Bangladesh Water Development Board

(BWDB)

Embassy of the Kingdom of the Netherlands

(EKN) Dhaka, Bangladesh

Department of Agricultural Extension

(DAE)




# Half-Yearly Progress Report

## July to December 2017

**February 2018**

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## The Blue Gold Program

**BWDB Office**

23/1 Motijheel Commercial Area, Hasan Court, 8th Floor, Dhaka 1000

(T) +88 02 711 15 25; +88 02 956 98 43

**Gulshan Office**

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

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# Glossary

| | |
|---|---|
| ADP | Annual Development Plan |
| ADG | Additional Director General |
| AEO | Agricultural Extension Officer |
| AGEP | Agricultural Growth and Employment Program |
| BAU | Bangladesh Agriculture University |
| BWDB | Bangladesh Water Development Board |
| CAHW | Community Animal Health Worker |
| CBO | Community-Based Organisation |
| CDMP | Comprehensive Disaster Management Program |
| CDSP IV | Char Development and Settlement Project Phase IV |
| CEIP | Coastal Embankment improvement Project |
| CGIAR | Consultative Group on International Agricultural Research |
| CIMMYT | International Maize and Wheat Improvement Centre |
| CO | Community Organizer |
| CPWF | Challenge Programme on Water and Food (CPWF) |
| CSISA | Cereal Systems Initiative for South Asia |
| DAE | Department of Agricultural Extension |
| DAM | Department of Agricultural Marketing |
| DLS | Department of Livestock Services |
| DoC or DOC | Department of Cooperatives |
| DoF or DOF | Department of Fisheries |
| DP III | Department of Planning III |
| DPP | Development Project Proforma |
| DTL | Deputy Team Leader |
| EKN | Embassy of the Kingdom of the Netherlands |
| EOI | Expression of Interest |
| EMM | Euroconsult Mott MacDonald |
| EWM | Equitable Water Management |
| FFS | Farmers Field School |
| FGD | Focus group Discussion |
| GAP | Gender Action Plan |
| GESAP | Gender Equality Strategy and Action Plan (of BWDB) |
| GoB | Government of Bangladesh |
| GoN | Government of the Netherlands |
| GPWM | Guidelines for Participatory Water Management |
| IRRI | International Rice Research Institute |
| ha | Hectare |
| HH | Household |
| IF | Innovation Fund |
| IFMC | Integrated Farm Management Component |
| IGA | Income Generating Activity |
| IMRC | Inter-Ministerial Review Committee |
| IPM | Integrated Pest Management |
| IPSWAM | Integrated Planning for Sustainable Water Management |
| IPSWARM | Guidelines for Integrated Planning for Sustainable Water Resources Management |
| IWM | Institute of Water Modelling |
| IWMI | International Water Management Institute |

| | |
|---|---|
| IWRM | Integrated Water Resources Management |
| LCG | Local Consultative Group |
| LCS | Landless/Labour Contracting Societies |
| LG | Local Government |
| LGED | Local Government Engineering Department |
| LGI | Local Government Institutions |
| M&E | Monitoring and Evaluation |
| MRL | Monitoring, Reflection & Learning |
| MoU | Memorandum of Understanding |
| MoWR | Ministry of Water Resources |
| MTR | Mid – Term Review Mission |
| NGO | Non-Governmental Organisation |
| O&M | Operation and Maintenance |
| PCD | Project Coordinating Director |
| PCWM | Polder Community Water Management |
| PD | Project Director |
| PDP | Polder Development Plan |
| PMC | Project Management Committee |
| PM | Progress Marker |
| PSC | Program Steering Committee |
| PWMR | Participatory Water Management Rule |
| SDE | Sub-Divisional Engineer |
| SVC | Strengthened Value Chains |
| SWAIWRPMP | Southwest Area Integrated Water Resources Planning and Management Project |
| TA | Technical Assistance |
| T&C | Training & Communications |
| TL | Team Leader |
| TNA | Training Needs Assessment |
| TOT | Training of Trainers |
| UAO | Upazilla Agricultural Officer |
| UP | Union Parishad |
| WAP | Water Management Group Action Plan |
| VC | Value Chain |
| VCA | Value Chain Analysis |
| VCD | Value Chain Development |
| VCS | Value Chain Selection |
| WASH | Water Sanitation and Hygiene education |
| WMA | Water Management Association |
| WMG | Water Management Group |
| WMIP | Water Management Improvement Project |
| WMO | Water Management Organisation |
| WRM | Water Resource Management |
| WUR | Wageningen University and Research Centre |
| XEN | Executive Engineer (BWDB) |
| ZSEs | Zonal Socio-Economists |

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# Executive summary

The Blue Gold Program has started its program activities in all of the selected polders. The program is now covering an estimated 199,326 households with an estimated area of 119,124 ha.

During the reporting period, there was a considerable economic change in the polders – driven by a large move to multiple cropping that is related to the popularity of short duration high yielding T. Aman varieties. The short duration Aman varieties appeared to have led to a doubling of yield and have freed up land in time for dry season cultivation. Different new crop rotations are coming in place in the different polders. These combine the new Aman paddy varieties (or fisheries) in the Kharif seasons with one or two crops in the dry season: Boro paddy, mung bean, mustard, vegetables, sesame or watermelon. These different new crop combinations depend on the level of land, the availability of fresh water storage and soil conditions.

There is an increasing tendency of the WMGs of taking the ownership of water and worked together to operate and maintain them. The WMGs are working closely with Union Parishad and other formal institutions for better water management. Collective actions included removal of water hyacinth, canal re-excavation, emergency repairs of embankments and construction of internal polder water infrastructure. Horizontal learning and expansion approach of BGP shows a positive trend in the project areas regarding learning sharing, community participation, partnership building and local resource utilization for development.

Coastal dwellers are now more collective to pursue the common goals that significantly support them to increase their agricultural productions as well as income. Most common collective actions among the members of WMGs include the joint purchase of pesticides, seeds and fertilizers, purchasing of others agricultural inputs, joint tillage, joint selling of products and community fisheries. Considerable financial benefits resulting from such collective actions like reduce input costs resulting from the joint purchase and better market prices resulting from joint sales.

With supports of DAE, BWDB and TA team, coastal communities have taken ownership over water management infrastructure that helped them to stimulate crop synchronisation, crop diversification, using new agri-technologies. On the other hand, farmers are now more market-oriented through better linkage with value chain actors. CAWM practices ensure a substantially higher production and earlier harvesting that open options for chance crops as well as the Rabi crops.

The RDPP between Bangladesh Water Development Board (BWDB) and EKN is still under process and currently awaiting approval of the Planning Commission. It is now the urgent need to approve the Revised Development Project Proforma (DPP) as early as possible otherwise it will hamper the planned improvement of water infrastructures. During the reporting period, the BWDB and BGP TA team are working together with the coastal communities to strengthen BWDB's capacity as well as the capacity of the local communities to take the ownership and responsibilities of water infrastructures and O & M activities.

# 1 Introduction

After the independence of Bangladesh, the Governments of Bangladesh and Netherlands have been working closely together in the coastal zone of Bangladesh to create a sustainable environment for a better livelihood of the coastal people. The Blue Gold Program (BGP) is designed systematically on the experiences and the lessons learnt over the past ten years of the different coastal project like IPSWAM and considered new insights in how to deal with the challenges created in the environment. The BGP aims to reduce poverty and stimulate economic development through improved water resource management that ultimately supports to improve agricultural and economic development in the polders.

The Blue Gold Program became operational in March 2013 and extends over a 7-year period, until June 2020. Its operations concentrate on 22 polders of four districts: Khulna, Satkhira, Patuakhali, and Barguna. This project aims to reduce poverty and improve food security through equitable water management and strengthened value chains-resulting in improved livelihoods for communities. The expected outcome of the project is that crop and water management practices will be reduced poverty for 199,326 households living in 119,124 ha of selected coastal polders by creating a healthy living environment and a sustainable socio-economic development the Southwest Coastal Zone of Bangladesh.

BGP is being implemented by the Bangladesh Water Development Board (BWDB) in the lead, and the Department of Agricultural Extension (DAE) – in association with Department of Livestock Services (DLS) and Department of Fisheries (DoF) with support of the Technical Assistance Team - and which is funded by the Governments of Bangladesh and the Netherlands. The BGP has also guided by different national policies of Bangladesh like the National Water Policy (NWPo, 1999), the Guidelines for Participatory Water Management (GPWM, 2000), the National Water Management Plan (NWMP, 2000) and the Participatory Water Management Rule (PWMR, 2014).

After the introductory chapter, the half-yearly progress report July -December 2017 presents a discussion and description on major trends and achievements within the Blue Gold Program (Chapter 2). The following chapter illustrates polder wise changes in term of agricultural productions and water management (Chapter 3). The next three chapters focus on the update on Monitoring, Reflection and Learning (Chapter 4), the progress of the Innovation Fund (Chapter 5) and Financial Report (Chapter 6). The last chapter of this report highlights Project management aspects.

# 2 Major Blue Gold Trends & Achievements

## 2.1 Households Reached & Area Covered

BGP is working with its full efforts in all the selected polders (22), covering an estimated 199,326 households and an estimated area of 119,124 ha

The household coverage is around 19% higher than the initial beneficiary target as set out in the original Development Project Proformas (DPPs) with the Bangladesh Water Development Board (BWDB) and Department of Agricultural Extension (DAE). In term of land coverage, the Blue Gold working area is 26% smaller than originally envisioned in the DPP.

## 2.2 Increased Production and Profitability

### 2.2.1 Improvement of cropping system

Increase cropping intensity is one of the main agendas of Blue Gold Program through an improved water management system as well as improved crop management technologies. Most of the program area had single or double cropping system and a low productivity when BGP started. According to the different polder teams many of the phase-1 polders even some new polders also have substantially improved water management following inter alia the construction/fixing of sluice gates, the building/repairing of inlet and outlets and the re-excavation of khals with help of government or through community initiatives. However, it should be noted the potential can be further increased with the implementation of infrastructural works under the RDPP with BWDB. There are also a limited number of areas which can be brought under a double or triple cropped system even without any further infrastructural improvement. During the reporting period, the Blue Gold Program raised awareness and provided technical assistance to farmers to increase their cropping intensity. In particular, Blue Gold technical experts support polder teams to take the following steps:

- *Assist implementation of DAE activities:* Complement DAE activities by facilitating horizontal expansion of improved agronomic practices through WMGs and selection of FFS sites that have a year-round cropping potential;
- *Assist implementation of CAWM:* Complement CAWM by bringing in technical assistance on improved agronomic practices and through horizontal expansion of proven CAWM interventions;
- *Implement demonstrations:* Initiate demonstration plots (with inputs such as improved seeds and fertilisers) to show farmers the potential of cropping system improvements.

This reporting period, July till December 2017, concerned mainly the monsoon and post monsoon season (running from June to November/December). Normally, WMG members cultivate local varieties of Aman rice. Since June 2016, the CAWM initiative has stimulated 27 WMGs across the zones of Khulna, Satkhira and Patuakhali to synchronise their crops and cultivate high-yielding varieties (HYV) of Aman (and in many cases followed by mustard, sesame and water melon), and spread those practices via horizontal learning to other WMGs (see Chapter -3: Polder-wise Trends in Agricultural Production & Profitability).

In addition, Blue Gold polder teams in close cooperation with DAE have set up short duration HYV rice trials followed by mustard cultivation, promoting simultaneously improved water resource management, to spread knowledge on how the present situation can be utilized for enhanced economic development. The promoted production system shifts aim at cropping intensity and land productivity increases, and at improving the profitability of the production system by reducing production costs and increasing revenues. The latter is promoted by networking for goods, services and information. In the process, the Blue Gold Program also introduced appropriate varieties, crop

diversification and technology adaptations by bringing value chain actors and support functions together.

According to the Annual Review Mission (ARM) Aide Memoire, there is considerable economic change in the polders – driven by a large move to multiple cropping that is related to the popularity of short duration high yielding T. Aman varieties (in particular BRRI dhan-49 and 52) and improved water management promoted under BGP. This is resulting in significant production increases that in turn increases income– (see the cropping cutting result in the Table 2-1 below). The short duration Aman varieties appeared to have led to a doubling of yield and have freed up land in time for dry season cultivation. Different new crop rotations are coming in place in the different polders. These combine the new Aman paddy varieties (or fisheries) in the Kharif seasons with one or two crops in the dry season: Boro paddy, mung bean, mustard, vegetables, sesame or watermelon. These different new crop combinations depend on the level of land, the availability of fresh water storage and soil conditions.

**Table 1: Yield and harvest data (based on official crop cutting) from 14 areas comparing BRRI Dhan-52 with local varieties**

| SL NO. | Name of WMG | Polder no. | CAWM | | | | | Non CAWM | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Crop cutting date | CAWM area (ha) | No. of Farmers | Name of Variety | Yield (t/ha) | Crop cutting date | Name of variety | Yield( t/ha) |
| 1 | Uttar Bazargona | 43/2D | 12/11/17 | 21 | 50 | BRRI Dhan-52 | 5.4 | 31/12/17 | Sada mota | 2.8 |
| 2 | Kalayan kolos Prodhan Khal | 55/2C | 28/11/17 | 17 | 50 | BRRI Dhan-52 | 5 | 27/12/17 | Sada mota | 1.9 |
| 3 | Purbo Kewabunia | 43/1A | 5/12/17 | 20 | 50 | BRRI Dhan-52 | 4.1 | 26/12/17 | Sada mota | 1.7 |
| 4 | Uttar Khakuni | 43/2F | 5/12/17 | 20 | 50 | BRRI Dhan-52 | 4 | 31/12/17 | Sada mota | 2.5 |
| 5 | Daksin Dharandi | 55/2A | 6/12/17 | 25 | 50 | BR -23 | 5 | 27/12/17 | Sada mota | 2.1 |
| 6 | Uttar Angulkata | 43/2F | 6/12/17 | 19 | 50 | BRRI Dhan-52 | 4.2 | 30/12/17 | Sada mota | 2.5 |
| 7 | Chawla | 43/1A | 9/12/17 | 30 | 50 | BRRI Dhan-52 | 4 | 29/12/17 | Sada mota | 2.2 |
| 8 | Paksia | 43/2D | 11/12/17 | 18 | 50 | BR -23 | 5.1 | 31/12/17 | Sada mota | 3.1 |
| 10 | Pashim barobagi | 43/2A | 18/12/17 | 19 | 50 | BRRI Dhan-23 | 5.7 | 31/12/17 | Sada mota | 2.9 |
| 9 | Gajendropur Uttar | 29 | 3/12/17 | 31 | 75 | BRRI Dhan-52 | 6.8 | 21/12/17 | Maric Sail | 3.5 |
| 11 | Senerber | 22 | 26/11/17 | 9 | 50 | BRRI Dhan-52 | 6.5 | 25/12/17 | Maric Sail | 3.5 |
| 12 | Bunarabad | 31 part | 22/11/17 | 16 | 50 | BRRI Dhan-72 | 3.5 | 26/12/17 | Maric Sail | 3.6 |
| 13 | Jiala Gadhondanga | 2 | 21/11/17 | 34 | 62 | BRRI Dhan-52 | 5.1 | 26/11/17 | Jmai Babu (MV) | 3.6 |
| 14 | Kaikhali Fulbari | 2 | 26/11/17 | 15 | 71 | BRRI Dhan-52 | 3.5 | 26/11/17 | Guti Sarna (MV) | 3.59 |

### 2.2.2 Trends among FFS Farmers

From April to November, 2017 FFS Cycle 9 took place in polders 25, 27/1, 27/2, 28/1, 28/2 in Khulna zone and in polders 55/2A, 55/2C, 47/3 and 47/4 Patuakhali. This cycle of FFS includes modules fish, beef fattening and nutrition and 1,425 farmers were trained where 79% was female.

The data shows that after completion of this FFS, farmers able to get a better production than earlier. With a higher production regarding beef fattening and fish production, farmers are consuming more eggs, poultry and vegetables compared to the bench mark survey. It is noteworthy to mention that data indicates that modules like beef fatting and fish helped to increase the household income while the nutrition module ensured a better nutrition of the farmer households.

The Blue Gold Program facilitates horizontal learning (Chapter 2.6) to scale up the agronomic practices adopted by FFS Farmers. The Blue Gold Program works together with BTV's Mati-0-Manush. The television program regularly reports about Blue Gold activities and promoted agronomic practices. Mati-0-Manush is watched by 55% of the surveyed farmers.

Based on the data of this circle of FFS more detail trends regarding fish culture, beef fatting and nutritional status of these households are given hereafter,

**FFS Survey Methodology**

At the beginning of a Farmer Field School (FFS), the FFS facilitator interviews the participating farmers with a short online questionnaire about their farm management and production (benchmark survey). The objectives of this benchmark survey are: (i) To establish benchmarks that can be used by the participants for measuring their progress or changes in behaviour and (ii) to generate interest and introduce the topics which will be discussed and practiced in the FFS.

At the end of the FFS the questions are repeated so that participants can assess their own progress (end line survey). The differences between the end data and the benchmark data (for example, an increase of production) can then be presented by the farmers during farmer field days to motivate other farmers to replicate FFS practices. By facilitating the organisation of such farmer field days, the Blue Gold Program aims at horizontal expansion of good agricultural practices.

### 2.2.3 Trends in Fish Culture

FFS Cycle 9 included the fish module, with an aim to promote and increase the production of fish for home consumption as well as an income generating activity. Technical topics in the module cover pond preparation, selection of fingerlings, stocking rates and stocking ratio, feed preparation, feeding, disease management, partial harvesting, and growing vegetables on dykes.

Farmers reported a considerable higher fish production after completion of the FFS Fish Module compared to the status of the production before getting fish modules training. Comparison of the end line data with the benchmark for all fish, data shows a 152% increase in fish production per farmer in Khulna and 316% in Patuakhali (see Table 2-2). Total production (kg per decimal) went up by 115% in Khulna while 333% in Patuakhali (see Table 2-3)

**Table 2: Comparison of Fish production (Kg) per farmer between benchmark and end line in Khulna and Patuakhali**

| Fish production per farmer (kg) | Khulna | | Patuakhali | |
|---|---|---|---|---|
| | Benchmark (N=825) | End line (N=825) | Benchmark (N=599) | End line (N=600) |
| Tilapia | 30.1 | 59.1 | 8.2 | 40.5 |
| Other fish | 66.1 | 183.6 | 32.8 | 126.8 |
| Total | 96.2 | 242.7 | 40.9 | 170.5 |

**Table 3: Comparison of Fish production (Kg) per decimal between benchmark and end line in Khulna and Patuakhali**

| Fish production per decimal (kg) | Khulna | | Patuakhali | |
|---|---|---|---|---|
| | Benchmark (N=825) | End line (N=825) | Benchmark (N=599) | End line (N=600) |
| Tilapia | 2.0 | 3.7 | 0.6 | 3.1 |
| Other fish | 4.3 | 11.5 | 2.5 | 9.7 |
| Total | 6.2 | 15.2 | 3.1 | 13.1 |

Findings of this FFS also show that farmers have changed different practices of fish cultivation. They reported that they have started using hatcheries and nurseries for their fingerling, using supplementary food, and also using local made or commercial fish feed. These practices were very less likely before getting the fish module training. However, farmer faced problem to follow these practice as the hatcheries, nurseries and shops for commercial food are unlikely within the proximity of the villages. To help overcoming these challenges, Blue Gold motivates and supports farmers to take collective action (e.g. joint purchase of fingerlings) and to strengthen their linkages with public and private service providers, such as the Department of Fisheries.

Data shows (see Table 4) that the fish module training brought clear knowledge on different modern technologies of fish production that are helping them to adopt these technologies both in Khulna and Patuakhali.

**Table 4: Comparison of practices of different technologies between benchmark and end line in Khulna and Patuakhali**

| Use of different technologies (% of farmer) | Khulna | | Patuakhali | |
|---|---|---|---|---|
| | Benchmark (N=825) | End line (N=825) | Benchmark (N=599) | End line (N=600) |
| Practice fish pond preparation | 4 | 98 | >1 | >99 |
| Know how to select good fingerlings | 1 | 98 | 0 | >99 |
| Know about stocking density | 2 | 99 | 4 | 100 |
| Know how to examine natural feed | 1 | 98 | 1 | 100 |
| Know about sampling | 0 | 100 | 0 | 100 |

### 2.2.4 Trends in Livestock

FFS Cycle 9 included the beef fattening (cattle rearing) module. Objective of this module is to increase theefficiency of beef fattening, which for many farmers is an income generating activity, especially in the period before the Eid festival. Technical topics in the module include cattle housing, feeding, preparation of Urea Molasses Straw (UMS), HYV fodder crops, de-worming, and vaccination. The module also emphasizes linkages and networking with input providers, service providers (such as animal health workers), markets, and with staff of the department of livestock services (DLS).

Attending the beef fattening module, the average number of animals per farmer increased considerably. However, the number of bulls decreased during the end survey that was conducted after Eid festival (see Table 2-5). It needs to note that Eid festival is the most preferable time to sell animals.

**Table 5: Comparison between benchmark and end line regarding average number of animals per farmer in Khulna and Patuakhali**

| Average number of animals per farmer | Khulna | | Patuakhali | |
|---|---|---|---|---|
| | Benchmark (N=825) | End line (N=825) | Benchmark (N=599) | End line (N=600) |
| Number milk producing cow | 0.71 | 0.81 | 1 | 0.80 |
| Number non milk producing cow | 0.45 | 0.57 | 0.62 | 0.72 |
| Number of male calf | 0.67 | 0.79 | 0.41 | 0.58 |
| Number of female calf | 0.55 | 0.6 | 0.51 | 0.53 |
| Number of bull | 0.37 | 0.3 | 0.81 | 0.54 |
| Total cattle | 2.75 | 3.07 | 3.35 | 3.17 |

Table 6 shows that farmers were able to increase 27% of the body weight of an animal and this could ensure income around Tk 20,000.

**Table 6: Comparison between benchmark and end line regarding meat production and income per animal**

| Meat production in Khulna and Patuakhali | Benchmark (N=773) | End line (N=773) | increased meat production |
|---|---|---|---|
| Meat production per animal per farmer (Kg) | 288 | 366.53 | 78.53 |
| Market value/income per animal (BDT) | 36,436 | 56,437 | 20,002 |

Cattle housing improved significantly. At the time of the end line survey 90-100% of the cattle farmers reported to keep ventilation, gutter for drainage and practice of daily cleaning while these practices were very less likely during the benchmark survey. Farmers also reported significant increases regarding production of green fodder (end line= 99%, benchmark: =<1% for both district) urea molasses straw (end line= 99%, benchmark: =<1% for both district), ability to measure the body weight (end line= 100%, benchmark=<0.5% for both district), de-worming (end line: 99%, benchmark: 7% for Khulna and end line=98%, benchmark=< 1% for Patuakhali). There is a gradual increasing tendency regarding shifting to a better way of feeding their animals, producing green fodder especially Napier and using of animal health services.

## Trends in Nutritional Aspects Among FFS Farmers

The FFS circle-9 also includes nutrition modules. In this module farmers learn about cooking procedures, hygiene, and about ingredients of balanced food. Emphasis is given on the “thousand-day food requirements” which refers to special requirements for mothers during pregnancy and the first 2 years of the child. Farmers also learn about health benefits of Moringa.

**Table 7: Comparison between benchmark and end line regarding correct cooking procedure, health benefit of drum stick (moringa) and 1000-day nutrient requirements in Khulna and Patuakhali**

| Percentage of farmer | Khulna | | Patuakhali | |
|---|---|---|---|---|
| | Benchmark (n=825) | End line (n=825) | Benchmark (n=599) | End line (n=600) |
| **Correct cooking procedures** | | | | |
| Does not know | 56 | - | 82 | 1 |
| Knows partly | 44 | 3 | 18 | 15 |
| Knows fully | - | 97 | - | 84 |
| **Knows moringa is healthy** | 2 | 100 | 2 | 100 |
| **1000 days nutrient requirements** | | | | |
| Does not know | 58 | 0 | 67 | - |
| Knows partly | 41 | 4 | 33 | 8 |
| Knows fully | 1 | 96 | 0 | 92 |

Table 7 shows that 56% and 82% farmers in Khulna and Patuakhali respectively did not know the correct cooking procedures while after attending the FFS 97% and 84% farmers in Khulna and Patuakhali respectively reported that they now fully know the correct cooking procedures. In addition, farmers of both districts were almost unaware about the health benefit of moringa and now 100% farmers aware about this. Furthermore, 58% and 67% farmers in Khulna and Patuakhali respectively did not know the 1000 days nutrient requirements while after attending the FFS 96% and 92% farmers in Khulna and Patuakhali respectively reported that they now fully know the nutrient requirements.

The comparison between benchmark and end line data regarding food habit especially days of consumption of meat, fish, egg, fruit, milk and vegetable in a week illustrates that after attending the FFS and at the same time practicing of fish culture and beef fatting positively contribute to increase the days of consumption of these foods per week in both districts (see Table 8).

**Table 8: Comparison between benchmark and end line regarding food habit**

| Food habit | Khulna | | Patuakhali | |
|---|---|---|---|---|
| | Benchmark (n=825) | End line (n=825) | Benchmark (n=599) | End line (n=600) |
| Meat (days per week) | 1.1 | 1.4 | 0.6 | 1.1 |
| Fish (days per week) | 3.6 | 4.3 | 2.1 | 3 |
| Egg (days per week) | 1.8 | 2.5 | 1.4 | 1.9 |
| Fruit (days per week) | 2.6 | 2.9 | 1.5 | 2.3 |
| Milk (days per week) | 2.5 | 3.8 | 2.2 | 2.7 |
| Amount vegetables per week (g) | 1188 | 1942 | 1020 | 2158 |

### 2.2.5 Collective Actions for Economic Development

BGP aims at making farmers more profit oriented and produce for generating more income. BGP supports the coastal communities to be more collective and expanding their network for economic development. Farmers have adopted collective actions and networking as they have seen direct benefit of cost reduction through them.

The Blue Gold Program organized collective action and networking workshops. BGP took actor capacity development efforts and relationship development attempt (e.g. RFs, power tiller operator, input traders, forward buyer and extension service providers) as part of its objective of improving economic situation of specific polder dwellers. Workshops have also been organised for Blue Gold TA Community Development Facilitators (CDFs). In these workshops, they were oriented on how to facilitate collective actions in communities.

Table 2-9 shows that collective actions really took off. The numbers in the table were derived from the WMG Tracker, which is a tool to track the progress of individual WMGs. Information in the Tracker is provided by WMGs and CDFs and might be biased. An independent audit on the numbers is planned for the 4th quarter of this year.

WMGs were asked how many of their members are involved in collective actions for Agricultural Development. They reported 13061 members to be involved in collective actions, out of which 17.2% is woman. WMGs estimate the financial investment of such collective actions at 193,40198 (BDT) equalling about 189,609 Euro. The average investment per participating, faming household equals 1226 BDT. Most common collective actions include joint purchase of pesticides, seeds and fertilizers joint tillage, joint selling of products and joint purchasing of agricultural inputs.

Success Story - Collective Action on new cropping pattern & inputs collection

Collectively Tilled mungbean field

Paschim Shakharia WMG is located at Polder-43/1A, Union Atharogachia under Amtoli Upzila of Barguna district. Farmers of this area traditionally grow local variety of T Aman having low yield and longer life. So, opportunities for timely producing Ravi crops become uncertain and most of the lands remain fallow during Ravi season. Through BGP activities they learned about cultivation of high yielding variety of rice and benefits and process of collective action for collecting inputs.

Ten members of MFS cultivated BRRI- 52 variety of rice in 8 acres of land as suggested in the MFS training during Aman season and production was almost double than the local variety. On the other hand as BRRI-52 is a shorter duration crop they got the opportunity to cultivate Rabi crops like mustard, watermelon and ground nut etc. This group collectively cultivated Mung bean (BARI Mung-6) after harvesting T Aman. These group members have save money through collective buying of seeds, fertilizer and collective use of tractor for land tillage at comparative lower rate. As they bought large quantity in wholesale price, required less transport cost and also saving in working hours. Since last year they are practicing collective buying of seeds and fertilizer. They are now planning for collective selling of their Agri. Products to ensure competitive price.

**Table 9: Participation in Collective actions in the different economic activities (source: Blue Gold TA WMG Tracker)**

| Collective Action | Total participants | % of Female | Economic Activities-Investment (BDT) |
|---|---|---|---|
| Bulking | 84 | 29.8 | 12750 |
| Collection & sale of milk at chilling center | 22 | 9.1 | 5250 |
| Community-led fish culture | 883 | 37.3 | 1638000 |
| Irrigation of Ag. Land | 132 | 12.9 | 112480 |
| Purchase of fertilizer | 1292 | 9.3 | 1066970 |
| Purchase of fingerling | 248 | 16.1 | 214600 |
| Purchase of fish Feed | 301 | 22.6 | 207800 |
| Purchase of lime | 260 | 46.2 | 37170 |
| Purchase of pesticide | 3312 | 14.9 | 1971595 |
| Purchase of seeds | 4495 | 9.6 | 3160315 |
| Selling products | 1483 | 14.2 | 6117033 |
| Tillage land for crops | 2046 | 7.1 | 4527310 |
| Vaccination of poultry & livestock | 1141 | 60.6 | 33360 |
| Others | 98 | 23.5 | 235565 |
| **Grand Total** | 15775 | 17.2 | 19340198 |

### 2.2.6 Value Chain Improvements

#### Introduction

Strengthening Value Chain (SVC) activities are focussed to improve the economic condition of polder dwellers through agricultural value chain development aimed at efficient production and improved market linkages. In this 6-month period, another range of supporting activities were executed to improve value chain efficiency and integrated with zonal level planning. The activities were implemented by polder teams with a view to achieve the nexus of improved water resource management-productivity and market orientation (MO). It helped achieve transformation of polder dwellers and WMG members achieve desired transformation in getting more earning from economic activities.

#### Major Achievements

DAE has been running 142 FFS with 7100 farmers in this Aman season. Their farmers are learning not only about improved production technologies but also about MO issues which were incorporated

within the FFS curriculum. The better market linkages are expected to result in more income from farmers' production.

In addition, BGP through its TA FFS has been implementing 67 FFS on vegetable-poultry-nutrition module with a total of 1675 participants in 10 different polders. The BGP worked to modify the FFS cycle 10 in which MO issues are getting extra emphasis to equip participants with more information on how market system works. Input procurement and distribution to FFS participants have been changed to allow for better linkage of farmers with value chain actors. It will help farmers establish linkage with quality source of input, hence it will create a sustainable supply chain, and for a few of them we expect them to become surplus farmers and engaged in CA for more income from sells.

New FTs are completing their entrepreneurship with this cycle and it is hoped that they will be able to play a central role in implementing a perceived modified FFS, in much specific shorted sessions, in upcoming cycle-11.

The concept of SVC was also integrated in the Cropping System Initiatives (CIIs). These CIIs were much appreciated by the WMGs. We saw the adoption of an additional crop (e.g. mustard, vegetables) before mung bean or sesame after short duration Aman rice using opportunities of WRM system to enable this cropping pattern.

A brief value chain report, along with case studies of collective actions (CA), on Moringa was prepared and shared with stakeholders that created enthusiasm among farmers as an alternative option for earning income. From a Moringa CA, farmers could earn an additional income of BDT 0.60 million. Similarly, CA on 'Basok', a kind of medicinal leaf that has demand in pharmaceutical industry as raw material, is being promoted at polder-2 among WMG members under leadership of resource farmer (RF) and an alternative source of income for polder dwellers. Farmers can earn Tk. 5 per kg of green leaf nowadays, while the leaf had before no economic value at all.

In order to consolidate MO issues to WMG members, BGP organized CA and networking workshops in various polders with WMGs. BGP has trained a new group of 30 potential RFs at polder-2 with a view to strengthen value chain development related activities. There were efforts to develop value chain actors to sustain the transformation of their economic situation. This has been earlier promoted by Market-Orientation FFS (MFS) and is currently sustained under the CIIs. The principal is the expansion of short duration HYV rice followed by a chance crop in BGP area and introduction of HYV mung bean and sesame. In this regard, two new groups of local level Input Traders (a total of 46) were trained. Moreover, business development coordinators (BDCs) together with polder coordinators and others, promoted CA among WMGs, not only for economic benefits but also for improving field channels or local level water resource management to enable farmers' early harvest and early sowing. This with the ultimate goal to increase production and income.

### 2.2.7 Other Achievements regarding Strengthened Value Chains

BGP polder teams in close cooperation with DAE have set up short duration HYV rice trials followed by suitable crop cultivation under improved WRM to spread knowledge on how the present situation can be utilized for enhanced economic development. Availability of seeds was an issue. BGP identified the problem and worked with farmers, WMG members and RFs to take timely steps to ensure farmers got the seeds by means of CAs from proper supply channels. There were also proactive meetings with BDCs and input supply chain members to enable farmers to receive the desired seeds on time.

BGP is working on creating awareness of the potential shifts in production systems supported by efforts in value chain improvement attempts. The BGP team constantly looks for sustainable VC improvements, thereby involving other actors and support functions, and trying to improve the Business Enabling Environment. For these reasons there were actor linkage programs initiated at zonal level. There were initiatives to link WMG members with trained input traders, RFs, service providers and forward buyers to create win-win situation and to promote profitable CA and income

options for all actors. In addition, small demonstrations were initiated with private sector companies to promote high quality seeds and technology at farmer level.

BGP also initiated Community-led Fisheries (CLF) in ponds and canals by involving WMG members with a view to enhance potential of aquaculture. There were efforts to build capacity of CLF participant, 2 members from each CLF were trained (a total of 48 farmer) on improved fish culture, market linkages, CA and networking to help them earn more from aquaculture. FTs were also given a refresher training on running TA FFS.

Innovation Fund projects have also been supportive in testing and expanding business ideas (e.g. ProPortion in assessing ICT based solution in solving farm level constraints, United Purpose in creation of Women Business Centres etc.)

Overall, the continued focus on SVC aspects in CIIs, CLFs and linkage programs is showing signs of improvements WMGs-polder economy. BGP polder dwellers are showing more interest in short duration HYV rice followed by a chance crop e.g. mustard (changing the cropping system where water infra allows). Farmers have shown enthusiasm in CA for either input collection or output sells of crops like- rice, fish, moringa, vegetables, water melon and basok. There is tremendous interest in different types of CAs and networking by farmers, particularly those which reduce costs or enable extra services. There seems to be a growing understanding of the practical importance of WRM and operating the infrastructure for economic development at catchment level. MRL team recently conducted an impact assessment on SVC activities particularly the impact of MFS. The report reflected tremendous change among farmers regarding knowledge on the market system. Farmers are now more profit motivated and taking production decision based on income earning opportunities and associated risks.

### Challenges, Mitigation Measures and Lessons Learned

As indicated in the above sections, MO issues have been introduced in FFS cycle no.10 sessions to transform farmers to be surplus farmers and take gradual shift into commercial farming. There was some initial resistance in proposing new procurement and distribution process to strengthen value chains during this on-going FFS cycle (no.10), however these could be solved through zonal level discussions. The challenge for the upcoming FFS cycle no.11 will be to modify the TA FFS into more specific shorter session FFS to achieve overall efficiency with limited number of CDFs and meet growing demand from WMGs.

For all parties and stakeholders involved in the BGP, the SVC concept remains innovative and challenging to integrate in standard activities like FFS. The keenness to so do is there. Also, DAE embraces the idea and has initiated integration in their FFS curricula. However, still more activities to create a better understanding, clarification, communication and motivation are required, especially for field staff directly working with farmers. Once farmers know how they can benefit from improved WRM based on market demand, its revenue and profit earning potential, they are very interested to adopt it.

However, it can be a challenge is to convince farmers towards MO on high-value crops, since those have extra risks under extreme weather events. Several times, heavy rain has impacted severely agriculture production among farmers who were stimulated by BGP to produce high-value crops. Weather and related risks are challenges that are mainly beyond farmers' control. BGP is trying to create more awareness of both profitability and risk, as well as more conscious decision making by farmers. An example is the success story on page 24, in which BGP team stimulated farmer to adopt boro rice instead of mungbean to have a good balance between profitability and risk mitigation.

## 2.3 Improved Water Management

### 2.3.1 Water Resource Management

#### Major Achievements

- An improved water management system ensure an estimated 80,000 hectares of land under increased flood protection, reduced water logging and less water stress.
- It is noteworthy to mention that Polder Development Plan (PDP) for all of the polders (22) of BGP has been finalized. In addition, DEM report of 7 out of 21 polders has been prepared.
- The RDPP is almost in the final stage and it was expected to be approved by end of January 2018 but still waiting to approve.
- All Water Resource Management (WRM) activities, including assessment of rehabilitation needs, engineering assessments, budgeting, preparation of rehabilitation plans and monitoring and quality control of rehabilitation works, were done in consultation/ along with the Blue Gold polder teams, zonal teams and WMOs, UPs BWDB and DAE.
- Almost all the repair works has been completed in the first 12 polders; the sluices, outlets and inlets are now functional. The remaining works are on-going and is expected to be completed by 2017-18, except construction of new structures.
- The most remarkable success is the implementation of emergency geo-bag revetment work at Chandghar, Polder 29. The Emergency Geo-bag Revetment Work in polder 2 is on-going and expected to be completed in a month.
- In each polder the initial needs assessment meetings and all other subsequent water resources management plans and rehabilitation plans involves the WMGs. The prioritization of their requirements is done in consultation with them. The validation of the final rehabilitation needs is then done together by TA Team, BWDB and the WMGs.
- TA staffing support for assisting field offices in estimate preparation, tendering, quality control and monitoring has also been provided; 2 SAEs for Khulna and 1 SAE for Patuakhali. One Mechanical SAE has been recruited for Khulna ME Division.
- Rehabilitation works are planned for all 22 polders in 2017-18 as per 2017-18. From July 2017 to till now, no new works have been undertaken, only some of the carried-over works from 2016-17 are on-going (cumulative progress up to December 2017 including on-going carried over works has been given in Table 10); Design Data Collection and Detailed Design for most of the infrastructure rehabilitation works from 2017-18 and 2018-19 are in progress (see Table 11). Table-12 below summarizes the total infrastructures planned for data collection and design; and status of design data submitted, design completed, estimated submitted and estimate vetted.

#### Challenges & Mitigation Measures

It was expected that the RDPP will be approved by January 2018. The rehabilitation plan for 2017-18 FY cannot be finalized until the RDPP is approved and many works cannot be done. The RDPP approval didn't take place by January 2018, so 2017-18 rehabilitation plan will be hampered.

The most severe erosion reaches are in polders 43/2A, 43/2B and 55/2C in Patuakhali and polders 22, 31 part, 34/2 part and 29 in Khulna. The retired embankment in these erosion areas has been planned but cannot be implemented before the RDPP approval. The construction of retired embankment in polder 29 restarted in March 2017 and is on-going in a slow pace.

Whenever any issue arises such as water logging or scarcity or even conflict between WMGs regarding water management, the polder team informed the WRM Team and WRM Team along with polder team arranged meetings with WMGs, BWDB to resolve any such problems.

Design data collection, detail engineering designs, estimate preparation and tendering process are some of the major constraints for timely implementation of rehabilitation works. BWDB has manpower shortage in the field offices as well as in the design offices that hinders timely completion of the above activities. To improve BWDB manpower capacity in the field as well as in the design offices, ARM 2016 recommended some special TA budget for additional staffing support to these offices. The status of design data collections has been already shown in the table 2-11 which is not very encouraging.

Many of the implementation works could not start timely because of late issuance of work orders. Some of the work orders have been issued in March and late April. Not only did the work start late, some LCSs even refused to start work in March-April. Some tenders are still in process.

Overall progress of the rehabilitation work during 2016-17 FY is not yet finalized but is anticipated to be around 60% and the progress of carried over works from 2015-16 increased from 28% to around 85%.

To follow-up on this (ARM recommendation), the Blue Gold Program outsourced survey and design data collection for 2017-18 and it is on progress and is expected to be finalized by July 2017. TA Team also assisted in recruiting 4 junior design engineers, under TA funding, for design circles 2 and 5.

**Table 10: Cumulative Progress up to December 2017**

| Work Items | Unit | Works Completed (up to June 2017) | Works still on-going (As of December 2017) |
|---|---|---|---|
| Embankment Re-Sectioning | km | 211.80 | 44.120 |
| Embankment Retirement | km | 2.84 | 1.735 |
| Canal Re-Excavation | km | 109.28 | 55.620 |
| Repair of Sluices | nos | 45 | 19 |
| Repair of Outlet/ Inlet | nos | 186 | 5 |
| Construction of Sluice | nos | 3 | 4 |
| Construction of Outlet | nos | - | - |
| Construction of Inlet | nos | 2 | 1 |

**Table 11: Plan for Design Data Collection & Design; and Status of Design Data Submitted, Design Completed, Estimated Submitted and Estimate Vetted**

| Work Items | Unit | Plan | Design Data Submitted | Design Completed | Estimate Submitted | Estimate Vetted |
|---|---|---|---|---|---|---|
| Embankment Retirement | km | 14.0 | 2.88 | 2.88 | 2.88 | 2.38 |
| Canal Re-Excavation | km | 238.5 | 156.74 | 112.51 | 38.78 | 30.68 |
| Repair of Sluices | nos. | 99 | 44 | 11 | - | - |
| Repair of Outlet | nos | 7 | - | - | - | - |
| Repair of Inlet | nos | 33 | 25 | 25 | 25 | 25 |
| Construction of Sluice | nos | 23 | 20 | 7 | 5 | 4 |
| Construction of Outlet | nos | 17 | 13 | 12 | 6 | 6 |
| Construction of Inlet | nos | 5 | - | - | - | - |
| Construction of Culvert | nos | 24 | 17 | 1 | - | - |
| Pump Shed Construction | nos | 6 | - | - | - | - |

**Table 12: Plan for 2017-18 Rehabilitation Works**

| Work Items | Unit | Plan for 2017-18 | | |
|---|---|---|---|---|
| | | Qty (Full) | Qty (Part) | Total |
| Embankment Re-Sectioning | km | 50.60 | 50.87 | 101.47 |
| Embankment Retirement | km | 4.88 | 4.00 | 8.88 |
| Canal Re-Excavation | km | 59.78 | 133.84 | 193.62 |
| Repair of Sluices | nos | 15 | 36 | 51 |
| Repair of Outlet/ Inlet | nos | 34 | - | 34 |
| Construction of Sluice | nos | 3 | 15 | 18 |
| Construction of Outlet | nos | - | 10 | 10 |
| Construction of Inlet | nos | 1 | - | 1 |
| Construction of Culvert | nos | 2 | - | 2 |
| Low cost Bank Protection work | km | 1.20 | - | 1.20 |
| Rehabilitation of Interior Dike | km | 16.00 | - | 6.00 |

### 2.3.2 Participatory Water Management

#### Collective Action for Operation and Maintenance of water Infrastructures

BGP encourage the coastal communities to take collective action thus they can use their collective ability/power to pursue their collective goals. Collective operation and maintenance of water infrastructure is one of the main focuses for the members of WMGs. The table below shows the different types of collective actions related to O&M of water infrastructure were taken by the members of WMGs. This data is taken from WMG Tracker, a tool to track the progress of all of the WMGs,

WMGs were asked how many of their members were involved in collective actions for Operation and Maintenance (See Table 13). They reported a total 95475 members were involved in collective actions, out of which 18.2% was woman. WMGs were asked to estimate the amount of money, labour (value in BDT) and in-kind contributions (value in BDT) to O&M. In total, they reported that collective actions for O&M amounted for BDT 2,636,260, equalling 25,846 Euro[1].

**Figure 1: Dakshin Darandi WMG (P-55/2A) members are excavating drain**

#### Success Story - Collective Action to Reduce Waterlogging

Dakshin Darandi Bazar Sluice WMG of Polder 55/2A (Union Kamlapur, UZ: Patuakhali Sadar) has taken an initiative for internal water management for irrigation purposes during boro rice cultivation. There was a meeting held with the WMG members and an agenda on Rabi crop cultivation (Next crop of T-aman rice) was discussed. The farmers said that they have had a bad experience in the last two years with mungbean cultivation, but still they did not see any other alternative than mungbean.

Hearing this, CDF Mr. Mukul Roy explored the opportunities of different rabi crops compared to boro rice. Though farmers have no experience on boro rice cultivation, they are agreed to start cultivating since they believed boro would have less risk and good market price. At the same time, they raised the question how to solve their irrigation problem, because their water source is about 270-280 meter far from their crop field and there is no existing irrigation channel/drain.

BGP TA team ensured to provide technical support along with DAE and presented a draft comparative calculation (farmers experience based) on return from mungbean and boro rice. From mungbean, according to farmers opinion, yield is 8 mound/acre that worth is 8 mound x Tk.3000 = Tk. 24,000 and from boro rice yield is 55 mound/acre which worth is 55 mound x Tk. 900 = Tk. 49,500. The investment costs for boro rice are Tk. 12,000/acre more than for mungbean. There is thus an opportunity to earn Tk. 13,500 more by mungbean cultivation than boro rice from one acre of land.

Seeing the calculation, the 11 farmers agreed to cultivate boro rice on their 8 acre of land. They have already collected 80kg seeds collectively and sown in a seed bed. This month they have started to make an irrigation drain which will be 270 meter long. The labour required is about 30 man-days. Now it is prepared for irrigation, but during monsoon it will be used as channel to drain out water. We think that it is a great example of internal water management by the WMG members.

[1] 1 EURO=BDT 102

**Table 13: Participation and financial value of collective actions for operation & maintenance (source: Blue Gold TA WMG Tracker)**

| Collective Action for O&M activity of Infrastructure | No of male involved | No of female involved | Total no of persons involved | % of Female involvement | Approx. value (BDT) of work |
|---|---|---|---|---|---|
| Cleaning of khals (silt removal, cleaning of water-hyacinth, removal of cross-dam, net-pata, etc) | 3550 | 1026 | 4576 | 22.4 | 1205260 |
| Repair of embankment | 1665 | 496 | 2161 | 23.0 | 599800 |
| Repair/maintenance of structures-Sluice | 1856 | 157 | 2013 | 7.8 | 559000 |
| Excavation of field channel | 394 | 15 | 409 | 3.7 | 127100 |
| Repair/maintenance of structures-Inlets | 228 | 28 | 256 | 10.9 | 91000 |
| Repair/maintenance of structures-Outlet | 63 | 15 | 78 | 19.2 | 33800 |
| Others | 49 | 5 | 54 | 9.3 | 20300 |
| Total | 7805 | 1742 | 9547 | 18.2 | 2636260 |

## Other Major Trends in Participatory Water Management

- Most of the WMGs are now more active in water management issues. They voluntarily clean their canals, sometimes with the assistance of UP. Many WMGs are self-motivated and have taken own initiatives to improve drainage situation by removing water hyacinth, cleaning khals, installing drainage pipes which resulted in the cultivation of HYV rice in a large area instead of local varieties which was a dream a few days back. The farmers started growing Rabi crops utilizing stored water in the canals/khals after successful harvest of T.- Aman.
- In some of the new polders where sluice gates are not functional, members of WMG reserved fresh water by making a cross dam to irrigate crop in Rabi season (e.g. polder 47/3, 47/4). Some places wooden gates have installed (e.g. Tegachia Azimuddin outlet of polder 47/3) by the WMG members to maintain water flow during the Kharif season and to preserve sweet water during the Rabi season. Farmers also made field channels for irrigation and drainage for Rabi season crops (e.g. 55/2A, 43/2F, 43/2E).
- WMGs and WMA have developed a partnership with LGIs for proper water management and to keep all WM infrastructures functional. For this purpose, WMA formed Sluice Catchment O&M Committees. They are raising O&M fund for O &M of infrastructures. Thus, all the WMOs became more inspired to go for different collective actions utilizing better water management situation.
- WMGs building up partnerships with LGIs, DAE, DoF, DLS, BARI, BRRI, BINA and CYMMIT through formal workshops, meetings and different informal activities. Some places, Union Parishad provided drainage pipes to WMOs for proper water management in the polder areas. When community people faced any problem related to water management (partial damage, erosion and breach of embankment etc.), they organized meeting under WMO, prepared meeting resolution, and sent to BWDB and UP to help them solve the problems.
- It was observed that owners of the gher always want to keep excess water into the polders for culture fish and it creates the waterlogging problem for other agricultural lands. To mitigate this problem, WMGs sat together with Union Parishad and took decision jointly for ensuring equitable water distribution considering high land and low land in the Polders. Besides,

different activities like forming catchment O&M committee jointly, organizing training, assist WMOs in preparing integrated WAP, are conducted with the presence of LGIs, DAE and BWDB representatives.

### Participatory Self-Assessments

Participatory Self-Assessments (PSAs) were conducted by Water Management Groups (WMGs) of 14 Blue Gold polders during October–November 2017. Through PSA exercise the WMGs assess their own performance against some potential targets. In essence, PSA encourages WMGs to be aware of the potential targets they should achieve and to evaluate their performance (progress or shortcomings) towards a full achievement of those targets. Based on their monitoring results, the WMGs can also make their own plan of actions to sustain progresses achieved and to improve further.

The PSA format presenting potential targets for WMGs was revised for this round of PSA in view of re-defining of the indicators of 'functional WMG'[2] by BGP – the redefined 'indicators of functional WMG' form the essence of potential targets of WMGs. In the revised PSA format, the WMGs indicated the potential targets set for them, it appears that the WMGs felt more comfortable with them than the previous format; WMGs able to relate them more easily with realities/activities of their day-to-day life.
A total of 352 WMGs participated in the self-assessment exercise during October-November 2017 (see Table 14). Based on the achievement levels they indicated by way of giving scores (on a scale of 0 – 3) against the potential targets, the WMGs have been ranked in 5 performance grades – 'A' if the overall achievement is => 80%; 'B' if the overall achievement is between 70 and 79%; 'C' if the overall achievement is between 60 and 69%; 'D' if the overall achievement is between 50 and 59%; and 'E' if the overall achievement is =< 50%. The following table shows the numbers of WMGs of 14 polders falling under different performance grades.

**Table 14: The overall self-assessed level of different WMGs in different polders**

| Polder | Grade A | Grade B | Grade C | Grade D | Grade E | Total (A-E) |
|---|---|---|---|---|---|---|
| 22 | 7 | 3 | 1 | 1 | 0 | 12 |
| 26 | 1 | 6 | 8 | 0 | 0 | 15 |
| 29 | 5 | 22 | 23 | 5 | 0 | 55 |
| 30 | 30 | 10 | 0 | 0 | 0 | 40 |
| 31 Part | 0 | 2 | 8 | 2 | 0 | 12 |
| 43/1A | 2 | 3 | 4 | 5 | 0 | 14 |
| 43/2A | 1 | 2 | 11 | 6 | 2 | 22 |
| 43/2B | 7 | 4 | 10 | 3 | 4 | 28 |

[2] "A functional WMG drives improving productivity and profitability in the primary sector through water resource management, which includes operation of water management infrastructure based on joint production planning and maintenance of water management infrastructure. Furthermore, a functional WMG builds partnerships for development."

| Polder | Grade A | Grade B | Grade C | Grade D | Grade E | Total (A-E) |
|---|---|---|---|---|---|---|
| 43/2D | 14 | 10 | 4 | 0 | 0 | 28 |
| 43/2E | 0 | 4 | 4 | 4 | 0 | 12 |
| 43/2F | 11 | 14 | 1 | 0 | 1 | 27 |
| 55/2A | 0 | 0 | 3 | 1 | 9 | 13 |
| 55/2C | 0 | 4 | 7 | 5 | 0 | 16 |
| 2 | 1 | 3 | 16 | 20 | 18 | 58 |
| Total | 79 | 87 | 100 | 52 | 34 | 352 |

The results of PSA, show that performance grade of about 22% of the total number of WMGs is 'A', overall achievement being 80% or more, while 10% WMGs belong to 'E' grade with overall achievement of 50% or less (see figure 2).

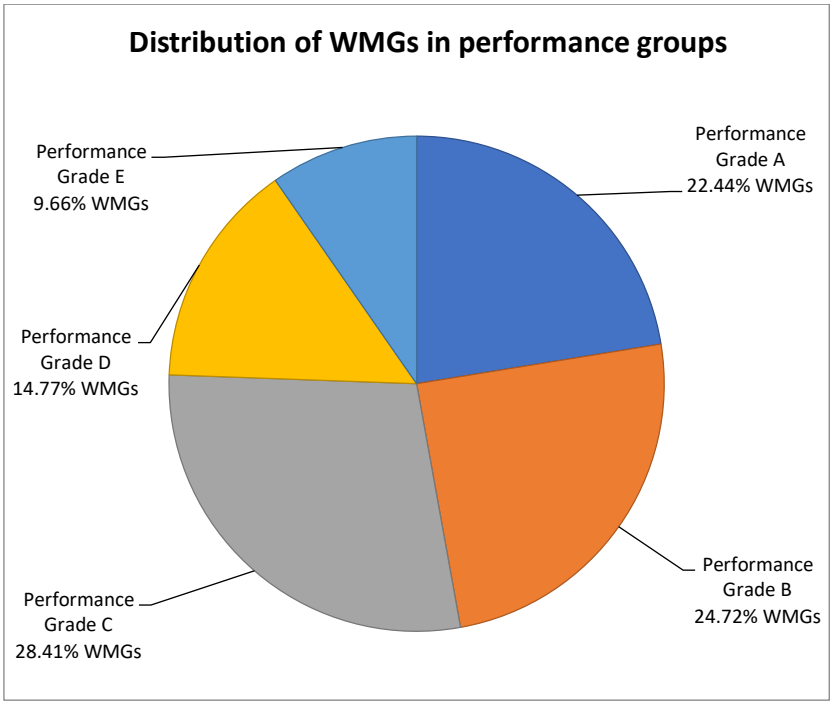


**Figure 2: Distribution of WMGs in performance groups**

### 2.3.3 Community-led Agricultural Water Management (CAWM)

#### Introduction

CAWM can be considered as an important approach to the type of changes Blue Gold Program wants to bring about and connects directly to its Theory of Change. It is an intensive approach in which field staff of DAE, BWDB and TA team have an active role (i) to strengthen the motivation and leadership of WMGs, (ii) to stimulate crop synchronisation and diversification, (iii) to build capacity in new agri-technologies, water management and marketing and (iv) improve community ownership over water management infrastructure. To create ownership the infrastructure is only co-funded by BGP and handed over to WMGs directly. WMGs develop an operation and maintenance plan which includes the insurance of labour contribution and the creation of funds (cash/crops) by the community. Through the provision of technical support and horizontal learning between WMGs the practices are executed and spread. The linkage with LGIs for conflict mediation and the technical support from BWDB, DAE and other service providers is also a key factor for success. This is with the ultimate aim to increase production and household income.

This reporting period, July till December 2017, concerned mainly the monsoon and post monsoon season (running from June to November). Normally, WMG members cultivate local varieties of Aman rice. Since June 2016, the CAWM initiative has stimulated 10 WMGs across the zones of Khulna and Patuakhali to synchronise their crops and cultivate high-yielding varieties (HYV) of Aman (and in some cases followed by mustard), and spread those practices via horizontal learning to other WMGs.

#### Impact of CAWM Initiatives

**Horizontal learning:** The BGP continued with horizontal learning sessions during the Aman season. For 186 WMG representatives from 30 host WMGs events were organised with a leading role for the practising WMGs. The horizontal learning events were also attended by LGIs, BWDB and DAE which contributed to developing effective linkages and better communication and coordination. For detail please see the Table 15 below:

**Table 15: Detail of Horizontal learning session during July-December 2017**

| Zone | No. visits | No. Host WMG | No. visiting/ guest WMG | No. Total participants | No. Male | No. Female | No. UP representativ | No. BWDB representativ | No. DAE representativ e | Others |
|---|---|---|---|---|---|---|---|---|---|---|
| Patuakhali | 11 | 9 | 64 | 325 | 251 | 74 | 11 | 07 | 15 | 40 |
| Khulna | 19 | 17 | 76 | 362 | 137 | 225 | 12 | 07 | 14 | 09 |
| Satkhira | 05 | 04 | 46 | 150 | 113 | 24 | 05 | 02 | 02 | 03 |
| Project Total | 35 | 30 | 186 | 837 | 501 | 323 | 28 | 16 | 31 | 52 |

This reporting period demonstrated that *the* ***introduction of CAWM has been successful and resulted in higher Aman production, earlier harvest dates and a significant amount of both facilitated and autonomous replication took place***. *Note: Unfortunately, we are not yet able to report independent quantitative outcomes of CAWM, since in August 2017 we decided to cancel the BRAC RED M&E contract due to ill-performance. The data we present below is based TA team measurements and fact finding. At the moment, the BGP is identifying a new mechanism for long-term monitoring of CAWM outcomes and impacts, which likely will be a combination of one or two independent national M&E consultant(s) and experts from DAE and BGP.*

**Facilitated replication**: The BGP has facilitated the adoption of CAWM principles with help of planning workshops, a limited provision of seeds, implementation of small-scale water management infrastructure and special CAWM Farmer Field Schools (FFS) led by DAE to 17 extra WMGs since June 2017. The special curriculum for CAWM-FFS includes topics on on-farm, sub-catchment and catchment water management and collective market action. It was developed in the previous reporting period and rolled out during this period. A first batch of Training of Facilitators for SAAOs was conducted in August 2017.

**Autonomous replication**: The horizontal learning events on CAWM have also induced spontaneous and autonomous replication of HYV Aman (BRRI dhan 52). In Table 16, one can see that for the Patuakhali zone the replication rate within the WMG catchment is on average 9-fold, while the overall replication rate (both within and beyond catchment) on average 25-fold. From just 138 ha of BGP supported CAWM areas in 2016, the respective polders were automatically up taking HYV Aman without support of BGP with a coverage of 3472 ha in 2017.

**Table 16: Autonomous replication of HYV Aman in the polders of Patuakhali zone were CAWM introduced**

| Polder No. | Polder area (ha.) | WMG catchment area (ha) approximately | WMG catchment area coverage in 2016 (ha) with support | Replication in WMG catchment in 2017 without support (ha) | Replication beyond WMG catchment in 2017 without support (ha) | Total coverage (ha) | Percentage of coverage in polder | Replication rate |
|---|---|---|---|---|---|---|---|---|
| 43/2D | 6500 | 260 | 21 | 130 | 301 | 431 | 7% | 21 |
| 43/2B | 5460 | 850 | 42 | 510 | 319 | 829 | 15% | 20 |
| 43/2A | 5182 | 300 | 15 | 210 | 419 | 629 | 12% | 42 |
| 43/1A | 2675 | 550 | 60 | 425 | 1158 | 1583 | 59% | 26 |
| 43/2F | 4453 | 0 | 0 | 0 | 110 | 110 | 2% | 0 |
| | | 1960 | 138 | 1275 | 2307 | 3472 | 23% | 25 |

The positive impacts of CAWM practices were not only visible in terms of replication, but also yields were substantially higher and harvesting dates earlier than in non-CAWM areas. Table 1 in Chapter 1 demonstrates that the Aman yields in CAWM areas were on average substantially higher, and harvests much earlier in most cases than in non-CAWM areas. On average harvest were about 3 weeks earlier.

Nevertheless, optimal yields were not yet reached for BRRI Dhan-52. Not everywhere the crop is properly maintained in terms of fertilization or crop spacing, or in some cases the areas were affected by pest infestation (Kaikhali Fulbari, P2), water logging (Bunarabad, P31-part) or received seeds too late. [See also lessons learned section]

### 2.3.4 Other Examples Indicating Successful Change by CAWM

In this reporting period, a number of significant practices demonstrating that sustainable change took place and that CAWM contributes to the capacity and motivation of WMGs (i) to plan the operation and maintenance of water management infrastructure collectively, (ii) to ensure more equitable water management with more income diversification and less conflicts and (iii) to improve drainage and

water storage at sub-catchment and catchment level. To illustrate this, two success stories of Jeala-Badandanga WMG and Khakdon WMG are presented below.

### CAWM Success Story – Jeala-Badandanga WMG

This year Jeala-Badandanga sub-catchment WMG in polder 2 planned to cultivate Aman BRRI dhan 52 crop under the CAWM initiative instead of Aus and Aman BRRI 28. In this catchment water drains through Sagla sluice, but previous years influential shrimp/fish farmers were closing the sluice to keep water in. This created waterlogging. When the WMG decided to implement CAWM, they realised they should drain water through the sluice and open it timely. They organised a meeting with the BWDB-XEN and he agreed to open the sluice ensuring water would drain, but he stated influential shrimp/fish farmers may close it again anytime. Therefore, the WMG decided to call UP/Upazila Chairmen and UNO to the meeting and UP/Upazila assured the farmers the sluice would be opened. The sluice was opened on 19 June 2017 in the presence of BWDB-XEN Satkhira and it appeared that slushy earth needed to be removed. For this purpose, Jeala-Badhandanga WMG, called in the other 2 WMGs in the Sagla sluice catchment: Purbo Machkhola Purbo WMG and Purbo Machkhola Pashim WMG. They organized themselves to jointly manage water and worked together to remove slushy earth from sluice up to the outfall river. The CAWM farmers also developed a small drain along their plots to connect to main channel (about 1.5km) with the cooperation of UP chairman. Shrimp/fish farmers were still trying to block the flow by the creation of a cross-dam during the monsoon, but the WMGs kept on working together to timely involve UP/Upazila chairmen to handle the situation.

### CAWM Success Story - Khakdon WMG

As preparation for Boro cultivation, 55 farmers of Khakdon WMG from polder-43/1A collectively bought seeds of RB-28 and BR-47 for 70 acres of land. As farmers were not getting seeds, they contacted BGP TA team and DAE field staff (CDF and SAAO) and requested for assistance. SAAO and CDF advised the farmers to contact with BADC and they did it. BADC responded positively and arranged required seeds for the farmers at official rate. SAAO provided informal training and technical support on HYV Boro rice cultivation to the particular group for cultivation. Following the request of the SAAO and CDF, the private company ACI provided required quantity of medicine/chemicals free of cost and helped the farmers treating the whole quantity of seeds. Farmers were satisfied with this arrangement and support. This is an instance of good linkage and cooperation among BGP TA, DAE, BADC and private sector.

### Challenges, Mitigation Measures and Lessons Learned

In the previous reporting period, we indicated that the weak institutional environment and a lack of resources is one of the main constraints to further upscale CAWM. Progress has been booked in this reporting period to guarantee better institutional ownership and funds. The CAWM approach has been integrated into DAE's BGP FFS manual and resource book. DAE has made arrangements to facilitate a year-long CAWM-FFS (instead of the standard season-long FFS) and is willing to roll out at least 200 more CAWM-FFS under the BGP. BWDB agreed to use the existing budget for WMG offices to the implementation of small-scale water management infrastructure for WMGs interested to adopt the CAWM approach (and where the physical environment allows for it).

The challenge remains to facilitate sufficient human resource capacity to plan, design and implement small-scale water management infrastructure (in general, but specifically under the BGP). Connected to this is the lack of trained staff on CAWM within the BGP.

Another ongoing challenge remains the timely distribution of high quality seeds. The procedure of releasing funds for seed distribution at DAE is complex. First approval at national level for the total FFS budget is required and funds need to be released. Those funds then require transfer to Upazila

level. The involved Upazila level officer receives funds from different projects and needs to coordinate this well (and timely) with his field staff (SAAOs). In the transfer process delays can occur easily and good communication is essential.

The BGP is mitigating these challenges through a constant dialogue with DAE and BWDB on the further upscaling of CAWM. Jointly, intermediate and practical solutions to problems are sought, e.g. BGP has already set up a special partnership between BADC and DAE to provide seed production and preservation training to WMG 30 members, and is planning extra capacity training for BWDB, DAE and TA staff (especially in new polders).

Furthermore, BGP has initiated a broader dialogue on CAWM within the government of Bangladesh and with other research and practitioner partners working in the coastal belt. In this reporting, time has been invested to link the CAWM concept in an integrated way to the work of MetaMeta on 'Roads for Polder Water Management' and to the TA team initiated sluice catchment planning workshops for representatives from different WMGs sharing one catchment in which at least one WMG already adopted CAWM principles.

## 2.4 Gender Equality & Women Empowerment

### Introduction

Within the Blue Gold Programme gender is addressed through integrating gender perspectives and implementing specific gender activities. Current activities  support to polder and zonal staff to integrate gender perspectives into their work, including conducting court yard sessions on the importance of women as WMG members and  important position of executive committee, implementation of Gender and Development Training to  polder and zonal TA, DAE and BWDB staff in Patuakhali , Khulna and Satkhira , support for updating  Gender Action Plan of BWDB; Innovation Fund projects such as liaising with United Purpose on their Women's Business Centres IF project; and providing gender training within other training and orientation programmes of DAE.

For the coming years of the Blue Gold Programme, the implementation of gender activities will be based on the following principles:

(a) Ensuring adequate gender mainstreaming in relevant BGP activities, with a special focus on the new polders
(b) Learning from gender activities / gender mainstreaming in earlier years of BGP
(c) Support to institutionalization of gender into the work of the BG partners (BWDB and DAE)
(d) Continuation of one going gender related activities, whenever justified
(e) Limited and carefully selected new gender activities, which can be well justified, adding value to the BGP.
(f) Maintaining / improving a gender aware and women-friendly working environment within the BGP.

### Initiatives for Women Empowerment

#### Gender-balanced WMGs in new polders

Within Blue Gold, including in the polder teams, targets for women's participation in new polders have been set as follows: 40% of the general membership and 5% of the positions of president and secretary to be women. This is in addition to the existing quota of the PWM Rules (30% of WMG EC membership to be female and at least one woman among the four WMG representatives in WMAs). In the recently established WMGs such targets have been generally achieved.

### Key messages for gender mainstreaming

Potential topics and key messages related to gender within Blue Gold activities have been identified and developed. Ensure gender mainstreaming in BGP, polder team members, and particularly CDFs, are able to address gender issues more easily and they can use two sets of flip charts (one is gender

issues and another is women importance in agriculture) with key messages in their WMGs general meetings, Discussion sessions, FFS and MFS. It is expected that these gender flip charts will also be shared with DAE (FTs and SAAOs) also will use their training sessions.

### Gender and leadership development (GLD) training

The gender and leadership development (GLD) training is to continue, but now using internal BGP staff instead of out sourcing A rapid assessment of the GLD training conducted by the external service provider that focused on (i) assessing the quality of the provided GLD training; (ii) assessing the "impact" of the training and (iii) assessing the pros and cons of the modality of the training, ie the outsourcing to an external service provider.

### Updating BWDB's gender action plan

A senior gender consultant (Ms Fawzia Khondker), started updating BWDB's Gender Action Plan (GAP). The final draft of GAP and summary of the gender equity strategy has been submitted to PCD. New gender equity committee will provide their inputs and then GAP and it is expected that the GAp will be finalized and adopted by BWDB in 2018.

### Support to DAE regarding gender issues

In 2017 Blue Gold TA supported DAE several times by conducting sessions on "women empowerment, gender issues and the importance of women in agriculture" as part of their basic training programmes to FTs and SAAOs, with the training module developed by DAE and TA team.

### Unpaid Care Work (UCW) as a potential topic for an Innovation Fund project

The issue of UCW is gradually more recognized, including in Bangladesh' current five-year plan. The BGP Innovation Fund project, aimed at investigating the extent that UCW is a limiting factor for increased agricultural production, as well as piloting solutions for reducing the amount of UCW for women, such as increasing the share of domestic work by male family members. During reporting period gender coordinator communicated with Action Aid and attended set meeting with them to know their interest. Action Aid will submit proposal to BGP Innovation fund about UCW by February. This is also one of the gender topics to be tentatively addressed in FFS

### Follow-up gender training for zonal staff

In September and October 2017, all BGP zonal and polder staff, as well as representatives from BWDB and DAE, participated in a two-day gender training regarding the knowledge and awareness on gender issues and mutual respect among BGP staff in four batches. BGP's gender coordinator will follow-up on this training with the zonal and polder teams, supporting them in applying the gender learning's in their daily work.

## Some Research on Gender Issues

A study has been taken to analyse gender issues in BGP and access the impact of BGP activities within a 3-month internship of four students of the Patuakhali Science and Technology University (PSTU). Based on the findings of the study a presentation and a draft report have been prepared. It is planned that a study on Study on Labour Contracting Societies (LCS) will be taken this year as the agreement for this study was cancelled in May 2017

## Challenges

1) Ensure the involvement of women in executive committee of WMG in new polder.
2) Participation and mobility of women are negligible in meeting of new polder.
3) Women cannot play significant role in decision making regarding any issue of WMG and Ad hoc committee

## 2.5 Environmental Sustainability and Disaster Risk Reduction (DRR)

### Environmental and Social Safeguarding

Environmental sustainability of BGP involves environmental and social safeguarding to make sure the activities of BGP will not cause any further degradation to the environment along with protection of existing environmental health. And second, the capacity support on disaster risk reduction (DRR) to union and upazila level disaster management committees and increasing the resilience of the local people and WMOs. The major progress on environment and DRR is highlighted below-

### DRR Capacity Support

For increasing awareness on disaster preparedness and strengthening resilience of our beneficiaries, we have observed "Disaster Preparedness Week" at the end of October with the theme of International Day for Disaster Reduction (IDDR), 2017. BGP has printed one pager with a number of 4,997 and awareness papers/guiding papers with a number of 20,000 for discussions at the WMOs regular meetings, FFDs, educational institutions (at high school and madrasa), religious institutions (mosques, temples and churches), UP meetings and people's gatherings.

With the support from 22 Polder Team, the president and secretary of WMOs, DRR counselors, teachers, religious leaders and UP chairmen taken leading role in discussion of awareness messages following the printed awareness materials. They discussed the preparedness messages at 22 high schools and *Dakhil* madrasa, 71 religious institutions, 16 FFS and FFD sessions, 23 meetings at UPs and 435 WMOs meetings. BGP reached directly to approximate 20,000 people (female- 8, 340 and male- 11, 694) and disseminated the messages. The president and secretary of WMOs, counselors and Polder Team got on job orientation on the disaster preparedness.

### Lessons Learned

Observation "Disaster Preparedness Week" at the educational and religious institutions is very effective. It is low cost but impact is huge. We have noticed the people carefully listen the message as it observes at the cyclone seasons. People take the message into consideration when the religious leader say at the weekly prayer day and parents put importance on the messages when their children are saying after coming from school.

**Figure 3: Discussions at WMG meeting and girl's high school in polder 47/4**

## 2.6 Horizontal Learning & Expansion

The activities of horizontal learning (HL) were started in April 2017 and since then a series of HL activities were implemented for awareness building and capacity development of WMGs. Different interventions of BGP like CAWM FFS and Innovation Fund projects are more likely to include part of the program stakeholders (e.g. WMO members, BWDB, DAE, LGI). So with the objectives to support more households and scale up good practices to a larger area, Blue Gold facilitates Horizontal Learning & Expansion. Horizontal Learning (HL) & Expansion is led by WMOs and supported by the implementing agencies (BWDB and DAE), LGIs and TA. ARM Mission appreciated the contribution of HL in scaling up of BGP success, linkage, Networking and recommended for further intensification of HL.

### Achievements

- Reviewed the good practices identified for developing Fact Sheets and prepared fact Sheets on the selected good practices for Horizontal Learning;
- Prepared "Compilation of Horizontal Learning good practices" on 38 good practices
- Distributed the compilation of good practices to the BGP Polder, Zonal, Central staff and relevant stakeholders (BWDB, DAE, DoF, DLS, UP, UZP, Private Sector);
- Briefed BGP polder and zonal staff on use of the compilation of good practices for sharing with the WMG members and know their choices to learn and replicate the good practices for their peers;
- Included HL in the training for Polder team members, Field Trainers and Community based workers and organized training accordingly;
- Briefed the pilot CAWM WMGs about organizing experience sharing visits for the neighbouring WMGs to the CAWM WMGs to share their experience and success towards scaling up of CAWM and other good practices;
- Organized 18 experience sharing visits for the 124 WMGs towards scaling up of BGP good practices, more than 450 WMG members participated in these visits. Visiting WMGs learned on different good practices and prepared draft replication plan as next step;
- Prepared report on progress of Horizontal Learning since MTR-2016 visit and shared;
- Prepared consolidated report on the HL experience sharing visits;
- Briefed CAWM farmers, WMO representatives on horizontal learning during experience sharing visits by them at pilots of CAWM and other good practices areas, facilitate for mutual learning among the visitors and host CAWM farmers and WMO representatives.

### Positive Changes Resulting from Horizontal Learning & Expansion

- Compilation of HL good practices is appreciated by WMOs and all other stakeholders;
- International Community Mobilization Specialist has appreciated HL activities and recommended to strengthen HL and experiential training instead of traditional training program;
- It is decided that capacity of WMOs on O&M of Water Management Infrastructure at sluice catchment level will be scaled up through Horizontal Learning in the phasing out polders;
- Planning of HL for scaling up of O&M of water management infrastructure included in the ToT for zonal and polder team members, BWDB and DAE field level staff and conducted ToT accordingly;
- The ARM-2017 appreciated the contribution of HL for scaling up of BGP good practices and recommended for further intensification of HL;
- Instances of results of HL and Partnership building are now visible at local level on improvement of in-polder water management, CAWM, operation of WM structure, maintenance of WM structure, improving the profitability of agriculture, poultry, and livestock (Fact Sheets/instances are included as annex);
- Partnership and cooperation among host and visiting WMGs and UPs increased in replication of CAWM concept in the neighboring WMGs of pilot areas;
- UPs are supporting WMG initiatives including construction of culverts to reduce water logging, emergency response, collective action of aqua culture in the local water bodies etc.
- HL and partnership is contributing for agricultural and economic development, environmental sustainability and overall for livelihood improvement in line with ToC summary result chain.

### Success Story on Linkage and Networking

Dumuria Dhakkin WMG of polder-29, Khulna has established successful linkage and networking with Government departments, LGIs and other organizations and achieved remarkable achievements of joint initiatives such as: canal re-excavation, road construction, afforestation, fish culture, cultivation of HYV rice etc.

**Union Parishad (UP):** In response to the request of the WMG UP has constructed 2100' pucca road, 1000' earthen road to facilitate farmers to transport their crops after harvesting and movement of their agriculture machineries from house to field and vice versa. Installed one hand tube well at Mirarkhali bil to ensure safe drinking water to the working farmers at field. Allocated BDT 700/month for 87 destitute WMG members and non-member hardcore poor people and provided blankets to them.

**BADC:** Re-excavated two canals total length 3 Km following the application of the WMG through UP.

**DoF:** Provided 600 Ksg fingerling to the WMG for fish cultivation in the above mentioned re-excavated canals.

**Department of Forest:** Provided 500 pcs. of Coconut, 1500pcs. of Betel nut, other fruit, timber and medicinal saplings to the WMGs following their request to plant on both sides of the above mentioned re-excavated canals.

**DAE:** provided 60nos. of silo dram for preservation of seeds, financial assistance and technical training to the WMGs.

**BWDB:** Constructed one sluice, 4 outlets and 4 inlets in the areas of a WMG.

Some members of this WMG participated in the experience sharing visit to CAWM pilot area at neighbouring area last year (2016) and learned about CAWM and replicated in their areas this year successfully. They also learned about joint business initiative and other good practices from other neighbouring WMGs and successfully replicated in their areas.

### Challenges, Mitigation Measures and Lessons Learned

- Follow up with the visiting WMGs, facilitate and provide technical support for replication of good practices they learned from their peer- WMGs.
- Polder and zonal teams are briefed on the importance of follow up and technical support to the visiting WMGs towards replication of good practices.
- CAWM scaled up at a faster rate in the BGP polders through Horizontal Learning.

## 2.7 Training & Communication

The training & communication team focuses not only on the development of knowledge, skills and changing mind-sets and attitudes of the coastal communities, but also the development of staff of the implementing agencies through training, workshops, seminars, and study tours in-country and outside country to put into practice a bottom-up, demand led and participatory approach in the Blue Gold Program.

During the reporting period from July to December 2017, the Training & Communication Team (T&C) worked to achieve the Blue Gold Objectives through organizing and implementing different Training activities for the WMOs, UP, UZ Parishad and staff of BGP TA, DAE and BWDB staff.

- Organized 2 batch workshops towards functional WMG in Patuakhali and Khulna where a total of 56 participants attended from the zonal experts and polder team members.
- Organized two days' orientation training with 88 participants of 3 batches with the objective of making farmers and staff (lead farmers, DAE, BWDB field staff) and Blue Gold TA staff about community-led water management, improve understanding of the concept of internal polder water management and techniques to execute a crop-water system analysis for a CAWM.
- Organized two days' workshop with 59 participants (members of the sub- committee of the catchment, WMA members) on Sluice catchment water management were piloted at Patuakhali and Khulna in August 2017.
- Organized training for 33 participants (SAAOs, FTs, CDF & SE) to assess the existing experience & practice of the SAAOs, FTs, CDF & SEs and to refresh/improve knowledge, understanding on facilitation skills; and review CAWM T-Aman training module/materials and practice & demonstrate the sessions utilizing participatory training methods and techniques.
- Organized 7 UZP orientations where 167 DAE, BWDB and UZP official/representative participated from Khulna Satkhira and Patuakhali to orient them on BGP activities, roles of UZP in implementing the program and develop partnership among DAE, DLS, DoF, UP, WMO and BGP.
- Organized 03 days ToT on operation & maintenance of water infrastructure to review their existing experience & skills of the trainees and to refresh/improve knowledge, understanding on facilitation skills; and review O&M training module/materials, practice & demonstrate the sessions utilizing participatory training methods.

- Organized two days training on Dashboard Uses and Management with_53 participants from BWDB, DAE & TA staff in 2 batch training at Patuakhali and Khulna.
- Organized one day training on seed production, storage and networking with_63 WMGs members to orient the WMGs members of CAWM areas on modern technology for seed production, storage and develop linkage with seed agency (BADC).

### Other Achievements of Training and Communications Team

- Developed CAWM FFS (T-Aman) Training Module
- Conducted CDF workload assessment
- supported in organizing Crop Cutting Festival at Patuakhali and Khulna led by the WMG.

# 3 Polder Level Progress

## 3.1 Increased Production & Profitability

| Polder | Polder-wise Trends in Agricultural Production & Profitability |
|---|---|
| 22 | ▪ In Aman season most of the farmers cultivated HYV T-Aman Rice BR 23 & BRRI 52 and many progressive farmers introduced BRRI 49 this year. Blue Gold program facilitates FFS on T-Aman Rice<br>▪ Farmers are now aware about short duration HYV T-Aman Rice and what will be the benefit using short duration high value rice cultivation. BRRI 49 is short duration and also price is higher than another T-Aman Rice variety. So farmers get more profit from BRRI 49 and go for third crop like mustard in between T-Aman and Sesame.<br>▪ Profit from agriculture has increased and farmers are getting more profit than last year from HYV T-Aman. |
| 25 | ▪ After completion of 9 cycle 450 families has been starting fish culture, beef fattening<br>▪ 4 Community Led fisheries are ongoing with success<br>▪ 227 members from 9 WMGs collectively purchased 2101 Kg Paddy seeds and 227 farmers are cultivating HYV varieties instead local varieties (BRRI Dhan-28, Syngenta-1203.Hira Dhan-4). |
| 26 | ▪ Farmers cultivated T. Aman paddy in their land and used the learning from FFS. They used the modern variety and technologies that increased yield and income.<br>▪ The farmers also used the HYV variety for vegetable cultivation in the homestead, dyke of ponds and ghers. As a result, increased total agricultural production and income.<br>▪ An increasing number of farmers cultivated both T. Aman and Boro paddy after participation in the DAE paddy FFS. Farmers drained out water from the rice fields after the panicle initiation stage of their rice. This enabled them to cultivate Rabi crops.<br>▪ Fish production in ponds is increasing after farmers learned about modern technologies from the FFS. |
| 27/1 | ▪ After completion 9 cycle FFS 185 families has started beef fattening and Fish cultivation in the pond.<br>▪ 2 community fisheries are ongoing.<br>▪ 2 WMGs initiated collective action for collective purcharse of rice seeds and collective sales of their crops and fish. |
| 27/2 | ▪ After completion 9 cycle FFS many families have started beef fattening and fish cultivation in the ponds.<br>▪ One community fisheries is on-going<br>▪ Collective actions have identified in the 6 WMGs such as; seed purchasing and vegetable selling. |
| 28/1 | ▪ 2 WMGs linked with two power tiller operators and collectively purchase tillage services for 39 farmers. As a result 161 acre lands come under tillage services.<br>▪ 3 WMGs collectively purchased 210 kg foundation & hybrid rice seed for 48 farmers.<br>▪ Increased cultivation of modern variety of T-Aman. |

| Polder | Polder-wise Trends in Agricultural Production & Profitability (ctd.) |
|---|---|
| 28/2 | ▪ 32 farmers collectively purchased 350 kg foundation & hybrid rice seed.<br>▪ 5 WMG arranged meeting of T-Aman rice producers for collectively selling rice to big buyer.<br>▪ Farmers participated in trials with a short- and early- rice variety (BRRI Dhan 49), covering 260 decimals of land. Introduction of short- and early- rice varieties is expected to contribute to increased cropping intensity.<br>▪ One WMG took initiative to cultivate vegetable by implementing FFS learning. In this reporting time already 45 HHs (25 are FFS members) cultivated different homestead vegetables |
| 29 | ▪ Farmers cultivated HYV varieties instead local varieties (HYVs are B-52, B-49, B-23 B-10, B-72 etc). Therefore, the overall production and income have increased (see crop cutting results).<br>▪ After observing the success of BRRI-23, almost all farmers of the WMG and other farmers of the community cultivated BRRI-23 and they observed a higher production.<br>▪ Out of 56 WMGs, 41 WMGs introduced HYV within this period that is an obvious step towards crop synchronization in respective WMG area.<br>▪ An increasing number of farmers (compared to last year) drained out water from the rice fields after the panicle initiation stage of their rice and practiced early cultivation of T. Aman. |
| 30 | ▪ Farmers cultivated HYV T-Aman Rice BR 23 & BRRI 52 and also progressive farmers introduced BRRI 49.<br>▪ WMG members collectively purchased seed, practiced collective tillage. Farmer practiced short duration HYV T-Aman Rice like BRRI 49. So farmers get more profit from BRRI 49 and go for third crop like mustard in between T-Aman and Sesame.<br>▪ Profit from agriculture, aquaculture, poultry and livestock increased too during the reporting period, They are using imporved seeds and management, using quality fingerlings and feed in aquaculture and using hazal and improved feed in poultry farming.<br>▪ Members of several WMGs purchased agricultural inputs jointly to reduce costs. |
| 31 part | ▪ Farmers cultivated HYV T-Aman (BR 23 & BRRI 52 ) and progressive farmers introduced BRRI 49.<br>▪ CAWM program facilitated in Bunarabad Goriyardanga WMG. Through CAWM, 50 female and 50 male farmers got knowledge and skill on production and farm water management.<br>▪ Farmers cultivated short duration HYV T-Aman and its price was higher than other T-Aman Rice variety. So farmers got more profit and also able to go for third crop like mustard in between T-Aman and Boro/ Sesame. |
| 34/1 part 1 | ▪ Blue Gold agricultural development supports just has started here.<br>▪ Blue Gold is now facilitating 10 cycle FFS in 5 WMG on poultry, homestead gardening and nutrition.<br>▪ 3 collective actions have identified in the 7 WMGs such as seed purchasing, vegetable selling and packet making . |
| **Polder** | **Polder-wise Trends in Agricultural Production & Profitability (ctd.)** |
| 43/1A | ▪ In Aman season, around 59% farmers cultivated HYV rice mainly BRRI-Dhan-52. This variety is short duration, flood tolerant and high yielding. It was recorded through crop cutting that yield of BRRI-Dhan-52 was 4.0 t/ha. |

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| | ▪ On the other hand three demonstrations were established ( BRRI-Dhan-52) with three WMG where four farmers were involved and land area was 3.00 acre under Cropping Intensity Initiatives(CII).<br>▪ 9 WMGs of 125 members collectively purchased 1460 kg HYV rice seed for T-Aman (retail rate was Tk.60/kg and collective rate was Tk.55/kg) and 104 WMG members purchased 281(retail rate was Tk.140/bottle but collective rate was Tk.130/bottle) bottle crop protection solution.<br>▪ Unexpected, heavy rainfall in March and April of this year hampered mung bean cultivation, as a result many farmers decided to cultivate HYV Boro rice this year. WMG already jointly purchased 700 kg BRRI-Dhan-47 and 28 for 70 acre of land with the support from DAE. The retail price of each kg rice seed was T. 80.00 where as they purchased 62.00Tk/kg. DAE organized training on the Boro paddy cultivation method, seed bed preparation and management, intercultural operation. BGP polder team and RF. Boro cultivation requires irrigation facilities and this facility is available there. BADC has subsurface irrigation channel in the areas. |
| 43/2A | • Cultivation of mung bean increased compared to last year's Rabi season. However, unexpected, heavy rainfall in March and April of this year hampered cultivation of mung bean, chili and ground nut.<br>• Part of the WMG members collectively sold Mung bean to the Japanese company Grameen Uglena resulting in a higher price than they would have gotten at the local market.<br>• Farmers report increased cultivation (compared to last year) of HYV T. Aman by 20 % 20% HYV production has increased. CAWM has inspired farmers to use modern variety.<br>• 04 FFS from DAE have accomplished which helped farmers to know agricultural modern technology.<br>• Farmers report increased crop synchronisation (compared to last year), which allow for joint operation of infrastructure and development of infrastructure at sub-catchment level. .<br>• Farmers report increased vegetable cultivation (compared to last year), which can probably be partly contributed to Blue Gold agricultural development interventions, such as Homestead FFS. |
| 43/2B | ▪ Aman season around 45% farmers cultivated HYV rice mainly BRRI-Dhan-52 & 22. This variety is short duration, flood tolerant and high yielding. BGP has been taken different initiatives like established demonstration through CII & CAWM, organized FFD, horizontal learning events, organized match making workshop between input providers and WMG's and also assist WMG's to prepare preseason plan for bulk buying of quality inputs.<br>▪ It was observed that crop synchronization has been increased compare to last year. Most WMG has been cultivating high yielding variety which production is very much linked with water management. The WMG cultivated short duration high yielding variety, and that has flood tolerant capacity. Blue Gold Program has supported them to provide information's on particular variety, its source, availability, pricing etc. |
| 43/2D | ▪ Two CAWM were initiated in two separate WMGs where 200 (100 male and 100 female) WMG members were participated with area coverage 96.00 acre. Farmers were cultivated HYV paddy(BRRI Dhan 52) in T-Aman season. Yield of BRRI-Dhan-52 was recorded 4.67 t/ha through crop cutting. With the support of DAE and Blue Gold Program, they also cultivated mustard as a chance crop after harvest of T-Aman rice but mustard was damaged due to unexpected rainfall.<br>▪ Demonstrations of Cropping Intensity Initiative (CII) were established ( BRRI-Dhan-52) with 4 WMGs where 43 farmers were involved with 7.18 ha of land. |

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| | ▪ 18 WMGs out of 28 have been initiated different types of collective action (collectively tillage T-Aman field, collectively ploughed 75 acres of land, collectively purchased 760 kg. HYV paddy seed, 3458 kg fertilizer and 376 packets pesticide (virtako)) for minimizing production cost, ensure quality inputs and for better prices.<br>▪ During the reporting period 6 WMGs have started investment of savings money in different Income Generating Activities (IGAs) including agricultural business, small-business and investment in land mortgage<br>▪ Production of Poultry and culture fish is increased in this prodder since a number of farmers are practicing improved farming approach they have learned from FFS sessions.<br>▪ One WMG initiated a community-led fish cultivation project in a semi-closed Khal. |
| 43/2E | ▪ Since the Blue Gold provided support to 4 WMGs for improvement of cropping system through short duration HYV paddy variety cultivation that gave option to the farmers of having an extra crop in between rice and mung bean as a chance crop.<br>▪ Drawing on the success of CAWM, DAE and Blue Gold TA also motivated WMG members to cultivate short-duration, BRRIdhan52 rice variety, which can survive in submerged conditions for 12-14 days.<br>▪ Farmers report increased crop synchronisation (compared to last year), which allow for joint operation of infrastructure and development of infrastructure at sub-catchment level.<br>▪ A total of 3 WMG out of 12 have been initiated different types of collective actions (collectively tillage 5 acre of land, purchased 35 packets pesticide (virtako), collectively removal of water hyacinth from canal) for minimizing production cost, ensure quality inputs and for better prices.<br>▪ Production of Poultry and culture fish have increased in this polder since a numbers of farmers are practicing improved farming approach they have learned from FFS sessions.<br>▪ Two WMGs have been implementing a community led fisheries (CLF). |
| **Polder** | **Polder-wise Trends in Agricultural Production & Profitability (ctd.)** |
| 47/3 | ▪ 3 TA FFS completed (beef fattening-fish-nutrition module) and 3 TA FFS are on-going (poultry-vegetable-nutrition module).<br>▪ Collectively cultivated BRRI dahn 52 near about 10 acres of land by 18 farmers.<br>▪ 60 farmers collectively stocked fingerling in a Khal and another 60 farmers collectively stocked fingerling.<br>▪ Collectively bought agricultural inputs (seed, pesticide etc.) for saving their time and money.<br>▪ New technologies have practiced in poultry production like Hazol preparation, chick separation and vaccination.<br>▪ 25 farmers collectively bought 400kg of Boro Dhan seed and they cultivated collectively. Members of a WMG made a cross dam (to preserve sweet water) in a Khal.<br>▪ One FFS farmer established a vegetable nursery in his homestead area and supplies these saplings to WMG members. |
| 47/4 | ▪ In Aman season, more farmers cultivated short duration flood tolerant and high yielding variety of paddy mainly BRRI-Dhan-52.<br>▪ 30 ideal households has been established farm within the household, they are cultivating fish in the pond, vegetables in the bead and dike, rearing duck and chicken in the modern poultry sheds, and producing farm yard manure.<br>▪ WMG members practicing in sacks vegetables due to avoid salinity.<br>▪ Members of two WMGs are cultivating fish collectively in the boropit. |

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| | ▪ The WMG members who were not in FFS, many of these farmers learnt and practicing different modern technologies like vaccination (120), vegetables in bead techniques (110), farm yards manure fertilizers( 50), mulching (35), fish cultivating (50), ideal seed bead of rice( 90), *Hazol* (160), prepare poultry shed (8).<br>▪ Some farmers cultivated fish in the paddy field and they inspired others. |
| 55/2A | ▪ Framers are adopting more high yielding variety of rice (BR-23). However cultivation of the HYV paddy (BR-23) was more in CAWM areas. The yield of BR-23 was recorded was 5 t/ha. DAE provided 8 FFS on T-Aman cultivation.<br>▪ About 40 modified improved poultry shed and 250 improved Hajol were made in WMG areas.<br>▪ There were 150 vegetables beds and 70 farm yard manure pit were made under the supervision of CDFs and in the polder area, farmers also made 20 cowsheds and 150 model ponds.<br>▪ DAE has distributed 50 coconut seedlings among the WMG members. Mustard seed were distributed to the 35 farmers which covered 11 acre land. |
| 55/2C | ▪ Area of HYV varieties of paddy cultivation has been increased during Kharif-2 season due to DAE FFS & WMGs motivational works and setting demonstration in the polder area.<br>▪ In this Boro/Rabi season, Boro cultivation (BR-28 Dhan) has been initiated in 6 WMGs areas with around 52 acres of land.<br>▪ Due to motivational work by CDF as well as implementation of TA-FFS, homestead vegetable cultivation, local poultry production, fish culture in ponds and beef fattening activities have been increased in this Polder area. About 20% more households (excluding direct beneficiaries) involved with efficient homestead production system and many fallow lands in the homestead area come under vegetables cultivation.<br>▪ Sweet potato has been distributed for crop diversification in 16 WMGs, 4 trials in 4 WMGs on strawberry and 8 trials on dragon fruits in 8 WMG by the supports from BAU (Innovation Fund).<br>▪ Besides these, collective actions by the farmers/WMGs for land preparation (tillage), inputs purchase (seeds, fertilizers, pesticides etc.), fish & poultry feed purchase supported them to make more profit than earlier.<br>▪ Farmers are more market orientation and linkages with the other organizations/agents and market actors, now, WMG/farmers are more confident on production and profitability.<br>▪ A workshop was organized with the Inputs Traders & Paiker/Faria from all 16 WMG areas on the mung bean market and problems. |
| 2 and 2 extension | ▪ Saline tolerant BRRI Dhan 67 has been introduced at two WMG areas.<br>▪ High Yielding Mustard (BINA Sorisha 4, BINA Sorisha 9 and BINA Sorisha 10) has introduced at 9 WMG areas. These areas are now turned into triple cropped area.<br>▪ 19 beels of Amodkhali catchment area shifted from single crop to double crop and for this reason famers harvested bumper yield of T. Aman rice.<br>▪ Horizontal learning events were held at two CAWM catchment areas and 7 WMGs committed to replicate CAWM activities.<br>▪ Horizontal learning events on summer tomato were organized by Kulla-Amodkhali WMG where 29 WMGs have showed their interest to replicate summer tomato technology.<br>▪ Poultry rearing and women led vegetable cultivation becomes a role model at Koikhali WMG area.<br>▪ Strawberry saplings are distributed to 4 farmers of 4 WMGs through innovation fund. |

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| | ▪ Community led fisheries and pen culture introduced at 6 (six) WMGs where mono sex tilapia and carp fish fingerlings were distributed and provided training on the modern aquaculture and management.<br>▪ Dwarf type coconut variety seedlings was distributed by DAE.<br>▪ Business planning training for RF, CF and FT and actor linkage meeting for WMG members with value chain actors was organized to strengthen networking and VC activities among WMG members.<br>▪ CII areas are successfully shifted from double crop to triple crop area. However we need to scale up this activity by small scale seed support and technical support. |

## 3.2 Polder wise Major Changes in Agriculture (2013-2017) based on block wise data from DAE

Analyzing the data of 12 different polders under Patuakhali, Barguna, Khulna and Satkhira districts covering the period 2013-2017, the following important changes were noticed. The year 2013 and 2017 are used as baseline and end line respectively. (This analysis used block wise data of DAE. The data covered 33 blocks under 8 upazilas.)

| Polder no. | Polder-wise Trends in Agricultural Production (2013-2017) |
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| 2 | • Cropping intensity is in a decreasing trend i.e. 201 to 182 by 4 years due to water logged situation. Farmers gradually moved towards 'Gher' cultivation. Some of the farmers have no option than converting the land to *Ghers*. Actually cropping intensity is increased for rest of the land. Production of fish and dyke vegetable of those areas has also been increased due to gher culture and ultimately increased productivity of the land.<br>• Rice area reduced by 11% due to gher culture but yield of rice is increased by 36% for better mgt. and use of modern varieties. Yield of Boro in gher is always higher than the crop land.<br>• Cropped area increased by 43% for Kharif season. |
| 22 | • Cropping intensity increased steadily from 113 in 2013 to 171 in 2016. It was dropped to 158 in 2017 due to excess rainfall. Farmer could not cultivate winter Rabi crop in the low laying areas.<br>• Local T. Aman is gradually replaced by HYV T. Aman and it's increased by 40%. At the same time yield of T. Aman and local variety has been steadily increased over the years. Yield of Boro remains the same as salinity increases in the khal's water during winter season. Boro cultivation is not much encouraged there.<br>• A land mark Increase in horticultural crop on a sustainable manner for all the seasons i.e. 500% increase by 4 years.<br>• There was tremendous increase of water melon area and production. At the same time sesame cultivation fluctuated due to climatic condition. The polder has become a harbor of water melon. Water melon cultivation has been patronized by Blue Gold since 2014 which resulted with a big jump of melon area and production. BG encouraged excavating mini ponds in the crop field to ensure irrigation in dry season. More than 600 mini ponds have been excavated by the farmers to grow water melon and other crops in their crop land following advice of BG team including the concerned SAAO. |
| 26 | • Cropping intensity increased on a sustainable manner from 179 to 198 |

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| | • Local T. Aman is gradually replaced by HYV T. Aman. Boro area is also increased significantly (20%). Rice yield has slightly increased over the years for T. Aman (HYV) and Boro.<br>• There is an increase in horticultural crop on a sustainable manner for all the seasons i.e. 30% in an average.<br>• Yield of different crop increased gradually due to adoption of improved production technologies and quality input. |
| 29 | • Cropping intensity of this polder remains constant (175%) as some area has gone under gher cultivation which restricted Aman cultivation. That's why cropping intensity could not increase although yield of crop has been increased over the years.<br>• Local T. Aman area is gradually decreased by 27% and is replaced by HYV T. Aman (HYV). Due to increased gher culture, Boro area has been increased (by 60%) and T. Aman area has been reduced (by 9%) subsequently. Rice yield has been increasing slightly over the years.<br>• Increase in total horticultural crop area by 62% on a sustainable manner for all the seasons.<br>• Area under Sesame has been reduced by 1000% due to the effect of excess and untimely monsoon rainfalls in the recent years. |
| 30 | • Sesame and Mung bean area has remarkably been reduced by 79 and 58% respectively due to early and late rainfall in the recent years which is the main reason for decreasing cropping intensity (from196 to 134%) in the polder.<br>• Local T. Aman is gradually replaced by HYV T. Aman reducing LV area by 11%. Due to water logged situation, farmers go for late Aman cultivation where scope for Boro is very limited. Boro area reduced over the years by 23%. Rice yield has been increasing steadily for Boro but not for T. Aman. During 2015-16 price of rice was low; less investment for HYV which resulted in lower yield. Water logging might be the other reason for low yield of HYV Aman<br>• Increase in horticultural crop on a sustainable manner but sharply in Rabi season by increasing an area about 118%. Farmers are growing vegetables after harvesting early T. Aman during Rabi season. |
| 31 | • There is no significant change in cropping intensity and it is still low (108%). Efforts are on-going and would bring significant change from next year.<br>• Local T. Aman has gradually been replaced by HYV T. Aman (9% reduction of LV)<br>• Increase in horticultural crop on a sustainable manner (52% average).<br>• Area under sesame has been reduced due to the effect of excess monsoon rainfall. |
| 43/1A | • Cropping intensity increased on a sustainable way from 191 to 246%.<br>• Local T. Aman is decreased by 26% and the land is occupied by HYV T. Aman. Aus area has also been increased by 56%. There is a steady increase of rice yield about 28% due to improved water management, use of good varieties and adoption of modern technologies.<br>• Horticultural cropped area of the polder has been doubled for all the seasons within four years, a great achievement.<br>• Significant increase of Mung bean (100%) and Water melon area (74%) |
| 43/2A | • Cropping intensity increased on a sustainable way i.e. from 229 to 253.<br>• T. Aman (HYV) area is doubled by 5 years. Aus area has also been increased significantly.<br>• There is a steady increase of rice yield due to improved water management and adoption of modern technologies by the farmers,<br>• Rabi and Kharif-I cropped area increased significantly i.e. 18% and 31% respectively. |

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| 43/2B | • Steady increase in cropping intensity i.e. from 194 to 218<br>• Local T. Aman (decreased by 48%) has been gradually replaced by HYV T. Aman. Rice yield for all the seasons has been increased by 13%.<br>• There is Increase in horticultural crop in a sustainable manner but sharply in Rabi seasons (40%).<br>• Area under Mungbean has been increasing (48%) but other pulse area has been reducing (59%). But sustainable increase in yield of mungbean and other pulses.<br>• Increase in ground nut (27%) and water melon (57%) area has been observed. |
| 43/2D | • Steady increase in cropping intensity i.e. from 184 to 198.<br>• Aus area reduced gradually by 64%.<br>• Increase in horticultural crop on a sustainable manner and that happened by 25%.<br>• Area under Mungbean has been remarkably increased (225% ) but grass pea area is reduced (by 50%). Sustainable increase in yield of mungbean (50%) due to varietal and management improvement. Yield of other pulses is also increased by 32% in average. |
| 43/2E | • This area is exceptional among the polders of Patuakhali zone, cropping intensity here is decreased over the years i.e. from 214 to 209%.<br>• Aus and local Aman area reduced gradually but T. Aman (HYV) area increased and there is gradual increasing trend in yield of rice.<br>• Vegetable cultivation in Kharif-I season is increased here.<br>• Mungbean yield affected due to rainfall and waterlogging in the year 2016-17. |
| 43/2F | • Cropping intensity is increased over the years<br>• Aus and HYV Aman area increased gradually by 500% and 100% respectively but T. Aman (local) area decreased by 47%. There is gradual increase in yield of rice by 53% in average.<br>• Very good achievement over the years for horticultural crops, increased area by 41%.<br>• Area under Mungbean has been increased by 39% but grass pea area has been reduced by78%<br>• Area has been increasing gradually for groundnut, sunflower and spices about 200% in an average |

## 3.3 Participatory Water Management

| Polder | Polder wise trends in Participatory Water Management |
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| 22 | ▪ Farmers are increasingly aware of the potential of water storage in canals and they also stored water in their mini ponds and water reservoirs. They used this water for irrigation of the Rabi crop. To reserve water in the reservoirs, they operated the sluice and inlets properly so that saline water did not enter. Blue Gold provides technical assistance to WMGs to increase the water retention capacity.<br>▪ Members of three WMGs have taken initiatives to improve water management facilities at sub-catchment level.<br>▪ WMA and WMG`s took initiative for embankment repairing in Telikhali erosions stared in polder 22 and also hole filling of the sluice of Fulbari gate. One WMG also taken initiative for removing obstacle from canal. Blue Gold created awareness about WMA and WMG`s role on emergency repairing and also established strong linkage with UP for seeking support for emergency response.<br>▪ Union Parishad, BWDB and WMA/WMG leader and members regularly worked for social awareness for land acquisition for retire embankment at Kalinagar. |
| 25 | ▪ Polder-25 part is consisted in 10 unions and has 17 drainage sluices where 6 are dead. The local elite/UP and political leaders takes decision for water drain in and |

| Polder | Polder wise trends in Participatory Water Management |
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| | drains out as the WMOs are yet not well functioning to take responsibilities for operating of water management infrastructure from Political leaders or Union Parishad but Blue Gold has identified catchment and existing situation. During mass meeting with community and UP meeting, BGP staffs with BWDB staffs shared operating system and raising awareness among the community, UP and WMG. one WMG is operating sluice and recruited a sluice gate operator.<br>▪ WMOs are initiating water management for production through WMGs executive committee and they identified water logging areas with internal water management system. 10 WMGs made plan for internal water management for production.<br>▪ 8 WMGs with help from UP cleaned water hyacinth in different Khals.<br>▪ Siltation in front of a sluice hampered water flow as well as hindered proper sluice gate operation. The respective WMG removed silt by the assistance of UP. 59 WMGs are raising O&M fund for maintenance of the water infrastructures. This year BWDB started re-sectioning of 6.400Km embankment. |
| 26 | ▪ Repairs of a sluice (3 bands) are on-going. The re excavation of a Khal (2.6 km)and works of others sluice like are also on-going and completion of this work will bring a total of 1200 ha of land.<br>▪ BWDB started repairing of embankment in Kakmari (one km).<br>▪ Members of two WMGs have done earth feeling to protect the embankment from erosion and tidal water.<br>▪ The members of four WMGs removed siltation.<br>▪ WMG members are successfully organised all the water management related infrastructure activities. WMGs, WMA and UP jointly worked to remove waterlogging and removal of silt. A total of 200 community people, WMG members, UP members were involved in silt removal works that brought 75 ha of land under rice cultivation. |
| 27/1 | ▪ The polder consists of 3 unions and has 7 drainage sluices where 3 are dead. The local elite/ UP and political leaders takes decision for water drain in and drains out. All WMOs are not yet well organized to take responsibilities for from political leaders or UP operating of water management infrastructures but Blue Gold has identified catchments and existing situation. One WMG is operating the respective sluice. BGP staff with BWDB staff shared operating system and raising awareness among the community, UP and WMGs. 10 WMGs made WMG action plan for using water towards production.<br>▪ Most of the Khal are silted, sluice gate has broken due to illegal fish cultivation, unauthorised cross dam and illegal sluice operation. Blue Gold is also mobilizing the community about water management towards production through awareness raising drama, community mass meeting, small meeting courtyard meeting.<br>▪ 15 WMGs have collected O&M fee. |
| 27/2 | ▪ This polder consists of 2 unions and has 3 drainage sluices where 2 are dead. As it is a new polder of BGP, the WMOs are yet not well organised to take responsibilities of water. UP chairmen and political leaders take decision of water management but BGP has identified catchment and existing situation.<br>▪ Most of the Khals are silted and gate are broken. There are illegal fish cultivation that initiated cross dam and unauthorised sluice gate operation.<br>▪ BGP is mobilizing the community about proper water management through awareness raising drama, community mass meeting, small meeting courtyard meeting. WMGs have collected O&M fee. |
| 28/1 | ▪ This is a new polder most of the khal are illegally occupied by some people who are engaged with big commercial fisheries and influential political people. Beside, |

| Polder | Polder wise trends in Participatory Water Management |
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| | water infrastructures are not functioning so the commercial fisheries people operate the sluice gate by their own initiatives according to their needs. The WMGs are not yet well organised to take the control over the water infrastructures.<br>▪ People who are engage with big commercial fisheries made some illegal cross dam in the Khal and it would be very difficult to remove. However, one WMG took initiatives for removing 16 illegal cross dam. Total of 32 members were participated to remove those cross dam to partially active the internal water flow system.<br>▪ Some Khals are fully covered and closed by water hyacinth and it interrupts the water flow system. One WMG took initiative to cleaning 200 meter water hyacinth from the Khal with the assistance of UP. |
| 28/2 | ▪ This is a new polder most of the Khal are illegally occupied by some people who are engage with big commercial fisheries and influential political people. Beside, water infrastructures are not functioning , so the commercial fisheries people operate the sluice gate by their own initiatives according to their needs. The WMGs are not yet well organised to take the control over the water infrastructures.<br>▪ People who are engage with big commercial fisheries made some illegal cross dams in the Khal. Two WMGs jointly took initiative for remove 3 illegal cross dam (fishing net).<br>▪ Two WMGs repaired the head wall with the assistance of UP. For successfully repairing that infrastructure, WMG collected fund Tk. 4500 from the villagers |
| 29 | ▪ WMG members are developing good relationship with UP's and getting involved in UP's standing committees purposefully to take control over the water infrastructures. WMG members already included in different standing committees of UPs.<br>▪ WMGs has raised (43 WMGs total) O & M fund with BDT 1, 46, 435 for regular and good operational activities of water management infrastructures, the WMAs have formed five catchment level sub-committees.<br>▪ In this reporting period, the works of constructing retired embankment is more improved (62% completed).<br>▪ 27 WMGs have taken initiatives of maintenance works including silt and hyacinth removal, minor repairing works of sluices and embankments and spent a total amount of BDT 68, 509 from O&M fund. |
| 30 | ▪ This year farmers were very much aware about water storage in canals and they also stored water in their canals and water reservoirs. In canals they created temporary cross dam to storage sweet water to use this water for cultivating the Rabi crops (watermelon). To reserve water in reservoirs they operate the sluice and inlets properly. Blue Gold takes initiative through WMG to operate the gate properly.<br>▪ In some areas WMGs took initiatives to improve the water management facilities at sub-catchment level.<br>▪ This year WMGs have collected more funds for effective management of infrastructures. This year member of WMA has been included in the monthly meeting of UNO office. Following the instructions and orders of UNO the EC committee of WMA will take part to reduce illegal use of Khals and embankments. |
| 31 part | ▪ This year farmers were very much aware about water storage in canals and they also stored water in their canals and water reservoirs. In canals they created temporary cross dam to storage sweet water for cultivating the Rabi crops. To reserve water in reservoirs they operate the sluice and inlets properly. BGP takes initiative through WMGs to operate the gate properly. |

| Polder | Polder wise trends in Participatory Water Management |
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| | ▪ In some areas, they already took initiatives to improve water management at sub-catchment level.<br>▪ Members of two WMGs repaired the sluice gate temporarily when there was a sudden hole in the sluice. They repaired the gate with wood.<br>▪ All WMGs regularly oiling and maintenance the infrastructure.<br>▪ One WMG removed obstacle from a canal.<br>▪ The 12 WMGs and WMA developed a strong relationship with the UP, who played a cooperative role for conflict resolution in the polder and WMGs. |
| 34/1 Part | ▪ This polder consists of 3 unions and has 11 drainage sluices where 5 are dead. As it is a new polder of BGP, the WMOs are yet not well organised to take responsibilities of water. UP chairmen and Political leaders take decision of water management but BGP has identified catchment and existing situation.<br>▪ Most of the Khals are silted and gate are broken. There are illegal fish cultivation that initiated cross dam and unauthorised sluice gate operation.<br>▪ Blue Gold is mobilizing the community about water management towards production through awareness raising drama, community mass meeting, small meeting courtyard meeting.<br>▪ Few WMGs are initiated maintaining works 13 WMGs have collected BDT. 100640 for O&M purpose. |
| 43/1A | ▪ The reporting period covers mainly rainy season, many WMGs have taken initiatives to irrigate seed bed from nearby canal for quality seedlings and timely drain out excess water for timely cultivation of the Aman paddy. As many WMG members cultivated short duration high yielding paddy variety with objective to cultivate additional crop (as chance crop-mustard) in the same land.<br>▪ Some WMGs who have sluice/inlet/out let taken different initiatives like colouring to protect from carbon damage, use of greeze, mobile for smooth operation, maintenance of loose apron, repair of nut and bolt, cleaning of canal for smooth flow of water, installation of chain koppa, remove water hyacinth for fish cultivation and use of canal water for the Rabi crop. |
| 43/2A | ▪ One WMG repaired embankment in connection of 01 inlet.<br>▪ 3 catchment level sub-committees have formed<br>▪ BWDB has repaired two sluices and 10 m embankments.<br>▪ Sluice gates are operating by WMGs/WMAs and catchment level sub- committees and farmers are getting water when they need and they can also drain out extra water as necessary. |
| 43/2B | ▪ The reporting period covers mainly rainy season, many WMGs have taken initiatives to irrigate seed bed from the nearby canal for quality seedlings and timely drain out excess water for timely cultivation of Aman paddy. Many WMG members cultivated short duration HYV paddy rice with objective to cultivate additional crop (as chance crop-mustard) in the same land.<br>▪ Some WMGs who have sluice/inlet/out taken different initiatives like colouring to protect from carbon damage, use of grease, mobile for smooth operation, maintenance of loose apron, repair of nut and bolt, cleaning of canal for smooth flow of water, installation of chain koppa, remove water hyacinth for fish cultivation and use of canal water for the Rabi crop. |
| 43/2D | ▪ Most of the water infrastructures of this polder are under operation of WMA/WMG and they have control over most of the infrastructures although some conflict arises in some sluices but WMG and UP played a vital role for conflict resolution.<br>▪ As the reporting period covered mainly rainy season many WMG's have taken initiatives to irrigate seed bed from nearby canal for quality seedlings and sometimes |

| Polder | Polder wise trends in Participatory Water Management |
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| | prepared internal drain to drain out excess water for timely cultivation of next crop. Many WMG's members cultivated short duration high yielding rice variety with objective to cultivate additional crop (as chance crop-mustard) in the same land.<br>▪ A total of 17 sluice catchment O&M committee have been formed for maintenance of water management infrastructures. Some WMGs that have sluice/inlet/out taken different initiatives like colouring to protect from carbon damage, use of greeze, mobile for smooth operation, maintenance of loose apron, repair of nut and bolt, cleaning of canal for smooth flow of water, installation of chain koppa, remove water hyacinth for fish cultivation and use of canal water for the Rabi crop.<br>▪ WMG members are doing minor restoration of embankment by their own initiatives and in some cases, with the O&M fund. |
| 43/2E | ▪ Farmers adjacent to Fedainagor Khal cultivating vegetable round the year on the dike of Fedainagor Khal since this khal is re-excavated by FHRC and project of Innovation Fund of BGP.<br>▪ Most of the water infrastructures of this polder are under operation of WMA/WMG and they have control over most of the infrastructures although some conflict arises in some sluices but WMG and UP played a vital role for conflict resolution.<br>▪ As the reporting period covered mainly rainy season many WMGs have taken initiatives to irrigate seed bed from nearby canal for quality seedlings and sometimes prepared internal drain to drain out excess water for timely cultivation of next crop. Many WMG's members cultivated short duration high yielding rice variety with objective to cultivate additional crop (as chance crop-mustard) in same land.<br>▪ A total of 5 sluice catchment O&M committee have been formed for maintenance of Water Management Infrastructures. Some WMG's that have sluice/inlet/out taken different initiatives like colouring to protect from carbon damage, use of greeze, mobile for smooth operation, maintenance of loose apron, repair of nut and bolt, cleaning of canal for smooth flow of water, installation of chain koppa, remove water hyacinth for fish cultivation and use of canal water for rabi crop, remove water hyacinth from sluice gate.<br>▪ WMG members are doing minor restoration of embankment by their own initiatives and in some cases, with the O&M fund. |
| 43/2F | ▪ In the reporting period, WMGs took more initiatives than last year to improve drainage and water storage facilities in their sub-catchment.<br>▪ More WMGs took part in cleaning the Khal by removing water hyacinth, and removing obstacles for water flow from the Khal at the monsoon period.<br>▪ More WMGs' members participated/contributed in regular O & M activities of WRM infrastructures<br>▪ There are an increasing awareness within the community regarding the relation between water management and economic development (increase agricultural production and profitability).<br>▪ Community people took part in repairing rain cuts of embankment, micro maintenance (colour burnish, tight screws etc.) of sluice, outlet, and inlets<br>▪ More WMG's members have contributed financially to make field channels/drains for improving drainage systems. |
| 47/3 | ▪ There are 8 sluices in this polder. But unfortunately none of the sluice have gate because after construction no repairing work had done. But WMGs took some small scale initiatives such as installation of wooden gate in outlet.<br>▪ Before 2017 there was no practice of the Rabi season cultivation because of scarcity of sweet water but in this year WMGs took initiative for sweet water preservation by |

| Polder | Polder wise trends in Participatory Water Management |
|---|---|
| | making cross dam in canals. BGP facilitated them for making this plan before the Rabi season.<br>▪ None of the water infrastructures in this polder are in good condition. After proper repairing of sluice, inlet and outlet community can take the responsibilities. BGP have a plan to repairing these infrastructures from 2018. |
| 47/4 | ▪ The condition of water infrastructures is not well. Some influential political people had all control on water infrastructures and they used that for their own interests. However, after formation of WMGs it is gradually reducing and political people have started supporting and they realised that this water infrastructure should operate by WMGs.<br>▪ 08 WMGs have made cross dam in 08 channels to reserve sweet water and this has been a wonderful initiative to reserving water for production and hopefully it will have them of having a good Rabi season crop.<br>▪ WMGs has created O&M fund and 80,000 taka already been spend for O&M purpose (cross dam).<br>▪ One UP has contributed 10,000 taka to make cross dam and invited 09 WMGs to introduce with upzila level officials. |
| 55/2A | ▪ As the reporting period covered mainly rainy season many WMGs have taken initiatives to irrigate seed bed from nearby canal for quality seedlings and sometimes prepared internal drain to drain out excess water for timely cultivation of next crop. Many WMG's members cultivated short duration high yielding rice variety with objective to cultivate additional crop (as chance crop-mustard) in same land.<br>▪ WMGs were involved in inter polder water management for increase production.<br>▪ Members of one WMG repaired the earth hole to protect the sluice. Some WMGs have taken different initiatives like colouring to protect from carbon damage, use of greeze, mobile for smooth operation, maintenance of loose apron, repair of nut and bolt, cleaning of canal for smooth flow of water, remove water hyacinth for fish cultivation and use of canal water for the Rabi season crops. |
| 55/2C | ▪ The conditions of the water management infrastructures are not good. Some WMGs are properly operating the sluice gates.<br>▪ In most of the WMGs of the polder, there is no specific plan for water management for production. But, during reporting period, 6 WMGs have started Boro paddy cultivation. Besides this, for removing water logging condition from a crop field, a WMG prepared a plan for water management and accordingly they have removed 7 blockades for smooth drain out of water from the particular crop fields.<br>▪ During the reporting period, Four WMGs repaired embankment near in their respective area. |
| 2 and 2 extension | ▪ 24.07 km embankment re-sectioning works are running (90% works completed).<br>▪ Data collection is running jointly by BWDB & BG TA team for repairing of 9 sluices (30% work completed).<br>▪ Re-construction of one sluice is running (40% works completed)<br>▪ Design data has sent for 5 culverts and 4 pump sheds<br>▪ 21.589 km Khals re-excavation works are running (35% works completed).<br>▪ 3 Khals (6.262 km) and 6.918 km embankment are within the tendering process<br>▪ A WMG cleaned 1.5 km draining channel to drain out water during Aman season and also pumped out water during excessive rain.<br>▪ A WMG removed water hyacinth to drain out from the sub-catchment area.<br>▪ In Aman season, 65% crop synchronization was practiced at CAWM areas. |

# 4 Monitoring, Reflection & Learning

## An overview of different tools of MRL

Participatory Self-Assessment (PSA): Participatory monitoring (self-assessment) of WMG takes place every 6 months. WMG assess their performance with respect to 19 outcome challenges, under four themes: (1) establishment of water management group (WMG) and water management partnership, (2) agriculture and economic development, (3) community participation in planning, implementation and use of water management infrastructures, and (4) water management and operation and maintenance (O&M) of infrastructure. The performance is described on 4 scales, from 0=no progress to 3 = full achievement.

WMG Tracker: WMG Tracker is an output monitoring instrument for showing visible achievement of each WMG. The WMG Tracker report provides quantitative data on "WMG Performance". It provides a great number in considerable detail of (1) Funds (income and expenditure) of WMOs, (2) quantity and type of infrastructural interventions, (3) membership, (4) trainings received, (5) Income generating activities, (6) agricultural methodologies, (7) FFS , (8) collective actions etc.

Dashboard: Dashboard is an information management tool of MRL that visually tracks, analyzes and displays to monitor the progress and key performance of BGP activities. The MRL Team reviewed and refined different tools for Dashboard and MIS development through discussion with BWDB, DAE, other members of TA Team and the assigned Consultant, mPower.

Trends Watcher: Trends Watcher aims at summarising the latest results and achievements of the Blue Gold Program.

### Major Achievements of MRL Team

Major achievements of MRL Team during the last six months (July – December 2017) include:

- Facilitated and coordinated data collection through WMG Tracker 2 times during the reporting period – in July for the period up to June 2017 and in October 2017 for the period up to September 2017. It provides information on progress of WMGs and it documents good practices in WMGs. Report on WMG Tracker was prepared for the period up to June 2017.
- Completed analysis of the results of participatory monitoring conducted in April-May 2017 and prepared report (WP8). The third round of Participatory Monitoring was conducted in October 2017.
- Finalization of the report of the Socio-economic Baseline Survey Phase II for sharing with BWDB.
- Monitoring tools for WMG Tracker and Participatory Monitoring were refined with contributions from zonal teams.
- Development of MIS Dashboard is on-going by the assigned Consultant, mPower; Phase-1 output (Participatory Monitoring & WMG Tracker) of MIS development was completed in October 2017.
- Training on Dashboard and MIS development was given to concerned officials of BWDB, DAE and TA, both at central and zonal level. This training was facilitated by mPower and MRL Team.
- Questionnaire has been developed for impact monitoring survey jointly with BWDB.
- Crop cutting has been done for Aman paddy in some selected polders of Blue Gold in cooperation with DAE in order to get information on crop production.
- The half-yearly report (January – June 2017) was coordinated.

The MRL Team has achieved its targets in regard of development, implementation and revision of monitoring tools and produce respective reports. BWDB, DAE and the MRL-team worked closely together on finalization of indicators of different tools and finalization of the methodologies of different studies like Baseline Survey Phase -2. The Annual Review Mission (ARM) appreciated the different tools of MRL and its effectiveness to monitor, reflection and learning processes of different activities of BGP.

### Summary of Reflection & Learning Activities of MRL team

The MRL Team shared the outcome results of participatory monitoring with zonal and polder teams. The outcome results were reflected upon, strengths and weaknesses of WMGs were assessed and learning issues were identified so that polders teams can plan for improvement of performance of WMGs.

The MRL Team also shared the output results of WMG Tracker with zonal and polder teams. The progress and achievements of WMG activities were discussed and reflected upon.

### Other Achievements of MRL team

In order to track the changes in agricultural production over time, DAE data on crop production in BGP areas for 2014/15, 2015/16 and 2016/17 was collected and analysed as well as a report has been prepared. Crop production data from DAE shows a general improvement in crop production over the time of Blue Gold program.

## Challenges, Mitigation Measures and Lessons Learned

### Challenges

- Slow progress of Dashboard and MIS development (by mPower).
- Data error in WMG Tracker
- Insufficient use of information at field level

### Mitigation Measures

- MRL Team has been in regular contacts with mPower.
- MRL Team has been holding sharing meetings and participating in zonal coordination meetings to improve data quality and to motive to use data properly

### Lessons Learned

- Error level in data collection could be minimized if analytical plan/outline can be prepared at the beginning of any study.
- MRL Team needs to put extra effort to facilitate reflection and learning together with the polder teams.

# 5 Innovation Fund Progress

The projects implemented through the Innovation Fund provide possibilities for economic growth and business development inside the Blue Gold area, and contribute to a wider understanding of development opportunities amongst both Blue Gold staff and beneficiaries.

## Summary of progress up to Dec 2017

Since its roll-out in 2015, the Blue Gold Innovation Fund (BGIF) has completed 20 projects and has currently 6 projects under implementation on agricultural production and food security and water resource management. In the period July to December 2017, two new BGIF contracts were signed, of which one[3] will start per January 2018. [Note: Another project[4] moved from the BGIF to the WMKIP fund.]. Below we highlight the progress of the running projects shortly and highlight how they are expected to bring change in agricultural productivity and profitability and/or the operation and maintenance of water infrastructure. ***The BGIF quarterly progress Q3 and Q4-2017 reports provide more detail on all completed and running projects as well as received concept notes and proposals under the BGIF.***

### United Purpose – Pilot study on women business centres

In this reporting period the feasibility study of women business centres (WBC) was approved and it has been decided to move on with a pilot of 12 months in polder 28/2 and 31-part (Khulna region). The WBC concept uses the proven model of 'Local Service Providers' (LSPs) who are selected by the target communities and trained by the project to become community agriculture and business advisors and charge appropriate fees for their services.

### ProPortion Inc & Grameen Intel (PP&GI) – ICT-based agriculture advisory services

ProPortion, together with Grameen Intel, has been continuing its feasibility study to develop a self-sustainable service and business model for a ICT-based agriculture advisory service. The investigation of PP&GI focuses on 4 services areas: soil nutrient testing, proper fertilizer application, affordable high quality agri inputs and fair market prices. In this reporting period PP&GI collected stakeholder data to develop a 'Deep Dive' report.

### Bangladesh Agriculture University (BAU) – Action research on fruits and vegetables

In this project BAU works directly with WMG members for 3 years testing new varieties (both vegetables and fruit trees) in their homestead to assess the agronomic potential as well as the acceptability of unknown varieties under a range of conditions. The focus lies on underutilized fruits and vegetables with a potential to provide produce in the lean-season (pre-summer and post-summer periods). At this stage, the project has distributed all vegetable and fruit samples for both periods, developed fruit and vegetables management guidelines and trained Farmers Leaders (Contact Farmers), CDFs and SAAOs.

### Bangabandhu Sheikh Mujibur Rahman Agriculture University (BSMRAU) – Introduction of fish polyculture

The BSMRAU has almost finalised a project to test whether seasonal stagnant waters in polder 2 can be productively used for food production and livelihood improvement of the farming communities by introducing fish pen culture (with tilapia). Two different WMGs have been involved in this action research. Project outcomes and lessons learnt were formally presented to BWDB and DOF on 11 December 2017.

[3] This concerns the "Sustainable Water Infrastructure Technology and Finance Project (SWIFT) of United Purpose.

[4] This concerns the "Assessing the technical and socio-economic feasibility of pumped drainage in polder 2" project led by Deltares and co-implemented by WUR, CEGIS and IWM.

### MetaMeta – Roads for Water Management Improvement and Flood Protection

This study of MetaMeta has the objective to investigate the feasibility of integrated road planning with BWDB and LGED to reduce drainage congestion and enhance flood protection. This with the ultimate aim to contribute to better O&M of infrastructure and improved agricultural productivity. MetaMeta is currently finalising its feasibility study and has started to prepare for the next phase (pilot project design).

### Moringa Ltd – Moringa business market study

Moringa Ltd has assessed the feasibility of professionalising Moringa production and processing in BGP area and developed a market strategy for one specific Moringa product. However, the produced feasibility report was disappointing and resulted in the decision to not continue with a pilot phase. The TA team is investigating the possibility to set up a special seminar on Moringa production and processing with private sector parties, NGOs and governmental departments to explore other options for testing innovations around Moringa.

## Success Stories

With 20 completed projects under the BGIF, the BGP can look back on a number of successes. In this reporting period 7 different projects were completed. Below 3 success stories are outlined:

### WorldFish – Ecopond and Empowerment of Women

In the Ecopond approach small homestead ponds are used to create shade and shelter for fishes with simple materials which can be easily collected and maintained by women. The Ecopond project has shown that the participatory methods and tools used were effective to engage women actively in the program even with small numbers of staff. It has demonstrated that development of community groups, setting up of the Learning Centers, involvement of women leaders and linkages with the WMGs and other stakeholders along with training were useful. A total of 3377 women owning around 4500 small ponds were involved and more than 80% were successful in generating income and receiving better nutrition from the small ponds. The Ecopond approach has been undertaken by other institutions too such as the CREL project of Winrock International who scaled-out the approach by working directly with more than 500 households near the Sunderbans. During the project, WordFish has developed a training manual, a video, a database and other articles and papers to promote upscaling. It has also acquired additional funds to keep on monitoring the Ecopond project in the BGP area up to June 2018 and upscale the project further in the coastal belt.

### Practical Action – Aquageoponics

Aquageoponics provides a solution for coproduction of fish and vegetables. Aquageoponics can bring revolution in future sustainable farming as it has the potential to give access to waterbody for both poor and commercial entrepreneurs, and control water pollution during intensification. It was tested in the BGP area in the salinity affected Satkhira district of Bangladesh with good results: a cost benefit ratio of 1: 1.75. Practical Action has in the meanwhile acquired other funds to continue testing and upscaling aquageoponics throughout Bangladesh.

### FHRC - Community Based Integrated Water Management

Maximising benefits of polder infrastructure developed by Blue Gold Programme depends on the performance and cohesion of local Water Management Groups (WMGs). This innovation fund project tested whether a combination of participatory action plan development and adaptive learning by networking between WMGs in cluster forums would be an effective way of improving water resource management and agricultural production. The two involved WMGs in polder 29 and 43/2F have executed a number of successful collective actions: excavation of Fedainagar khal, development of fish sanctuary, establishment of market centres and hire out of farm machinery. It is expected that through the established cluster forums of WMGs further upscaling will take place.

## Challenges, Lessons Learnt and Mitigation Measures

From the onset, the major challenge of the BGIF is to attract innovative conceptual thinking from Bangladeshi and Netherlands' based applicants to invest in an economically low developed area with complex reality and a difficult implementation landscape. The ideas and solutions proposed by applicants do therefore not always match with local needs. The Blue Gold TA team, in close contact with EKN, BWDB and DAE, has been working to formulate lessons learnt from 2.5 years of BGIF operation and developing a number of mitigation measures to overcome these challenges. During this reporting period the following actions were taken:

- A special section on the potential future direction of BGIF as part of the ARM Position Paper was developed. The paper proposes three options to address the mentioned challenges. In consultation with EKN, it has been decided to proceed with organising another solicited call[5], which will enable the BGP to address local needs on the basis of a well-specified TOR developed in close collaboration with polder teams, BWDB and DAE. At the same time, BGIF management will keep on coaching a limited number of applicants under the unsolicited procedure with a special focus on Dutch SMEs and Bangladeshi organisations active in the polder areas.

- The Dutch Network Group (nowadays called No. 9) conducted and finalised a promotional campaign for the Blue Gold Innovation Fund amongst SMEs and entrepreneurs in the Netherlands. This in order attract a large number of innovative concepts from Netherlands. This resulted in 17 applications for feasibility studies. Some of the concepts were no good match with the BGIF criteria, but we are in close touch with about 4 applicants (BioMyGreen, Huizing Harvest, Eijkelkamp, Plant International) to coach them to develop a full application.

- The Social Business Youth Alliance (SBYA) / YY Goshti organised two Blue Gold Business Challenges in Patuakhali and Khulna to support local young entrepreneurs from the BGP area to develop and implement their innovative business ideas. It resulted in about 70 applications and in the end 7 winners. The winners were guided by SBYA to develop an operational business plan and some of them applied to BGIF. The BGIF management will evaluate the applicants and coach the young entrepreneurs further. The TA team is considering organising a special match making event for potential donors/funders and supporting organisations.

- As part of continuous effort of reaching appropriate researchers and academicians for unsolicited proposals, visits and meetings were arranged in December 2017 at Khulna University, BAU and BSMRAU Information on BGIF was shared with senior professors at different departments of those universities with a view to attract relevant proposals. There were also meetings arranged with Bangladesh Fisheries Research Institute, director BAURES (the apex body for research at BAU) and director research of BSMRAU. The intention of BGIF is to let Bangladeshi researchers collaborate with Dutch organizations/universities, and the respective universities showed interest to do so.

- Agreements with the Water Management Knowledge and Innovation Program (WMKIP) were formulated to facilitate innovative research on key water management issues in South West Bangladesh in the context of the Blue Gold Program. The WMKIP aims to develop a deeper understanding of the realities and implementation landscape of the Blue Gold Program and as part of the EKN's commitment to water management solutions for Bangladesh. The WMKIP will be complementary to BGIF.

[5] The first call "Improved Information for Agriculture" is running from June 2017-January 2018. Implementation will start in February 2018 and run till September 2019.

# 6 Financial Report

| Budget Line | Original Budget | Revised Budget 4th contract amendment | Total claimed 31-Jul-17 | Claimed Q3 2017 | Claimed Q4 2017 | Total cumulative | % Spent | Balance Remaining |
|---|---|---|---|---|---|---|---|---|
| **TA contract** | | | | | | | | |
| TA team – Component 1 | 4,337,926 | 5,119,174 | 3,187,402 | 209,750 | 175,634 | 3,572,786 | 70% | 1,546,388 |
| TA team – Component 2 | 2,852,156 | 3,943,722 | 1,984,324 | 141,028 | 163,717 | 2,289,069 | 58% | 1,654,653 |
| TA team – Component 3 | 3,552,313 | 3,806,177 | 2,441,226 | 125,379 | 91,234 | 2,657,839 | 70% | 1,148,338 |
| TA team – Component 4 | 2,077,640 | 2,256,274 | 1,533,324 | 86,265 | 72,226 | 1,691,815 | 75% | 564,459 |
| Program Management | 1,988,418 | 2,160,857 | 1,272,248 | 79,738 | 98,587 | 1,450,573 | 67% | 710,284 |
| Equipment | 1,169,053 | 1,096,163 | 666,525 | 5,754 | 29,880 | 702,159 | 64% | 394,004 |
| Training | 2,456,500 | 2,234,940 | 1,159,880 | 15,058 | 8,306 | 1,183,244 | 53% | 1,051,696 |
| Operational cost | 1,272,600 | 2,928,341 | 1,983,372 | 135,720 | 137,708 | 2,256,800 | 77% | 671,541 |
| Contracted Services | 7,542,000 | 6,322,933 | 2,165,539 | 120,022 | 194,558 | 2,480,119 | 39% | 3,842,814 |
| Water Management Innovation Fund | 2,400,000 | 1,400,000 | 551,112 | 122,727 | 150,322 | 824,161 | 59% | 575,839 |
| Productive Sectors Innovation Fund | 1,900,000 | 1,050,000 | 271,866 | 44,056 | 91,012 | 406,934 | 39% | 643,066 |
| Annex B | 0 | 877,058 | 311,179 | 69,919 | 71,721 | 452,819 | 52% | 424,239 |
| **SUBTOTAL TA contract** | **31,548,606** | **33,195,639** | **17,527,997** | **1,155,416** | **1,284,905** | **19,968,318** | 60% | **12,803,082** |
| GoN Contribution to BWDB | 15,750,000 | 27,320,000 | 8,567,950 | | 2,000,000 | 10,567,950 | 39% | 16,752,050 |
| GoN Contribution to DAE | 995,000 | 1,495,000 | 663,446 | 360,000 | 160,000 | 1,183,446 | 79% | 311,554 |
| **Total GoN contribution** | **48,293,606** | **62,010,639** | **26,759,393** | **1,515,416** | **3,444,905** | **31,719,714** | 51% | **29,866,686** |

# 7 Project Management

## 7.1 Restructuring TA-team

**Reframed ToR:** Reframed ToR by Blue Gold Program for its TA teams at central and zonal level inspired in taking up the extended responsibly under unified approach to provide services and implement program activities involving the partner agencies of Blue Gold program in the field.

Three cross-disciplinary teams: 1) Improved Livelihoods; 2) Equitable Water Management; and 3) Strengthened Value Chains at Dhaka and zonal levels are working actively to achieve the Blue Gold objectives and goals with increased collaboration and coordination.

**Zonal Coordination Team:** Zonal Coordination Team has been established with the members of multi-disciplinary experts. The zonal coordinators (ZCs) are engaged to lead BGP TA activities and coordinate the technical experts at zonal and polder level with the support from a team of senior technical experts and advisors at the central level. They are also responsible to coordinate the public/private sector development (services and production) activities of partner agencies in the polders.
Zonal TA Coordination Teams facilitate in planning and implementation of day-to-day activities - coaching the Polder Support Teams, keeping the close contacts with union and upazila parishads, stimulating reflection and learning through active sharing of good practices and lessons learned. Blue Gold Zonal Coordination team engaged their experts to take up responsibilities as Polder Coordinator in all 22 polders considering the polder activity plan and its time-line. The role of Polder Coordinators are instrumental for implementation of program activities and a number of Polder Coordinators were relocated from one polder to another in different time based on the demand of their experience, expertise and workloads.

**Polder support Team:** Polder Support Teams are reformed and established, responsible for the implementation of BGP activities in each polder, with support from Zonal TA Coordination Team. The Polder Support Teams are responsible for working with BWDB, DAE, LGIs, other relevant line departments/agencies and WMOs at catchment/polder level in an integrated approach.

Community Development Facilitators CDFs) are engaged considering the polder activity plan and its time-line. All the CDFs are active under unified approach and sharing their responsibilities among themselves. Based on the performance assessment, CDFs (polder level staff) are posted, promoted and remunerated in Blue Gold Program. A number CDF have been given opportunities to improve their performance and a number of them are also discontinued considering their performance.

It may be noted here that concentration of CDF has been reduced according to the phase out plan while higher number of CDFs are engaged in new polders. However, Blue Gold program is planning further to distribute and reshuffle its CDFs following the suggestion of ARM, especially in new polders based on the population density. BGP is also planning to recruit new CDFs against the vacant/discontinued positions. BGP recruited 10 CDFs and engaged under CWM as additional support to BWDB. In the meantime, one CDF has been discontinued for his low performance and BGP will suggest CWM to engage remaining 9 CDFs in phase out polders to continue the institutional support from BWDB.

**Reframed ToR for field staff:** Blue Gold Program has prepared a common and general ToR for its CDF following the Participatory Water Management Approach developed by BGP as recommended by the MTR and ARM. Blue Gold has also developed a Field Manual for Zonal and Polder support Team members. This Field manual has been developed based on a working paper prepared by Blue Gold Program in August 2016 reviewed by ARM: “Water Management for Development: a unified work process”. The document was developed with support from the field level staff/experts and shared with BWDB/DAE representatives in early 2017. The draft field manual was circulated to adapt

in the field. Over the period the draft manual was updated incorporating comments and observations from the field and finally it was distributed in English and Bengali version to all BGP staff members to use day today program activities.

Blue Gold is in the process of phase-out from old 8 polders by end of June 2018 (except the implementation of infrastructure development activities) under 1st batch, phase out from 4 polders by June 2019 under 2nd batch and phasing out from 8 remaining polders in June 2020 under 3rd batch. Nine CDFs engaged under the field officials of CWM are already posted in the 1st batch of phasing out polders, and will be assisted by existing BGP CDFs until end of 2017. Thereafter, a reduced number of BGP CDFs will continue to ensure O&M activities in the 1st batch of phasing out polders as per suggestion of ARM 2017. However, it may be noted here that BWDB requested BGP to continue the O&M activities for one monsoon after phasing our date as hands on exercise.

**Unified Approach:** Polder Support Team and Zonal Team members have imparted the training on Unified Approach under a special effort. Polder Co-coordinators are selected and engaged from CDFs while the Coordinators are selected and engaged from the Zonal TA coordination team members. From early this year Central, Zonal and Polder team members started jointly worked to develop the indicators on Functional WMGs and based on the final indicators WMG tracker was refined accordingly. Data on different variables of WMOs has been compiled and published based on 4th Quarter information. In addition the success stories of BGP activities under unified has also been published in October 2017.

**Reduction of international staff & relocation of national staff:** Under the new arrangement for extended period, input of international consultants have been reduced while a number of national consultants have been relocated from Dhaka to field to ensure their higher involvement in the field. Few national senior experts who left the program have been replaced by national junior experts and BGP has done it in the fields of agriculture, fisheries and socio-economy.

BGP has engaged a number of additional technical staff to support the BWDB field offices in Khulna and Patuakhali. BGP has also engaged 4 junior engineers to support Design offices in Dhaka under their supervision, guidance and management. The engineering team has been relocated to Motijheel and working closely with the BWDB-offices.

**Challenges:** The challenges for regular staffing in BGP are (a) a number of senior/mid-level experts left the project as they got offer of higher remuneration and better facilities in ADB and World Bank Project (b) a number of CDFs also left to join in South West and few LGED projects where they were offered higher salaries and service benefit with longer employment. These departures of BGP staff/experts are disrupting the regular activities in Blue Gold Program. In addition, it is also difficult to find experienced and good quality staff with the present remuneration structure of BGP.

## 7.2 DPP Revision

Revision process of DPP was started in May 2016, EKN sent “Expression of Intention” on 14 September 2016 with intention of additional financing (Grant) Euro 11.57 Million for the BGP (BWDB Component) as RPA with a hope the draft DPP will be submitted by October 2016.

The RDPP was reviewed and approved by BWDB on 13th November 2016. The document was submitted to MoWR on 14th November 2016. The RDPP was presented and discussed at MoWR on 1st January 2017. Ministry made few comments/recommendations and PCD addressed all the comment and incorporated them in the RDPP and resubmitted the DPP to BWDB and subsequently to the MoWR.

RDPP was finally submitted at Planning Commission on 16th March 2017, they forwarded their observation to MoWR on 4th June 2017, and MoWR forwarded same to BWDB on 19th June 2017. BWDB addressed all the comment and submitted them again to MoWR on 4th July 2017 and subsequently to the Planning Commission. IMED submitted their findings based on the site visit in

Blue Gold Program in April 2017 and their observation report is mandatory in the process of approval of RDPP.

In order to expedite the approval of RDPP, EKN perused to ERD through an email on 7th August 2017 and ERD forwarded the same to MoWR on 10th August 2017 and subsequently to Planning Commission.

Based on the persuasion from all concerned Planning Commission appraised the submitted document on 18th September 2017 and made comments/recommendation to be address before presenting at Pre ECNEC (PEC). PCD addressed all the comments and incorporated them in the document and resubmitted to the Planning Commission. The updated version of the RDPP was also presented at PEC on 2nd November 2017. PEC made very few comments and suggested to address them and to present it to ECNEC. PCD addressed all the comments of PEC and updated the document further. Following the established procedure PCD resubmitted the DPP to BWDB on and subsequently to the MoWR by end of December 2017.

In the meantime, ARM was commissioned by EKN during 24th November to 4rd December 2017, they also argued to expedite the approval process of RDPP and get it done by January 2018. PMC meeting was held on 14th December 2017 where PCD presented the outcome of ARM and the highlights of final version of RDPP. Based on the importance and urgency, PMC also emphasised to get the RDPP approved at earliest possible time. However, it appears that the final version of the RDPP will be submitted to the Planning Commission in January 2018 for presenting it at ECNEC.

(Chapter 2.3.3. includes more detailed information about the consequences for infrastructural development if further delays would occur in the RDPP approval.)

# Annex I – Project Outputs

## Membership of Groups

| Summary Results of WMG Tracker | Up to December 2017 |
|---|---|
| No. of Total WMG | **489** |
| **% of HHs represented in WMG** | ***61.1*** |
| No. of enrolled WMG male members | 72482 |
| No. of enrolled WMG female members | 54765 |
| **% of WMG female member** | ***43*** |
| No. of TA-FFS GROUP | 601 |
| No. of enrolled TA-FFS male members | 2224 |
| No. of enrolled TA-FFS female members | 12871 |
| **% of TA FFS female members** | ***85.3*** |
| No. of DAE-FFS GROUP | 341 |
| No. of enrolled DAE-FFS male members | 8538 |
| No. of enrolled DAE-FFS female members | 8512 |
| **% of DAE FFS female members** | ***49.9*** |
| No. of MFS GROUP | 188 |
| No. of enrolled MFS male members | 2957 |
| No. of enrolled MFS female members | 1686 |
| **% of MFS female members** | ***57*** |
| No. of LCS groups formed | 319 |
| No. of enrolled LCS male member | 13835 |
| No. of enrolled LCS Female member | 7958 |
| **% of LCS female member** | ***36.5*** |

## Financial Situation of WMGs

| Summary Results of WMG Tracker | Up to December 2017 |
|---|---|
| **Total WMGs Fund** | **Total WMGs Fund** |
| Admission fee (TK) | 203,0317 |
| Savings (Tk) from Male | 123,67711 |
| Savings (Tk) from Female | 966,9913 |
| O&M fee (Tk) | 176,2440 |
| Miscellaneous Fees (Tk) | 274,0795 |
| Undistributed Profit/Income (TK) | 208,64,040 |
| **Total WMG Funds (Tk)** | 494,35,216 |

## Capacity Building

| Summary Results of WMG Tracker | Up to December 2017 | |
|---|---|---|
| *Training/Orientation/Workshop* | *Participants* | *% of female participants* |
| Account Keeping and Audit System | 2,011 | 20.7 |
| Collective Action Group (CAG) Workshop | 2,170 | 32.5 |
| Collective Action Promotion (CAP) Workshop | 356 | 13.8 |
| DRR | 906 | 40.6 |
| Gender and Leadership Development | 2,245 | 47.3 |
| LCS training | 15,320 | 42.9 |
| Management of Agricultural Machinery | 5,898 | 35.3 |
| Organizational Management | 3,904 | 34.5 |
| Others | 18 | 0.0 |
| Participatory Monitoring | 1,755 | 25.5 |
| RF/FT/LF Capacity Development | 229 | 27.5 |

| | | |
|---|---|---|
| Savings and Credit | 1,014 | 18.6 |
| **Total** | 35,826 | 37.1 |

## Agricultural Development

| **Summary Results of WMG Tracker** | **Up to December 2017** | |
|---|---|---|
| *Modules/Topics* | *Participants* | *% of female participants* |
| Boro, Homestead & Nutrition (DAE) | 1,747 | 50.1 |
| CAWM and Nutrition (DAE) | 1,513 | 44.6 |
| Cropping system, market linkage and production technology & gender (TA) | 1,756 | 20.0 |
| Homestead Vegetables & Fruits, poultry and Nutrition (TA) | 9,250 | 88.1 |
| Mungbean, Homestead Vegetables & Fruits & Nutrition (DAE) | 2,775 | 48.1 |
| Mungbean, Market Linkage and Production Technology & gender (TA) | 1,270 | 19.4 |
| Pond Fish, Beef Fattening & Nutrition (TA) | 3,773 | 72.3 |
| Pond Fish, Dairy Cow & Nutrition (TA) | 1,175 | 79.6 |
| Poultry, Market Linkage and Production Technology and gender (TA) | 673 | 84.2 |
| Sesame, Homestead & Nutrition (DAE) | 750 | 48.7 |
| Sesame, Market Linkage and Production Technology and gender (TA) | 1,352 | 28.4 |
| T-Aman, Homestead & Nutrition (DAE) | 7,786 | 49.4 |
| T-Aus, Homestead & Nutrition (DAE) | 450 | 59.3 |
| Tilapia, Market Linkage and Production Technology & gender (TA) | 735 | 76.9 |
| Watermelon, Homestead Vegetables & Fruits & Nutrition (DAE) | 450 | 52.7 |
| Others | 484 | 82.6 |
| **Total** | 35,939 | 61.0 |

## Agricultural Development (ctd.)

| Summary Results of WMG Tracker | Up to June 2017 | |
|---|---|---|
| *Demonstration of Crops* | **Total** | **% of Female** |
| Beef Fattening | 138 | 70.3 |
| Dragon Fruit | 58 | 37.9 |
| Drumstick | 121 | 100.0 |
| Dwarf Coconut | 250 | 50.0 |
| FYM | 241 | 82.2 |
| Groundnuts | 22 | 22.7 |
| Mung bean | 96 | 11.5 |
| Mustard | 36 | 16.7 |
| Others | 22 | 72.7 |
| Passion Fruit | 30 | 63.3 |
| Pond Fish | 161 | 58.4 |
| Poultry Housing | 352 | 97.2 |
| Sapodilla | 1,422 | 95.1 |
| Sesame | 67 | 3.0 |
| Sunflower | 24 | 0.0 |
| T-Aman | 233 | 15.0 |
| Tilapia | 27 | 74.1 |
| Vegetables | 468 | 89.3 |
| Wheat | 12 | 16.7 |
| **Total** | 3,780 | 76.3 |

## Horizontal Learning

| **Summary Results of WMG Tracker** | **Up to December 2017** | |
|---|---|---|
| Horizontal Learning Activities | Total | % of female participations |
| Cage Culture/Fisheries | 424 | 38.2 |
| Exchange of FFS/MFS learning | 11,924 | 55.4 |
| Exchange visits to CAWM schemes | 734 | 28.2 |
| Exchange visits to better performing WMGs (WAP, O&M, CII, CA, WM, etc.) | 2694 | 43.0 |
| Farmer's Field Day (DAE) | 27,165 | 48.0 |
| Farmer's Field Day (TA) | 95,912 | 58.8 |
| Others | 8,641 | 42.6 |
| **Total** | 147,494 | 55.1 |

# Annex II – Reports Published

| No | Name | Date |
|---|---|---|
| IR | Final Inception Report | 31 Mar, 2014 |
| APR 01 | Annual Plan 2014 | 06 Feb, 2014 |
| APR 02 | Annual Plan 2015 | 29 April 2015 |
| APR 03 | Annual Work Plan 2015 - 2016 | 14 July 2015 |
| **Progress Reports** | | |
| QPR 01, 2013 | Progress Report 2013, Q2+Q3 (April – September 2013) | 10 Dec, 2013 |
| QPR 02-03, 2013 | Progress Report 2013, Q4 (October – December 2013) | 26 Feb, 2014 |
| QPR 01, 2014 | Progress Report 2014, Q1 (January – March 2014) | 15 May, 2014 |
| QPR 02, 2014 | Progress Report 2014, Q2 (April – June 2014) | 04 August, 2014 |
| QPR 03, 2014 | Progress Report 2014, Q3 (July – September 2014) | 17 November, 2014 |
| QPR 04,2014 | Progress Report 2014, Q4 (October – December 2014) | 15 February, 2015 |
| QPR 01, 2015 | Progress Report January-March 2015 | April 2015 |
| QPR 02, 2015 | Progress Report April-June 2015 | July 2015 |
| HYPR 01, 2015 | Progress Report July – December 2015 | March 2016 |
| HYPR 01, 2016 | Progress Report January - June 2016 | September 2016 |
| HYPR 02, 2016 | Progress Report July – December 2016 | April 2017 |
| HYPR 01, 2017 | Progress Report January – June 2017 | August 2017 |
| Technical Reports | | |
| TR 01 | Proceedings of the Workshop on Blue Gold Draft Inception Report Presentation, 26 June 2013 | Sep, 2013 |
| TR 02 | Health & Safety Measures | 18 Dec, 2013 |
| TR 03 | WMO Functionality Assessment in four polders | 12 Dec, 2013 |
| TR 04 | Introduction to the M&E Manual | 17 Dec, 2013 |
| TR 05 | Geo information for Blue Gold: Inventory of needs, data collection and roadmap for implementation | 01 Dec, 2013 |
| TR 06 | Household Survey Report – Polder 22, 30, 43/2D and 43/2F | 31Mar, 2013 |
| TR 07 | Field Trip Reports 2013 | 31 Mar, 2014 |
| TR 08 | Operational Manual for Output and Outcome Monitoring | April, 2014 |
| TR 09 | Water Management Organisations - Comparative Analysis | April, 2014 |
| TR 10 | Outcome of WMO functionality assessment, Volume 2 (five polders) | 02 September 2014 |
| TR 11 | Training Plan 2013-2019 | 15 January 2015 |
| TR 12 | Partnership Strategy 2014-2019 of the Blue Gold Program | 12 January 2015 |
| TR 13 | Engaging Local Government Institutions In Water Management – DRAFT Sourcebook | 19 March 2015 |
| TR 14 | Baseline Survey Report | 31 March 2015 |
| TR 15 | Communication Strategy | 05 May, 2015 |
| TR16 (A &B) | Field Trip Reports of 2014 | 09 June 2015 |
| TR 17 | Semi Annual Outcome Monitoring Report | 05 May, 2015 |
| TR 19 | Improved water management levels | July, 2016 |

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|---|---|---|
| | (Community Water Management Pilot Polder 30, Batiaghata, Khulna) | |
| TR 20 | Strategic Plan for Community Water Management | July, 2016 |
| TR 21 | Field Trip Reports of 2015 | July, 2016 |
| **Technical Notes** | | |
| TN 01 | Use of ODK software in FFS Cycle 3 FFS | May, 2015 |
| TN 02 | Tilapia Value Chain Analysis | July, 2015 |
| TN 03 | Benchmark Report on Mung Bean | September, 2015 |
| TN 04 | Local Poultry Value Chain Analysis | September, 2015 |
| TN 05 | Mung bean Value Chain Analysis | September, 2015 |
| TN 06 | Moringa oleifera Cuttings | December, 2015 |
| TN 07 | FFS Cycle 4 Benchmark and End Data | December, 2015 |
| TN 08 | Nursery Management in Khulna and Patuakhali | January, 2016 |
| TN 09 | Trial ponds of fish FFS 2015 | March, 2016 |
| TN 10 | Nursery Management training | June, 2016 |
| TN 11 | FFS Cycle 5 | June, 2016 |
| TN 12 | FFS Cycle 6 | September, 2016 |
| TN 13 | Water melon cultivation & fish culture in mini pond, polder 22 | October, 2016 |
| TN 14 | Trail ponds 2017 | May, 2017 |
| TN 15 | Report data FFS Cycle 7 | May, 2017 |
| TN 16 | Report data FFS Cycle 8 | May, 2017 |
| | Market Oriented Farmer Field Schools (MFS): Impact Assessment report | November 2017 |
| | Report data FFS Cycle 9 | November 2017 |
| **Workshop & Training Reports** | | |
| | Orientation on the Blue Gold Program for DAE Officials Khulna | 16 Nov, 2013 |
| | Retreat Report 2015 | August 2015 |
| | Retreat Report 2016 | May 2016 |
| | Training of Zonal Socio Economist & Community Organizers | August 2013 |
| | Training report TOT for FOs | November 2013 |
| | LCS Training Report – Khulna and Satkhira. | May 2015 |
| | LCS Training Report - Patuakhali. | May 2015 |
| | Training Report on Multi-level Water Governance | December 2015 |
| | Training Report AIWW water policy | December 2015 |
| | ToT for FOs on Dairy module - Satkhira | May 2016 |
| | Refreshers training for FFS - Beef Fattening and Fisheries | August 2016 |
| | Workshop Report – Fisheries and Poultry District level | October 2016 |
| **PDP Reports** | | |
| PDP 22 | Polder Development Plan for Polder 22 | April 2015 |
| PDP 43-2F | Polder Development Plan for Polder 43-2F | 15 June 2015 |
| PDP 43-2D | Polder Development Plan for Polder 43-2D | 30 Sep 2015 |
| PDP 22-29-30 | Polder Development Plan for Polder 22-29-30 | 10 November 2015 |
| PDP 22 | Polder Development Plan for Polder 22 v2 | December 2017 |
| PDP 26 | Polder Development Plan for Polder 26 | December 2017 |
| PDP 29 | Polder Development Plan for Polder 29 | December 2017 |

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|---|---|---|
| PDP 30 | Polder Development Plan for Polder 30 | December 2017 |
| PDP 31 Part | Polder Development Plan for Polder 31 part | December 2017 |
| PDP 2 | Polder Development Plan for Polder 2 | December 2017 |
| PDP 43/1A | Polder Development Plan for Polder 43/1A | December 2017 |
| PDP 43/2A | Polder Development Plan for Polder 43/2A | December 2017 |
| PDP 43/2E | Polder Development Plan for Polder 43/2E | December 2017 |
| PDP 43/2F | Polder Development Plan for Polder 43/2F v2 | December 2017 |
| PDP 43/2D | Polder Development Plan for Polder 43/2D v2 | December 2017 |
| PDP 43/1B | Polder Development Plan for Polder 43/1B | December 2017 |
| **Woking Paper** | | |
| BGP - WP1 | Theory of Change | 30 November 2015 |
| BGP - WP2A | Exit Strategy v2 | February 2016 |
| BGP - WP3 | Building organisation | 2 June 2016 |
| BGP - WP4 | Vocational Training | 23 August 2016 |
| BGP - WP5 | Theory of Change rev 2 | 25 May 2016 |
| BGP - WP6 | MRL Plan | 31 August 2016 |
| BGP - WP7 | Polder Growth & Business Development | 31 August 2016 |
| BGP - WP8 | Participatory Monitoring Report | 20 November 2017 |
| BGP – WP9 | WMG Tracker Report-June 2017 | 22 November 2017 |