Md. Shamim Ahamed Yousuf. Ag. expert, BGP, Patuakhali	Discussed FFS
26.02.2018 (Morning)	Zonal office, BGP, Patuakhali	S.M. Badrul Alam UAO, Amtoli, Barguna	Discussed FFS, crop demo, field day, cross visit, HL, extension method, sustainability of agri-

Date	Location	Worked with	Activities/Tasks Performed
			activities within polders and Agri technology transfer methods & process etc.
	Dakshin Sonakhali WMG, Sadar, Patuakhali	EC members of WMG and farmers	Discussed sluice operation by WMG, FFSs, market linkage and marketing of watermelon & rice and visited watermelon field
	Basak Bazar, Sadar, Patuakhali	Community members	Discussed drama content and follow-up experience by WMG
		Mr. Mosharaf Hossain M/S Mridha Enterprise	Discussed the marketing of agri-inputs through WMG
26.02.2018 (Afternoon)	zonal office, BGP, Patuakhali	Zonal team, BGP, Patuakhali & central staff	Conducted joint analysis
27.02.2018 (Morning)	BWDB local office, Kallyan Kalash Prodhan Khal WMG, Galachipa, Patuakhali (Polder # 55/2C)	EC members of WMG & farmers	Discussed FFS, CAWM, BRRI dhan52, boro cultivation, sluice management, canal excavation, CLF etc.
27.02.2018 (Afternoon)	DFO office, Patuakhali	Dr. Abdul Hasanat DFO, DoF, Patuakhali	Discussed CLF and intensive pond fish culture within polder
	DLO office, Patuakhali	Dr. Moloy Kumar Sur, DLO, DLS, Patuakhali	Discussed poultry rearing, cow rearing and animal health
28.02.2018 (Morning)	Cyclone Shelter, Betagi Chikerbandh WMG, Galachipa Patuakhali (Polder # 55/2A)	EC members of host WMG & 50 guest members from 5 WMGs	Observed HL for small scale local chicken-duck rearing
28.02.2018 (Afternoon)	Zonal office, BGP, Patuakhali	Zonal team, BGP, Khulna & central staff	Conducted Joint analysis
01.03.2018 (Morning)	Company Khal WMG, Kalapara, Patuakhali (Polder # 47/4)	EC members of WMG & farmers	Experience shared on WMG formation (self-evolving process), crop cultivation through storing sweet water, FFS, FT, etc.& visited canal with fresh water and boro rice cultivation field etc.
01.03.2018 (Afternoon)	Pakhiapara WMG, Kalapara, Patuakhali (Polder # 47/4)	EC members of WMG & farmers	Discussed WMG & UP collaboration, FFS and visited cross dam
02.03.2018 (Morning)	SDA guesthouse, Patuakhali	-	Preparing PowerPoint presentation for Blue Gold
02.03.2018 (Afternoon)	Travelled from Patuakhali to Dhaka	-	-

Annex 3

The Amodkhali canal re-excavation

In 2000, the 10 km-long Amodkhali Canal silted up. So during the winter rainy season the water had nowhere to go. A vast area in the middle of Polder 2 became a seasonal lake. Villagers hung on, growing rice in the dry season. Many migrated for wage labour in the winter.

Then in May 2017, Blue Gold began to re-excavate the Amodkhali Canal. By July they had dug out 8.4 km. It

was a big job. At 2.5 meters deep and 6 meters wide, thousands of cubic meters of mud had to be moved. Some was done by machinery and some by hand. Groups of women were organised into Labour Contracting Societies (LCS) to earn money doing the work.

Local people near the canal saw the work. Even those living far away heard about it, and when the rains came in July 2017, farmers could see with their own eyes that the rainwater was draining away.

Like a river, a drainage canal has a sort of watershed, called a catchment area. This canal drains a roughly tear-drop shaped area some four by six kilometres: a big place. The thousands of farmers in the area didn't have to be begged or cajoled into planting rice: they just did it.

My colleagues and I met local farmer Nozrul Islam near the banks of the canal. He said that he was so happy with the canal. He has two hectares of land and when the water drained off, nobody told him to plant rice. He simply went to Khulna, a neighbouring district, and bought rice seed for all of his land. He hadn't planted winter rice for over 16 years.

Nozrul's experience was replicated all over the area. In the village of Koikhali, a group of women told us that they also planted winter rice last year.

There was no experimentation, no hesitation. People simply recreated a cropping system that they had not been able to grow for almost a generation. The total catchment area is 4326 ha. That first year they planted 2106 hectares of aman rice, and harvested 12,000 tons of rice. Much of this rice was sold on the national market.



The re-excavated Amodkhali Canal allows a profitable rice crop to be grown

Annex 4

The crop cutting field day

On 13 February 2018 the WMG of Chater Beel, near Satkhira, held a field day with about 50 farmers, almost all women. The women were from Chater Beel and from two neighbouring groups. The activities started in the morning. First the CDFs and the host farmers cut a small circle of ripe mustard, and then threshed it and estimated the yield.

The demonstration was large, about a hectare (seven bighas), planted by five farmers. Two host farmers explained the results to the group. There were several ingredients to this successful harvest. The host farmers said that one should:

Plant an improved variety (BINA Shorisha 4).

Fertilise appropriately, per bigha

- 10 kg gypsum
- 10 kg urea
- 15 kg TSP
- 10 kg MOP
- And then a top dressing of 10 kg of urea.

The host farmers, Rajul Karim and Sultan Ahmed, explained how the mustard plants from the demonstration were bigger than other mustard plants. Rajul and Sultan brought a plant of a local variety from a neighbour's field and compared it to one they had grown in the demo. The local variety had fewer pods and only nine or 10 grains per pod instead of 20.

Twenty of Sultan's neighbours had already seen the demonstration; Sultan hadn't waited for the formal event to start sharing the results.

Sultan added that the new variety was also oilier, so it would fetch a better price. He thought it might have 350 g of oil per kg of grain, instead of 250.

Sultan explained to the group that gypsum was important. "If you give a cat rice and fish bones, the cat will eat the fish bones, because that is its food. Gypsum is like that; it is the food of the mustard."

The farmers who had grown the demo plots also explained to the visitors that mustard cannot withstand stagnant water, so as the area is drained by the Amodkhali Canal (see Annex 3),



Farmers Rajul and Sultan do most of the talking, giving the event credibility

there is an opportunity for farmers to respond to it. The demonstration mustard was harvested a bit early; it's still a little green, because the farmers want to plant boro (spring, dry season) rice. Most of the neighbours have already transplanted their dry season rice.

The response was enthusiastic. Two SAAOs (sub-assistant agricultural officers) were there from the DAE: such involvement helps to ensure that government extension will backstop the initiative once the project ends.

Local UP member Modhushudon Mondal was not expected to attend, because his father had died the day before, but he took his seat wearing his white robes of mourning, suggesting how seriously local leaders take this initiative.

One of the CDFs, Akidul Islam, wrote down the farmers' names and phone numbers on a whiteboard. The visiting farmers took note so that they could ring back and buy seed.



CDF Akidul writes down farmers' phone numbers. So visitors can buy seed from them. CDFs plan an important back-stage role, organising and preparing the event

One of the visitors, Rina Biswas, said that she learned how to sow seed, fertiliser management, and irrigation management. The high yielding grain has good grain quality. "I learned where to get the seed," she added. "A network (of farmers) was established." She wants to cultivate this variety next year on her own land."

Discussion. As this experience shows, a field day has to highlight a previous experience. It could be an FFS or as in this case a "crop cutting field day". The field day can be based on a demo instead of an FFS.

The attendance of local government officials and extension adds social sustainability.

The farmers formed a network, sharing phone numbers and the farmer seed producers agreed to sell seed to the visiting farmers. Through this event the host farmers receive demand for seed: they could later supply seed as a business. The guest farmers also benefit by obtaining quality seed in a timely manner.

The farmer-experimenters do most of the talking, adding credibility.

Many more field days could be held with this demo. After the field day, the farmers started to harvest, but one could hold many field days at this same location, if the host farmers had the patience to do that.

One could also film the event to share on social media like Agtube. Each event like this should be written up and shared with local WMGs.



Rina is eager to try growing mustard next year

Annex 5

CDFs facilitate experience sharing after FFS

The value of an extension method depends on how it is combined with other methods and how it is used by different social groups.

FFS, for all its quality teaching, has rarely been demonstrated to be very good at sharing information outside the group. FFS graduates don't share much information, in part because they don't have the mandate to do so, but also because FFS curricula can include complicated topics (like insect ecology), which are difficult to share.

But in the village of Koykhali, Satkhira, the WMG now has 310 members, almost half of whom are women. Members of this large group have taken FFS on homestead vegetables, poultry and rice. Different members have taken different FFS and some have taken no FFS at all. The local CDF, Farjana, arranges for field days and exchange visits. Twenty four women in the village are raising poultry commercially. Sometimes as many as 70 women at a time come to visit Shordar, a local woman, to learn from this innovative farmer.



Farjana (left) and another CDF bring farmers to visit poultry farmer Shordar (right) making sure that innovations from FFS are shared

So while in the past, FFS graduates have not always exchanged much information, such sharing can be facilitated by the CDF. The CDFs are also ideally placed to help identify innovative farmers with whom farmer-to-farmer training videos can be made.

Annex 6

Self-evolving WMO in Morichap

The BGP wants its WMOs to remain in place, functioning and sharing information after 2020: “self-evolving” is the Blue Gold term for this durability.

In Morichap, a village near Satkhira, the 12 executive committee members of the WMG meet every month. They schedule their own meetings on the 14th of each month. The 12 members including five women meet in the morning and go over their action plans from the various information sharing events they have attended. The group is quite large now, with some 400 members.

They are collecting two kg of rice from each person per bigha and selling it and putting the money in the bank. They may share it with the WMA as needed, but the money is for O&M

They have attended two FFS; or rather 25 people from here have attended one of the two field schools. Likewise, the horizontal learning events involved relatively small groups of people, some 50 at the most at each event.

Of the 25 people who attended the FFS on poultry, 20 persons keep brooding hens on a ceramic, straw-filled nest (hazol); three other people also use such a nest.

Three people got training from the Department of Fisheries on community-led fisheries. Then they gathered 46 people, including some landless ones and organised the group. The members contributed their own money and invested 20,000 taka (\$240) in fish in a large drainage canal. But they had to start over again elsewhere after they had a conflict over the right to use the canal. They started over again in a pond. They had to buy a net and make a bamboo fence in the pond, which increased costs. They sold 57,000 taka (\$687) of fish, but the cost to produce it was 66,000. They didn't get a good price because in December the price of fish fell. If they hadn't lost money in the canal they might have made money. At least they made enough money to cover their losses.

The numbers of people involved in the FFS and the fishery are fairly low, for a community of some 400 households.

Two experiences in Morichap suggest that people are exchanging information among themselves. When two men came back from a horizontal learning event on summer tomato, one of their neighbours, Humayun, heard about it and got interested. One of the men who attended the horizontal learning was planning to invest 10,000 taka (\$120) in 2 decimals of tomato land, but Mr. Humayun's brother was willing to loan him 18 decimals of land and enough money to plant summer tomatoes on it. After listening to his neighbours, Humayun visited the Blue Gold offices in Satkhira and spoke with Shahadat Hossain, the agricultural expert,



who agreed to visit Humayun's farm and advise him.

In a second experience, the CDF told the group about a neighbouring group, Jordiya, that was also raising fish. So the Morichap group rang them up and sent a delegation of four people to meet them during one of Jordiya's regularly scheduled meetings.

Blue Gold classifies Morichap as a medium performing group (i.e. it is not one of the top performing groups). There are several indicators that Morichap WMG is self-evolving.

1. The executive committee meets regularly on its own.
2. They distribute some, limited information among themselves.
3. They manage money as a group.
4. They have signed up almost every household and want to register all of the village households in the WMG.
5. When asked if they would continue after 2020, they said yes, saying that the group was like a sapling that would continue to grow into a tree.

The biggest limitation is that most training events, whether horizontal learning or FFS, involve 20 to 50 members of the community and fail to reach most of the 400 households.

Annex 7

WMA to WMA

The WMA of Moheswarkati meets at the local Union Parishod office. In a large hall on the second floor, overlooking a green expanse of bil land planted in boro rice. On 24 February 2018, the chairman of the WMA, Mr. Bhobendra Nath Sarker, had invited the chairman of the Amodkhali WMA, Mr. Md. Shamsur Rahman, to visit and explain his experience.

Mr. Rahman from Amodkhali was generally positive. He said that conflicts could be resolved. For example if a very poor person who only had six decimals of land was going to lose it to the construction of a canal, the canal could be moved a bit. He also said that if someone had more land, he could stand to lose a few decimals in order to make several bighas more productive. Most farmers were understanding about giving up small amounts of land.

The local UP chairman, Mr. Mosaddek Hossein, spoke, promising the cooperation of the union parishod.

The president of the Moheswarkati WMA stressed the importance of re-excavating the large drainage canals in this area, as soon as possible.

Other local committee members spoke, their voices becoming more emotional, saying that they needed the canals re-excavated right away. In the rainy season people are stuck at home. They have to cross the water on boats. They have a hard time collecting firewood and cooking because the food preparation area is under water and the firewood is wet. Sometimes there is so much water they can't bury their dead. So while they want to plant amon rice, there are many other reasons why they want the water drained, to improve life in the area.

The people at the meeting were respectable, local leaders, well-dressed and articulate, who were contributing their own time, with the participation of local elected officials, and inviting each other to visit their meetings. This is an indication that the WMAs may continue to evolve after 2020.



A WMA is able to get local leaders to donate their time to water management

Annex 8

The Shagla Canal and the WMA

Where the Shagla Canal enters the Betna River, the river has silted up, creating a broad levee between the canal's sluice gate and the stream. Brick companies love the additional silt. They dig it out to make bricks and some farmers raise fish in the pits left behind by the clay diggers.



Organising people to build dams.
Local WMOs are functioning, with a little help

In 2017, Blue Gold re-excavated some 350 meters of the canal, including the section between the sluice gate and the river. Three hundred and fifty meters doesn't sound like much, but it was enough to start draining some of the land, and the members of the SSM (Shaille Shagla Machkhula) WMA were pleased. But the Betna is a tidal river, and the farmers knew that the brackish water would enter their land at high tide, bringing toxic salt with it. TA staff from Blue Gold attend all of the WMA meetings, and at one of these Blue Gold and the leadership of the WMA began talking of building a simple cross dam, just an earthen barrier, over the mouth of the canal.

So they did. Four WMGs, members of the WMA, donated labour and 2500 taka (\$30) each—money they collected from the 60 taka (\$0.72) membership fee that the villagers pay to join. People join just because they see the importance of managing water; 60 taka is no longer considered an important sum of money in Bangladesh.

The local people will have to tear down the dam in the next rainy season, so that fresh water can drain from their fields, but now the dam is protecting their soil from salt damage during the dry season.

Discussion. The local people see the value of the newly repaired waterworks, and are willing to invest their own time and money in operations and management.

The WMA was able to convene 4 WMGs for a collective action.

The WMGs are able to collect money and labour from group members, who participate out of their own enlightened self-interest.

It is an example of a WMA managing water in a sluice catchment area.

There was little training involved in this experience. The local people knew how to make an earthen dam. But in the words of Joyнал Abedin, the zonal coordinator for Satkhira, “much of our work is mentoring, organising and motivating.”

Annex 9

A new rice variety and a clean canal

In Jaela Badhandanga WMG in the north central Polder 2, WMG president Abdul Khaleq explains how the group has taken two concrete actions to manage water.

In 2017 some of the members took an FFS on rice, where they learned to use a new variety, BRRI dhan 52, which is moderate duration, high-yielding and tolerates standing water.

For two years the group had not been able to grow amon (wet season) rice because of flooding. (The north of the polder is a little higher than the communities visited in Annexes 2 to 8, and can usually produce amon rice). In 2017 they were able to grow amon rice on 70 bighas of land, including some that was under water for ten or 12 days. Blue Gold helped them to hold a field day with 50 families from neighbouring groups. They met in the shade of a tree by the edge of the road. Ten of the visiting farmers asked to buy rice seed. The Jaela Badhandanga group members have saved their seed and if asked again, will sell it. Not that they are eager to sell. In 2018 they plan on planting amon rice with their stored seed of BRRI dhan 52 over a larger area.



Confident that municipal elected officials will help the WMG deal with local big shots

In 2018 the group also organised their members to clean the water hyacinth from four km of feeder canal. Blue Gold helped with the mentoring and organisation. But the members donated their own labour and completed the task.

Cleaning the weeds from the waterways will help drain the land, but could annoy influential locals who are using the canals to raise shrimp, and don't want to see the canals used for drainage. The president of the WMG says that if they have any problems with fish or shrimp growers, the group will "manage them" with the UP, suggesting that local WMOs see local government as a crucial partner.

Discussion. The WMG is able to conduct some water management below the sluice catchment level. The FFS functions for adaptive research (varietal trials) and as a way of producing seed. Conflicts may arise over something as innocuous as O&M; the ability of the WMGs to deal with it will depend on their maturity and conflict management skills. WMG leaders are confident that local government will support them, which suggests that elected officials see the group members as constituents, and that the groups may continue to self-evolve.

Annex 10

The sluice catchment area committee

The study team met with the sluice catchment area committee chosen from the five WMGs that live on the land that drains into the Bakultola Sluice in Polder 20. The committee members are chosen by the general members of each WMG, and depend on finding civic-minded community members who are active, and willing to work on the sluice committee. There is no minimum number for these committees, but this one was formed in 2017 with 12 members, including just two women. It is difficult for women to join a committee that often has to meet at night and may have to do some heavy work, like opening a sluice gate or freeing it of obstructions.



Committee members display Blue Gold publications, suggesting that people might read papers pinned to a bulletin board

The committee has two sluice gate operators and when the committee needs the gate opened or closed, they contact one of the operators. The president of the WMA is not a member of the committee, but he attended the meeting, suggesting that these unpaid positions are filled by community-spirited people who are willing to invest time in local organisations.



Willing to donate their time to water management

Sluice catchment areas are basically watersheds: the land that drains into a single sluice. WMGs, on the other hand, are based on villages, and seldom cover an entire catchment area, or a WMG may overlap with more than one catchment area. The sluice area catchment committees are an example of how Blue Gold has realised the importance of organising people in watersheds, how the land is drained, and not just on residential or political units.

The WMGs are organised at the village level. Bangladesh has no village-level political organisation. So when Blue Gold organises a new WMG, it is often the first formal, village-wide social grouping in the community. The lowest level of local government is the Union Parishod which groups several villages.

This sluice catchment committee meets every month (or more if necessary) in the one-room, corrugated metal building of the Bakultola WMG, where the walls are decorated with action plans, Blue Gold posters, and copies of the Program's newsletter.



Powerful people no longer open the sluice gate at their whim. The sluice catchment area has gate operators

The committee members explain that previously they were not organised, and any powerful person could come and open or close the sluice. But that has changed. Now the sluice gate is operated by the committee, in the interests of the wider community.

Annex 11

WMG recovers from dormant period

In Kanchan Nagor, we met several women members of a WMG. The president of the local WMA also joined us. One of the women, Binita Ray, is well-known in Blue Gold for her successful seed business. She was written up as a success story in one of the fact sheets.

In the field school, local people learned about pesticides, mineral fertiliser and HYV rice in the field school. They had also observed that HYV demanded more fertiliser.

Binita explains that first she participated in a FFS and learned about agriculture and how to work in a group to get more profit. After the FFS, she asked how many people need sesame seeds. 50 people said they needed sesame seed, so she went to the market and got seed for them.

If the farmers bought these seeds from the local market they have to pay 100 taka (\$1.20), but she sold them for 70, and she kept 10 taka for herself. She says that next year even more farmers have expressed interest in buying seed from her.

She sold 350 kg of sesame seed, so she grossed 3500 taka (\$42), minus about 700 taka (\$8) for expenses. She has also sold rice seed.

But the other women had also done activities of their own to make money. One woman has a tea stall. Another cultivates fish and vegetable. One has a poultry farm.

Besides managing water and money, the women also belong to grassroots social initiatives. They work at a clinic with pregnant women, on health and nutrition. They strive to prevent early marriages by counselling the parents, and if that fails, by involving the Union Parishod. This suggests that WMGs rely on the energy of good people who are willing to work for the benefit of their community.



The women make money, and support local community development

Annex 12

Networking in Dumuria

In Dumuria, farmer trainers and FFS farmers told us that they are trying a new HYV rice, BRRI dhan 52, but they are not quite as taken with it as some other farmers, and may go back to growing another HYV. They have however, informally shared some information about it with other farmers.

The WMG of South Dumuria was also organised by IPSWAM, but went inactive. Blue Gold has learned that water management is not enough to develop the livelihood of the people who live in the polders. So Blue Gold stresses agricultural development through FFS and other training. Blue Gold also teaches the groups to become sustainable by forming strong ties with DAE and other organisations. (Blue Gold may find the following videos useful for working with this and similar WMGs: [Village savings and loan associations](#) and [Let's talk money](#), about showing farmers how to calculate costs and benefits).



This community has linked with their local Union Parishod and the upozila chairman as well as DAE, and other organizations. (One union parishod member attends our meeting, showing that he takes the group seriously).

The group recently went to the union parishod UP chairman to ask to have water drained from their land. He helped to connect them to BADC (Bangladesh Agricultural Development Corporation), which helped them to drain the water through the main canal (khal). After that success, the villagers wondered what else they could do, so they contacted DoF (Department of Fisheries) and applied at DoF to get fingerlings. The group claims that they are involving all the WMG members in the fishery.

Then the WMG contacted the Forestry Department to reforest both sides of a road that they use to get their products to market. Then LGED (local government engineering department) helped to pave their road with bricks and to drill a deep tube well. All of this networking, as well as increased production, is helping the farmers take more produce to the market.

Annex 13

Irrigating watermelon

Hat Bari in Polder 22, near Khulna, is the site of a well-known case, one of the success stories written up as a fact sheet, about farmers who took an FFS on watermelon. Then one of them, Ashim, got the idea of digging mini-ponds to irrigate the watermelons.

Success has many fathers, and local farmer Sujit Roy claims that he was the first to grow watermelon in the area. In 2011 he was visiting relatives in Bajuwa, a village in nearby Dachob upozilla, when he saw watermelons being grown. He came back to Hat Bari and started to grow watermelons himself. The fruit is profitable and other farmers followed his lead. A few more grow watermelon every year.

Watermelons are grown during the dry season, starting in February, and the farmers said that there are few other options. They still grow rainy season (amon) rice, but they were previously growing sesame in the dry season. The farmers found watermelon to be much more profitable.

The DAE offered a watermelon field school in 2014, and in 2017 the farmers decided that what the watermelons were missing most was a source of irrigation water. A local resident, Mr. Rinku, explains that he is an entrepreneur and was able to lower the cost of excavating the shallow wells (called “mini-ponds”) in the fields. He went to Pabna and found an excavator who came out and make several wells at once. This lowered costs and the excavator was able to dig each well for 6000 taka (\$72). Now there are 200 mini-ponds in the polder (not all of which were made with facilitation by Mr. Rinku). This is a rapid spread of innovation by any standard, and is due in part to the informal horizontal learning (information sharing) that goes on spontaneously from farmer-to-farmer.

In 2018, everyone in Hat Bari WMG is planning on growing watermelon. Hopefully there is enough demand for watermelon in Bangladesh to support this increased production.



Ashim shows Harun-Ar-Rashid his mini-pond. These wells are an innovation, organised locally and spread spontaneously



Everyone in Hat Bari is going to grow watermelon in 2018. That is successful innovation by any standards

Annex 14

Farmer trainer, farmer innovator

In the village of Syed Khali, near Hat Bari (see Annex 13), the study team meets Lochon Sarkar, who is about to graduate from university. This educated young man started growing watermelon a few years ago. The story is similar to Hat Bari. Lochon also visited relatives in the same village, Bajuwa (about 10 km from Syed Khali), where Sujit Roy (Annex 13) learned about watermelons.

After seeing melons in Bajuwa, in 2008, Lochon went to his upozilla agriculture officer (UAO) at Paikgacha Upozila, DAE, where he learned where to buy seed and he got some basic information on planting. He was confident enough to plant one bigha (1333 square meters) of land. He earned 45,000 taka (\$540) and planted two bighas the next year. By 2009 there were 12 people growing watermelon in this polder, including three in the village. That same year, DAE held a field day at Lochon's watermelon plot, and brought 450 farmers to see his work.

- There were about 50 in 2010, including six in the village.
- There were about 100 by 2011, including 12 in the village.
- In 2012 there were 25 in the village, and 60 by 2013.
- In 2014 there were about 100, with the influence of Blue Gold.
- In 2017 300 households in the village were growing watermelon.



In 2014, TA taught a FFS here on watermelon. Then the DAE started teaching the field school here and in other villages. Lochon is an FT (farmer trainer) who has taught the watermelon FFS five times. He got one month training from the DAE at the AIT (horticultural centre). He received training on rice, sesame, watermelon and mung bean and fruits and vegetables. He learned about facilitation and market orientation, especially for leafy vegetables, sweet gourd, lady fingers, mango, kul (a fruit: jubube), guava, coconut and lychee. Lochon has innovated a way to grow larger fruit, removing all but one watermelon from the plant.

Lochon is also proud to have led a three-day training for 26 SAAOs at the DAE horticultural centre at Daulatpur, Khulna in March 2017. Farmers visit or phone Lochon every day during watermelon season. And while he is paid for teaching FFS or other formal trainings, he says that farmers who ask for advice informally are not accustomed to paying for information. Lochon is thinking of starting a small inputs shop, and of buying and selling watermelon at the wholesale market during the harvest season. He thinks that these types of agricultural businesses may allow him to make a living while continuing to advise farmers. Perhaps other farmer trainers could be encouraged to start enterprises that allowed them to keep their expertise in the community. This is an example of farmer to farmer extension method.

Annex 15

Farmer trainers

Farmer trainers in Bhoshurabad, Polder 30, near Khulna are part of a community that has a WMA and a sluice catchment area committee.

The farmer trainers include three women, Ila Gangoli, Aporna Bhattacharjee and Bharoti Dhali, and a man, Shirdharto Mondol.

Ila is a little older than the other trainers, but she is a college graduate, and her husband is a professor of sociology. Ila was motivated to become a farmer trainer by a desire to do something for society.



Farmer trainers are motivated in part by a desire to serve the community

Two of the farmer trainers took the training four years ago, and two took it in 2017.

Ila received FFS training on poultry, household gardening, nutrition, and fish culture, as well as rice, vegetables, sesame, mango, jujube, coconut, pumpkin, okra, country bean, brinjal, and leafy vegetables. Now she teaches field schools for the DAE.

First, the farmer trainers teach one FFS with a DAE mentor and then they teach another FFS by themselves. The farmer trainers are paid a little money for doing the course, but they seem to be as strongly motivated by the desire to serve the community.

They can ask the SAAO if they need more information, but mostly they rely on the other farmers in the FFS when they need information they don't have. When none of the FFS farmers know the information, the farmer trainer asks the DAE.

Fish. A sign in Bhoshurabad mentions a fish project. The DAE gives each group 20,000 taka (\$240) to invest in projects. This group added 30,000 (\$360) of their own money and bought fingerlings of local fish. They raised them in a pond, feeding the fish rice bran, and fish feed. The group wants to sell the fish, but the price is low. So they are going to wait until March and try to recoup their investment. They never asked TA for information. Fish was not one of the FFS topics, but about 30 people are in the group, suggesting that more people are active in the group than just the executive committee.



A sign could say more

While the sign alerted the authors to the story about the fish pond, it could have said more. A sign could tell local people what species are being raised, where to buy fingerlings, what to feed them and where to go for help.

Annex 16

Thin mustard

At a mustard experience sharing event in Polder 29, on 19 February 2018, thirty farmers (all men) met to learn. The host farmers, especially Abdul Rab, explained what they had done and honestly admitted that they had not followed the recommendations for fertilising their new mustard crop.

In the field, instead of a well-ordered mustard cutting like the one we saw in Satkhira (Annex 4), here we arrived at the small field to find a farmer harvesting the crop, but not measuring it.



The farmers on the right stop harvesting mustard to let the visitors inspect the crop. Disappointment leads to complaints

The visitors were unimpressed. These are new groups and when they got back to the tent they started to complain that this mustard would do them no good, that in their area they grow rice in boro (spring, dry season) not amon (wet season, winter). They said they could not try mustard because their land is too different from this land. With voices rising, they began to demand the re-excavation of their main canal. Several people from Blue Gold spoke back in defensive tones and the meeting nearly unravelled.

Nazrul Islam, the upozila agriculture officer for the DAE for the Dumuria sub-district (upozila) spoke calmly, saying that if they wanted inputs and material help, they need to organise. They will only get help if they are organised. Later he told the study team that DAE wants to give farmers technology, but farmers want inputs. (This is a familiar tension for many extension agencies).

Mr. Islam was sympathetic about working with groups after 2020. He has 42 extensionists (SAOs), three for each union, and will continue to work with the WMOs. Such support will be crucial for self-evolving WMOs.

Discussion. The meeting started late, which contributed to the crankiness of the audience. The demo farmers had not fertilised the crop as advised, and they had fewer innovations to share. When the visiting farmers saw the crop being harvested, it looked thin. Underwhelmed with such low yields, the visitors felt free to voice their main demand: re-excavation of their large drainage canal, which they cannot do themselves.

Annex 17

The FFS

Twenty-five farmers, all women, sit around a large, orange plastic sheet in the courtyard of a farmhouse in the village of Chhoybariya. Their attention is focussed on the CDF, Hafsa Khanom, who speaks in a loud, but pleasant voice, obviously excited about her topic. Hafsa is teaching the women about alternative pest control: remedies that are safe to use and generally inexpensive. Hafsa has help from farmer trainer, Mr. Habibur Rahman. Hafsa and Habib have prepared well. Before them are several bowls filled with ash, detergent, chilli and other (mainly) household products.



Hafsa explains how to make low-toxic pesticides with help from farmer trainer Habib. Later he will lead his own FFS.

Hafsa starts by preparing Bordeaux mix, a copper-based fungicide which is permitted in organic agriculture and has been used to control crop disease sustainably since it was first tested in France in the late 1800s (Campbell and Griffith 1999).

Hafsa also shows them how to mix ash with kerosene, to control insects.

Hafsa mixes one litre of water with some detergent and pours it into a plastic jar. She also shows the women a pheromone bait, to use to make a trap to capture adult female stem borers (gourd pests). She explains that the female moths are attracted to the smell of the pheromone. The moths will fly through holes cut in the side of the plastic jar, and drown in the sudsy water-with-detergent.



Ash and kerosene, soap and detergent, chili powder and Bordeaux mix (clockwise from the top)

Some of the farmers snap pictures with their cell phones to help them remember what they are learning (see cover photo).

Rural youth are increasingly comfortable with digital information technology.

Next the group walks to a nearby plot, labelled with a sign. They pour the Bordeaux mix into a small, hand-held bottle with a nozzle, like a squirt gun. They spray the Bordeaux mix onto the tomatoes, while they attach the pheromone traps to a stick pushed into the ground. It's a lot of information for one day, but the group is eager to learn.

Discussion. The farmers were engaged, snapping photos to recall the information later. The CDF led the session, but the farmer trainer was paying attention, to be able to lead the field school on his own later.



Setting up the pheromone trap in the home garden

Annex 18

Supportive local government

One of Blue God's concerns is that the WMOs established in 2013 through 2020 remain in place after the program leaves, as self-evolving organizations. On 20 February 2018 we caught a glimpse of how that might work. The union parishod is an elected council serving nine rural wards, so the chairman of a union parishod is basically a small town mayor. This is the most basic form of local governments. The union parishod does not have office hours, explains Razaon Mollah, chairman of the UP of Damaliya, in the upozila of Dumuria in polder 24. People can come at any time of day or night. Even a beggar may approach the chairman, to say "I need 10 taka for food."



Razaon is a personable man. As we entered his crowded office he motioned for Jeff, Harun, Tahmina and Aowlad to come sit with him, behind the big desk. The members of a recently formed WMG join us. We were a bit surprised that the chairman meets with WMGs, instead of the higher-level WMAs, but he seems happy to see any of his constituents. We are also joined by some of the members of the union parishod (i.e. basically, some of the town council).

They explain that the chairman is an advisor to the WMG. All of the UP chairpersons are advisors.

A major canal is being re-excavated. When we ask if everyone wants this, the people in the room shout "yes" all at once.

"Will the WMG keep going after 2020?" We ask.

The chairman is optimistic. "This is our link to our livelihood."

The chairman says he will resolve any problems by discussing them with the people involved.

Discussion. So at least on union parishod chairman is committed to water management, and even some training and to collaborating with the WMGs, which he sees as permanent structures. Elected officials win and lose elections based on how well they satisfy the felt needs of their constituents, and many rural people are keen to have their water properly managed.

Annex 19

An effective notice board

Rudarghara village in Dumuria only organised a WMG in September of 2017, but they already have 540 members.

“No, 570,” the secretary of the group says. More are joining all the time.

The group has a lot of enthusiasm for water management. They have already taken several concrete, collective actions.

They removed the water hyacinth from three km of the canal, where it drains through the sluice gate. That was just six months ago but the aggressive weed has

already grown back. Not to be defeated, the group is planning on removing the water hyacinth again, with all the group members contributing labour. They have also hired a permanent sluice gate operator at a salary of 6000 taka (\$72) a month to open and close the gate and to clean silt from the sluice. When the silt is soft he stirs it so it flows out with the water.

They have also re-excavated part of the canal.

In August and September the group spent 1.1 million taka (\$13,253) re-excavating 2100 feet (700 meters) of canal. They are expecting the government to reimburse them, but they thought it was important to get the job done right away, so they didn't wait for the money.

At the sluice gate, at their own initiative, the group has erected a sign. It reads:



Taking ownership of the sluice gate

Special notice

- Do not block the free movement of water in the canal
- Do not place a net in the canal
- Do not place fishing equipment in the canal
- Do not catch fish by parta
- Soil cannot be taken from the canal
- The sluice gate is not allowed to be closed for fishing
- Do not cut soil from the embankment
- Do not plant bananas or other plants on the embankment
- Vegetables may not be cultivated on the slope of the embankment
- No types of houses or shops may be built on the embankment
- Trees or logs cannot be brought through the sluice gate
- No type of damaging work may be done on the embankment or on the sluice gate



The sign or notice board is one way of saying “this sluice gate is ours and we make the rules”

Please remember that this water management structure, for example the sluice gate, embankment and canal belongs to the citizens, and the citizens have every right to enjoy these. Therefore, this is our moral responsibility to save all this.

On request from Rudarghara Water Management Group, Polder 25.

Discussion. A WMG that takes so much responsibility for its own water management, and a new one at that, suggests that the members basically just needed a spark to organise themselves. They do collective actions, donating their own labour. They collect money and spend it for maintaining public goods. And they feel empowered enough as a legal entity (a WMG registered with the Water Board) to put up an official sign demanding that people respect their rights to water.

Annex 20

Animal health

The CAHW (community animal health worker) is a well-known concept (Catley et al. 2002). Local people are organised to vaccinate livestock and treat common diseases. The CAHW charges for medicines to be able to buy more to replace the drugs. And sometimes to make a small profit.

In the Khulna office of BG, we met Nurjahan Begom and Shochindra Nath Goldar. They explain that they are CAHW in an area where Blue Gold no longer has activities, but they continue their work with local people and their animals.

In 2015 Blue Gold trained 40 CAHW, including 20 women, and all but three or four are still active. The women work with poultry (chicken and ducks) and the men treat goats and other mammals.

Worldwide, one of the greatest threats to village chickens is Newcastle disease, caused by a contagious and fatal virus. The only solution is vaccination, which is tricky. The vaccine comes in large doses and has to be kept cold.

Nurjahan Begom buys enough vaccine for 200 to 300 birds and keeps it cold in a Styrofoam box, until she can get it home and keep it in her refrigerator. Just the fact that villagers in Bangladesh are starting to have a fridge is a sign of how life is improving. Nurjahan Begom serves 17 or 18 villages. In each one she sets a date for a vaccination camp, arrives at a central place, and vaccinates all the birds, especially for the new chicks. She charges 2 taka per bird, which local people can afford, but it is enough to sustain the service, allowing Nurjahan Begom to buy more medicine for the next village.

Annex 21

The fish group

On 22 February we saw a fish group at Baliar Bil. They existed before Blue Gold, with five members. The CDF encouraged them to add three more members, including two women, so they did.

The group received a 20,000 taka (\$240) loan from Blue Gold and added 160,000 taka (\$1928) of their own money, to invest in fingerlings and feed.

They had two trainings with Blue Gold and several more with the DoF on feed and adding fertiliser to the water, such as compost, urea and other mineral fertiliser to encourage the growth of plankton that the fish eat. They also received training in marketing. Instead of selling at the first market, the group visits several, finding out the price and selling where they can get the highest price. (Blue Gold may be interested in the video [Food for fish](#)).

When we saw them, they had hired a small gang of men to catch their fish in a net. The fish group hires the men with the net because the fish group doesn't have a net and doesn't know how to catch the fish. The men with the net charge 2000 taka (\$24).

The fish group hopes that they will make a profit. Of the 180,000 (\$2170) invested, they have already earned that much from sales, in spite of depressed fish prices, and they hope to get 120,000 taka (\$1445) more, in profit. They will pay back the 20,000 taka (\$240) loan with 5% interest to the WMG.

Such pre-existing groups are crucial for WMGs. Three of the members of this fish group are on the executive committee of their WMG.



The community fishery group was one of the pre-existing organizations on which the WMG was based



The group hires men with a net to harvest the fish



The sign tells visitors how many of each species have been stocked. The sign could say more, and be a better tool for extension

Annex 22

The CDF

Sayed Atiqullislam “Atiq” is the CDF who works with the fish group (Annex 21). He has 10 WMGs. He considers himself a mobilisation specialist.

There is an FFS going on in the group during our visit, but Atiq has asked one of his colleagues to give it, a person who knows more about beef fattening, fish and nutrition. The CDFs share their workloads with each other, each one taking on tasks that suit their skills.

There really is a lot of work to set up one of these groups. Blue Gold visits the community to find out what sort of groups (like a fish group) already exist there. These become the core for setting up an ad hoc committee to form the WMG.

At the first general meeting with the WMG (i.e. with all or most of the community members) the CDF enlists the ad hoc committee to write a list of community members and to call for elections of the executive committee, which then writes its own by-laws, based on a model provided by Blue Gold (see Annex 32).

A lot of the CDF’s work is facilitation. Each month at the coordination meeting of the executive committee of the WMG, the stakeholders come and sit together and prepare a plan. And they communicate by mobile phone. The CDF coordinates with the DAE for field schools (see Annex 34).

Atiq thinks that the WMGs will continue in the future, after the end of Blue Gold, because they are collecting savings and they can keep accounts and will sustain operation and maintenance (O&M). The WMGs have created an O&M fund and regularly attend their meetings, quarterly and annually and they have an action plan.



Atiq is optimistic about the survival of the WMGs

Annex 23

FFS graduates and their neighbours

Joynab Begom attended a cattle fattening FFS in Baliar Bil. Like many FFS graduates, she put the information to good use. She raised one calf on improved feed (which included mustard cake, molasses, urea and straw), sold the calf for twice what she paid for it and then bought another calf.

However, her nearest neighbour, Habiba Begom, living just a few steps down the land, had never heard of the FFS and was rearing a calf the conventional way, on a diet of mostly rice straw, with a little rice bran and oil cake.



Habiba and her neighbours, rearing cows in time-honoured fashion

Another neighbour, Sharmin, had an improved dairy with several cows living in clean stalls with a brick floor. She was vaguely aware that there had been an FFS on cattle, but did not know what they learned there. Sharmin had learned about cattle feed from her husband, who had a salaried job at BRDB (Bangladesh Rural Development Board).

As previous studies have shown, FFS graduates share little information with their neighbours.



Sharmin has a small, commercial dairy, but hadn't heard of the FFS

Annex 24

The cropping intensity initiative

Mokbul Hossain is the dignified president of both his WMG and his WMA in Madhya Amkhula, Patuakhali. In 2016 he and a few others from his WMG attended an event in Uttar Soyla Buniya, where they saw BRRI dhan 52, the high yielding rice variety.

So in 2017, with help from two of their CDFs, Mr. Mokbul decided to try BRRI dhan 52. They planted it two weeks early, so they could harvest it early. There was a signboard, which has since been removed, explaining to passers-by what the rice was. In November 2017, they harvested it and a few community members, mostly young men, came to see. Then they planted mustard, which had recently been harvested and was on the drying floor when we visited.

It had been a cold, wet winter. Mokbul Hossain had not seen one like that in 50 years or more. The other farmers know that the rain had been bad for the mustard, so they would give it a second chance. Nine out of ten of them would plant mustard next year.

Now they have boro rice in their field. Interest is growing. “Cropping intensity initiative” (CII) means adding an additional crop to the year’s calendar. For this group of ten, their initiative is to grow the fast-maturing BRRI dhan 52 rice for amon, followed by a quick crop of mustard, followed by boro rice.

The older, conventional system was amon rice followed by mung beans or watermelon.

The SAAO from DAE attends our visit, even though it is Saturday, her day off, and she’s had an accident and is using crutches. She is here for all of the extension events with the CDFs. She was here for each step of the cropping intensity initiative and is in constant contact with the CDFs by mobile phone. This is a lot of commitment from a civil servant, but suggests that the WMOs may have the support they need after 2020.

The group has an action plan. It is long and filled with pedantic vocabulary, but it is a device that allows the CDF to reconvene the community, even if it is less useful for the farmers themselves.



Mokbul Hossain (in white), surrounded by his neighbours, the SAAO (in the blue sari) and CDFs Tojammel Haque and Shafiqul Islam (in pink shirt). Innovation can involve a lot of people



The farmers want to keep planting boro rice, but it would be more interesting if they could add another quick crop before boro, such as mustard

An action plan is not always necessary. This group did not have an action plan from their experience sharing visit where they learned about BRR1 dhan 52, and that is the exception that proves the rule. They are experimenting with BRR1 dhan 52 even without an action plan, although the CDF had helped them keep track of costs and income in a notebook (see figures below) to show that they were expecting to make a profit. Some simple accounting like this may be more useful than a formal work plan.

<p>2018 February 05 * Land area: 10 acres * Rice variety name: BRR1 dhan28 * Total farmers: 10 (WGM-Members) * Rice seed used: 100 Kg (Seed cost: Tk. 6,000) * Travel cost for seed: Tk.200 * Crop Duration of BRR1 dhan28: 135-145 days * Date of seed sowing: 25/12/2017 * Field canal: 1,800 feet * Completed work by their own labour of group members & hired labour * Possible cost: Tk.120,000 * Possible income: Tk. 320,000 Income: Tk. 200,000 * Net-Profit: Tk. 200,000-Tk. 50,000 (miscellaneous cost) = Tk. 150,000</p>	<p>Madhya Amkhula WGM Collective Action</p> <ul style="list-style-type: none"> * Land area: 10 acres * Rice variety name: BRR1 dhan28 * Total farmers: 10 (WGM-Members) * Rice seed used: 100 Kg (Seed cost: Tk. 6,000) * Travel cost for seed: Tk.200 * Crop Duration of BRR1 dhan28: 135-145 days * Date of seed sowing: 25/12/2017 * Field canal: 1,800 feet * Completed work by their own labour of group members & hired labour * Possible cost: Tk.120,000 * Possible income: Tk. 320,000 Income: Tk. 200,000 * Net-Profit: Tk. 200,000-Tk. 50,000 (miscellaneous cost) = Tk. 150,000 <p>Members:</p> <ol style="list-style-type: none"> 1. Mokbul Hossain Gazi 2. Abdur Rashid Akon 3. Nayon Gazi 4. Rezzaque Gazi 5. Shahabuddin Gazi 6. Berek Gazi 7. Ibrahim Kazi 8. Belayet Kazi 9. Zahangir Biswas 10. Kawser Akon
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What interests the group the most is water management. They are a bit disappointed that in 2017 they did not have the support to clean out all of the water hyacinth and re-excavate their canal, but they hope to do it this year in 2018.

FFS.As we leave the house, I notice the calves eating plain rice straw, instead of mustard oil cake and other improved feeds. Even among the project’s closest friends, the FFS innovations are adopted piece meal, by small groups.



Cows don't get very fat eating rice straw

Annex 25

Collective action

In Musharikathi, Patuakhali, the WMG had some big news. One km of canal had been re-excavated by the BWDB in 2016, at a cost of 1.7 million taka (\$20,480) to a depth of 6 or 7 feet, i.e. 2 meters, and 24 feet (8 meters) wide. The canal has allowed 300 acres (120 ha) to be drained, including 100 acres (40 ha) that used to be under standing water.

This is allowing farmers to grow amon rice, followed by winter crops such as a sweet potato, groundnut, cucumber, watermelon, mung beans and others and early summer crops including watermelon.

There is a lot of water to drain from these 300 acres. Even in the dry season the canal is full of sweet water. So the farmers are able to pump water from the canal, using gasoline-powered pumps. They dig neat sumps (holes) in the earth and from there carefully hand water the watermelon and other plants with a plastic bucket.

In their monthly meetings with the WMG, the CDF helps teach them about new vegetable crops that can be grown, but some, like watermelon, are rapidly expanding. They grew perhaps 20 acres (8 ha) before re-excavating the canal. Then in 2017, taking advantage of the newly drained land, the community members grew 90 acres (36 ha) of watermelon. This year they are growing 150 acres (60 ha).

Ten men, including the WMG president Shah Alam Howladar, are growing eight acres (3.2 ha) of watermelon as a collective action, facilitated by Blue Gold. (In this case collective action mostly means that they bought the seed and other inputs together and receive training together).

It's clear that the group is delighted to have all of this land back in production, thanks to a canal that drains it in the rainy season and provides irrigation in the dry season.



The group has a sluice gate operator, who lives nearby, who is not paid, but who is rewarded by being able to take fish from the gate once in a while.

By his visits the CDF is able to help the community to diversify its crops as they adapt rapidly to the new opportunity offered by the dry land plus irrigation. The CDFs, Tojammel Haque and Shafiqul Islam, often come together, even though there is only one who is formally responsible. At these frequent visits, the CDFs are able to advise the WMG members informally about sweet potato and other promising new crops to try.



Even in the dry season the canal waters rush through the sluice gate, providing the occasional fish for the gate operator

Annex 26

Animal health, market-oriented field school and demo

Nuruzzaman in Golbasbunia has worked with animal health for a long time. In 2006 he took a three-month course on animal health in Barisal, with the Ministry of Youth Development. Then he started a little village shop, selling animal vaccines and medicines. In 2014 he took a 10-day, CAHW (community animal health worker) course with Blue Gold in Khulna. He continues to offer vaccinations and primary care for livestock from his small shop, where he is able to make enough money to supplement his income from farming. Nuruzzaman says that there is more competition now than when he started, but also more demand, so he is still able to make money.



Nuruzzaman (in white cap and pink shirt) is still treating animals and the MFS graduates are still working together, although their female neighbours don't know what the field school was about

A group of neighbours has assembled to join in the conversation. When we ask how many use the CAHW's services, they all enthusiastically raise their hands.

The group also had a two-season FFS. It started 15 November 2015. It ran for 13 seasons on mung bean and 13 more on amon rice. And the group still meets. As recently as December, 20 of them got together to see who needed mung bean seed. Most save their own seed, but they did buy some seed as a group for those who needed it. This is one of the best things about FFS; the members often stay together after the field school has ended, cooperating on one or more activities. The FFS graduates tell us confidently how they learned that farming is a business and how to calculate costs, including unpaid household labour. (Please see the video [Let's talk money](#)).

In spite of the success of this MFS (market-oriented field school) the other neighbours present, the ones who did not take the FFS, have little or no idea what happened there. The women say "That's why we attended this meeting, to see if we could learn what they did in the MFS." It may have been half in jest, because people laughed, but there is a serious issue here. The neighbours don't learn from a FFS. There is no trickle-down, no pass-on effect. Only the FFS graduates learn very much (see Annex 23).

A convincing demonstration. CIMMYT (International Maize and Wheat Improvement Centre) does a demonstration of machine sowing of mung bean in the community. They have done one completed cycle and are now starting on their second. CIMMYT loans the machinery to local operator Samsul Haque, who runs the two-wheeled tractor and the seeder on 28 acres (11.2 ha) for a fee of 600 taka (\$7) per day.

The local people have paid close attention to the demo, and can list advantages and disadvantages to machine sowing, based on their observation.



Learning to plant mung bean in lines with machinery.
In the CIMMYT demo

Advantages. The machine sows in lines, which makes the crop easier to weed and to apply insecticide and fertiliser, and to irrigate and harvest. This saves labour compared to a broadcast crop. Planting density and yields are both higher.

Disadvantages. The machine uses fuel. If the land is wet it is difficult to operate. When the land is moist it becomes compacted and it is difficult for plants to emerge. If the seed is small, the machine plants two seeds at once.

Samsul is also impressed by the demo, and wants to buy the machinery himself. The two-wheeled tractor with the seeder would cost 165,000 taka (\$1988). He asks Harun's opinion, as if he still needs a little persuasion, but he seems ready to make what would be a large investment for him, as a result of participating in this demonstration. Few things are as convincing as a demonstration.

Annex 27

Adding value to melon

The village of Dokshim Sonakhali has a complex sluice gate that looks like a siphon going under the large embankment. Built in 2017, it has a chain-operated sluice gate on each side. From there a canal leads down to the river. The community had paid for half of this work; a group that will invest in water management may continue to self-evolve after the end of a project.



The community paid for half of this complex sluice gate

They have 20,000 taka (\$240) in the bank, and three people are authorised to sign at the bank. Two out of three can withdraw money. But as the Blue Gold staff say later during our joint analysis, the WMGs really shouldn't have money in the bank. They don't like it. It leads to fears that the money will be misappropriated.

We watched them fertilise the watermelon with chemical fertiliser. They talked about working together to sell watermelon as a group, but they seemed unsure of their answers. It's not easy to earn more when the buyers have thin margins themselves. However, one farmer told us that his buyer had taught him to prune off all of the fruits but one per plant. That way the fruit would be bigger and the buyer could pay more for it. Producing what the market wants may be the best marketing strategy.



Fertilising watermelon

Marketing is also made more efficient by electronic communication. When people have a field, they ring up their fruit buyer (phoriya) on the cell phone. He comes out and buys all the fruit in the field, and loads the watermelons onto a river boat.

These farmers do buy their inputs as a group from an input dealer. Later we would see how that works (Annex 29).

Annex 28

Drama

In Basak Bazar, near the city of Patuakhali, we stopped to see four senior men who had watched a drama produced by Blue Gold. It was called Nil Shona (“blue gold”).

From the drama, the men got the idea that water is wealth.

They learned a lot of things and applied them. We were a little surprised that the drama went beyond just letting people know about the Program. The drama also introduced the notion of planting mung beans in line and suggested growing sunflower. No doubt other project activities reinforced what these men learned, but they did recall the drama clearly, which they had seen in April, 2017.



Learning from drama,
and remembering the lessons

They recalled the plot of the drama, in which the daughter of an influential man went against him and organised a WMG because her father was blocking a canal with fishing nets. The men said that in real life they had a community member who was blocking the canal with his cross dam. They went to talk to him as a group, saying that they would report him to the DC (district commissioner) and the canal blocker took down his dam, and began to treat them politely.

Villagers who organise really can become empowered.

There may have been more to this story than just watching a drama. No doubt facilitation by the CDF and WMG meetings also helped the group to make their plan and carry it out. But they were moved by the drama, and they remembered it clearly.

Annex 29

Input dealer

In Basak Bazar, we visited Mosharof Hossain at his input shop. He works with 15 FFS groups and has been in contact with the Blue Gold business development people since 2014. All 15 of these FFS groups have come back to him, to buy again, after the field school. He has a bicycle van with a hood, which he uses to take inputs to the community. He carries a complete range of products: seed, pesticides, fish and poultry feed and other supplies. He even stocked boro rice seed this year at the suggestion of Blue Gold.



He offers the farmers a 2% discount if he can deal with them as a group. And he goes to the community, saving farmers on travel and transport costs. Mosharof invested time in building relationships: he went to some of the FFS sessions to meet the farmers, before selling to them.

Mosharof is an authorised Syngenta dealer. He doesn't sell products of other manufacturers, but Blue Gold does deal with other dealers who are linked to other suppliers. Blue Gold is linked to about 50 dealers just in Patuakhali alone.

Annex 30

CAWM in Kallayankalash Prodhan Khal

In 2017, Blue Gold taught four field schools in the community of Kallayankalash Prodhan Khal.

Two on fish, beef, nutrition, taught by TA

A third one on poultry, homestead vegetable gardening and nutrition taught by DAE

A fourth one on rice and vegetable taught by DAE with TA.

Near the end of the FFS on rice, Blue Gold was able to bring some rice seed for the farmers to try. A list was passed around the community, and 53 people signed up to receive between four and 10 kg of BRRI dhan 52, which was given free of charge to those who wanted the seed.



Most of them, about 40, have saved some of the seed and 15 to 20 other community members here expressed interest in getting some of that seed to try. They appreciate the new variety because it tolerates being submerged for up to two weeks and it can be harvested early.

People have been growing watermelon here since 1988 and they also grow mung bean, groundnut and other crops. Local farmer Milon worked in Dhaka for some years and then came back with ideas about growing some new crops such as cucumber. Where the land is free of water during the winter, people grow various vegetable crops.

After trying BRRI dhan 52, local people engaged in several water management initiatives.

In 2017, BWDB repaired a sluice gate in the community.

The local people cleaned water hyacinth from the canal. They also learned that when they open the sluice gate at high tide, water enters the canal unevenly, to one side, unless all three gates were opened. As the water swirled around it eroded the bank in a round, garlic shape

now the WMG opens all three gates at once. They have also placed a barrier of sticks along the bank to stop erosion.

One large bil in the centre of the village was flooded with water in the rainy season, because a village road on a raised platform blocked the flow of water. The WMG convinced the UP to build a culvert in the road, allowing the upper bil to drain.

100 community members then cooperated to dig a small canal, two feet by three feet (65 cm by one metre) and 1000 feet (220 metres) long, through their lower bil, into a wetland. They did this recently, just in January 2018. They were able to drain this land. They are hopeful that next year they can grow amon rice here.



The 1000 foot canal

They have also made a pipe culvert through another road.

The WMG has networked with various agencies, and used their own initiative, to bring about these desired changes.

Annex 31

Horizontal learning exchange visit

In Begati Chikerbath, Shamsur Naheris an energetic CDF in a bright orange sari. She has organised an exchange visit so that local women can tell their stories about making money and changing their lives by the simple means of raising chickens.

A year and a half earlier, the village had hosted an FFS on poultry, where the women learned to vaccinate their chickens and ducks with eye drops and to keep the hens in small coops. When the hen has a clutch of eggs she sits on them in a nest, called a hazol, which the villagers make themselves, a technique they learned in the FFS. The hazol is a kind of earthen bowl with two small cups on one side for feed and water. The hen sits on straw in the hazol and broods her eggs with water and food handy.



Raising a local breed helps conserve agrobiodiversity

More chicks live to maturity with this system, and when they are six weeks old, they are let loose to find their own food, which lowers costs and saves space in the chicken coop. Then the hen can start another brood. This way she gets five or six broods in a year, over a useful life of some five years, until she ends up in the family cooking pot.

“How can you stand to eat your old friend?” one visitor asked, concerned that the women might have become too attached to the hens to eat them.

“It’s easy, we just soften the meat first with green papaya,” one of the chicken farmers explains.



Shamsur Nahar, far right, taught 60 families to produce backyard, commercial poultry

While there may be little sentimentality attached to the birds, the women are all keen to raise them. Every house has a two-storey chicken coop in the back yard and all of the little structures are filled with healthy birds.

In a meeting with visitors from other villages, five local women tell how raising chickens has improved not just their income, but also their self-esteem.

“I used to be very poor. I would have to ask my neighbours for loans, but they would not give me any money. Now I have money to loan to them,” explains Forida, a local farmer.

Another innovative farmer, Joshnah tells how her husband was once reluctant to give money to her and their



Forida speaks out

children. Now, thanks to the hens, Joshna has money to give to him to make nice meals at home and to pay for private tuition to give the kids a better education.

Three other women tell similar stories of improved livelihoods.

The audience is clearly moved. The visitors are farmers and their husbands, 25 couples from six WMGs.

Having the husbands attend was a touch of inspiration. It would ensure that the men would be convinced and would support their wives as they started small-scale commercial poultry. The visitors asked questions like:

“What do you feed the chickens?”

“Do any of them die?”



Joshna tells how poultry has improved her standard of living, and her self-esteem

The questions reveal that the people from neighbouring villages wanted more technical information.

They got some answers as they toured the village, seeing one hen house after another. They were growing local chickens, a breed with black feathers and a bald neck. It is in demand locally. Raising local chickens encourages agrobiodiversity.

There were many backyard poultry operations and the coops were all quite similar. After the FFS, the CDF had taught other women to make chicken coops; essentially she replicated the teachings of the FFS through conventional extension, visiting the women at home and teaching them the innovations. This is why all the hen houses were so similar in design.

“Why should we not all make them the same way, if we are making money at it,” one of those farmers explained to us, when we asked by the coops were all of the same design.

Unfortunately, at the end of the event some of the energy was lost when the organisers asked the couples to each fill out an “action plan,” a table with headings about sharing the “good practices”. Few of visiting villagers had many years of formal schooling. They sat bewildered with their large sheets of paper while the project staff filled them in.



People sit with their action plans on their laps, waiting for help to fill in the plans. Writing assignments for community members should be simpler

There are always children at village events, and by 2pm the kids were getting noisy and restless. Everyone was hungry. The district livestock officer graciously took the floor and offered some kind words of advice, such as buying from a specialised poultry provider, not from the market. But by then it was hard for people to listen.

In spite of these problems with the action plan, no doubt many of the visitors will succeed in making their own chicken coops. For one thing, their own CDFs were in attendance and will be able to help them.

BTV recently filmed a TV show on the village's poultry efforts, which aired on 27 February on the Mati-o-Manush program. That TV show could also be recorded and screened in villages.

Annex 32

Organising Company Khal WMG

A lot of work goes into forming a WMG. First, Blue Gold does a survey, to identify each household in the polder, and to find the collective action groups, basically any existing group that lives in the area and manages fish, land, water or any other resource. The CDF uses these to form a core ad hoc committee which calls together the community. At a community meeting, community members select an ad hoc committee which then organises the elections of a 12-member executive committee of the WMG



An executive committee is chosen by the community, with the aid of local people who are already in organised groups

The community discusses the people who are willing to join the committee. As in the case of the village of Company Khal, Patuakhali, local people often avoid having a formal election. They discuss among themselves and choose interested people. In Company Khal they said they avoided having an election between a slate of candidates which would cost time and money and might generate conflict.

Then the CDFs organise FFS and other trainings. In Company Khal, two people, a man and a woman, were chosen to become farmer trainers.

Sabina Aktar received training for 18 days in Patuakhali on livestock, fishery and nutrition and training for 12 days in Khulna on poultry and vegetables. Rasel Hawladar took livestock, fisheries and nutrition for 18 days and a second training on vegetable gardening, poultry and nutrition for 12 days. Both trainings were in Patuakhali.

At first the farmer trainer attended the FFS. Later the farmer trainers led the FFS under the eye of the CDF. The farmer trainer is paid 400 taka (\$4.80) per session. One of the trainers thinks he will be able to continue working afterwards, mainly by vaccinating animals.

The farmer trainers can teach FFS, but probably won't unless a project supports the effort.

The group also had an interesting experience with water management. They could grow amon rice but a second crop. In November-December 2017, at the suggestion of Blue Gold, the WMG built an earthen dam over the canal and backed up water for four kilometres, 40 feet (13 metres) wide and 6 feet (2 metres) deep. They use gasoline powered pumps to irrigate 50 acres (20 ha) of crops in the dry season, such as boro rice, sunflower, chilli and watermelon. With experience they may be able to irrigate much more. The local people are encouraged by their experience and would like to have that canal re-excavated so that it is deeper and will retain more irrigation water.



A dam over the mouth of the canal allows it to store sweet water

Annex 33

Collective action and local government

The WMG of Pakhiapara has a canal and a sluice gate built in the 1960s. The sluice drains into a channel of sea water, an arm of the Bay of Bengal. At high tide the salt water would enter through the damaged sluice gate, unrepaired since the 1960s, and send salt water for four kilometres up the canal.

In the rainy season the farmers could grow amon rice. In the dry season they could grow nothing. Many would migrate to Dhaka or other cities, looking for work.

In 2017, Blue Gold suggested that the community members build a dam over the mouth of the canal, below the sluice gate, to keep out the salt water.

The WMG approached the union parishod chairman who said “Blue Gold will not give you money for this, only advice.” The chairman eventually agreed to give the community a grant of 10,000 taka (\$120) if they would find the rest of the money. They eventually collected 20,000 (\$240) taka of their own money by asking individual households to pay 50 to 500 taka (\$0.60 to \$6), according to their ability to pay. With 30,000 taka they hired labourers and with no help from engineers (“we are our own engineers”) they threw an earthen dam over the mouth of the canal, blocking out the sea. The canal filled with sweet water for a length of four km. Now, for the first time in recent memory, at least 31 farmers are growing boro rice, irrigated with pumps. Based on this successful experience, more farmers will no doubt grow dry season crops next year.



A dam keeps out the sea water, allowing a dry season crop to be grown for the first time in living memory

Annex 34

Responsibilities of CDFs

Provided by CDF Md. Shafiqul Islam

In three sections

- A. Organisational related responsibilities
 - B. Water management related responsibilities
 - C. Agriculture and business-related responsibilities
-
- A. Organisational related responsibilities
 - 1. Working area demarcation and conduct household survey
 - 2. Formation of water management group (WMG) with at least 55% of the total number of members of the group
 - 3. Implementation of election process for formation of Executive Committee of WMG in line with the Government's Guidelines on participatory water management under the rules 2014
 - 4. Ensuring the regular monthly meeting of WMA/WMG
 - 5. Ensuring the annual general meeting (AGM)
 - 6. Presentation on income and expenditure of last financial year at the AGM, presentation and finalization of next year's budget and annual work plan with water management action plan
 - 7. If necessary, organise special meeting and annual meeting
 - 8. Motivation on the savings of the members of the group
 - 9. O&M fund formation for structure operation and maintenance
 - 10. According to need, complete O & M works
 - 11. Ensuring to deposit money to Bank account of WMG/WMA
 - 12. Up-dating and preservation of cash book, regulation, bill & voucher etc.
 - 13. Motivation on fund investment for income generation activity (IGA) of the WMG
 - 14. Motivation on collective action and group work
 - 15. Take initiative to solve small scale conflict within the organizations
 - 16. Help to prepare bi-weekly surveillance report for the group
 - 17. Prepare WMG tracker
 - 18. Formation of sub-committee for sluice O & M, provide training and follow-up the progress of action plan
 - 19. Formation of sub-committees (e.g. savings, agriculture, audit etc.) for maintaining work balance of WMG
 - 20. Develop linkages with LGI, BWDB, DAE, DLS, DoF for the WMGs
 - 21. Help to implement the annual audit of WMG
 - 22. Providing training on accounting and audit method, participatory investigation, agricultural equipment, gender etc.
 - 23. FFS formation and imparting training
 - 24. MFS formation and imparting training

B. Water management related responsibilities

1. Assessment on structural demand on water management issue through general meeting
2. Rating task on priority basis, formation of labour contracting society (LCS) and completion of work through LCS.
3. Help to maintain regular communication with local government institutions for accurate water management and proper distribution of water.
4. Arrange for participation of members of WMG at union parishad (UP) budget meeting
5. Regular follow-up on sluice operation and maintenance
6. Motivation on community led fish culture
7. Motivation for the members on canal water management
8. Arrange for removal of water hyacinth and dam
9. Motivation on maintaining regular communication with Bangladesh Water Development Board (BWDB) for improvement of structure
10. Sub-committee formation for structure operation and maintenance
11. Motivation for WMG/WMA on small scale repairing of embankment and informing the risk in case, when not repairing the embankment

C. Agriculture and business related responsibilities

1. Motivation for members of WMG on agriculture as a business
2. Motivation for members of WMG on HYV (high yielding variety) cultivation
3. Motivation for multi-crops cultivation on the same land throughout the year following CII concept
4. Ensuring the use of improved agricultural technology
5. Awareness development for members of WMG on improved seed collection and preservation
6. Motivation on land preparation, agri-inputs buying and agri-outputs selling
7. Linkage development with various companies, market actors and growth centres
8. Awareness development on selling and buying of agricultural products through price verification in various markets
9. Help to prepare agriculture planning of the group
10. Providing various technical training on agriculture through FFS and various meetings
11. Motivation on the use of improved technology for livestock and poultry rearing and fish culture
12. Encourage regular use of fertiliser, insecticides and IPM
13. Help to increase agricultural production through introduction of CAWM
14. Provide messages to all on learning the information about agriculture for free through the agriculture call centre (16123).
15. Awareness development of members of WMG/WMA about the advantages of agriculture production through CAWM

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