



# Blue Gold Trends Watcher

This is the second issue of Blue Gold Trends Watcher, a seasonal project bulletin that aims at summarising the seasonal agricultural information of the Blue Gold polders which includes climate, cropping, contexts, outcome, impact, and lessons learned. This issue offers some insights of different activities of the BGP. Firstly, a brief overview of the Community-led Agricultural Water Management (CAWM) of BGP and a comparative analysis of crop damages due to heavy rainfall in CAWM and non-CAWM areas. Secondly, a Value Chain Analysis on mustard as an alternative profitable crop for farmers. Thirdly, a description of fish trial ponds that focus on the difference between theory and practice from the learning point of views. Rest of the parts of the bulletin highlight the dietary improvement and success stories of BGP beneficiaries to provide a glimpse of the impact of BGP interventions.

The next Trends Watcher is expected to be issued in October 2017. Suggestions for improving the content of this seasonal bulletin are very welcome and can be sent to: [bluegold\\_mrlteam@bluegolddb.org](mailto:bluegold_mrlteam@bluegolddb.org)

## In this Issue:

- ① Community-led Agricultural Water Management (CAWM) and a comparative pictures of crop damages due to heavy rain fall in CAWM and non-CAWM areas.
- ① Dietary improvement
- ① Outcome of Fish Trial Ponds
- ① Mustard Value Chain Analysis in Patuakhali-2017
- ① Success Stories

## COMMUNITY-LED AGRICULTURAL WATER MANAGEMENT (CAWM)

BGP is trying heart and soul to make the Water Management Groups (WMGs) more functional by supporting different sorts of collective actions and economic activities. One of its major efforts is the CAWM that is trying to ensure proper internal water management of the polders and empowering farming communities through collective efforts that support them to ensure more production as well as profit.

Below table shows a brief overview of the CAWM coverage

CAWM coverage	Total
Total No. of polders	7
Total No. of catchments	10
Total No. of CAWM groups	10
Total sluice catchment size covered (ha)	418
Total CAWM area (ha)	64
Total No. WMG members	928
Total No. HHs covered	1020
Total No. CAWM farmers	275

## Major Challenges in CAWM Areas

The communities of CAWM areas face the challenges of waterlogging, risks resulting from climate change (e.g. heavy rainfall, early monsoon), unavailability of quality seeds and inadequate technical knowledge on improved varieties and production system, lack of group unity and crop synchronization.

## Mitigation Measures in CAWM Areas

In CAWM areas, some mitigation measures were demonstrated by BGP while cultivating demo crops. The farmers of CAWM areas have adopted some mitigation actions like creating field channels and constructing X-dams between high and low land; and, these initiatives have helped them to protect their lands and crops. The last Rabi season cropping was hampered due to heavy rainfall in the coastal areas, especially in the polder 43/2A, 43/1A, 43/2B, and 43/2D in Patuakhali and in the polder 22, 29, and 31 Part in Khulna. According to the BGP technical experts, rainfall-induced crop damage was significantly lower in CAWM areas compared to non-CAWM areas. A comparative analysis of the crop damage in CAWM and non-CAWM areas is discussed below for some of the BGP polders.

## Patuakhali

Polder 43/2A: BGP technical experts estimated that in areas adjacent to the CAWM areas, crop damage was about 70-80% for local Mung bean, Groundnut, and Chili, while it was 50% for Sesame and Groundnut in the CAWM intervention areas. It is noteworthy that the production of sunflower and Mungbean-BARI-6 was not affected in the CAWM area.



*Excavating field channel in polder 43/2A*

**Polder 43/1A:**

In this polder, most of the farmers cultivated Watermelon in last Rabi season. In CAWM areas, the damage of Watermelon was estimated around 25-30% while outside of the CAWM areas, it was more than double (60-70%). Though there were field channels and dykes in the CAWM areas, drainage structure (very old outlet) was out of order. So, heavy rainfall led waterlogging in these areas. However, the CAWM farmers took initiatives to pump out water from the field channels to outfall river that resulted in less damage of watermelon compared to non-CAWM areas.



*Good production of potato in polder 43/1A*



*Field channel in polder 43/2B*

**Polder 43/2B:**

CAWM farmers participated actively in improving field channels and in operating the Amkhola sluice to protect their land from waterlogging. As a result, the production of Watermelon, Sunflower, Sweet potato and Pumpkin was not affected in the CAWM areas. However, it estimated that 10-15% production of the Mung bean BARI-6 was damaged due to waterlogging while 80% production of local Mung bean, chili, sweet potato, and Cowpea was damaged in the non-CAWM areas.



*Good production of watermelon*



*Members of CAWM are working in the polder 2*

**Khulna**

**Polder 22:** The harvest of Sesame was hampered in both the CAWM and non-CAWM areas due to waterlogging resulted from heavy rainfall. However, improved field channels and proper management of the Gopipagla outlet ensured the expected yield from Sunflower and Mung bean production whereas 60-70% of the Mung bean production was damaged non-CAWM areas.



*Good Rabi crop production in the polder 2*

**Polder 31 Part:**

During the last Rabi season, farmers used pumps for irrigation for the first time in the CAWM areas. They also improved the field channels and constructed small dykes around their plots for improved on-farm water management. The technical experts of BGP estimated that 50% of the CAWM farmers' sesame was damaged while the around 100% of non-CAWM farmers were not able to get any return from their sesame cultivation.



*Water logging in the polder 31 part due to heavy rain*

## Learning Points

- ① Linking micro-level water management infrastructures to sluices and khals proved to be effective in reducing waterlogging;
- ① Strong organizations (WMGs/WMAs) and local leadership are crucial factors for the acceleration of improved water management practices;
- ① Farmers from the CAWM areas were motivated to adopt CAWM technologies and practices after observing the potentials for increased profitability.



Members of the CAWM group in the polder 31 part

**CAWM Lesson Dissemination:** CAWM-WMGs introduced Horizontal Learning to scale up CAWM in the BGP Polders during November- December 2016. Through Experience sharing visits for horizontal learning about 330 representatives of different WMGs visited the 10 CAWM pilot areas. The host CAWM farmers explained what they learnt through CAWM-FFS, e.g. effectiveness of field channels, small dykes around plots, maintenance of infrastructures including branch khals and overall internal water management. Observing the water management practices and achievements in crop production of the host CAWM (WMG), the visitors were inspired and encouraged to undertake similar initiatives in their own areas; inspiration and enthusiasm were also generated from the workshop on planning of Rabi crop cultivation (with DAE initiative). Besides, the farmers of neighbouring areas/WMGs are also taking lessons from practices in CAWM areas and practicing these in their own areas.

## DIETARY IMPROVEMENT

Blue Gold promotes diverse and healthy diets in its Farmer Field Schools (FFS). To monitor the changes resulting from the FFS, benchmark surveys (at the start of each new cycle) and end line surveys (at the end of each cycle) are conducted. The last FFS Cycle (8) took place from October 2016 to March 2017. As part of this cycle, 64 FFS were held on poultry, homestead garden, and nutrition. Table below shows that the introduction of new practices through the FFS (e.g. poultry module include housing, feeding, use of hazal, separating chicks from the mother hen, candling, and vaccination, linkages with input providers, community poultry workers and with staff of the department of livestock are strengthened) resulted in a significant increase of eggs per hen. With the increase of birds and the increase of egg production within the households, we see that the households consume more eggs and birds that were produced in their own households.

**Table : Level (%) of households reporting to consumption of egg and poultry from own HH production**

Egg and poultry consumptions from own HH production	Khulna (percentage of HH)		Sathkira (percentage of HH)		Patuakhali (percentage of HH)	
	Benchmark (n=200)	End FFS (n=200)	Benchmark (n=700)	End FFS (n=700)	Benchmark (n=600)	End FFS (n=700)
Consumption of egg	83%	99%	41%	100%	89%	100%
Consumption of birds	27%	86%	16%	97%	64%	99%

Farmers also estimated how many eggs they eat in a week and how many poultry they eat in a month. The following table shows that egg and poultry consumption increased as a result of the higher production. This contributes to better nutrition of the farming households.

**Table: Egg and poultry consumptions per HH**

Egg and poultry consumptions per HH	Khulna (average)		Sathkira (average)		Patuakhali (average)	
	Benchmark (n=200)	End FFS (n=200)	Benchmark (n=700)	End FFS (n=700)	Benchmark (n=600)	End FFS (n=700)
Eggs eaten per week	6.0	8.5	2.2	9.1	3.1	7.1
Poultry eaten per month	0.3	1.3	0.4	1.5	0.8	1.4



### OUTCOME OF FISH TRIAL PONDS

Fishery is a major source of income and nutritious food in the coastal zone of Bangladesh. Blue Gold supports 10,000 households directly in increasing their fish production, e.g. through establishing functional linkages between the local communities and the Department of Fisheries (DoF) and the Department of Livestock Services (DLS). It is expected that more households will be benefited from the Blue Gold interventions through horizontal learning and expansion. Blue Gold promotes and helps developing skills on Fingerling stocking in feasible water bodies and sanctuary development and nursery management.

Blue Gold supports communities in becoming a driving force for using existing natural resources, such as ponds and public water bodies. In close collaboration with the Department of Fisheries, technical assistance is provided to polder inhabitants, including assistance in identifying, testing, learning, and replicating innovations. By establishing linkages among the polder inhabitants, the government agencies and private sector actors, the institutional framework for future development is established.



Applying of mixed feed in trial pond



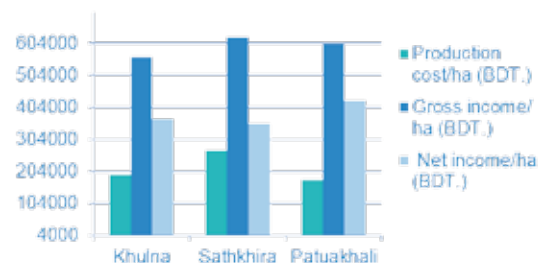
Application of lime in trial pond

Blue Gold (fisheries & livestock part) has conducted 88 FFS (April to Mid-December 2016) with a combined module of fisheries, livestock and nutrition) in the 3 divisional districts with proper liaison with the DoF and the DLS, mainly the Upazila and district level fisheries officers were involved. BGP has given more priority to the poor WMG members to involve in the FFS activities. A total of 88 trial ponds were established for 88 FFS in 88 WMGs of 3 districts -Khulna, Sathkhira, and Patuakhali- for “learning by doing” for the participants.

The highest income was recorded from Patuakhali (BDT. 424,345/ha) and followed by Khulna (BDT. 367,289/ ha) and Sathkhira (BDT. 353,110/ha). However, the highest production was recorded in Sathkhira district 5,187 kg/ ha/ 7 months) due to the supply of the more supplementary feed in their ponds. Data indicated that the average production of all districts was 4,487 kg/ha with the highest production in Sathkhira (5,187 kg/ ha), followed by Khulna (4,199 kg/ ha) and Patuakhali (4,075 kg/ha).

It is remarkable that farmers of Sathkhira were more conscious about the fish culture and also aware about the supplementary feed. Some of the farmers were easily motivated by the FOs of BGP during learning session of the fish module.

The highest net income was recorded from Sathkhira (BDT.424,346/ha), followed by Khulna (BDT. 367,289/ha). The production of fish was little bit higher in Khulna than the Patuakhali zone but net income/ha from Patuakhali was higher due to the better management and farmers also reported that they supplied more fertilizers in their ponds to grow more natural feed.



Comparative analysis of Production cost, gross income & net income per hectre

## Some Experiences and Learning Points from These Trial Ponds

- Using industrial supplementary feed helped increasing production but it also increased production costs which is the core reason behind higher production and at the same time higher production costs in Satkhira;
- Better management of ponds and use of the home made supplementary feed for fish decreases production cost which showed a significant effect in Patuakhali;
- Heavy rain fall hampered production, especially during the fish culture period. In such cases, sufficient protective measure might help certain production loss. However, mixed culture is possible with low feed cost by providing home-made feed side by side creating a natural feed through using organic and inorganic fertilizer in pond.
- Ensuring natural feed (phytoplankton and zooplankton) for fish production evidently reduces the cost of production and also increases the quality of the fish produce.
- Motivation plays an important role for pond preparation and supplying the supplementary feed in the pond which increases production. Supplementary feed consisting of at least 25% protein increases fish yields;
- It is wise to avoid the practices of over stocking that hampers the expected production rate. In addition, Bigger size fingerlings stocking is good for production, as mortality rate of small sized fingerling is higher.
- For Genetically Improved Farm Tilapia (GIFT) culture, commercial farming is (2-3 crops / year) is required to provide a sufficient amount of supplementary feed.
- Seasonal ponds (where water will be available up to end of October) are suitable to produce marketable sizes of GIFT and Rajputi;
- Due to social norms and values, women often do not buy inputs at the market, but depend on male members to do so. Developing linkages between female household members and input suppliers and providing access to price information about inputs is likely to reduce their dependency on male household members;
- Early stocking in April/ May results in a better production than the traditional practice as because in those months daytime is longer than winter season;
- The constraints for sustainable pond fish farming in these areas were insufficient water in dry season, higher production cost (mainly fingerlings and feed), insufficient supply of quality fry and fingerlings, lack of money and credit facilities and inadequate extension services.
- The HHs have broadly improved their food consumption, increased protein intake from fish, gradually increasing the standard of living by selling fish, and also increased choice level and economic ability through fish farming.



Farmer releasing fingerlings in trial pond



Harvesting of fish for sampling period

## MUSTARD VALUE CHAIN ANALYSIS IN PATUAKHALI-2017

### Opening Cropping System Opportunities:

During 2016 BGP focused on introducing short duration rice varieties (BRRI Dhan 52 with 44 farmers in 44 groups and BRRI Dhan 53 with 37 farmers in 37 groups). There was very limited high land available, so both varieties were introduced for experiential learning on medium high land as such land serves as a proxy for better drainage or improved water resource management and can give farmers an idea of the achievable potential.

BRRI Dhan 52 was generally favoured by the farmers due to its high yield, while earlier harvesting led them to recognise benefits in terms of food security, loan repayments, livestock feeding and savings on labour.



Information collection from output actors

### Introducing Mustard:

The comparatively short duration rice variety BRR1 Dhan 52 allowed harvesting some 35 days earlier than traditional varieties. Participating farmers were encouraged to change also their traditional harvesting practice to consider the cultivation of Mustard. The idea of growing Mustard in the area was not new but evolved from Blue Gold – DAE collaboration as DAE has been undertaking Mustard demonstrations in the area before. A critical innovation was the selection of short duration Mustard varieties, which in combination with the short duration rice, would allow also Mung bean to be grown in a T-Aman-Mustard-Mung cropping system.



*Mustard field at Polder 43/2F*

In consultation with BARI, 3 short duration Mustard varieties were identified with the potential to serve this purpose. 23 successful farmers experienced in short duration rice on their lands, participated to cultivate short duration Mustard on 7 block demonstrations of 1 acre each across the polders. On the instigation of DAE UAOs in the area, so-called block demonstrations were supported instead of the small field school trials.

### Core Value Chain Analysis (VCA) Findings:

The cultivation of Mustard has not been practised in the Patuakhali polders since many years. This has several consequences which were compiled in a detailed Technical Report on Mustard Value Chain Analysis (VCA) Report. A short brief of core findings are stated below:

- Land preparation and seed sowing cannot take place at optimal time that lead to limited production acreage
- Farmers (Primary producers) have limited knowledge of Mustard cultivation practices
- Productivity lags behind potential (no intensive production practices) acreage
- Farmers do not use appropriate seed variety
- Input suppliers are unaware and lack interest due to low demand
- Irrigation water scarcity during production season, but is required to boost productivity
- There are opportunities to capture more of total market value
- Local crushing technology is inefficient in terms of oil production
- Limitations in the service providers
- Several constraints in the Business Enabling Environment
- Additional labor input requirement from women

## SUCCESS STORIES

### INTRODUCTION OF GARLIC AS A NEW CROP

**Omar Roy**  
KashorabadKhal WMG  
Surkhali Union, Batiaghata Upazila  
Polder 31 Part, Khulna

Mr. Omar Roy is a small farmer but was courageous enough to demonstrate a new crop in his small piece of land (land size-150 sq. ft.). In November 2015, he cultivated garlic for the first time. One of our Blue Gold polder staff has previous experience of advising farmers about garlic cultivation. After joining Blue Gold, out of curiosity, he started inspiring the farmers to try for garlic cultivation. At one point, Mr. Omar was convinced to offer his land and labor to test the new crop in that area.



*Good production of Garlic by a member of the CAWM in the polder 31 Part*



## Garlic Cultivation Method

This crop can be grown in clay soil. It requires row to row spacing 15 cm and seed to seed spacing should be 10 cm. Fertilizer should be applied two times; before transplanting the seed and after 25 days of transplanting. Then the mulching should be done by rice straw. Regular weeding, watering and other intercultural operations need to be done periodically. Garlic cultivation needs two times watering by watering cane if there is scarcity of water.

Initially Mr. Omar invested BDT 350: for buying seed (BDT 150), fertilizer - Urea, TSP, MoP, Zypsum, Zinc and Boron (BDT 50), Mulching (BDT 50), land preparation, watering, weeding and labour (BDT 100). Cultivation of garlic is quite easy in comparison with other crops as it is a zero tillage crop. However, this zero tillage crop has specific mechanism to cultivate. Blue Gold helped him with this technical knowledge and provided necessary training. Not only that, as it was grown for the first time in the BGP area, Master Trainers regularly visited the field and provided technical support as and when it was necessary. 120 days after sowing, during mid-March 2016, he harvested the garlic. Mr. Omar got 15 kg garlic after harvesting, which was worth BDT 2250 as per local market price. However, he did not sell the garlic, but consumed 13 Kg and saved 2 kg as seed for transplanting again. He was happy with this new crop and was enthusiastic enough to cultivate this crop again in the next season. Last November 2016, he again cultivated garlic and doubled the land area. He is now waiting for his harvest. As garlic is a very short duration crop, a farmer gets option to use the same land for summer vegetable cultivation. Observing the success and easy way of cultivation, Mr. Omar's relatives and neighbours were also inspired and 25 farmers from his community also cultivated garlic in their land this year. The main benefits of this crop are- it is a low cost and labour intensive crop and a better option for the farmers that offers a higher income compared to the other crops. However, garlic cultivation has some challenges as well. As a new crop garlic seed is not locally available; further linkage development activities with extension service and private sector actors are necessary to make the seed available. It can only be grown if farmers avail early T. Aman season and grow short duration rice varieties. In addition, proper water management is also necessary for that particular area. However, farmers are very happy with this new crop and hope that garlic would be a profitable cash crop for them during Rabi season when their lands remain mostly fallow.

## PRODUCTION OF HOMEMADE POULTRY FEED BECAME A PROFITABLE IGA

**Ruma Akhter**

**Age 26**

**Dakshin Chingra WMG,**

**Village: Dakshin Chingra, Shovna Union,**

**Dumuria Upazila, Polder 26, Khulna**

Ruma Akhter is a small business owner in her locality. She used to be a housewife doing all sorts of household chores. Now she is running a small backyard poultry business along with her household chores. Women in rural areas rear chicken, ducks, and livestock around their home or in their backyard. It is a quite common scenario in Bangladesh. But very few women are able to convert this into a full-fledged business. That is what Mrs. Ruma did.

### Organic Process Of Producing Poultry Feed At Home

For making balanced feed for poultry rice polish, fish scale, and bone, eggs shell and salt are generally used. These mixed feed ingredients are then dried up in the sun. After proper drying, it needs to be ground into powder form and then it is ready for feeding poultry. This food is delicious and palatable for the birds.

Ruma used to rear chicken using traditional means but by involving in a Blue Gold Farmer Field School (FFS) she learned advanced techniques on chicken rearing and producing poultry feed at home at low cost using ingredients available at home. She not only produced poultry feed for her own use but she sold this to her neighbors and thus she has some earnings also. Ruma is also vaccinating her chicken and ducks herself. Initially, she invested nearly BDT 700 which she saved from her household's expenditure. Earlier Ruma had only 3 chickens but now she has 40 full grown birds, and her hens are laying at least 10 eggs every day.

She is not only selling the eggs (at BDT 10 per egg) but also uses them for household consumption, which contributes to the nutritional requirements of her family. She has now a separate Bank account for the transaction of earning money from this initiative. The profit she made from poultry allowed her to buy a cattle spending BDT 40,000 and to build a house for cattle spending BDT 7,000.

She is now planning to build a separate house for the chickens to expand her small poultry farm into a bigger farm. Besides, she is now contributing to her family, especially for her children's education. Her life is changing slowly. She has started with little money but her income has increased her income by rearing poultry and cattle. It has given her a power and respect among the family members and relatives. Nowadays her opinion is cordially invited by her husband; her husband respects her opinion in any decision making. She is now confident enough that she will not look back anymore and in future, she dreams to stand for UP election as a Member and to work for the women who are still living behind. She is very keen to share her skills and knowledge with other people. Ruma's neighbours are very keen to learn this new technology of producing poultry feed and they come to her to learn and get advice.



*Ruma Akhter with her poultry*

## COLLECTIVE ACTION – 'COMMUNITY BASED FISH CULTURE'

### Purba Shakharia WMG Atharogachia Union, Amtoli Upazila Polder 43/1A, Barguna District

Purba Shakharia WMG is a well-functioning WMG. CDF Seuly Akter gave the idea of fish farming in khals to the WMG members. WMG members cordially accepted the idea. General Secretary Mr. Nizam Howlader took a lead role to form a Community Based Fish Culture Group in May 2016 comprising of 20 members (Male-12- female-08); he became President of that committee. The members of the WMG jointly selected Taltoli Khal for fish cultivation as it was best-fitting with their needs. BGP Fish expert guided the respective CDFs so that they can help the group run their collective fish culture activities properly. BGP also arranged 3 training sessions on technical issues, mainly on pre- and post-stocking management and cultivation of dyke vegetables. As a result, in addition to fish cultivation, the community also grew vegetables on the embankment of the canal including bottle gourd, country bean, and red amaranth.



*Fish releasing in the Khal by collective action in the polder 43/1A*

This Khal was filled up with water hyacinth for many years. The president of the WMG mobilised members and engaged additional labourers to remove water-hyacinth and also used herbicides for controlling water-hyacinth. He also contacted a fingerlings supplier. The president initially took the responsibilities to pay the cost of these and other necessary things. Afterwards the group members paid him back. In June 2016, they released 48 kg (about 1500) fingerlings of Silver carp, Katla, Bighead, Ruhi, Mrigal, Mirror carp and Rajputi in the nearby Khal of 0.607 ha. They spent BDT 8,000 in total which was shared by members. Due to heavy rainfall in Patuakhali area, the embankment of the Khal was inundated and a lot of grown fishes flooded away. That is why they earned BDT 27,100 which is a bit less than their expectation level. However rather than distributing the profit, they have jointly decided to invest this for buying fingerlings. Using this money this year (2017) they bought nets to protect the embankments from fish inundation.

They spent BDT 1,270 and BDT 4,550 for buying 80 Kg lime and re-excavating the Khal respectively. They have also decided that 5% profit of the fish cultivation will be allocated for the WMG O&M fund. In March 2017, they spent BDT 10000 to release 60 Kg fingerlings in the Khal. They are planning to increase the number of members of their group. They are trying to get registered as a cooperative society and they have already started the process of registration as "Fish Farming Society" through the Department of Fisheries under the Bangladesh Cooperative Department.

### Blue Gold Role in 'Community Based Fish Culture'

- Assist the community to identify the Khal.
- Motivate them to use the Khal for productive purposes and conduct discussion session for proper management.
- Provide technical training on fish cultivation in the Khal.
- Assist them to link with the input market actors
- Assist them to establish linkage with the output buyers.
- Provide free fingerlings and vegetable seeds to inspire them.