



# KGF NEWSLETTER

A Half Yearly Newsletter of the Krishi Gobeshona Foundation (KGF)

September 2017 to February 2018  
Vol. 01, Issue 02

## Editorial

Over the journey through the first decade of KGF, a good number of technologies have been developed from a good number of research projects been scaled up as an intermediate step between technology generation and large-scale adoption by farmers. There are tangible outcomes in terms of technology generation, adoption of successful agricultural technologies and capacity building across the broad agricultural field through different research projects from the KGF endeavor. Scientific, institutional and social impacts have been reflected positively as the consequence of on-farm and on-station trials of technologies and practices developed through different research projects carried out during its first decade from 2008 to 2017.

A large number of scientists from public and private sectors engaged in projects had direct link with the farmers in implementing the projects. An effective linkage among scientists, farmers and extension personnel has been established through the implementation process of the projects. Over 87,000 farmers from 50 districts have been associated with the implementation of KGF projects and benefited by improving their knowledge and skill. Apart from economic gain that they accrued from adopting/practicing the improved technologies, many of them now gained better command over the farming communities because of their new knowledge and skills. All the leading Institutions of NARS in Bangladesh, many of the agricultural and other universities, private sector, NGOs are engaged in implementing the projects for adoption and popularization of the potential technologies across the different areas of the country. Scientists, farmers and extension personnel have been trained on adaptive research and different aspects of agricultural development including livestock, fisheries and aquaculture. It is believed that there has been positive impacts on capacity building, linkage and knowledge sharing among the involved researchers and extension providers in dealing with the research and development projects from the broad agricultural sector. Backward, resource-poor and women farmers have been especially encouraged to increase production by adopting improved technologies. Greater emphasis has been laid on production enhancement in the unfavourable ecosystems with greater risks of climatic changes using the technologies in Bangladesh.

KGF started initially under NATP funding for undertaking research projects with major focus on on-farm applied and adaptive research for investigating production, marketing, socio-economic aspects including value addition and quality product development issues under Competitive Grants Program (CGP). Now, the funding of KGF is maintained by the Bangladesh Krishi Gobeshona Endowment Trust (BKGET) from the income of an endowment fund created by the Government of Bangladesh (GoB). KGF is now closely linked with mainstream research through the Bangladesh Agricultural Research Council (BARC). KGF operates various programs covering crops, livestock, fisheries, natural resources, agroforestry, value chains, cross cutting issues like climate change and gender. The KGF programs are mainly categorized as (i) Competitive Grants Program (CGP) including basic research projects and technology piloting projects (ii) Commissioned Research Program (CRP), (iii) Capacity Enhancement Program (CEP) and International Collaboration Program (ICP). There are 67 research projects which are on-going from the thrust areas of agriculture and allied disciplines under KGF funding while about 118 projects have so far been completed since the inception period of KGF.

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## Seminar, Workshop and Training

### Seminar on Sustainable Development Goals (SDG)

Krishi Gobeshona Foundation (KGF) in association with Food and Agriculture Organization (FAO), Bangladesh organized a seminar on 'Role of Partnerships with Academia and Research Institutions of Bangladesh in delivering the Sustainable Development Goals'. The seminar was held at BARC Conference Room on 06 December 2017. Ms. Kakoli Ghosh, Coordinator of Partnerships, Food and Agriculture Organization (FAO), Rome,



Distinguished guests of the SDG seminar

Italy presented the keynote paper on 'Role of Partnerships with Academia and Research Institutions of Bangladesh in delivering the Sustainable Development Goals in the seminar'.

Around 90 (ninety) participants including eminent scientists, heads of the NARS institutions, civil society organizations, Professors from Agricultural Universities and University of Dhaka. Participants from different extension agencies, private sectors, FAO, BRAC, SAC, CGIAR Organizations, PKSF,

SME Foundation and former and current KGF experts attended the occasion. Dr. Paresh Chandra Golder, Member-Director (Planning & Evaluation), Bangladesh Agricultural Research Council was present as the Chief Guest and Mr. David Doolan, Deputy FAO Representative in Bangladesh was present as the special guest in the seminar respectively.

Dr. Kazi M. Kamaruddin, Program Director (Livestock & Fisheries),

KGF welcomed the participants of the program while Dr. Wais Kabir, Executive Director, KGF presided over the seminar. The Keynote speaker Ms. Kakoli Ghosh emphasized on the SDG goals with a special focus on SDG-2 (Zero Hunger) and stressed on the need for partnerships development not only between academia and research institutions but also with other stakeholders like private sector, international associates, extension agencies and civil society.

### Second Annual Progress Review Workshop on CRP-II Project

A day-long progress review workshop on CRP-II Project - 'Modeling Climate Change Impact on Agriculture and Developing Mitigation and Adaptation Strategies for Sustaining Agricultural Production in Bangladesh' was held at BARC Conference Room, Farmgate, Dhaka on 24 October 2017 organized by Krishi Gobeshona Foundation (KGF).

Presided over by Dr. Wais Kabir, Executive Director (ED), KGF, the review workshop was attended by Dr. Bhagya Rani Banik, Executive Chairman, BARC as the Chief Guest and Dr. A. Atiq Rahman, Executive Director, Bangladesh Centre for Advanced Studies (BCAS) as Special Guest respectively. Dr. Kazi M Kamaruddin, Program Director (L&F), KGF welcomed the workshop participants. Participants included NARS Institutes, Department of Livestock and Fisheries and Department of Agricultural Extension, Professors of Agricultural Universities, BUET, BMD, CEGIS and relevant renowned experts from different organizations in Bangladesh.

Executive Chairman, BARC emphasized the need to address all of 30 AEZ of the country under this Climate Modelling project. She also stressed upon future development strategies on climate change issue considering the comments from the audience. The project could also provide important policy guidelines on

climate change mitigation, she mentioned. Dr. A. Atiq Rahman from BCAS mentioned that Bangladesh does not need any mitigation for next 10-20 years and only require adaptation of technology in agriculture. ED, KGF requested to follow the recommendations came from audience. Climate change modelling needs more activities for bringing out the results to the farmers to improve their livelihoods, he added. Dr. Kabir emphasized strengthening of monitoring, evaluation and reviewing the progress of the project.

**Following are the recommendations adopted from the discussants:**

- KGF can bring out a report on the published publications from the project.
- Identifying the climatic threshold like dry and wet spell, wind flow/speed and weather index based research for risk management.
- Reviewing agriculture commodity based diseases /insecticides behavior in the project. KGF may continue this project consisting of localized mean temperature, blast disease, BPH.
- Avoid duplications and make coordination with other similar projects of NATP Phase -I, & Phase - II, AFACI etc.



Guest and participants in the workshop

- ❑ Work on the climatic variability on ground and surface water like fisheries and different climatic variability that decreases the production of livestock and fisheries
- ❑ Emphasize on climate change behavior like enhanced temperature ultimately increased infestation of insect/pest, mite on fruits and vegetables, and requested to make input for early warning by this project. Need to include horticultural crops in the project considering disease/insect-white fly, red mite/thrips that related to high temperature/rainfall etc.
- ❑ Capacity building for working on the location specific data through GIS and generated data should be available in the website.
- ❑ Modeller should provide a clear message to the stakeholders and help to develop an advisory system like India for two weeks early warning for farmers and fine tuning of data for farmers.
- ❑ Modeller to work fast and effective and validate all information and mechanism of policy for adaptation to

save crops from the changes of 20C high temperature and provide comprehensive clear messages on interaction due to climatic parameters in agriculture to the policy makers, scientists and extension service providers for climate smart agriculture and develop/collate future climate change scenario. Need importance on assessment of GHGs emissions, suitable agronomic management options to reduce GHGs emission, adoption of methods for C sequestration, to identify suitable adaptive measures to sustain agricultural production under CC scenarios, to develop capacity in assessing risk of climate variability & CC on agricultural production & developing best management practices for adapting Bangladesh agriculture to changing climate.

- ❑ Need addressing for 30 AEZ in this project and provide importance on motivation and interaction on the policy level. KGF should take projects in future to achieve SDGs.
- ❑ Strengthening the monitoring, evaluation and reviewing the progress of the project.

## Second Annual Review Workshop on CGP 2<sup>nd</sup> Call and CEP Projects

A two day long ‘Second Annual Review workshop on CGP 2<sup>nd</sup> Call & CEP Projects’ was held in the Training Room of BARC during October 3-4, 2017. A total of 15 projects were presented in the workshop where 9 projects were on crop and 6 projects on livestock sub-sector. Crop sub sector includes 7 CGP (Competitive Grants Program) and 2 CEP (Capacity Enhancement Program) projects those were presented on 1<sup>st</sup> day. The livestock sub-sector projects were presented on 2<sup>nd</sup> day of the workshop.

Dr. Wais Kabir, Executive Director (ED), KGF chaired the inaugural session while Dr. Bhagya Rani Banik, Executive Chairman, BARC was present as the chief guest. Dr. Kazi M Kamaruddin, PD (L&F), KGF welcomed and delivered a short briefing about the workshop. Participants from different NARS Institutes, Department of Livestock Service, Department of Agricultural Extension, Hortex Foundation, universities and



Guest of the workshop

relevant experts from other organizations attended the workshop.

Projects presented in the workshop are under implementation by different NARS institutes and Universities. All respective coordinators and PI were requested to follow the feedback and suggestions of the review workshop as recorded in the proceedings for improvement and successful implementation of the projects. Each of the project reports was reviewed by preselected relevant experts before the workshop and they have submitted their comments/suggestions in review report. The

review reports are already sent to the respective coordinators/PIs and all are requested to follow that for improvement in future implementation of the projects activities. ED KGF emphasized strengthening of project monitoring; evaluation and reviewing the progresses to better guide the researchers in achieving their set objectives. The chief guest stressed the need for more attention on climate change research, haor agriculture, variety development and use of machinery in future agriculture research.

## Training on Monitoring and Evaluation for Evidence Based Decision Making

A six days long training program on **Monitoring and Evaluation for Evidence Based Decision Making** was organized by Krishi Gobeshona Foundation (KGF) and Bangladesh Evaluation Society (BES) during 26 to 31 January 2018 at BARC Complex, Farmgate, Dhaka. The objective of the training course was to update the participants' role on monitoring and evaluation of research program management and to assist them in evidence based decision making through result monitoring.

Mr. Mofizul Islam, Secretary, Implementation Monitoring and Evaluation Division (IMED), Planning Commission, Government of Bangladesh was present in the inaugural session as the Chief Guest and Professor Dr. Nazmul

Ahsan Kalimullah, BTFO, Vice Chancellor, Begum Rokeya University, Rangpur and Vice President of BES was present as Guest of Honour. Presided over by Dr. Wais Kabir, Executive Director, KGF, the opening session was attended among others by Mr. Md. Khalilur Rahman, Vice President of BES and Director-General, Prime Minister's Office, Government of Bangladesh as Special Guest.



Guests of the inaugural session of the M&E training program

The concluding ceremony of the training course was arranged at the Bangabandhu International Conference Centre, Dhaka where Professor Kamal Uddin Ahamed, Vice Chancellor, Sher-E-Bangla Agricultural University attended the ceremony among others. A total of fifteen (15) participants from KGF attended the training program and received course completion certificates during the closing ceremony.

## Training programs in the pipeline

Krishi Gobeshona Foundation (KGF) has planned to organize different training program under Capacity Enhancement Programs. Under technical assistance from Asia Farmer-to-Farmer Program, Winrock International, KGF has planned a training program on Capacity Development for Advanced Agricultural Research Methodology & Scientific Report Writing for the mid-level scientists from National Agricultural Research System (NARS) Institutions and public Universities of Bangladesh.

Foundation Training for the fresh scientists from NARS institutions will be organized at NATA Gazipur. KGF has approved fund for the four-month long foundation training

course and supposed to be held soon. Training Program on 'Intellectual Property Rights and Technology Commercialization in Agriculture' is another demand-led training for the scientists is planned to be organized by KGF. Trainers from home and abroad will provide trainings to the participants from the NARS institutions and likely to be held at BRAC CDM, Savar.

KGF is going to organize training on open source software R, a statistical tool used for scientific analysis. In collaboration with the ASICT Division of BARI, 300 scientists in 15 batches from different NARS institutions will be trained from KGF funding.

## KGF starts implementing new Research Projects

KGF Board has approved 28 research projects recently from the CGP 3rd call and out of them 26 projects have already been awarded to the respective Principal Investigators from different NARS institutions and Universities for a period of three years. Out of the awarded 26 projects, highest 14 projects fall under crop sector, 7 under livestock, 4 under fisheries and one research project under agro-forestry sector.

Competitive Grants Program (CGP) has been the main area of attraction to address location specific, demand driven, multi-disciplinary short to medium term research projects. CGP involves public and private sectors through open circular for calling proposals with major focus on on-farm applied and adaptive research to enhance production, create marketing, develop socio-economic conditions and investigate value addition and quality products.

KGF also designs and develops projects under Commission Research Program (CRP) with multi-disciplinary and multi-institutional research approach to minimize the multi-dimensional problems due to unfavorable ecosystems. CRP projects covers vast areas in Hill Tracts, Coastal areas, Haor (inundated as deep water body in rainy season) belts, charlands and drought prone north-western region. Recently, KGF has started financing a CRP project entitled 'Development of Upazila Land Suitability Assessment and Crop Zoning System of Bangladesh' CRP-V being implemented by BARC for a period of five years. The specific objectives of the projects are: (i) creating, updating and validation of land/crops suitability database as drivers of appropriate farming practices and sustainable socio-economic development in Bangladesh; (ii) development of online GIS based software for crop land suitability assessment.

KGF organizes short to medium term training programs as Capacity Enhancement Program (CEP) in relevant areas for capacity enhancement of scientists from NARS institutions, agricultural universities and private sectors, so that they can design appropriate researches to address agricultural problems and ensure necessary development. Under CEP, KGF has started a 'Skill Development Trainings program for the

Scientists, Field Vets, Livestock Workers and Poultry/Dairy Farmers'.

In addition, KGF explores the avenues for undertaking short to medium term collaborative programs through co-financing with Universities/Organizations of developed countries like ACIAR/CSIRO (Australia), NRI (UK), NUFIC (Netherlands), Cornell University (USA) etc. Collaboration with the international agencies has been found effective to upgrade quality of agricultural research and enhancing scientific capacity. Under International Collaborative Program, KGF has started two new projects on (i) 'Nutrient Management for Diversified Cropping in Bangladesh (NUMAN) and (ii) 'Incorporating Salt Tolerant Wheat and Pulses into Smallholder Farming Systems in Southern Bangladesh'. KGF has started establishing database centre for all the sub-sectors of agriculture including export and import for agricultural research & development. The data will be used for developing policy briefs and supporting relevant institutions/agencies that may help in formulating action plan/strategy. It can be mentioned that KGF is currently funding for a total of 67 (See Table below) different research projects on the thrust areas of agriculture and allied disciplines in collaboration with partner organizations.

### Current status of Research Projects under KGF funding

| SI #         | Project Type/<br>Nature             | # Project on-<br>going | # Project<br>Completed |
|--------------|-------------------------------------|------------------------|------------------------|
| 1            | Competitive Grants Program (CGP)    |                        |                        |
|              | - NATP Phase I                      | 0                      | 84                     |
|              | - CGP 1 <sup>st</sup> Call          | 0                      | 14                     |
|              | - CGP 2 <sup>nd</sup> Call          | 17                     | 2                      |
|              | - CGP 3 <sup>rd</sup> Call          | 26                     | 0                      |
| 2            | Basic Research                      | 8                      | 0                      |
| 3            | Commissioned Research Program (CRP) | 5                      | 0                      |
| 4            | Capacity Enhancement Program (CEP)  | 4                      | 0                      |
| 5            | International collaboration         | 3                      | 0                      |
| 6            | Pilot Project                       | 4                      | 18                     |
| <b>Total</b> |                                     | <b>67</b>              | <b>118</b>             |

## KGF Publications

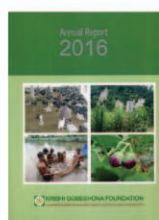
### KGF Newsletter



A half-yearly Newsletter contains information on technologies generated in the fields of crops, fisheries, forestry, livestock, etc., in Bangladesh and abroad. This is the mirror of the foundation. Its vol. 1, Issue 1, and 2 has been published.

KGF Reassessed Need based Programs on thrust areas in agriculture research and development for NARS Institutions.

### KGF Annual Report



The report containing information about KGF major functions and completed activities/programs of 2016 & 2016-2017 have been published.

### KGF Database

KGF has started establishing a database of all sub-sectors of agriculture productions including export, import figures over series of time period aimed to be used for agricultural research and development. The database will be used for developing policy briefs and supporting relevant institutions and agencies that may help in formulating action plans and strategies.

## KGF Website ([www.kgf.org.bd](http://www.kgf.org.bd))

The contents of the website have been updated on regular basis and improved the quality of the website.



## KGF Brochure

The newly designed brochure was published for the use of public to have ideas of KGF.

## Panel of Experts

KGF has prepared a panel of experts for reviewing/monitoring/evaluation of KGF research proposals with specific areas of expertise. The list contains the reviewer's name with full address including contact numbers and specializations from Bangladesh and abroad on crops, livestock, fisheries, forestry and agricultural economics etc.

## Field Visit

Dr. Wais Kabir, ED, KGF; Dr. Tapan Kumar Dey, Senior Program Specialist (Crops); Dr. Md. Hazrat Ali, Program Specialist (Field Crops); Dr. S. Ahmad, Program Specialist (Horticulture); Mohammad Nuruzzaman, Program Specialist (Fisheries) and Dr. Mohibul Hasan, Technical Editor visited hill districts and attended the workshop on CRP 1: Hill Agriculture Project during 26-30 October 2017.

Dr. Wais Kabir, ED, KGF visited IRRI, Los Banos, Philippines along with Begum Matia Chowdhury, Honourable Minister, Ministry of Agriculture, Government of Bangladesh on Rice Variety Improvement during 26-29 November 2017.

Dr. Md. Hazrat Ali, Program Specialist (Field Crops) visited the project on Farm productivity improvement in Haor Areas through integrated farming systems approach on 07 November 2017.

External Experts visited the project on intensification of Rice-cotton intercropping and jhum system in the Khagrachari, Bandarban and Rangamati on 12 November 2017

Dr. Kazi Kamaruddin, Program Director (L&F) and Mohammad Nuruzzaman, Program Specialist (Fisheries) visited Natore and

Sirajgonj during 9 - 11 December 2017 to visit the Project on 'Up-scaling of Community Enterprise Approach for intensification of floodplain fish production in Chalan Beel' project sites and attend Inception Workshop held at Natore.

Mohammad Nuruzzaman, Program Specialist (Fisheries) and Dr Habibur Rahman Khandaker, Monitoring Specialist, Coordination Cell paid a visit to the Project on 'Adaptation of Disease Management Strategy in the Existing Culture Practices of Shrimp through Aquamimicry System' project site at Munshigonj, Satkhira and visited Khulna and Bagerhat district from 2-4 February 2018.

Nasrin Akter, Communication Specialist visited to Chittagong Hill Districts and Cox's Bazar during January 07 to 11, 2018 to monitor and reporting the project activities in the region.

Dr. Wais Kabir, ED, KGF attended the training workshop Sher-E-Bangla Agricultural University as special guest of the project on production and utilization of white maize on 05 November 2017. He also attended a program in celebrating IDE's 35th anniversary program on 08 November 2017

## Conservation Agriculture deserve due attention by the farmers, extension providers and policy makers

Conservation Agriculture (CA) is a set of soil management practices that minimize the disruption of the soil's structure, composition and natural biodiversity. CA has proven potential to improve crop yields, while improving the long-term environmental and financial sustainability of farming.

CA encompasses three management objectives: eliminating or significantly reducing tillage to minimize soil disturbance; retaining crop residues on the soil surface; and encouraging economically viable crop rotations that best complement reduced tillage and crop residue retention. It is important to note that CA is not a fixed management system, but rather a set of principles that have demonstrated value across a wide range of agro-ecological regions. The precise ways that CA based management strategies are implemented as well as the advantages derived from these management innovations are

contingent on regional and site-specific cropping system characteristics. Benefits of CA based crop management often include as reduced production costs and labour and energy requirements; timely field operations and avoidance of terminal heat stress; improved soil quality and reduced erosion; enhanced rainfall infiltration and reduced evaporative losses; higher crop water productivity (kilogram of grain per cubic metre of water); more stable and higher crop yields under rainfed and lack of assured irrigation conditions; and many other environmental benefits.

CA based crop management can provide a buffering mechanism against many of the abiotic stresses that limit productivity in rainfed conditions, especially with respect to conserving and maximizing the productive use of water. For poorer farmers, there must be short-term payoffs from

investments in climate risk management since the cost of adaptation can erode the asset bases of vulnerable groups and increase insecurity. The strength of CA is that in many circumstances it can be profitably adopted by farmers with no regret because it reduces production costs and can stabilize and enhance crops yields against current climate risks as well as building resilience to future climate changes and variability. This should significantly reduce production risks posed by climate factors and labour shortages, thereby enabling a higher level of investments in inputs and management intensity that, in turn, would lead to sustained increases in yields and more secure livelihoods for resource-limited farmers. To be certain that farming systems as a whole benefits from any new

interventions, innovations like CA based crop management are most usefully viewed from an enterprise perspective. This perspective facilitates the identification of optimal allocation strategies for competing uses for resources (crop residues for livestock versus soil quality), thereby minimizing tradeoffs and building synergies across the entire farming system.

As a land scarce country, where every small piece of agricultural land is overused through chemical fertilizers, pesticides and extraction of ground water for irrigation, should seek adoption of CA based crop management to minimize erosion of soil quality to improve crop yield and better address the long-term sustainability of farming systems.

## Potential technologies identified during the 1<sup>st</sup> Decade of KGF

Scientific, Institutional and Social Impacts have been reflected positively as the consequence of implementation of KGF projects through on-farm and on-station trials and technologies generated thereof as part of the KGF funded projects carried out during the first decade (2008-2017). The potential technologies identified out of the KGF project during the period of first decade (2008-2017) are as follows:

1. Developed and released two high yielding garlic varieties: BAU Rashun-3 (8.6 mt/ha instead of traditional variety-7 ton) and BAU Rashun-4 (9 mt/h)
2. Rice-cotton intercropping with improved management practices as an alternative to traditional jhum farming in the Hills (Jhum income Tk. 10,000 per ha and rice cotton Tk. 70,000)
3. Pullorum vaccine for poultry against Salmonella Pullorum, a bacterial disease
4. Improved animal health service management practices and milk marketing method for the char areas of Rangpur and Jamalpur (Disease incidence rate reduced by 37%, Milk production increased 0.8 L/day/cow, Producer price of milk increased 37%)
5. Low cost milk replacer for calves to save the costly milk without affecting the health of calves
6. Cost effective complete feed formula for improving productive and reproductive performances of buffaloes
7. Yeast and Trichoderma based low cost feed for broiler using locally available feed resources
8. Package for controlling calf mortality in the cross bred dairy herd through addressing seven risk factors that influence the mortality in calves
9. Package for controlling and management of coconut mites
10. Improved management practices for the control of rhizome rot disease of Ginger (Seed treatment with Clorox against foot rot)
11. Improved management practices for the control of canker disease of citrus (By Sanitation, pruning older branches and treatment with chemicals: Sodium orthophenyl phenate (Sopp))
12. Shorter duration HYV BARI Sharisha-14/15 and their management practices for inclusion in between T. Aman-Fallow-Boro cropping pattern
13. Intensive cropping system (4 crops/year) with less irrigation water requiring crops for the N-W region of Bangladesh (Cropping Pattern: T. Aman-Potato/Mustard-Aus-Mug)
14. Integrated crop-fish production system using ditch-and-dyke method in tidal floodplain areas of Bangladesh
15. Shing fish (*Heteropneustes fossilis*) culture technology in the homestead/household ponds
16. Dry direct seeded boro rice system for improving crop productivity in areas with limited water supply
17. Resource conservation technologies (RCT) for improving productivity in the drought prone areas
18. Appropriate control measures for livestock diseases in Hilly areas
19. Cage culture system in Haor areas for enhancement of aquaculture
20. Sustainable management of flower and fruit dropping of mango
21. Package for treatment and control of pigeon diseases
22. BAU-broiler chicken (white and colored): The energy efficient, disease resistant broiler chicken with the taste of local poultry
23. Productivity Enhancement of Goor and Chewing type Sugarcane through management of Major Diseases in Non-mill Zones
24. Validation and Upscaling of Bee Keeping Practices for Improving Yield and Quality of Bee Products
25. Increasing storability of potato in natural storage and income generation through small scale processing of potato. BARI
26. Adaptation of improved Sesame varieties in Khulna District optimizing sowing time and Nitrogenous fertilizer management. Khulna University
27. Adaptation of Community Enterprise Approach in Tidal Floodplains for crop-fish culture - Jhalokathi Model. SHISUK
28. Upscaling of tricho-compost and tricho-leachate production for disease management in vegetable and spices (rhizome and bulb crops)
29. Scale up of Community Enterprise Approach (CEA) for Intensification of floodplain fish production in Chalan beel.
30. Adaptation of high yielding soybean in polder areas in Barguna and Patuakhali districts
31. Integrated management practices for the control of major diseases of Brinjal and Tomato (Seed, seed bed & soil treatment can save 40-45% yield reduction)

## Cage Culture System in Haor areas - A technology has got Potential for Haor Livelihood



Cages in Haor water

The KGF funded project on Production Enhancement of Aquaculture through Innovative Technologies in Cage Culture System in Haor areas of Karimganj, Kishoreganj was implemented by Bangladesh Agricultural University (BAU), Mymensingh in collaboration with Krishibid Fisheries Ltd. (KFL) and Organization for Rural Advancement (ORA). The main objectives of the project were to empower and develop skills of Ujandhanu Nadi Jolmohal fishery stakeholders on innovative floodplain aquaculture based on cage culture system and promoting business entrepreneurs of cage culture, improved fish handling and marketing, and up-scaling of technologies.

Mono-sex tilapia production in haor water cages has been found very profitable. Nursing and over-wintering of fries and fingerlings of tilapia, common carp, and Vietnamese Koi along with their cultures in cages under mono-culture and poly-culture system were also found profitable and sustainable. An innovative fry nursing and over-wintering technique was developed where fish fries were nursed in hapas set inside the cages due to the scarcity of ponds in the haor areas.

The growth of tilapia in cages in haor waters within a growing period of 4.5 months was found to be very significant and encouraging. The fish attained an average weight gain of 600g against the FCR of 1.1 in CP feed. It was the first published record of the highest growth performance so far in Bangladesh in tilapia cage culture venture. These new ventures showed a wider avenue of improved aquaculture system to raise fish in low-lying flood plains.

A new low-cost feed for Tilapia culture in cages was developed. The result showed that complete replacement of fish meal by DL-methionine, an amino acid gave very satisfactory growth of fish and reduced feed cost by Tk. 4 per kg. A number of entrepreneurs were developed at Mithamoin, Austogram, Nikly, and Tarakanda haor upozilas having the training on 'Haor cage culture and setting up of cages in haor areas' from the project. Several private entrepreneurs set new cages at different sites of haor and have been operating Tilapia cage culture profitably.

The new innovations have brought a tremendous change in the attitude, activities, and socio-economic condition of the haor people in Karimganj and nearby upazilas. Aquaculture was quite new in the region due to the scarcity of ponds and seasonality of water sheds. The cage culture has created an opportunity of fish production and thereby earning a livelihood of haor people in the lean period. Successful cage culture innovations created a complete aquaculture package for haor area with many forward and backward linkage opportunities viz., spawn/fry nursing and rearing, over-wintering of fry, fry transportation, fish handling, transportation and marketing, value-addition of fishery items, etc. Moreover, the endeavor was found as an environment friendly initiative as the use of floating feed technique did not allow any deposit at the bottom to cause pollution. Thus, the water environment remains clean and pollutant-free all along.

A drama highlighting the benefit of cage culture innovation in haor waters and a documentary film narrating the entire cage culture ventures were made and being telecasted in BTV regularly. Cages in Haor water

### Importance of the technology

A new low-cost feed for tilapia culture in cages was developed. The result showed that complete replacement of fish meal by DL-methionine gave very satisfactory growth of fish and reduced feed cost by Tk. 4 per kg. A number of entrepreneurs were developed at Mithamoin, Austogram, Nikly, and Tarakanda haor upazilas having the training on 'haor cage culture and setting up of cages in the haor' from the project. Several private entrepreneurs set new cages at different sites of haor and now have been profitably operating tilapia cage culture independently.

*(Few more potential technologies to be published in the next issue)*



Cage culture of fish at Haor water at Karimganj

### Krishi Gobeshona Foundation (KGF)

Established 2007 [Company Act, Reg. No. C-684(05)07]

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