Extension Approaches of Extension Service Providers in Bangladesh

INTEGRATED FARM MANAGEMENT COMPONENT (IFMC)
DEPARTMENT OF AGRICULTURAL EXTENSION
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Contents

Background

The national dialogue on farmer centred participatory extension approaches will take its point of departure in the FFS approach but will have a wider perspective in terms of farmer-centred extension approaches. The establishment of a national platform for exchange of experiences will enable the IFMC to benefit from and share lessons learned and practises of other components of AGEP as well as other projects of DAE and other extension actors in the country.

The idea of developing a platform where various progress extension actors can meet and exchange ideas is to systematically strengthen linkage in the field of agricultural extension through close and frequent collaboration between all actors be they public sector, NGOs or private sector. The establishment of a national platform for exchange of experiences will enable the IFMC to benefit from and share lessons learned and practices of other components of AGEP as well as other projects of DAE and other extension actors in the country. Strengthening of the national dialogue on farmer centered extension approaches will be led by DAE. Through structured discussions among all major extension providers, including but not limited to DAE, DOF, DLS, various projects implemented by these organizations, larger NGOs, development partners and private sector companies, a common understanding of different approaches as well as of activities being implemented by the players in the national agricultural extension system will be made .

- The platform will encourage actors to exchange experiences both from long term activities and from pilot activities, discuss ideas, consider opportunities for collaboration and ways to avoid duplication and find synergies in current and future projects and activities. Sharing outcomes of evaluations and studies of ongoing activities will also be encouraged through the platform.
- By the end of project we will develop “Best practice guidelines” for group extension methodologies in Bangladesh in a useful format for the use of all partners and future participants in agricultural extension in Bangladesh.

For achieving this activities under output-3 of IFMC project document, the project has been facilitating to form a National Platform of Extension Actors in Bangladesh.

Formation of Bangladesh Agricultural Extension Network (BAEN)

During 2010 Global Forum for Rural Advisory Services (GFRAS) was established. On 14-15 January, 2014, Agricultural Extension in South Asia (AESA) as a part of GFRAS organized a meeting at Katmandu, Nepal for "Strengthening Extension and Advisory Services in south Asia". A total of 29 participants from seven South Asian countries including Bangladesh, Bhutan, Maldives, Nepal,Pakistan, Srilanka and India attended in this meeting. Kbd. Md. Himidur Rahman, the then Project Director of Second Crop Diversification project (SCDP) under DAE was selected as the Country Representative of Bangladesh. Accordingly, Dr. Rasheed Sulaiman, Chairman, GFRAS and Focal Point of AESA requested Kbd. Md. Hamidur Rahman through Ministry of Agriculture, Bangladesh to lead the establishment of a country forum in Bangladesh. On 01 September, 2014 SCDP with technical collaboration from AESA organized a one day meeting on "Agricultural Extension in Bangladesh" at BARC. A total of 75 participants from various Departments of Bangladesh involved with agricultural extension and advisory services attended in this meeting. The meeting was decided to form an extension network in the name of "Bangladesh Extension Network (BENet). An Ad-hoc Executive Committee of BENet was formed consisting of 18 Members. On 23 September, 2014, Ad-hoc Executive Committee meeting of BENet was held at SCDP-DAE Conference room Chaired by Prof. Dr. M. Abul Kashem, BAU, Mymensingh. A sub-committee was formed headed by Prof. Dr. Md. Sekender Ali of SAU, Dhaka for preparing the constitution of BENet. On 12 February, 2015, A seminar was organized by Integrated Farm Management Component (IFMC) of DAE to Create a National Platform for Extension Actors (NPEA) in Bangladesh and a Working Committee was formed headed by Director Field Service wing, DAE. On 12 July, 2015 A working committee meeting of NPEA was held and decided to work with BE-net and form a sub committee to develop a ToR for NPEA and BE-net. On 26 July, 2015 NPEA-BEnet sub-committee meeting proposed a draft ToR. On 16 September, 2015 A joint meeting of NPEA and BE-net working committee representatives was held and decided to work together with a new name Bangladesh Agricultural Extension Network (BAEN). The meeting formed a 7-member sub-committee headed by Prof. Dr. Md. Sekender Ali of SAU, to make a draft bylaw for the new organization and finalize work plan of BAEN for 2016.On 01 & 20 October, 2015 Two meetings of Draft bylaw preparation sub-committee were held and committee proposed a draft bylaw for Bangladesh Agricultural Extension Network (BAEN). On 3 November, 2015 Second joint meeting of NPEA and

BE-net executive committee was held and discussed with draft bylaws of BAEN. On 29 November, 2015 Meeting of bylaw preparation sub-committee was held and the subcommittee corrected draft bylaws of BAEN. On 15 December, 2015 Third joint meeting of NPEA and BE-net executive committee was held. The meeting approved the bylaws of BAEN, formed the first executive committee headed by Kbd. Md. Hamidur Rahman, DG, DAE and finalize work plan of BAEN for 2016.

VISION of BAEN:

Extension services for sustainable agricultural productivity

MISSION of BAEN:

Sustainable growth in agricultural productivity through identification, documentation and dissemination of good agricultural practices and extension approaches for environment friendly socio-economic growth in Bangladesh.

OBJECTIVES of BAEN:

- Identifying, documenting and disseminating good practices of extension approaches. Developing innovation in extension approaches
- Strengthening capacity of the extension professional.Supporting research for socio-eco-friendly sustainable agricultural productivity.
- Promoting awareness, knowledge sharing and networking for building effective and efficient extension and advisory services .nationally, regionally and globally

FUNCTIONS of BAEN

- Acting as a national platform for agricultural extension actors for coordination and exchange of knowledge and information
- Contributing in development, reform and advocacy on National Agricultural Extension policy
- Identifying and disseminating climate smart agricultural technologies Rewarding for good agricultural practices and extension approach
- Identification of potential stakeholders of agricultural extension
- Establishment of collaboration among all agricultural actors of private and public sectors
- Sharing of ideas by arranging national seminars, extension day/extension fair, symposium, workshop, training etc. For presenting the good agricultural

practices and extension approaches and developing a common action plan for way forward

- Joint activities including visits to field implementation and presentation on agricultural practices and extension approaches
- Facilitating in common understanding of different agricultural practices and extension approaches
- Development of common presentation format and set evaluation criteria of good agricultural practices and extension approaches
- Development and documentation of Manual/Guideline for Good Agricultural Practices
- Focusing on institutional development for the producer/farmers group and explore the way of linking them with extension platform
- Developing directory of agricultural extension and advisory service providers

OBJECTIVE OF THIS GUIDE BOOK PREPARATION

- To documented good extension approaches of different extension service providing organization working in Bangladesh.
- To fulfils the project output-3 requirement to develop a '**Best Practice Guideline'** for group extension methodology in Bangladesh.

MEHODOLOGY:

For Identifying, documenting and disseminating good agricultural extension approaches BAEN has conducted several presentation workshop followed by field visit. This guide book is a compilation of presented approaches of different extension service providing organizations. BAEN invited to all member/non-member Government, NGO, International Organization extension organization covering crop .livestock and fishes to submit their good practices of extension 4 times. BAEN Organize 4 presentation workshop with the help of IFMC and about 37 organization/project presented their approaches as following format.

Presentation format of Good practices in Extension

-Name of the Organization

-Mission and vision of the Organization

-Name of Projects/Program (goal and specific objectives)

-Major extension methodology or pilot activities - may be in the area of application of ICTs in extension, ways of reaching women effectively , linking farmers to markets, capacity development of farmer and extension workers, role of farmer organizations, addressing nutrition through extension, adaptation to climate change etc.

-List of good practices(crops/ livestock/ fisheries)

-Why is the approach considered a good practice

-Number of groups/ beneficiaries involved with good practices

-Timeline of the activities

-Supportive study/Survey/FGD and key findings

-Adoption status

-Constraints and limitation

-Extension opportunities

-Linkage and collaboration

-Experience and lesson learnt (in terms of sustainability)

-Remarks/recommendation (if any)

After presentation BAEN organize joint field visit with respective presenting organization to observe the approaches in the field. During field visit following points was consider and conduct FGD with respective project beneficiaries.

Points were considered during Field Visit

1. Appropriateness of the approach in line with objectives/ mandate/intervention
2. Sustainability
3. Capacity development strategy
4. Way of dissemination /dissemination process
5. Market linkage approach/Market development facilities
6. Climate smartness
7. Mainstreaming of gender issues
8. Linkages and partnership with the concern stakeholders
9. Scaling up of success
10. Identification of challenges of the system

Integrated Farm Management Farmers Field School – increasing agricultural incomes through maximizing resource utilization

Approaches:
-Farmer Field School (FFS)
-Farmers organization and Market linkage

Department of Agricultural Extension (DAE) is the department of the Ministry of Agriculture which provides extension services to all farmers. The core functions of DAE include increasing agricultural productivity, human resource development and technology transfer. DAE has contributed significantly to crop production and played an important role in the country's quest for sufficiency in food.

DAEs mission is to provide efficient and effective needs-based extension services to all categories of farmers, to enable them to optimize their use of resources, in order to promote sustainable agricultural and socio-economic development.

Integrated Farm Management Component (IFMC) is a DAE project supported by the Government of Denmark. The project aims to increased agricultural production of landless, marginal and small farming households. It is the largest component of the Agricultural Growth and Employment Programme (AGEP), financed by a grant from the Government of Denmark with GOB financing 30% of IFMC's budget. IFMC started from July 2013 and will continue to at least June 2018. There are expectations of a one year no-cost extension due to delays in start up of implementation during the first year.

The development objective of IFMC is pro-poor, inclusive and sustainable growth and employment creation and the specific objectives are

1. Female and male farmers have been empowered and increased number of total farm activities and diversification adopting IFM FFS promoted technologies and management practices
2. Female and male farmers have been empowered in Farmer Organization formation and linked to service providers, market actors and micro-finance organizations to increase farm profitability
3. National meeting/seminar organized to discuss farmer-centered extension approaches

Farmer Field School (FFS) on Integrated Farm Management

The impetus for a new and holistic Farmer's Field School (FFS) on Integrated Farm Management (IFM) emerged from the success of earlier FFSs on Integrated Pest Management (IPM) and Integrated Crop Management (ICM). The IFM FFS builds on the synergies within the farm household and the farming system with the aim of improving productivity, encouraging diversification, building capacity and encouraging the adoption of appropriate technologies.

The IFM FFS curriculum is designed following the basic concept of FFS experiential learning or "Learning by Doing." A regional approach is followed allowing for adaptation of the curriculum to local conditions including market opportunities and challenges

arising such as those of climate change. IFM FFS includes a menu of nine modules which are offered based on the needs of farmer groups. The modules include a preparatory module, rice module, homestead vegetable gardening poultry rearing module, small ruminant module, cattle rearing module (milk or meat), fish cultivation nutrition and farmer organization and social issues module.

IFMC is implement a total of 20,000 IFM FFS. The FFS are facilitated by trained Farmer Facilitators selected from amongst FFS graduates with monitoring and backstopping by DAE and project officers. Each FFS concludes with a field day to share lessons with local communities. Twice per year review and planning workshops are held with all facilitators to allow for an opportunity to learn lessons and adjust implementation accordingly.

IFMC operates in 373 upazilas covering around 3000 unions. Areas with high levels of poverty or vulnerability to climate changes and other natural calamities are given preference in selecting the FFS sites. IFM FFS participants are farmers with 0-2.49 acres cultivable land and resources such as homestead, pond, cattle, small ruminants and poultry. Farmers of poorer households and functional female headed households get preference in selecting participants for FFS.

The duration of an FFS depends on the number of module selected by the participants but there are two FFS seasons each year, with one in each cropping season. On average there are two sessions per week for the period of the FFS.

Each IFM FFS is facilitated by a pair of Farmer Facilitators (FF), selected from amongst promising and enthusiastic IFM FFS participants. After selection they undergo a Training of Trainers course and later, after they begin implementing FFS they receiving further training through two short courses called Season Long Learning (SLL) sessions. This ensure FFs get a chance to ask questions and get help in addressing issues as they arise during implementation, as well as making learning a large amount of new material more manageable. Like FFS, the ToT and Season Long Learning are practical and participatory.

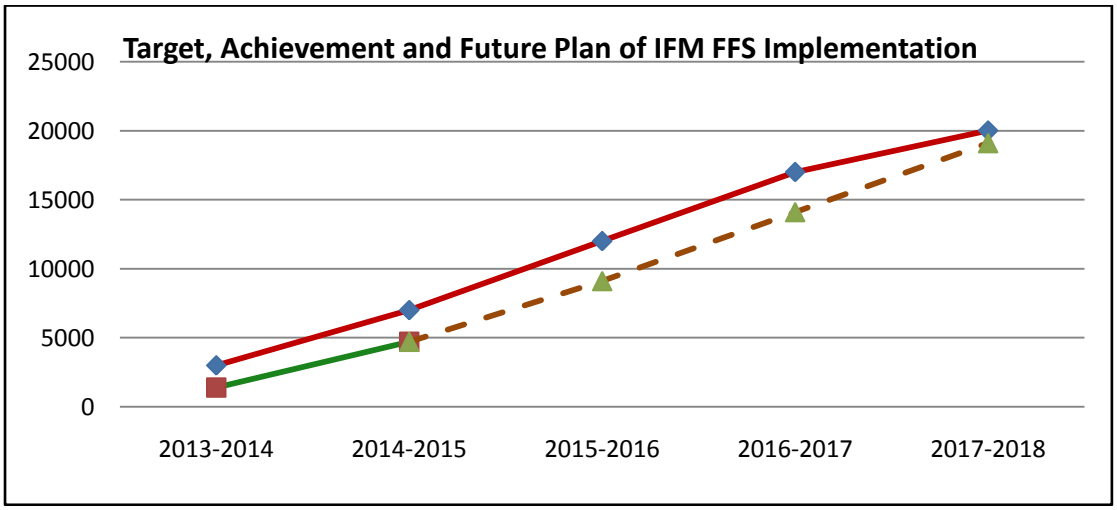
Quality control of implementation is ensured through monitoring of each FFS by union, upazila, and district officers of DAE as well as officers of Departments of livestock and fisheries. All the involved officers are given orientation on IFM FFS monitoring and backstopping.
At the end of each FSS, the participants organize a field day to share their new knowledge with the neighboring farmers. Learning booths are prepared and FFS graduates present the FFS topics to the visitors giving an opportunity to share technologies and ideas as well as to reinforce the topics learnt.

FFS Group

Field observation

Trials in IFM FFS

The five year program aims to implementation of 20,000 FFS training 1,000,000 farmers on crops, livestock and fisheries and working with over 1000 farmer's organization on market linkage. IFMC establish 6956 FFS during the 2013-2016 in 373 upazilas of 61 districts under 6 IFMC regions.



External evaluation of FFS approach

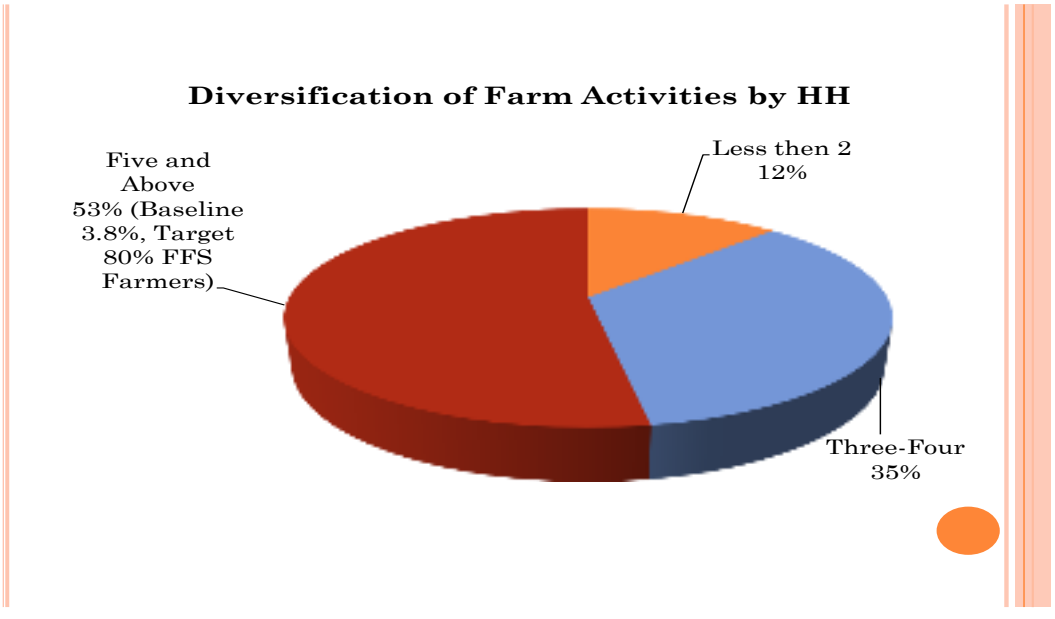
An extensive, external evaluation of FFS in the earlier Danida funded ASPS II program was carried out in 2011 and this evaluation found that FFS is a cost-effective approach to agricultural extension with the potential to have significant impact on the livelihood of poor rural households. The evaluation showed that the average annual income within

households that has participated in an FFS has increased significantly more than in control village households, providing a clear indication that FFS investments generate growth in income at the household level. The evaluation also showed that there is a strong production diversification effect from FFS. The evaluation recommended that development interventions aiming at stimulating growth and employment within the agricultural sector should target small-scale farmers as well as hard-core poor and marginalized farmers as core FFS members. Thus, the IFMC builds upon the positive results of previous project and continues to follow the FFS learning approach. The FFS evaluation showed that the FFS methodology, being a demand led, farmer centered participatory approach is an effective way to reach positive results.

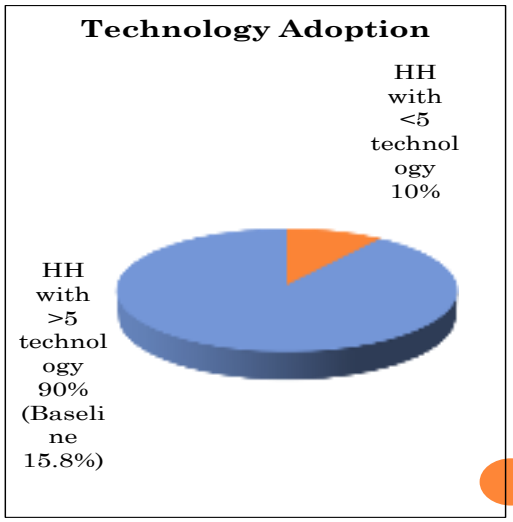
Findings on result monitoring showed that IFM FFS increases in diversification of farm activities and through improve technologies adoption by trained farmer.

Module wise training received and practices (some of the technologies) in the farm by HH

Name of Module	Nos. of farmers received training	Practice in their own farm	
	HH	HH	%
Rice Cultivation	90	77	86
Homestead Gardening (Vegt.)	152	136	89
Homestead Gardening (Fruit)	149	138	93
Poultry Rearing	150	119	79
Cow/Buffalos Rearing	118	79	67
Goat Rearing	41	32	78
Fish Culture	101	78	77



IFM Technology Adoption by Module		
Name of Module	Total Nos. of technology	Avg. Nos. of adopted Technology
Rice Cultivation	5	3
Homestead Gardening	5	4
Poultry Rearing	5	3
Cow/Buffalos Rearing	5	2
Goat Rearing	5	2
Fish Culture	5	2



Constraints and limitation

- Less Follow up leads less adoption technology
- Men participation minimum rather then women in landless farmers group
- Vaccine supply not regular & Vaccination is difficult by FFS members when needed
- FF skills are not up to the mark in some cases. (only 26 days crash course is not enough to conduct such activities)

Extension opportunities

- Scope of Improved technology dissemination & adoption by the IFM farmers
- Use of family labor maximization
- Reduce malnutrition-food intake diversification
- HH income generates
- HH production increase
- Diversified utilization of Household assets
- Woman are able to speak publicly
- Alternative earning source creation
- Develop the skills on farm management analysis
- Control over the earning money/assets

Experience and lesson learnt (in terms of sustainability)

-IFM FFS increases utilization of the unused homestead resources.
-Farm resources utilization minimize the production cost and thus gives more profit to the farmers.
-IFM FFS increases farmers analytical & problem solving capacity.
-IFM FFS creates opportunity of employment for the farmers family members with productive activities within the home, especially benefiting women and child.
-IFM FFS gives diversified opportunity of learning of farmers own choice.
-Compared to earlier FFS (ICM/IPM) IFM FFS give more opportunity to involve women in FFS.
-IFM FFS is popular with women especially livestock and homestead activities, and women's participation is high.

Farmer Organizations and Marketing 'Larger Volumes – Better Prices'

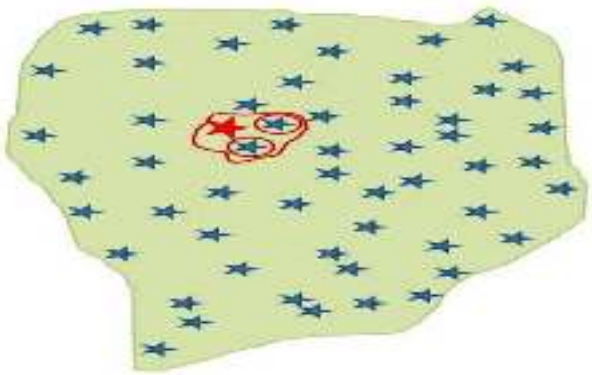
Before: Selling milk individually
After: Farmers bring milk to collector. Collector brings to buyer. Buyer is a sweetshop owner who makes sweets

How do we get there

- Build capacity of IFMC staff and DAE
- 10-day training of Business Focal Person(BFPs)
- Producer groups
- Early business start-up
- Gender reform
- Inaugural workshop in Upazila
- 8 sessions at FO level
- Collective marketing

Type of FOs: Small village groups, constituted, bylaws, Enthusiasm for collective marketing, Accountable management, FOs with women in Executive Committee, Existing IPM and ICM clubs and New IFM FFS groups

Cluster approach



- Opportunities of forming networks and larger production units. Larger scale business.
- Saving human and financial resources.

Process

- Selection of FO - criteria and procedure.
- Selection of BFPs - criteria and test by DAE.
- Training of BFPs: 10 days MLT
- Training of DAE : 1) SAAO-SAPPO 5-days, 2) UAO-AEO 3-days
- Dissemination meeting by BFP, possibly gender reform

- Producer group formation, possibly pilot FO business
- Inaugural workshop at Upazila level, signing MoU, linkages.
- FO-level training: 8 sessions by BFPs, max 35 FO-members.
- Meeting with output traders

Business Focal Person (BFP): 2M & 2F BFPs trained per FO. BFP is a person with available time and interest to organize collection points and collective marketing.BFPs have some education, business background and facilitation skills, if possible all.25-35% of BFPs also hold leadership positions in their FOs.

Curricula Development
Business Focal Person (BFP) training curriculum, 10-days,DAE Official training (5-days, 3-days, 2-days),BFP Handbook and Implementation Manual (Tool Box)

Market Linkage Training

1. Farming-as-a-Business, Markets, Business, Agriculture Marketing, Risks
2. Gender Roles and Challenges in Household, Marketing and Business
3. Market Analysis, Price Setting, Fluctuations, Cyclical Trends, Negotiation Skills
4. Collective Marketing, Collection Points, Business Models, Collectors, Aggregators, Producer Groups, Commodity Calendars
5. Market-Oriented Production Planning
6. Value Addition, Post-Harvest Handling, Grading, Sorting
7. Business Planning, Book Keeping
8. Market Linkage, Market Visits, Network, One-on-One, Inventory
9. FO Good Governance, Transparency, Accountability, Members' Civic Rights
10. Facilitation Skills, Teaching Adults, Participatory Learning

Role of DAE in implementation: Endorsement, leadership, support. Implementation through DAE Upazila offices, Selection of potential FOs and BFPs, Support all FO-level training, Advise on high value crop / market demand / crop production, Support reform of FO Executive Committees, gender, Support good governance in FOs, Conduct need-based training.

Process continued
Business plan, commodity calendar, producers groups ,production plan,Market linkage tour / exchange visit, Linkage and follow-up workshop at Upazila level,FO collective marketing starts at FO collection point,1-day training needs assessment workshop at district or regional level (R&P workshop),Mentoring and follow-up visits at FO by DAE and IFMC and Need-based trainings according to business type and needs.

Training of FO leaders
FO vision development, The FO as a marketing organization, How leaders mobilize for collective marketing, Roles and responsibilities of executive committee members and BFPs, Good governance, Book keeping, Transparency and accountability and Gender

Collective Marketing in practices
FO (**Dikshail Iswardi**) formed 3 producer groups with each 35 female farmers. One female was selected as commission agent. She works 2 h/week for 100 Tk. To increase income she also started as chicken vaccinator. She serves FO members and others. The cashier made the market link, not yet commission. Extra surplus went into FO capital.

Profit Sharing in practice
FO(Matikura, Bogra)started bulking and selling to wholesale trader in Dhaka. Sorting,Packaging in crates provided by trader. Traders lorry picks up and bring it to Dhaka. Farmers get higher prices. Farmers pay a small commission fee to FO per crate. Lately they have formed cluster with 2 nearby FOs. Also linked to tomato paste producer.

Better prices
Char Hujuri FO in Feni used to get Tk. 4-5 per pumpkin. Pumpkin buyers at Feni Market had created a syndicate. Many times farmers sold pumpkins as cow feed or let it to rot, The FO started bulking and established link to Noakhali Bazaar, Now they sell to a Noakhali trader for Tk 12-15 per pumpkin.

Gender and marketing
Mainstreaming in numbers and training subjects. Women in FO Executive Committees (Chair, Secretary, Cashier),Real influence tool, Female focused FOs and female focused FO business, Business where females hold cash after selling.50% of females in BFP trainings (quota).Gender equity (day leaders only women, women up front).Role models (business women and female FO leaders).'Gendered spaces' where women can access resources, engage in dialogue, gain self-confidence, without conflict or discouragement. Building capacity of female DAE and IFMC staff. Annual gender awards in different categories

Successes: Training of BFPs and training at FO-level by BFPs mobilize FO-members and make them buy-in to the concept of collective marketing.70-90% of FOs begin organizing producer groups, collection points and collective marketing. Producers in many places get slightly better prices. Some trader syndicates have been broken. Female producers get cash in hand at the collection points. Females are engaged in book keeping and collective marketing at collection points. FOs have at least on female in one vital leadership position
Challenges: Identifying and selecting potential FOs.FO book keeping, especially accounting. Scaling up number of producers. Scaling up volumes. Females getting real influence

Good Practices in Extension- Experience of Local Agri-business Network (LAN) of Katalyst

Approaches:
- Local Agri-business Network (LAN)
- Public Private Initiative (PPI)

1. *Name of Organization*: Katalyst.

The Agri-business for Trade Competitiveness Project (ATC-P), branded as Katalyst, is a leading market development project which aims to increase the income of poor women and men in rural areas of Bangladesh. It has been contributing to positive systemic changes in selected agricultural sectors since 2002 by facilitating changes in service, improving access to public and private extension services, information, inputs and output markets and, in general, an increasing involvement of the private sector. Phase 3 was designed based on the experience of Phase 1 and 2 and the implementation of Phase 3 started in March 2014.

2. *Mission and vision of Katalyst*: *"*Katalyst consolidates a practical approach proven to increase rural incomes for more than a million poor men and women on a continuous basis"

3. *Name of Project:* *Local Agri-business Network (LAN).* A common pattern noticed in developing country's extension process is that government resources have limitattions, and extension services are supported by external funding (particularly grants or NGO/development agency executed programmes) tends to last as long as the project duration. But this raises the question of sustainability in the long run. Rather than ask "how do we get more funding into extension?" or "how can we redress public sector financing issues?" to expand outreach, Katalyst instead assessed how the use of existing resources might be made more efficient and effective. Based on this the model of LAN emerged. The primary goal of LAN is to create a complementary channel for the public extension services to reach the farmers more efficiently. The vision of LAN is : "Networks between upazila traders associations and farmer groups is strengthened and used by public and private sectors as a complementary mechanism to reach more farmers"

4. Major extension methodology: According to the extension manual of DAE, there are different types of extension processes. These include extension through mass media like television, extension through local means such as street drama, agricultural fairs, group based extension like field days and discussion, formal training of farmers via farmers field school and demonstration. Executing all these activities exclusively by the government extension agencies can be quite challenging. This is because government resources have limits, and extension services supported external funding (particularly grants or NGO/development agency executed programmes) tends to last as long as the project duration. This prompted LAN to think about the issues related with how to get more resources into extension to expand outreach. The primary focus of LAN is to create a complementary channel for the public extension services to reach the farmers more efficiently. To do this LAN focues on two key approaches: A) Formation of Trader Association-Farmer Group Network and B) Formation of Public Private Initiatives.

a. **Formation of Trader Association-farmer Group Network:**

LAN looked for appropriate actors having the right incentive and position to create better access to extension services for the farmers. It was identified that traders relevant to agriculture at upazila level usually have stable relations with the local government extension offices and they also have good levels of interaction with farmers to whom they either supply, or buy from. Usually, these traders are organized into associations for solving their common problems. To address this, LAN focused on complementing the existing extension system.

The first step taken by LAN is to identify suitable trader association based on whether there is sector specific trader association consisting of agriculture related traders. If not, whether there is a general bazar specific trader association consisting of traders who are either agricultural input sellers or purchasers of agricultural outputs. After that a *Rapport Building* process is conducted to help them understand the objectives of LAN and identify if they are willing to work with LAN. Once the traders agree to work with LAN, a *Vision Sharing Workshop* is held for the TA members where the idea of LAN and the PPI model are explained, experiences of previous cases are shared, and general consent taken from the traders to work with LAN.In the meantime, upazila extension officers are communicated and necessary resources are shared with them to give them an idea about LAN. If necessary, district officers are consulted as well. After that, the Upazila Launching ceremony takes place where both the TA members and the upazila extension officers remain present. During this event an MoU is signed between the trader association and the LAN program with the government officials as witness. After this the members of the trader associations are taken to upazilas where LAN has worked previously to show them firsthand how it works.

In the next step a surveyor is employed by the trader association who collects the information about the existing farmer groups in the region from the local government offices and shares it with the association. After this, the farmer groups are invited for an induction workshop where the representatives of interested farmer groups fill out a form and get inducted under the trader association. During this event, a need assessment is done where the farmer groups raise areas of challenges. In order to address such large number of farmer groups, the trader association members are trained on multiple areas to improve their capacity (details in section 8).

An important note to be mentioned here is that the LAN program engages with the trader association based on a “deal”. The deal is that the LAN program will support the Trader Association with necessary training and support IF they induct and continue to induct farmer groups under their umbrella and support them with arranging training and relevant agriculture related information.

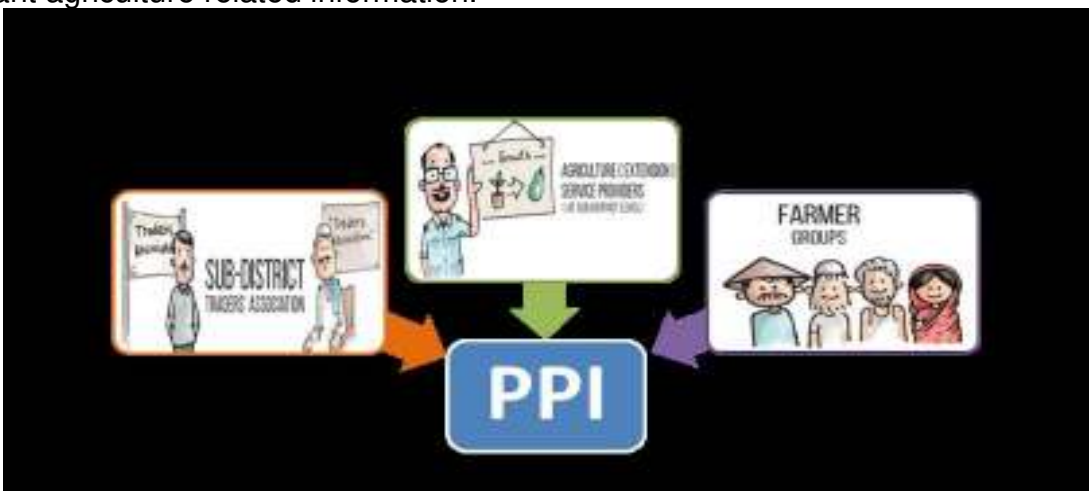


Fig: 1 Overview of PPI

b. *Formation of Public Private Initiative:*

Although progress was visible, the model of trader association and farmer group network was still somewhat of a supplementary measure in sub-districts where conventional practices remained prevalent. LAN needed to build in more space for farmers to set their own learning and information needs agendas so these could inform government planning practices and make better use of the time extension officers would otherwise spend answering individual queries. This meant to make this relationship more *formalized and recognized* by all the relevant stakeholders. Looking to build upon their improvements to extension, LAN sought to expand the model introduced further with a greater focus on the identification of farmers information needs spanning a whole production season, and, with it, the institutionalizing of routine interactions between nominated farmer group representatives and those able to best advise them. From this, the concept of the "public-private initiative" (PPI) was developed and piloted.

The LAN model has been accepted largely at the local level, especially the concept of Public Private Initiative. This is because the National Agriculture Policy (2013) reflects the need of forming partnerships at local level (Ref: Section 5.4, National Agriculture Policy 2013). Also section 1.7 of Agricultural Extension Manual of The Department of Agricultural Extension stresses on the need of forming partnerships between government and private stakeholders. A wider acceptance of LAN is thus supported by the presence of the policies. These policies encouraged LAN to explore further on establishing effective partnerships between the public and the private sector.

The objective of the PPIs were to bring together nominated farmer group representatives, their association committee counterparts, and a public extension officer to jointly identify the nature of support needed and plan for the delivery of timely solutions before and throughout the growing season as necessary. LAN provided training to educate the aforementioned stakeholders as to how PPIs could provide a more supportive delivery model for the knowledge requirements farmers were demanding, and advising how such initiatives could be set-up and managed. This overall activity between all the stakeholders was done with the help of an MoU between the representatives of the public and the private sector.

Till date approximately 1900 events have taken place through LAN program, especially via PPI. Some of the instances of PPI activities done with the partnership of the extension department's knowledge and skills supported by sponsoring of private sector include printing of leaflets for farmers, addressing urgent issues in agriculture such as how to address problems of brown grass hoppers, managing blast disease in rice cultivation and improved management of onion cultivation. There are several instances of training initiated by the help of the local private sector. Also it has been noted that national private sector companies like ACI, Bayer Agrocorp and Haychem is partnering with the PPI committees in different regions to sponsor trainings which is arranged by the public extension departments. So far more than 50,000 such leaflets have been printed which has helped farmers to gain access to valuable information on agricultural practices and these have been done by the help of the private as well as the government extension departments.

5. *List of good practices*:

a. Demand driven extension.

b. Need based planning.

c. Linking farmers with mainstream markets.

d. Utilizing private sector resources for extension.

e. Immediate crisis management.

f. Integration of gender into extension.

6. *Why is this approach considered a good practice*:

a. Helps implement the national policy related with Public Private Partnership.

b. Provides necessary opportunity for resource sharing by private sector and technical knowledge of the public extension agencies

c. Reduced extension officer burdens as there is no need for restructuring government extension plan.

d. Increased market linkage for the farmers.

e. Increased knowledge of the farmers about market demand.

Experience of Baly Begum working with a Trader Association

"I now have my own vermi compost business and this season I have earned a profit of BDT 5,600 from selling my compost and the vegetables grown with my compost" said Baly Begum a 32 year old female farmer, from Bhangura Upazilla of Pabna. She and her husband have been producing vegetables in traditional way where application of inputs and methods are shaped by personal experience. Though they were able to make some earning from vegetable but it was not good enough for them. She reasoned, "We cultivated vegetable with whatever knowledge we had." On April 2015, Baly Begum and her samity members were introduced to the Traders Association and soon after that, through PPI committee they received training on modern cultivation techniques of vegetables and the processing vermi compost fertilizer. She is now producing compost fertilizer on a commercial scale and with the help of the trader association. She is also able to sell the fertilizer at market price. "We are now earning sufficient to send our children to school and ensure better food for them" says Baly Begum.

7**. *Number of Groups involved with this good practice*:** 294 Trader Association and 12,654 farmer groups. Farmers Access to LAN: 476,938

8. Time line of activities:

The activities implemented under LAN followed sequenced multiple steps in five regions. These regions include districts around Barisal, Comilla, Dinajpur, Kushtia and

Mymensingh. However, they were implemented during different timelines. The steps undertaken under LAN are outlined below:

a. Suitable Traders Association (TA) is selected based on the selection criterion based on

b. Rapport building process is conducted to make them willing to work with LAN

c. Once the traders agree to work with LAN, a Vision Sharing Workshop is held for the TA members.

d. Parallel to the above activities, upazila extension officers are communicated and necessary resources are shared with them to give them an idea about LAN. If necessary, district officers are consulted as well.

e. After that, the "Upazila Launching Ceremony" takes place where both the TA members and the upazila extension officers remain present.

f. After these activities, the TA appoints a surveyor for mapping the Farmers' Groups.

g. Once the suitable FGs are identified, the Samity (Farmers' Group) Induction Workshop is organized.

h. In order to increase the capacity of the TAs to perform their new roles, they are trained on several issues which include:

i. Organizational Management: The objective of this training is to increase the capacity of the TA to manage large number of farmer groups and maintain a list of the farmers

ii. Information Management: The objective of this training is to help the trader associations to manage large number of data generated from the induction of the farmer groups.

iii. Advocacy: This training helps the Trader Association to present the needs of the farmers to the relevant extension officials in an official manner rather than on an ad-hoc basis.

iv. Gender: This training sensitizes the trader associations to realize the importance of participation of women in agriculture workforce.

v. Media relations: This training enables the trader associations to maintain a close relationship with the journalists and helps them to bring critical agricultural issues in the knowledge of the media.

vi. Public-Private Partnership: This is the final and the most important training provided. This training informs the trader association members about the fundamentals of how to partner with the government counterparts and how they can share resources with the extension departments for better planning. This training, also received by the extension officials, helps to build the trust between the trader association and the government extension department.

i. LAN also organizes training for district level extension officers who will later facilitate the training the upazila extension officers on Public Private Partnership.

j. After that, upazila level extension officers are trained on the PPP concept.

k. During these training, upazila officers prepare an Action Plan for his or her respective sector and respective upazila

l. The Action Plan is shared with the respective TAs, and based on this action plan, sector specific PPI committees are formed.

9. Supportive Study, Survey and Documents:

a. Impact Assessment Reports (Independent Third party)

b. Sense maker Study (Independent third party),c. Task Force Report on the Improving Local Government Services (previous name of LAN).

10. ***Adoption Status***: LAN has taken several steps to ensure smooth adoption and anchoring of the lesson learnt. For instance to anchor the experiences of LAN within the planning wing of the extension departments, a training is currently planned. This would be helpful for including the learning in future Government projects. To ensure that the learning of this model is properly handed over to the relevant stakeholders, LAN is working closely with the Agriculture Training Institutes. Under this activity, the concept of PPI has already been included in the syllabus with the support of Bangladesh Technical Education Board. Another ongoing activity is to incorporate the learning within the Agriculture Extension Manual of The Department of Agricultural Extension.

11. ***Linkage and Collaboration***: LAN has potential to share the experiences with the current government projects. At present the Integrated Farm Management Component (IFMC) program is closely working with LAN. Some of the major activities done include training the Farmer Business School under the IFMC program. Apart from that, LAN trader associations have inducted farmer groups formed under the IFMC program in areas which are common for both. LAN has also contributed in developing the training module of the Farmer Business School.

Apart from that LAN has potential to share its learning with other government projects such as SCDP and NATP.
In order to promote LAN among the relevant stakeholders, the following events were conducted:

a. National Launching Workshop (April 2014)

b. Regional Workshop (In 178 Upazilas)

c. National workshop with private sector stakeholders (November 2015)

d. PPI launching workshop in selected upazila

12. ***Experience and Lesson Learnt (in terms of Sustainability):*** Local Agri-business Network was setup in upazilas throughout the country with the objective of complimenting government extension services in rural areas; taking information and advice closer to farmers. Based on the lessons captured we can see early signs that more and more private sector companies have started to utilize the network to promote their products and services. Regional offices these companies are already partnering with Trader Associations to sponsor training event and in promote products at the same time. Workshops held by Katalyst to sensitize corporate management on their utilization of LAN has made it evident that companies ranging from input seller, agro food processors, banking and insurance are keen to utilize the network to gain access to large number of farmers.

Agricultural Extension Approach of Agriculture and Food Security Project (AFSP-II)in CHTDF

Approaches:
- Farmer Field School (FFS)
- Collective marketing

Agriculture and Food Security Project (AFSP - III), A Component of Strengthening Inclusive Development in Chittagong Hill Tracts (SID-CHT), Ministry of CHT Affairs and UNDP

Background Related to Agriculture in CHT

Regular development was disrupted until Peace Accord signed in 1997.CHT districts/upazilas rank among lowest in terms of key development indicators. Most (about 80%) people depend on agricultural activities for their livelihoods. Seasonal food crisis prevails in some areas – where single crop is harvested annually – mostly Jhum and Fringe land cultivators in Kaptai Lake. Very limited use of improved agricultural technologies. Agricultural diversity with different challenges (topography, slopping, soil condition, different practices etc.). Absence of 'unique' CHT Specific Agricultural Strategy and Guidelines. Difficult terrain, larger areas – not easy to cover by different line departments (e.g. Sajek Union is bigger than a district).Hill District Councils manage all transferred subjects including DAE, DLS and DoF

AFSP in Brief:

AFSP II: 1 Jul 2013- 31 Dec 2017
AFSP III: 1 Jan 2018 – Jun 2021
Donor: DANIDA
Targets: All 26 Upazilas and 121 Union with 45,000 Poor and marginal farmers
Hill Districts Councils are implementing partners in the ground

Overall Objective:

Increased pro-poor and inclusive growth and sustainable employment creation in the Chittagong Hill Tracts (CHT), *and accelerated implementation of the 1997 CHT Peace Accord*

Immediate objectives:

- **Agricultural production** of female and male marginal and small farm households **increased and diversified** through IFM FFS in the Chittagong Hill Tracts
- Implementation of the CHT 1997 Peace Accord accelerated through further devolution of agricultural services to the Hill District Councils.

Approaches Followed

- Integrated Approach – Integrated Farm Management (IFM) first piloted in CHT (2009) while FFS remain the key for facilitating Farmer's learning

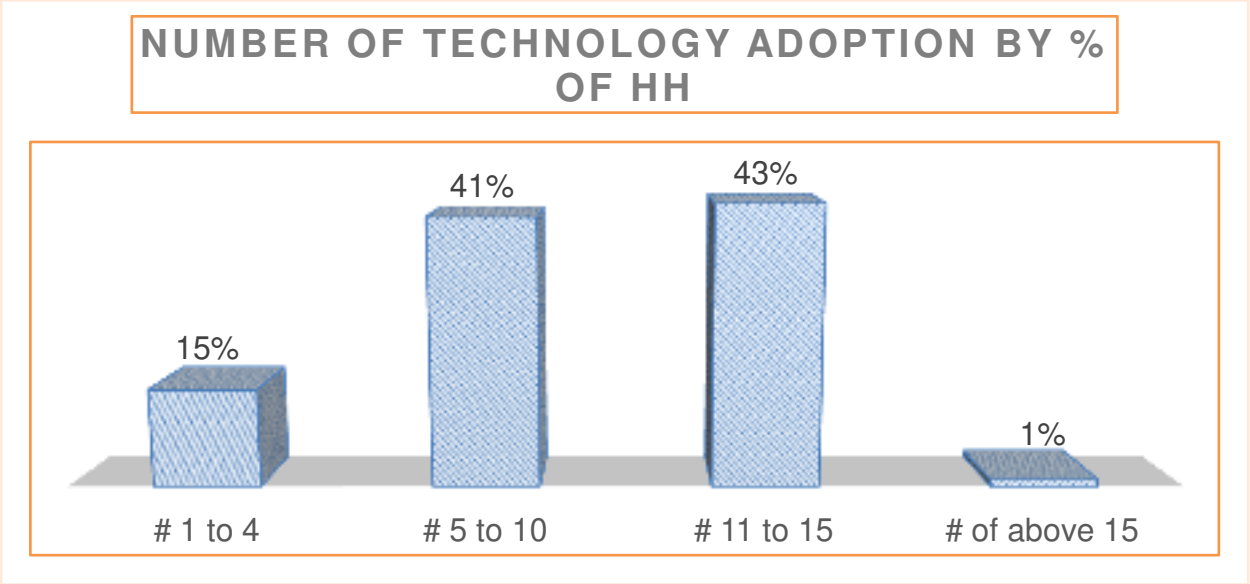
- ❑ Facilitate farmer's learning and strengthening linkages between farmers and GoB Line Departments or Private service providers
- ❑ Project staffs **NOT TO ACT as "Technical Service Provider"** – rather connecting with GoB line departments for technical advices
- ❑ Selecting learning subjects through consultation with communities and experts
- ❑ Engaging Para Development Committees (PDCs)
- ❑ Focusing on developing local resource persons / experts (Farmer Facilitators, Livestock Workers, Nursury Growers, aquaculture resource persons etc.)
- ❑ Farmer Field Days (FFD) – with Practical Examples (instead of simulation/models demonstration)
- ❑ Learning/Exchange visit within and outside CHT
- ❑ District Working Group (DWG) – all district Officers of DAE, DLS, DoF are members while the Councilors of Hill District Councils Chair the Group
- ❑ Increasing knowledge / capacity of field based GoB Officers on IFM-FFS and High Value Crops/livestock/fisheries
- ❑ Farmer Facilitator (FF) from community and work as "Model Farmer"
- ❑ Follow up period after FFS Graduation
- ❑ Following completion of FFS, the selected Farmer Facilitators are promoted for marketing linkages

AFSPII RESULTS

Evaluation Findings from Draft Report

Popular technology	**% of HH adopted**
Planning of Homestead space	78
Cultivating Vegetable in pit/bed	74
Preparation and use of Farm Yard Manure (FYM)	77
Hand pollination in Cucurbits	85
Use of IPM techniques in vegetables, fruits,	65
Use of pruning, tanning in fruit trees	82
Use of fertilizers in fruit trees	87
Line sowing/transplantation in rice field	67

Prepared and using improved egg hatching pan for chicken	69
Provide feed and water to broody hen at hatching pan	65
Vaccinated chicken, duck, goat, pig, cattle etc	81
Provide supplementary feed to cattle, goat, pig	89
Manage good housing for cattle, goat and pigs	54
Prepared the pond/creek for stocking	68
Utilize the seed treatment technique in ginger and turmeric	69



Project Results

- Around 85% beneficiary farmers of the targeted communities adopted at least 5 IFM FFS promoted technologies.
- Around 85% of the beneficiary and 13% of control farmers received vaccination services on demand while 97% and 85% of them respectively mentioned that services were useful.
- 71% treatment farmers received technical services/suggestion from officials of DAE, DLS and, DoF;
- Agriculture production increased: vegetables production (50%) followed by eggs (40%) fruits (20%), pig (35%), milk (30%), goat (35%) fish (30%) and field crops (20%).
- Agriculture income increased from Tk. 74,156 (baseline 2014) to Tk. 113,237 (End evaluation 2017) per household by 52.7% . While it increased from Tk. 61,963 to Tk 76,117 by 22.8% for the control farmers.

- Around 13% of the beneficiary women can spend money earned from selling vegetables and 23% can spend money earned from selling poultry. In case of spending money jointly, majority of the women of the beneficiary group (80-87%) have more liberty to spend the money individually than the control group (56-77%).

Good Agricultural Practices of AFSP II:

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Prepare and use of improved egg hatching pan for broody hen management

Higher hatching rate(> 90%)- Shorter gap between laying cycle.-Less weight loss in broody hen- Control the attack by chigger mites and family members feel much comfortable. Quick result through study plot setup Farmer to farmer extension. In some areas community people do not rear chicken

It can be expanded even in other communities (other than FFS) easily It can be targeted to poor and landless farmers including women.

Use of pit/bed in vegetable cultivation

Pit and bed method has been found more effective comparing with the traditional cultivation system sometimes only dibbling. Quick result through study plot setup Farmer usually cultivate vegetables. It can be expanded even in other communities(other than FFS) easily.

Preparation and use of Farm Yard Manure

With minimal investment farmers are able to get organic manure, they don't need to buy from market. Plant debris and cow dung are well utilized. Quick result through study plot setup. No extra cost required for purchasing chemical fertilizer from market. It can be expanded even in other communities(other than FFS) easily

Fruit tree management through Mulching pruning and fertilizer management

With little investment in management fruit tree gives more production .During dry season mulching helps to sustain the fruit trees even in drought season. Quick result through study plot setup Farmers usually grow fruit trees.It can be expanded even in other communities(other than FFS) easily.

Hand pollination incucurbits

Natural pollination is hampered due to less presence of bees, flies, Hand pollination increases production. Quick result through study plot setup. Very simple technique Farmer usually cultivate vegetables. It an be expanded even in other communities(other than FFS) easily

Seed treatment of ginger and turmeric

Farmers did not get good harvest from ginger and turmeric due to stem rot disease. Through seed treatment healthy crops can be grown and thus higher production. Study plot results., Ginger and turmeric are the main cash crops for most of the CHT farmers, so it is an interesting subject to know for them. It can be expanded even in other communities(other than FFS) easily

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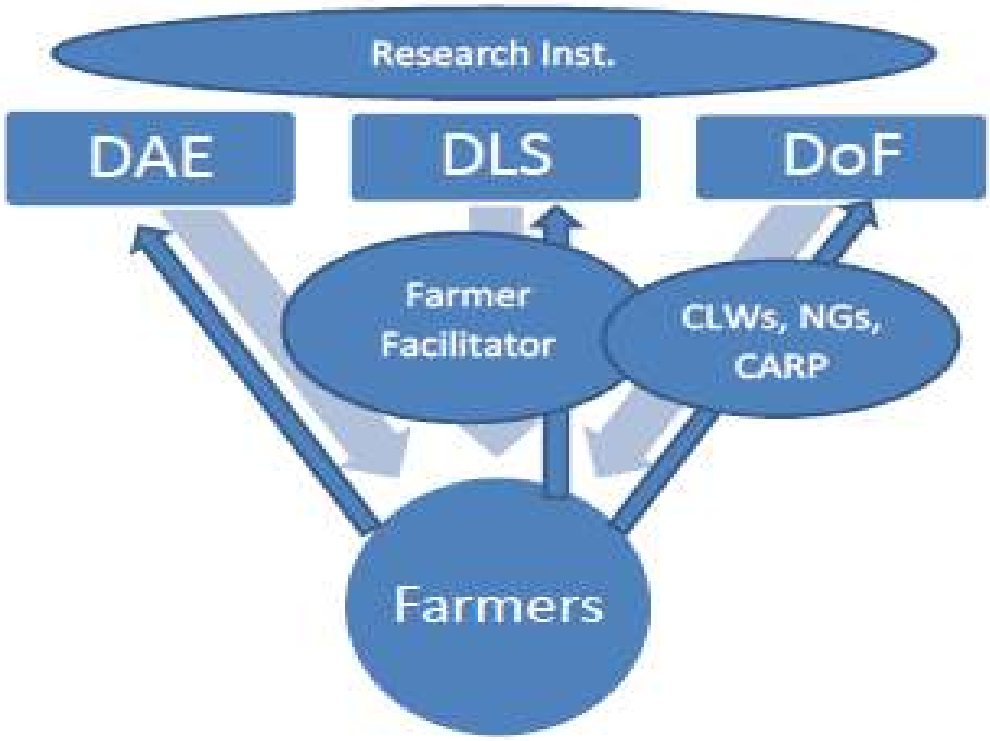
Vaccination of chicken, duck, goat, pig, cattle etc.

Timely vaccination and de worming decreases mortality rate of livestock thus more production. Community Livestock Worker's role through presence at local level and motivational factor through FFS activities. In some areas community people do not rear

chicken, duck, goat, pig, cattle. It can be expanded even in other communities(other than FFS) easily.



Lessons learnt

- Engaging real farmers as Farmer Facilitator and recruiting from locality yields better results;
- Due to remoteness and inaccessibility, scattered community extension works in some areas remains a great challenge. However, the presence of such Facilitators, Community level service providers ease the situation to some extent;
- If FF is a “Model Farmer” it helps to motivate other farmers;
- Language barrier is a challenge both for delivering quality FFS sessions as well as transferring any extension messages. However, if someone is involved from the community or area it helps to reduce the gap;
- Farmer Facilitators become a local resource person and sometime an extension agent after graduation of FFS. It is always easy to deliver extension messages by someone who is already expert on the area.

Second Crop Diversification Project: an Integrated Extension Approach

Approaches:
- Formation of Small Farmer Group (SFG) and credit distribution for HVC cultivation
- Farmers training, Result Demonstration followed by field day
- On Farm Small scale Structure (OFSSI) for value addition &Collective marketing

Introduction: The Second Crop Diversification Project (SCDP) was designed on the basis of the lessons learned and the new opportunities identified upon completion of the Northwest Crop Diversification Project (NCDP). SCDP commenced in July 2010 and will be completed in June 2017. The primary objectives of the project are: (i) increasing rural income through increased production of high value crops (HVCs) and promoting efficient marketing; and (ii) building sustainable capacities of beneficiary farmers, and partnership among department of agricultural extension (DAE), and participating micro-finance institutions (MFIs) in services delivery to the farmers. The project area covers 52 upazilas under 27 districts of southwest and northwest regions of the country.

The project aimed at diversifying and promoting HVCs amongst project beneficiaries to raise their income, and generating employment. This will be achieved through utilizing marketing opportunities, improving marketing efficiency and value chain integration, agro-processing, reducing import dependency, increased agricultural lending and involving more women in production, and processing and marketing of HVCs. The project's supports are designed into five components: (i) HVC production support, (ii) Value addition support, (iii) Credit support, (iv) Institutional strengthening, and (v) Project implementation support.The major tasks include: (i) forming small farmers groups/common interest groups enrolling about 240,000 members following certain criteria; (ii) imparting technical training on production and value addition technologies and on other related subjects to the beneficiaries; (iii) extending need-based credit support to 203,200 beneficiaries through qualified MFIs; (iv) extending need-based value addition support to interested communities; and (v) institutional strengthening of DAE and partner MFIs.

The Approach: The project adopted an interlinking approach and the approach is: appropriate selection of the farmers → group formation → awareness raising and participating in the savings scheme → participating in the technical training → availing credit support → marketing of the products by the group members.

Small Farmers Group (SFG) Formation: Right selection of the interested small scale farmers and forming effective SFGs is the real key for achieving project's development goals. All other follow-up activities (i.e. awareness raising, technical training, dissemination of HVCs production technologies, credit operation, scaling up of HVC cultivation, bringing incremental areas under HVCs, etc.) are closely linked with the formation of groups As of 31 October 2014, 12,000 groups have been formed comprising 112,894 male farmers (5,620 groups) and 139,560 female farmers (6,380 groups).

Farmers Training: So far, a total of 200,126 farmers were trained under a day-long technical training organized at the Upazila Agriculture Office (UAO) of DAE. SCDP allowed the women farmers as training participants those who are accompanying children. In such cases, temporary facilities were developed for taking care of the children separately during the training classes, which enabled the women with children for actively participate in the training sessions. In order to increase effectiveness and to

ensure learning environment audio-visual training materials and life samples are used in such training courses. Farmer friendly leaflets (with appropriate illustrations) were provided to the training participants, which further are being used as post training reminder materials by the trained farmers. Besides, in –situ training courses are also being organized based on the felt needs of the SFG members.

Technology dissemination through establishing demonstration trials and organizing farmer field days: So far, a total of 14,795 demonstration trials involving different HVCs have been conducted, in different project upazilas, which is above the envisaged target of 14,000 demonstrations. With a view to increase effectiveness of the demonstrations, two new innovative demonstration models (block demonstration and technology village) adopted by the project. Moreover, In order to ensure wider dissemination of results from the demonstration trials farmer field days were organized. The success of the demonstration trails depend on timely ensure budget, seasonality, required starting materials, advance planning, keeping records particularly for costs and benefits, and reporting. The resources and expertise of horticulture development and training centers (HDTCs) in the project area were utilized effectively in establishing demonstration trials at the farmers' field. The farmers in the mean time adopted and expanded the technologies upon experiencing the technical viability and economic profitability from the technologies demonstrated by the project.

Credit Disbursement: T he main objective of the project is to increasing income of small scale farmers through increased production and marketing of HVCs. The targeted farmers confront lack of capital to buy inputs and maintain farm level production target. Thus the project design appropriately included credit support for them. The Bangladesh Bank was lead agency for credit component and BASIC bank and Eastern bank limited was selected as wholesale bank to disburse credit. BRAC were selected and involved to support the SFG members with credit operation in the field. Due to increase in production cost, the actual average loan size estimated about Taka 16,000.00 against the DPP target taka 10,000.00 resulted the seed money for credit 2,030 million taka exhausted in the month of July 2014 by providing credit to only 120,954 qualified SFG member against the target of 203,200 SFG members. The MFI committee decided and advised BRAC to start revolving credit operation from July 1, 2014 by re-borrowing funds from wholesale banks every 6 months. By the end of January 2016, BRAC revolved taka 2,858 million and provided credit to 75,691 SFG members. Hence, SCDP created access credit to 196,645 SFG members by utilizing seed money and revolving funds. The number of loans, at 261,718, showed that 65,073 beneficiaries had availed of credit more than once. Additional area coverage through production credit: The total additional area coverage by HVCs production by credit provision is 50,000 hectare. According to the revised target, the plan of area coverage was distributed for fruits 20%, vegetables 40%, Spices 20% and others (flower, medicinal plants, mushroom) 20% of the total land was targeted. By the end of January 2016, land coverage achieved is 171% was for vegetables, 94% fruits, 156% for spices, and 86% for others (flower, potato relayed with maize/mung bean and mushroom). Please see the detail in following table.

Crops	Target (ha)	Distribution in %	Achieved (ha)	Percentage
Fruits	10000	20	9391	94%
Vegetables	20000	40	34234	171%
Spices	10000	20	15622	156%
Others	10000	20	8630	86%
Total	50000	100	67877	136%

Value Addition and Marketing Support: To take advantage of value addition options and improve marketing efficiency, marginal, small and medium farmers must group their produce as the small individual farmer does not have the necessary economy of scale and capacity and knowledge to operate beyond basic farm gate level. The Project provides farmers and farmer community groups with training and awareness-raising in value addition options to improve their production and marketing decisions to increase their marketing efficiency and raise profitability.
To reduce post harvest losses and improve the produce quality, the Project supports farmer community investment in low cost on-farm small scale infrastructure (OFSSI), which act as, (i) on (or near) farm collection and post harvest handling centers; including washing, drying, sorting, grading, and packaging facilities. The project facilitated formation of Farmer Marketing Associations (FMA)bythe representatives of SFGs. Generally, the FMA general committee consists of the representatives from the SFGs exist within the five radius kilometer of the OFSSIs. The general committee further form a executive committee of the FMA consists of seven, nine or eleven members. And the executive committee of the FMAs is directly responsible for ensuring day to day operations of the OFSSIs.

For effective implementation, the project assigned Private Service Provider (PSP), selected from qualified agribusinesses company. Contracted service provider assist farmer marketing Associations (FMAs) to: (i) make informed pre-season decisions on what crop to plant based on agricultural market knowledge and trends in production and consumer preferences; (ii) acquire innovative post harvest technology to reduce losses and improve quality; (iii) enter into mutually beneficial seasonal or long term supply contracts for raw and value added produce through networking with large traders, seed merchants, retailers, agro-processors and exporters; (iv) sign seasonal out-grower contracts with larger farmers to take advantage of premium prices offered for larger volumes of produce; and (v) sell branded produce at premium prices through the establishment of a recognized name in the market. The project and service providers also support linking farmers to the central and district market actors.The project also promoting Local Service providers(LSPs) within the life of the project so that they can continue providing business development services to SFGs and FMAs after completion of the project.

Impact of the project:

- According to the internal outcome survey results, the total Income of households estimated at taka- 179,805.00 in 2013 and 232,146.00 in 2014. The total household income in 2012 was taka-117,228 as per the published baseline report in November 2012. The year wise income data shows that in 2013 53% income increased compare to 2012 and 29% income increased in 2014 compare to 2013. SFG members earned income from 8 (eight) major sources, such as: small business, field crops (food grains), wages, livestock, homestead perennial crops, other homestead crops, HVC production and HVC value addition. Income from the HVC production sources 23.34% in 2013 and 21.98% in 2014 respectively, which estimated the highest.
- 479,586 person days employment generated annually.
- 137,886 women members involved in agriculture based economic activities.

Integrated Pest Management (IPM) Farmers' Field School (FFS) – a road to educate farmer to produce safe crop

Approaches:
- **Farmer Field School (FFS)**
- **Result Demonstration on biological control**
- **IPM Club formation**

The Department of Agricultural Extension (DAE) is the largest public sector organization that provides extension services in crop sector and has the experiences of running FFS. It has strong structure in all upazila and provides services up to block level. The core functions of DAE include technology transfer, increasing agricultural productivity and human resource development. DAE has contributed significantly to crop production and played an important role in the country's quest for sufficiency in food. The mission of the Department of Agricultural Extension is to provide efficient, effective, decentralized, location specific, demand responsive and integrated extension services to all categories farmer in accessing and utilizing better know how to increase sustainable and profitable crop production.

Safe Crop Production Project through Integrated Pest Management (IPM) Approach, popularly addressed as "GOB-IPM Project", is a DAE project supported by the Government of Bangladesh. This project started from July 2013 and will continue up to June 2018. The project aims to produce safe crop and achieving food security by reducing environmental pollution.

The development objective of SCPP-IPM is to produce safe crop by maintaining Eco-friendly Agriculture and the specific objectives are

a) To Strengthen Safe Crop Production activities through establishing farmers' field school, IPM club and farmers training;
b) To assist in achieving food security in Bangladesh without affecting environment;
c) To increase farm output and income of farmers on an environmentally sustainable basis;
d) To accelerate project activities all over Bangladesh through the manpower development of DAE;
e) To popularize biological pest management in vegetables and fruits production for ensuring pesticide-free products;
f) To enhance Organic farming for getting quality vegetables and fruits and
g) To create awareness among the farmers about safe Crop Production.

Farmer Field School (FFS) on Integrated Pest Management

FFS is a widely accepted training tool for educating farmer in his own field. It is strongly believed by the extension functionaries that Farmers Field School (FFS) can be used as an effective extension vehicle through which new knowledge, ideas and messages can be transferred to farming communities even where the literacy rate is very low.

A FFS mainly consists of a group of 25 male and female farmers, their crop fields, some training materials and two well trained facilitators who graduated from a season long Training of Trainers (ToT) course. FFS sites are selected by the upazila team where pesticides are used indiscriminately. Preferably include farmers with a high pesticide use. In FFS, at least 20% of the participants should be women. The facilitators will conduct FFS sessions weekly or if the growth season extends beyond 14 weeks

then the 14 sessions should be spread over the full growing season. There will be a total of *14 sessions* during a complete cropping season (seed to seed including seed health and post harvest practices) including one field day for neighboring farmers. Learning booths in the field day are prepared and FFS graduates present the FFS topics to the visitors giving an opportunity to share technologies and ideas as well as to reinforce the topics learnt.

The IPM FFS curriculum is designed following the basic concept of FFS experiential learning or "Learning by Doing" and it has been developed to serve as a general guideline for the FFS facilitators. Actual contents of each session can be changed by the facilitators and based on the local need, wishes of farmers and of course on the crop. In every ordinary session, the facilitators will select a "special topic", which is most relevant for the farmers at that moment based on the field situation. There are separate IPM FFS curriculums for Rice, Vegetables and fruits. The curriculum includes crop husbandry, pest management, nutrition and farmer organization. The Rice IPM FFS are facilitated by trained Farmer Trainers (FT) with monitoring and backstopping by DAE. Vegetable and fruit IPM FFS are facilitated by trained Departmental Trainers (DT).

SCPP-IPM operates in 275 upazilas of 64 districts. The five year program (July 2013-June 2018) aims to implementation of 6700 FFS (1200 Rice, 5000 Vegetable and 500 fruit). So far SCPP-IPM implements a total of 3875 FFS (700 Rice, 2875 Vegetable and 300 fruit).

Activities achieved

Types of FFS	Season wise achievement					Total
	2013-14	2014-15		2015-16		
	Kharif-2	Rabi	Kharif-1	Rabi	Kharif-1	
Rice FFS		200		500		700
Vegetable FFS	75	300	200	1400	900	2875
Fruit FFS		100		200		300
Total	75	600	200	2100	900	

Number of farmers received training through FFS

Types of FFS	Season wise achievement					Total
	2013-14	2014-15		2015-16		
	Kharif-2	Rabi	Kharif-1	Rabi	Kharif-1	
Rice FFS		5000		12500		17500
Vegetable FFS	1875	7500	5000	35000	22500	71875
Fruit FFS		2500		5000		7500
Total	1875	15000	5000	52500	22500	96875

Performance of FFS approach

The follow up survey is conducted by the upazila team after the completion of each FFS. By reviewing the data of Brinjal FFS, it is observed that the use of organic fertilizer is 54% increased, the pesticide cost is 8.35% reduced, 14% yield increased and cost of production is decreased by Taka 2.47 per Kg. It is also observed that the use of sex pheromone is increased by 33.6%. The performance of FFS will be evaluated widely later on as per project schedule.

The Mid-term evaluation team (MOA, IMED & DAE) comments that IPM trained farmers, can understand that all insects in a crop field are not harmful. Beneficial insects (parasite & predator) are many fold more in the crop ecosystem than the harmful insects. The FFS evaluation showed that the FFS methodology, being a demand led, farmer centered participatory approach is an effective way to reach positive results.

Constraints and limitation

- Not enough trained person in project area,
- Transfer of trained staffs to outside project area,
- FT skills are not up to the mark in some cases,
- During transplanting and harvest period Farmers presence are poor.

Extension opportunities

- Scope of Improved technology dissemination by farmers' group,
- Use of machineries may increase by farmers' group,

Experience and lesson learnt (in terms of sustainability)

- FFS trained farmers have an active role in decision making process on crop production specially in pest management.
- Trained farmers are becoming aware of adverse effect of chemical pesticides
- Sex pheromone, perching, fruit bagging is widely accepted.
- IPM trained farmers understand that all insects in a crop field are not harmful.
- Trapped insects are visible in sex pheromone so farmers are convinced. Performance is better than any other insecticides,
- Develop relation with the extension people

Good Practices in Extension Approaches of Integrated Agricultural Productivity Project (IAPP)

Approaches:
- **Formation of Farmers group**
- **Demonstration, Seed village concept**
- **Adoption**
- **Process Monitoring**

Major Extension Methodology or Pilot activities:

Demonstration ⟹ *adoption* ⟹ *Process monitoring*

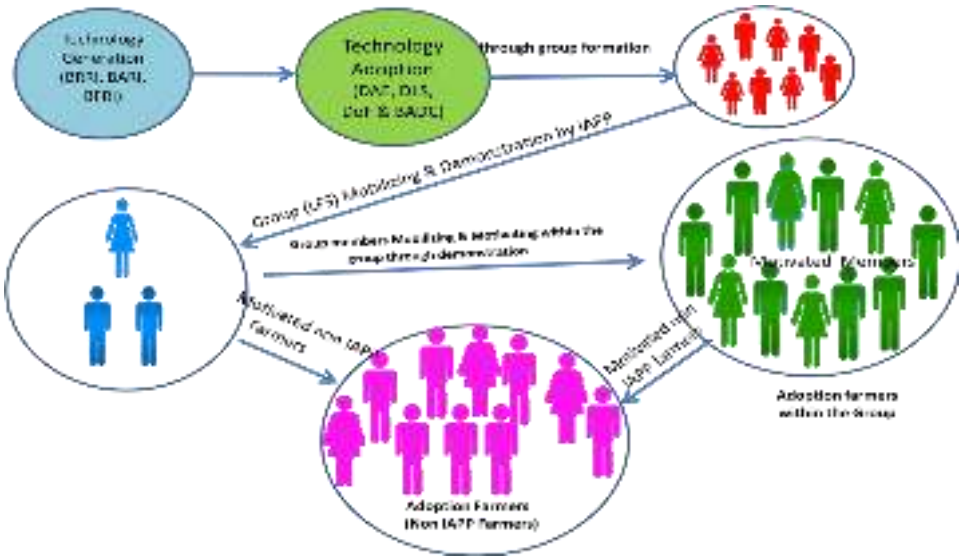
The main theme of this new approach is to form suitable group through PRA or Village emersion and select targeted farmer for productivity increase and to build up their capacity. The farmers'group then fix up for need based and related technology training fortnightly in farmers' field.

In first year Demonstration set up within advance farmer of the group for targeted new technology 3-5 in number.

Second year is the adoption year. Rest of the farmers in the group will be under adoption process. The difference is that adoption farmer will get support 20%-50% in comparison to Demonstration farmers.

Third year is the year of process monitoring. Whatever we did in previous two years in this year we monitor whether farmers have been following those technologies/ new varieties in consecutive year without any logistic support.

The group session training will be continuing first two years. If process monitoring year found any group farmer need refresher training for betterment to continue his activities then another 3 session could be arrange for that group in need based.



Technology transfer process in figure

List of Good Practices:

a) Organic cultivation through using vermin-compost.
b) Pesticide free vegetables cultivation.
c) Preparation of organic pesticide
d) Create awareness to community benefit of organic cultivation.
e) Vermin-compost and FYM production in large scale.

Why the approach is considered as good one:
The main strength of this approach is sustainability. The approach has strong monitoring mechanism. Adoption activities monitored for three consecutive years. The approach is further monitored after completing Exit Plan.

Number of groups/ beneficiaries involved with good practices:
Total 7200 groups (each group consisting 25 members) involved with this good practices.

Timeline of activities:
3 years. 2012-2013 to 2014-2015

Supportive study/ Survey/ FGD and key findings:
Main agricultural crops under cultivation:Rice, Wheat, Maize, Mustard, Sesame, Mung-Bean, Lentil, Sunflower, Watermelon, Summer Vegetables and Winter Vegetables.

Use of organic and inorganic fertilizers: Due to interventions of IAPP, the proportion of farmers used organic fertilizers had been increased 43.55% over baseline year (2011) and particularly they used Vermin Compost, FYM, green munure etc.

Adoption of new high yielding variety: The farmers received new HYV had been increased approximately 98% after completion of the project with the increase of 626% over baseline year (2011).

Organization provided technological assistance/training: Approximately 95% farmers received technological assistance/ training from local level DAE with the increase of 1351% over baseline year.

Use of BRRI, BARI developed special production package: At the baseline year of IAPP only 0.39% farmers received short duration variety of crop, which was increased 9.41% in the endline (2016) with the increase of 2313% over baseline year. They also received saline prone crop production package, and high yielding variety of crops.

Kinds of seeds used by the farmers: At the baseline year (2011) of the project, most (81.87%) of the farmers used seeds of local varieties of crops and no seed village had been formed; therefore, the famers did not use this type of seeds. Due to project interventions, users of local seeds had been drastically reduced at 5.37% in the end line (2016) with the decrease of 93.44% over baseline year. Conversely, the proportion of farmers using HYV seeds had been increased strikingly at 62.21% in the end line (2016) with the increase of 576% over baseline year (2011). The hybrid seed users had also been increased in the end line with 263% over baseline year.

Productivity of Boro rice: Irrespective of locations under IAPP, the productivity of Boro paddy had been increased after IAPP intervention. On an average, the production of paddy at the baseline year (2011) of the project was 5.23 ton/ha, whereas the production was 6.73 ton/ha in the end line (2016) with the increase of approximately 28.65% yield over the baseline year and approximately 23.37% yield increase over the control area practiced by the non-users.

Productivity of maize, pulse and oil seed crops: In case of wheat, the production at baseline year was 3.62 ton/ha, whereas it was increased at 4.35 ton/ha after completion of the project (2016) with the increase of 20.17% over baseline year production. In case of maize, the production at baseline year was 7.55 ton/ha, whereas it was 8.96 ton/ha in endline (2016) with the increase of 18.68% over baseline year.

Hazards of climate change faced by the farmers: Most (99.4%) of the farmers of Jhalokathi district faced hazards of climate change during their agricultural crop production. This was followed by Patuakhali district, where 61% farmers faced hazards of climate change.

Changes in cropping pattern: About 95 to 100% farmers reported that the propping patterns in their areas had been changed due to interventions of IAPP, i.e. the IAPP was successful to play role in changing the cropping pattern in its catchment areas.

Types of cropping patterns changed: About 95 to 100% farmers reported that the cropping patterns had been changed in the IAPP areas. In **Southern region** the cropping pattern Boro-Fallow-T. Aman was practiced by 40 to 50% farmers at baseline year of IAPP, which was increased to about 60 to 70% in current year (2016). The cropping pattern Pulses-Oil seed Crops-Fallow-T. Aman was practiced by 10 to 15% farmers at the baseline year, which was increased to 40 to 50% farmers in the current year (2016). The least popular cropping pattern was Boro-Fallow-T. Aman practiced by 20 to 25% farmers in baseline year (2011), which was decreased to 5 to 10% in current year (2016). Alternatively, in the **Northern region of IAPP**, about 60 to 70% farmers practiced Boro-Fallow-T. Aman cropping pattern in the baseline year (2011), which was reduced about 20 to 30% in the current year (2016). About 30 to 40% farmers practiced Potato/Boro-Fallow-T. Aman at the baseline year, which was increased to about 60 to 70% after completion of IAPP. The cropping pattern Potato-Maize-Fallow-T. Aman cropping pattern was practiced by 5 to 10% farmers at the baseline year (2011), which was increased to about 20 to 30% in 2016.The cropping pattern Wheat/Mustard-T. Aus-T. Aman was practiced 5 to 10% farmers in baseline year (2011-12), which had been increased about 25 to 30% farmers in 2016

Effect of changed cropping patterns: On an average, 93% farmers reported that the changed cropping patterns influenced on the high production of agricultural crops, whereas only 3.44% farmers reported production cost had been reduced and rest 3.44% farmers reported that cropping patterns adopted with climate change.

Days to preserve food grains in household: In almost all areas of the project,the days to preserve food in household by the farmers had been increased after completion of the project (2016) over baseline year. However, the percent increase over baseline year was ranged from about 15% to 85%. On an overall average of the IAPP areas, the days to preserve food in household was 190 days in baseline year (2011), whereas it was increased at 267 days after completion of the project (2016) with the increase of approximately 40.34% over baseline year.

Improvement of food consumption pattern: Almost all of the crop farmers under the IAPP areas reported that the due to interventions of IAPP the food consumption pattern had been increased which was ranged from 98.90 to 100%, where the highest proportion of the farmers reported from Jhalokathi and Kurigram districts and the lowest proportion of farmers reported from Barguna district.

Interest to continue the good practices of IAPP in future: The farmers in almost all of the project areas expressed their interest to continue the good practices in future. On an average,99.6% farmers under IAPP expressed that they were interested to continue the good practices achieved from IAPP in future even at the end of project. These findings reflected the sustainability of the interventions provided by the IAPP.

Employment generation: Considering the overall average of the IAPP areas, about 38.82% additional demand for day labor in others' agriculture farmers had been created in addition of involvement as day laborer in own farms. In this case, about 42.06% crop farmers involved as day laborer in others' agriculture farms in the baseline year (2011), which was increased 57.78% in the end line (2016) with the increase of 37.37% over the baseline year.

Adoption Status:

Adoption status is well enough than those of previous approaches.

Constraints and limitation:

The consecutive work and step of this approach is the main critical thing to be followed. For monitoring number of skill manpower is essential.

Extension opportunities:

In small and marginal farmers level it has a great opportunities.

Linkage and Collaboration:

Linkage with Research Organization (BARI, BRRI) is important. In some of the cases other service provider and NGO would play a vital role for dissemination.

Experience and Lesson learnt: (In terms of sustainability)

- impact of the project in terms of agricultural production at household level;
- Benefits acquired in terms of employment and increased production by various categories of farmers;
- Growth in income and employment of landless laborers at the household level;
- Impact on bio-diversity and water quality, and
- Impact on poverty alleviation and on overall socio-economic development.

Remarks/ Recommendation (if any):

Based on the findings of the study the following recommendations are made as follows:

- Considering the success, IAPP should be extended in the other vulnerable districts/areas of the country;
- A definite exit plan should be made with the continuation of the effective and successful technologies by the involvement of implementing concerned department to ensure its sustainability;
- The most effective concepts under IAPP should be replicated in other areas which are given as follows: o Crop Sectors,

  a. Seed village concept.
  b. Vermin compost.
  c. Supply and use of climatic stress tolerant crop varieties.
  d. Quality seed supply.
  e. Demonstration--adoption--process monitoring concept as a new Extension tool.

Production, Storage & Distribution of Quality Seeds of Pulses, Oils & Spices at Farmers Level Project - 3rd Phase

Approaches:
- **Seed Production block/SME and Field day**
- **Research plot, Seed certification**
- **Apiculture in crop field to enhance pollination**
- **Motivational tour**
- **Farmers training**
- **Mentoring and follow up discussion**
- **Supply of seed management equipment**

Overall Objectives

Increase production of pulses, oils, & spices crops to fulfill the demand of the country by ensuring & enhancing sustainable production, storage and distribution of quality seeds (pulses, oils, & spices) at farmers' level.

The Specific Objectives

- To ensure & enhance timely supply and easy access to quality seeds of Pulses, Oils and Spices crops for the farmers
- To increase production of Pulses, Oils & Spices crops through Improved seed management & use of modern technology
- To save foreign currency by reducing import of Pulses, Oils & Spices
- To generate rural employment & improve socio-economic condition of the rural poor women by involving in quality seed management & apiculture
- To ensure & enhance supply of quality seeds and establishing technology dissemination unit at the door steps of farmers through ward-based "Seed SME".
- To develop and restore soil environment through introduction of Pulse, Oils & Spices crop in cropping cycle
- To develop nutritional level of human body by increasing use of Pulses, Oils & spices in diet
- To reduce use of ground water in crop management
- To boost up crop yield through increased pollination by introduction of Apiculture
- To ensure quality of seed through direct involvement of Seed Certification Agency (SCA)
- To ensure accountability of seed producers, users, Seed Certifying Agency (SCA), seed producing agencies & personnel involved in Extension of Agro. technology in quality seed management
- To develop capacity of farmer & personnel involved in Agril. Extension.

Extension Methodology

Seed Production Block/ SME: The Seed production block will help produce quality seeds & technology transfer within the neighboring farmers through spillover effect. The produced seed : - preserved by the seed SME,- bagged, certified by the SCA,- preserved for distribution/exchange/sale among farmers within reachable market price. Seed production block : land 01(one) acre each and 36100 nos.01 (one) block in each union. Famers group of 04 (four) member, leading by a progressive farmer (SME).The small, marginal, medium and tenant farmers will be the beneficiaries. The farmers will be selected based on previous experience & capability of seed preservation. In addition, social acceptability will be taken into consideration. The beneficiary farmers will provide the cost of labor, land, harvesting, seed processing & marketing, etc. The rouging will be done directly by UAO or his nominated person.

Field Day & Review Discussion: Most effective, efficient and quick method of technology transfers through method and result demonstration of Seed plot. One farmers Field day & review discussion in each year in each SME. Participants: will be the neighboring farmers who are using the seed. Resource Personnel : DAE, BADC, Research institute & SCA. Total Nos.: 18000 numbers in 4 years.

Research plot: The research institution develops varieties & supply the seeds to BADC for multiplication. But scope for field testing of these varieties are limited. Provisions are kept for testing these new varieties in all the 64 district. A plot of area 0.50 acre is kept in each district in each year. Altogether 256 nos. of variety testing plot will be established in the project period.The research institute will cooperate for its implementation

Seed Certification: Certified seed bears the best trust and value among the framing community. Hence, seeds needs to be certified by SCA at the farmers' level. A special arrangement will be made with Ministry of Agriculture and the seed SME for certification by SCA, packaging, labeling and bagging the seed and finally marketing.This certification also will serve as cross check because this will be done at the end of the seed production stage. Two time visit by District Seed Certification Officer (DSCO).

Motivational Tour: Seeing is believing" is widely accepted proverb in Agricultural Extension Services. Motivation through observation of the modern technologies: Research institutes, private & public sectors seed production, processing, preservation center, Honey processing center, Running SME. Involvement : SME, SAAO, Officers of DAE. Senior officers of DAE & SCA will serve as guide & resource person. PD office will co-ordinate .Nos. : 100 batch

Farmers/Seed SME Training : Continuous refreshment of farmer's knowhow, development of skill and motivation through change of attitude by training is always significant in extension methodologies. In the view of changing the attitude of the Farmers/Seed SME training will be organized for a duration of 3 days. The Officers of DAE & SCA will serve as trainer. A total no. of 600 batches of seed producing farmers with SME will be trained having 30 farmers in each batch averagely

Mentoring & Follow up discussion: At the end of each year instant evaluation needs to be necessary to repair or renovate the whole activities. Yearly unions of the seed SME at the district level. Here discussion will be on success/failure of different component & immediate means for its repairing. This will also contributes to accountability & responsibilities. Guided by District Project Monitoring Unit (DPMU) headed by Deputy Director Agril. Extension of the concerned district. A total of 128 nos. of mentoring & follow-up discussion will be conducted in project tenure.

Supply of Seed Management Equipment

Seed storage container: Each SME will be provided with minimum 04 number of plastic seed container each with a volume of 120 liter.

Sieve: On an average each SME will be provided with 3 sieves of different mesh depending on seed concerned.

Sealing machine: For marketing of seed, the seeds needs to be sealed. A total 4500 sealing machine will be provided to 4500 SME.

Weighing machine: For marketing of seed weighing in necessary. For this purpose, all together 4500 weighing machine will provided to 4500 SME.

Bag: Each SME will be provided averagely 400 number of Polly/gunny bag per year of 1kg /2kg capacity. In total, 72 lakh bag will be provided.

Moisture meter: To maintain quality of seed moisture level plays the most vital role. A total of 1473 nos. of moisture meter will be provided & distributed to concern Upazila with 3 nos. for each average.

Apiculture: As cross pollinated crops are involved in the Project, hence set up of pollinator is necessary for boosting up production. Seasonal rural waste labor will be involved in honey production, processing and marketing, which in turn will enhance the income level of the farmers. A total of 40 MT. honey will be produced per year amounting 160 MT for the project tenure .A total number of 2000 Bee Box will be provided to the Seed SMEs during the tenure of the project for beekeeping. The farmers and his family member will be involved for this Bee keeping process.

Targets and Outputs: Quality Seed Production, Storage and Distribution Enhancement .The project will provide foundation seeds, fertilizers, other inputs along with improved technologies for quality seed production of Pulses, Oils and Spices. In addition, the project will provide support for Apiculture to boost-up productivity (15-30%) through efficient pollination and at the same time to increase production of honey. This will also generate employment at the rural level including household women. These all, in turn will increase family income Quality Seed Production, Storage and Distribution Enhancement.1800000 farmers including poor women & waste labor will be benefited through 4500 rural Seed SMEs (Small and Medium Enterprise/Entrepreneur). At least 5% productivity of pulses, 6% oils and 3% spices will increase which will be contributing reduction of import and saving of foreign currency and this wave will be dispersed gradually among all farmer in due time. In addition, 40 Mt. of quality honey will be produced per year at the farm level & this will be continuing year after years.

List of good Practices

- Formation of SME in view of establishing seed production block
- Establishment of research plot at farmers level.
- Arrangement of training for farmers and officers
- Appropriate crop zoning
- Use of updated / modern varieties
- Use of high quality seeds in block demonstration: Foundation seeds
- Appropriate/ rational doses of fertilizers and pesticides

Apiculture in crop field to enhance pollination: Two times Field visit by SCA authorities to produce certified seeds at farmers level .Mentoring and follow up discussion for SME .Use of modern tools such as moisture meter for seed preservation. Field day observation and review discussion. Arrangement of 3 months long certificate course on Apiculture. Reward of the SME: Provisions are kept for rewarding be best

SME of the district each and every year. This will create competition among the SME's to reach at higher level of performance.

Why is the approach considered a good practices: Through this approach farmers get foundation seeds to use in seed production block resulting good quality seeds production under supervision of SCA, two times visit by SCA officials. Seeds are harvested properly and graded using sieve which is finally stored in proper storage condition including time to time Moisture Content measurement by Moisture Meter. Seed are certified by the SCA authority, so that high quality seeds are being available at farmers' level. In addition, incorporation of apiculture will enhance crop yield by 15 to 20 percent with maintaining biodiversity. Through this SME approach, sustainable seed management will be develop at farmers' door. Ultimately, Community farmers will get quality seeds with reachable market price which lead increased crop production.

Number of groups / beneficiaries involved with good practices: The ultimate beneficiaries are 1800000 farmers including poor women & using waste labor through 4500 rural Seed SMEs.

Timeline of activities: July/ 2018 – June/2022

Adoption Status: The project activities are yet to be implemented at field/farmers level.

Constraints and Limitation: Proper SME selection is difficult. Political and social intervention in case of SME selection. Getting SME from each union across the country. Distribution of inputs to the SME in time.SME/ Farmers are not educated. Lack of Vehicle to monitor the farmers field properly. Coordination between DAE and SCA. Climatic problems such as drought, flood, early rain, untimely rain and so on.

Extension Opportunities: There is a great opportunity for expansion of technologies across the country. Several factors influence in this extension. A) We have experienced extension worker at block level. B) Project activities involved with high value crop for which farmers get motivated very easily. C) Apiculture in crop field is simply an innovation which has huge potentiality to incorporate with pulse, oil and spices crops as because this technology induces pollination rendering increased production. Project will provide bee box and honey extractor to the farmers to encourage apiculture in their crop field.

Linkage & Collaboration

Research : High yielding improved varieties, as well as modern technologies. The research institute may be the part of project monitoring and evaluation.

BADC: The Project will be directly linked with BADC for foundation seed supply.

SCA: The project will directly involve SCA for monitoring & certification process and also in capacity development of farmers and extension personnel in the seed quality management process. This will help to add value through certification of Pulses, Oils and Spices seeds for commercialization of seed business at rural level.

BSCIC: A linkage with BSCIC will be maintained for promoting Apiculture for experience sharing and also technical support.

In addition, the Project will maintain linkages with national & international research and development institute to collect modern technologies through experience sharing and technical know-how exchange.

National Agricultural Technology Project (NATP-2) DAE COMPONENT at a glance

Approaches:
- Bottom up demand driven Planning & Implementation
- Formation of CIG
- Services through FIAC
- Planning through Upazila Extension Coordination Committee (UECC), District Extension Coordination Committee (DECC)
- Farmers training, Demonstration, field day

Objectives:
Revitalize the national agricultural technology system to increase farm productivity and household income

Specific objectives of the project:
27,150 CIGs will be organized, mobilized and supported on a continuous basis in 270 project upazilas of 57 districts;

NATP-2 Philosophy/Approach
Bottom up demand driven Planning & Implementation
Planning

- CIG Micro plan- Prepared by CIG
- Union Extension Micro Plan-
- Compiled by Union Extension Facilitation Team (UEFT)
- Upazila Extension plan-
- Compiled by Upazila ResourceTeam (URT)
- Approved by Upazila Extension Coordination Committee (UECC), District Extension Coordination Committee (DECC)

CIG- Common Interest Group
10 CIG/Union ,20-30 farmers/ CIG ,At least 35% female farmer ,CIG Formation

CIG Mobilization/Sustainability: Rules, Active committee, Coordination, Work Plan and Transparency. Savings and Savings Management, Organizational Capacity Building CIG registration, Governance/CIG management, Financial Management and Accountable Action Plan.

ICT activities of DAE -Mobile Innovation in Agriculture
Agricultural Extension Services in Bangladesh

Approaches:
-Different mobile Apps & Webpage Application

Background: DAE has about 13,500 SAAOs at block level. NGOs are directly or in collaboration with DAE, mainly credit program based. Private Sectors are involved in Contract farming, business development in agriculture. Mobile Services Providers engaged in e-extension services.

Extension Information: Information Source: Research Institutes, online services, extension portals, Apps. Information dissemination: DAE, NGO, Private Sectors through Demonstration, Training, Workshop, Field days, Contract Farming, Online Services, Call Centers, Apps etc. Information Recipients: Farmers and Farming Communities
Problems Underlying: Traditional extension system and slow growth of e-agriculture .Limited ICT tools and capacity to collect real time information from the field. Insufficient capacity of extension personnel in ICT. Non-Coordinated e-extension services
Upcoming Extension Services: Developed Mobile Innovations
App: Krishoker Janala: Webpage and Apps based on farmers problem and solution. Innovator: Md. Abdul Malek, UAO, Balagonj, Sylhet, DAE.Inaugurated by HE Agriculture Minister on 4 January 2017.WISIS awarded in 2017 .Browsed in webpage: 64,609 time and downloaded the App 10,640 times .Google Play Store Rating: 4.7 out of 5.
App: Krishoker Digital Thikana: App & Webpage Application: Image based Crop Production System and Pesticide Management Decision Support System .Innovator: Mohammad Shahadat Hossain Siddique, Senior Assistant Director, NATA, Gazipur .Inaugurated by HE Minister on 4 January 2017 .Awarded Public Service Innovation Award 2016 .Webpage visited: 69,941 times and App downloaded: 2530 times
App: Pesticide Prescriber: App and Webpage based on the registered pesticides of DAE .Mainly for Extension Services Providers, including Advance farmers .Innovator: Mr. Sukulpa Das, Additional Deputy Director, Mymensingh. Inaugurated by HE Minister on 4 January 2017.Webpage visited: 16,108 times and App downloaded: 1032 times
App: Floating Bed Veg Cultivation : International Heritage of Bangladesh by UNDP in 2015 .It's a mobile App .Developed by ICT Division and DAE
App: Crop Production Reporting

App: Salinity Information System

App: Organic Farming

Apps: In the Pipelines: DAE Staff Database ,Fertilizer Registration, Insecticide Registration, Registration for Import Permit (IP),Staff Recruitment

Blue Gold Program -Water Management for Development

Approaches:
-Farmer Field School (FFS)
-Demonstration and Motivational tour
-Community based water management group
-Collective marketing
-Horizontal learning

Objective

The Blue Gold Program aims to reduce poverty and improve food security through improved water management and increased and diversified agricultural production in approximately 115,000 ha in 22 coastal polders in Bangladesh.

Outcomes

Water resources infrastructure, water management partnerships, agricultural productivity and profitability and new practices and innovations

Fact Sheet

Project Duration	March 2013 to June 2020 (financial end: December 2020)
Project Area	115,000 ha in Khulna, Satkhira, Patuakhali & Barguna
Donors	Government of the Netherlands, Embassy of the Kingdom of the Netherlands Government of Bangladesh
Implementing Partners	Bangladesh Water Development Board (BWDB) Department of Agricultural Extension (DAE) Department of Livestock Service (DLS Department of Fisheries (DoF)
Consultant	Euroconsult Mott MacDonald, Fem Consult, Socioconsult, BETS, EMM Bangladesh
Contribution GoN	Total € 61,915,000
Contribution GoB	Total € 14,034,015

DAE(Crop): Capacity building-SL-ToT for AEOs and SAAOs, ToT for Farmer Trainers, FFS (rice, field crops, homestead vegetables and fruits),Demonstrations, Motivational tours, Inclusion of water management & market oriented issues.

TA - Fish & Livestock (focused to landless/poor farmers, FFS (Production, WM and Market orientation) by Community Dev. Facilitators (CDF)/FT, Demonstrations, Motivational tours.

FFS approach: The field is the school, Group of 25 farmers, Season-long learning activity (seed to harvest),Regular meetings (2-3 hours),Learning by doing, Learning from experience (set learning trials),FFS organizer is not a “trainer” but a “facilitator” FFS formation, Start with WMG as entry point, Farmer selection and FFS location (by WMGs),Demand driven, Emphasize horizontal learning (WMG ownership),Develop Resource Farmers (RF),Developing Local Service Providers.

Community-led Agricultural Water Management (CAWM in BGP): Sustainable Internal Polder Water Management. Intensive technical and agronomic guidance to WMG members via CAWM-FFS sessions. Coaching WMG members to become market oriented, to initiate collective action, and improve linkages with LGIs and other relevant actors. Maximizing benefit of water management. Reducing crop damage, Diversifying crop production, Expansion of HYVs in Aman season resulting in: Higher yields, Shorter crop duration – 2 weeks earlier harvest and drying of fields and Early establishment of Rabi crops. Rabi crops were more successful than in neighbouring areas, More diversification in Rabi crops, Field drains saved crops from too-early heavy rains, Higher market prices, Profitable production and Support from field level DAE (SAAOs) helped to establish CAWM concept and field exercise.Local BWDB (XOs and SAEs) extended technical support to address the water management issues at catchment/sub-catchment leve

Main Pillars of CAWM-FFS

CAWM concept, benefits and challenges- A crop-water system analysis at catchment level, Improved production technology, Collective production and sales planning, On farm water management, Record keeping on cost of production and revenues and Horizontal learning

Challenges: CAWM will need to be formalized /internalized in BWDB and DAE mainstream activities. CAWM will need to be recognized in BWDB and DAE DPPs. Strong coordination and cooperation is needed in between BWDB and DAE to establish CAWM. Shortage of field staff at BWDB to support CAWM initiative. Water management planning and market orientation are new knowledge/skill areas for SAAOs. Contingency plan for emergency. Synchronized cultivation, collective production and sales planning

Other major extension methods followed

Demo on Cropping Intensity Initiative (CII),BPG Fair (Mela),Interactive Popular Theatre (IPT/Natok),Video preparation and screening, Using mass media and Horizontal Learning (HL)

Horizontal Learning

BGP Horizontal Learning may be defined as “outcome-based Peer learning process that assists WMOs/Farmers to identify, learn and replicate good practices from their peers with assistance form BWDB, DAE, DoF, DLS, LGIs and BGP and others”.
The main theme of Horizontal Learning is- Same level of people will learn from each others good practices and replicate according to their needs, ability and resources

Principles of Horizontal Learning: Appreciate: To realize our inherent value, strength and potential to overcome the limits that we often unconsciously impose on ourselves. Connect: To break down the distinctions that separate us from the essence of our peers and detract from our collective well-being. Adapt/Replicate: To start with those things that are already working and enable learning through exposure to good practices within their local context.

Some Results of Horizontal Learn

Horizontal Learning is well accepted in BG project areas and WMGs/farmers started to replicate different good practices of their peers. Replication of CAWM in 4,200 ha

against pilot areas of 138 ha within one year. WMGs/farmers started informal HL Experience sharing visits at the places of good practices through their own initiative

Extension Methodologies Study conclusion

BG Extension methods has been successfully carried out. Horizontal Learning is a valuable way to communicate successful innovations to a large audience. CAWM convinced communities to utilize local resources and connect local authorities to improve internal water management.CII convince farmers of practical ways to add a new crop to the annual cycle.FFS farmers share successes with their neighbors and friends

Extension Methodologies Study Recommendations: Organize more HL Experience sharing visits. Prepare more Fact Sheets on good practices and share. Produce/collect more quality farmer to farmer videos and organize display. Organize more one Field day for farmers cross visits.BG has prepared Strategic Action Plan to maximize the impact of extension methodologies those are found effectively

Artificial Insemination Activities Extension and Embryo Transfer Technology Implementation Project (AIET, 3rd Phase)

Approaches:
-AI technicians (volunteers) training
- Enhancement of semen production and AI
-Training and demonstration
- Embryo transfer technology implementation

Background of the Project:

Cattle are the main economic livestock throughout the world. Livestock is playing an important role as a means of livelihood. In most developing countries, often the number of livestock is quite high but food from animal origin remains deficit. For example, Bangladesh possesses more than 25 million cattle and buffaloes but the country imports over 56% of the total amount of milk and equivalents consumed from elsewhere. Nevertheless, milk consumption in Bangladesh is one of the lowest even in the south Asian region. In most tropical countries, the growth in the dairy industry remained modest over the decades. The limited growth in dairy industry is certainly due to poor genetics of the cattle. Artificial insemination (AI) has been practiced as a potent breeding tool to improve genetics of adopted indigenous cattle in the tropics since late 1950s.

Over the last 50 years, a substantial change has been made in improving local cattle genetics by inseminating zebu cows with imported bull's semen of European breeds. Currently, about 116 million cows and heifers are available in Bangladesh. With the breeding bulls available at present less than 50% of the cows and heifers can be artificially inseminated. This means that currently still more than 50% cows are not inseminated; implicating that genetic improvement is very slow for this population. Therefore, expansion of the AI program is the only way for genetic improvement of cattle in Bangladesh.

Presently, the number of semen production under the Government facility is around 3.4 million per year. The developmental projects (AIET; Phase 1 and Phase 2) have played a significant role for this extraordinary success. To cope up with the increasing demand of AI having semen of improved genetic merit, the number of semen production should increase at least 7.0 million in the coming days. Consequently, the capacity building for increased semen production should be doubled. Similarly, to reduce the problems associated with inbreeding, modern AI data recording and semen distribution system should also be incorporated. Therefore, it is of the utmost importance to take AIET project (Phase 3) to continue genetic improvement of native cattle.

5. Goal of the Project:

The main goal of the project is to increase milk and meat production through expanding AI coverage up to Union levels, to create self-employment, and to reduce poverty.

6. Objectives of the Project:

(a) To extend modern AI activities up to the farmers' doorstep by establishing union AI points.
(b) To increase semen production in order to cope up with increased demand.
(c) To improve genetic merits of the non-descriptive native cattle in Bangladesh.
(d) To ensure people's nutrition security by increasing milk and meat production.
(e) To take part in poverty reduction program through manpower

7. Rationale of the project activities:

This project has been proposed mainly on the basis of recommendations obtained from evaluation report of AIET project (2nd phase) made by the Implementation, Monitoring and Evaluation Department (IMED) of the Planning Commission. The 2nd phase of the project completed in June/2014. IMED has clearly highlighted that there are no ways of improving genetic merit of native cattle without AI. Therefore, AI is of the utmost importance to increase milk and meat production many folds. AI is ongoing activity for cattle development. Hence, the existing AI services should be extended up to the farmer's doorstep levels throughout the country. In this regards, breeding bulls with high genetic merit need to be incorporated into the existing breeding bull stocks. Moreover, new AI Lab cum bull stations and bull calf rearing units cum minilabs need to be established in order to increase semen production. Likewise, the existing AI labs and bull stations need to be renovated and equipped with necessary equipment. Furthermore, consumable items and related instrument of AI such as liquid nitrogen, hand gloves, semen straw, AI tube, AI sheath, AI gun, liquid nitrogen container, etc. need to purchase to support the existing AI activities conducted by DD (AI) of DLS.

Establishment of 1000 AI points at union level and strengthening of 22 district AI centers are fundamental activities of the proposed project. However, establishment of two AI labs cum bull stations at Chittagong and Faridpur; and five bull calf rearing units cum minilab in Sylhet, Bogra, Barisal, Khulna and Rangpur are proposed to strengthen the AI activities under DLS. Necessary equipment and appliances will be purchased during the project implementation period. Stud Bull calves will be purchased from field level with better breeding record for semen collection. Project Director will be responsible for overall implementation of the project activities**.** At the end of the project period, the project activities will be run by the Government setup of DLS, where the Deputy Director (AI) will continue the activities of the project using revenue budget. The detailed rationale of the project activities according to its main components is stated below:

a. **Bull calf collection to make breeding bulls:** To meet the increasing demand of semen for AI and to replace the retiring bulls, around 16 bulls need to be included into the breeding bulls stock every year. Thus, a total of 80 breeding bulls will be selected during the project tenure. The collection of breeding bulls is also important for replacing the old bulls. The emphasis for breeding bull collection will be given at farmers' levels in order to maintain heterogeneity in genetic level. A high power selection committee consisting of member from DLS, BLRI, and project personnel will collect bull calves from farms of throughout the country.

During the 5 years of the project implementation, 350 growing bull calves will be collected from farmers at different districts. After a detailed scrutiny of the 350 bulls, 80 breeding bulls will be selected. Two selection committees will judge bull calves and breeding bulls. Primary committee will judge bull calves based on Genotype, Phenotype, Pedigree, Body conformation, etc. Final committee will judge breeding bulls based on technical report with additionally semen quality either soon after semen collection or post-thaw qualification. As per proposal of the two committees, the selected bull calves will be purchased through this project.

b. **AI technicians (volunteers) training:** Newly selected 1000 AI technicians (volunteers) (Appendix-19) need to be trained for six months with modern AI techniques in order to extend AI activities. Moreover, a refresher training course needs to arrange to train the existing ULA, VFA, FA(AI) and AI technicians (volunteers). A selection committee consisting of DLO, AD (AP) of the respective district and ULO of the respective Upazila will select the AI technicians (volunteers) from the selected unions.

The qualification of AI technicians (volunteers) will be at least SSC (Science preferable) pass youth but HSC (Science) pass youth will be given preference. In case no candidate is found from the selected unions, AI technicians (volunteers) could be selected from the neighboring unions. Importantly, the vacant unions due to dropped out of the volunteers trained in the previous phases of project (Phase 1 and Phase 2) will be given preference in selection at phase 3.

c. **Establishment of new AI lab cum bull station:** Central AI laboratory at Savar is the core laboratory for frozen semen production and distribution throughout the country. Considering the difficulty and cost involved in distribution of frozen semen from central AI laboratory, a regional AI laboratory cum breeding bull station is established (AIET project 2nd phase) at Rajshahi. Since there are many dairy potential regions, establishment of more new Regional AI Lab cum Bull Station will extend AI activities many folds. Therefore, establishment of two new AI labs cum Bull Station in Chittagong and Faridpur has been proposed in AIET project (3rd phase). Both the AI Labs cum Bull Station will be established in the existing livestock compound. The AI Labs cum Bull Station in Faridpur will be established at Faridpur Dairy Farm; and the AI Labs cum Bull Station in Chittagong will be established in conjunction with Chittagong (Hathajari) Dairy Farm and Chittagong District AI Center. Therefore, no land acquisition will be required to establish of the two proposed AI Lab cum Bull Station.

d. **Establishment of new bull calf rearing station cum minilab:** Adequate semen production is a key factor in successful AI program. However, breeding bull producing semen for the AI program has about 5-8 years. The breeding bull goes to retirement after the productive life. Therefore, a continuous supply of breeding bulls is required to maintain adequate supply of semen for the AI program. For that reason, establishment of five bull calf rearing units cum minilab in Sylhet, Bogra, Barisal, Khulna and Rangpur has been proposed in the AIET project (3rd phase). The bull calf rearing units cum minilab in Sylhet, Bogra and Barisal will be established in the existing livestock compound (dairy farm and/or DAIC). Therefore, no land acquisition will be required for them. However, a total of 10 acre of land acquisition will be done for establishment of bull calf rearing units cum minilab in Khulna and Rangpur.

e. **Enhancement of semen production and AI:** Enhancement of semen production is a key for extension of AI program. In the proposed project, bull calves with high a desired genetic merit will be selected from farmers throughout the country every year of the project period. The bull calves will be finally selected as breeding bulls if they conforms certain criteria. As a result more bulls will be added in the pool for semen production after being selected as breeding bulls. Therefore, every year of the project period, semen production under DLS will be increased.

National Breeding Policy will be strictly followed in all steps of bull calf selection, breeding bull production and extension of AI activities. In the breeding policy (stated in the National Livestock Development Policy 2007), there are 3 policy terms such as Short term (up to 5 years), Medium term (6 to 10 years) and Long term (beyond 10 years). Under the short term policy (project duration is 5 years), the semi-intensive cattle will be inseminated with the bulls containing 50% exotic genes. Other conditions stated in the breeding policy will also be strictly followed.

At the end of 5th year in total 80 bulls will come in full swing for semen production. Therefore, it is expected that the project will help to meet the increased demand of semen production with the existing DLS activities. Moreover, two new AI labs cum bull

stations and five bull calf rearing units cum minilab will be established during the project period. However, they will come in production only after completion of the project. These AI labs cum bull stations and bull calf rearing units cum minilabs will ultimately be able support growing demand of semen production under DLS. Moreover, about 1000 AI technicians will be trained to work as AI volunteer. So the yearly AI will also be increased. A detail of semen production and AI during year 2014-2015 with an expected semen production and insemination at the end of the proposed project are presented in Table 1.

f. **Allowances for AI technicians (volunteers):** In total, 2000 AI technicians (volunteers) were trained through the 1st and 2nd phase of the AIET project. Another 500 AI technicians (volunteers) has been trained through different programs. Therefore, DLS already has about 2500 AI technicians (volunteers) working in the field. They will receive the allowances for entire project period (5 years). Another 1000 AI technicians (volunteers) will be trained through the proposed 3rd phase. However, the 1000 AI technicians from the 3rd phase will receive allowances/incentive only after being trained through the proposed project. Since the training under the proposed project will be organized throughout 5 years of the project period, 50% of the anticipated 1000 AI technicians (volunteers) will receive allowances for the project period. Consequently, for all the 3500 AI technicians (volunteers), allowances/ incentives are proposed on average for 3000 volunteers per month for 5 years to motivate them for better achievement. The AI technicians (volunteers) who have completed their basic training for at least 3 months and have been working satisfactorily under their authority will be eligible to get the allowances. On behalf of PD, the DD(AI) will disburse the allowances among the volunteers preferably after every six months of the project period.

g. **Equipments, appliances and furniture:** District AI centers and AI labs will be equipped with all necessary equipment and other appliances. Moreover, necessary furniture will also be purchased for district AI centers, proposed AI labs cum bull stations, proposed bull calf rearing units cum minilab, and proposed union AI points through this project.

h. **Training and demonstration:** In total 100 AI technicians (volunteers) will be trained through the proposed project. Moreover, 1000 staffs including AI technicians (volunteers), upazila livestock assistant (ULA), veterinary field assistant (VFA), field assistant of artificial insemination (FA AI) and Compounder will get refresher's training on AI services, bull rearing, semen collection, processing and transportation during 5 years of the project. Duration of the refresher's training will be 5 days. Moreover, 8000 lead farmer will be demonstrated total mixed ration (TMR) for a day.

i. **Embryo transfer technology implementation:** The reproductive potential of each normal newborn calf is enormous. There are an estimated 150,000 potential "eggs" or ova in the female and countless billions of sperm produced by each male. By natural breeding, only a fraction of the reproductive potential of an outstanding individual could be realized. The average herd bull will sire 15 to 50 calves per year and the average cow will have one calf per year. With artificial insemination, it is possible to exploit the vast numbers of sperm produced by a genetically superior bull. However, the reproductive potential of the female has been largely un-utilized. She will produce an average of eight to 10 calves in her entire lifetime under normal management programs. Like artificial insemination has done for the bull, embryo transfer is a technique that can greatly increase the number of offspring that a genetically important cow can produce.

8. Project Target:

o 1000 union AI points will be established.

o Two AI lab cum bull stations and five Bull calf rearing units cum minilab will be established to run under revenue budget after completion of the project.

o Yearly semen production will be increased about 9.3 lakh doses in addition to the existing 37.2 lakh doses.

o Yearly AI will be increased about 8.2 lakh in addition to the existing 32.5 lakh.

o The existing central AI lab (Savar) and regional AI lab (Rajshahi) will be facilitated for greater capacity.

o 1000 unemployed youths will be self-employed.

9. Output of the project:

o Increase production and productivity in livestock sector and better service delivery.

o Human resource development.

o Accelerate the speed of the departmental extension services.

o Development of infrastructure of semen production labs, proper monitoring, evaluation of AI activities, development of cattle with better genetic merit and superior productivity and cope up of the demand of frozen semen at the field level.

10. Effect/impact: (i)Environment like land, water, air, bio-diversity etc. The project has prepared to increase crossbred livestock population by crossing of local cows with upgraded genetic merits and high productive bulls. In order to do so breeding bull stations will be established. The activities will be done without affecting environment, water, air and bio-diversity. Rather, the project activities will directly help to safe environment providing organic manure to soil of the selected areas. So, the overall project activity will not affect environment at all.(ii)Women and children

Through increased production of livestock products and extending of service delivery system more women are encouraged to have AI services for their cattle, veterinary services, especially who are traditionally engaged in household activities. Hence, participation in income generation, women empowerment will be strengthen in the family since rural women are generally engaged in backward rearing of cattle. Furthermore, children nutrition security will be ensured through increase milk yield of crossbred cattle.

(iii)Employment, poverty alleviation, etc.

Through production of quality semen from breeding stations and AI activities of DAIC, more entrepreneurs are expected to come forward in livestock rearing, feed formulation, fodder cultivation, milk marketing, making of milk products, and other related business. As a result, the employment opportunity will increase exponentially which will ultimately alleviate poverty.

(iv)Regional disparity**:**

Two Bull Stations cum AI Labs will be established at Chittagong and Faridpur in order to boost milk and meat production which will also remove regional disparity. In addition, five Bull calf rearing units cum minilab will be established in Sylhet, Bogra, Barisal, Khulna and Rangpur in order to boost semen production through increasing the number of breeding bulls.

11. Implementation Arrangement

The project will be implemented by the DLS under the administrative control of Ministry of Fisheries and Livestock. The project implementation unit (PIU) will be formed in the DLS in Dhaka. Project Director will work as a head of the PIU. Project Coordinator and Monitoring Officer will look after day to day project activities, finances and procurement of project goods. S/he will also take charge of the project in absence of Project Director. Training Course Coordinator will arrange and coordinate all sorts of trainings (AI volunteers, refreshers, study

tour, and farmers demonstration etc.) jointly with Training Officer (AD/AI, additional charge). In addition, other necessary manpower will be deputed from DLS. Moreover, the required number of manpower will directly be recruited through open advertisement or through outsourcing. The deputed personnel will get pay and salary, TA/DA & all other admissible allowances and benefits from the proposed project.

On behalf of Department of Livestock Services, Deputy Director (Artificial Insemination and Fodder Production) is directly responsible for the extension of the AI activities throughout the country. So, the proposed project should be implemented in close collaboration and consultation with the DD(AI). An overview of the implementation arrangement of the AIET project is presented in Figure 1.

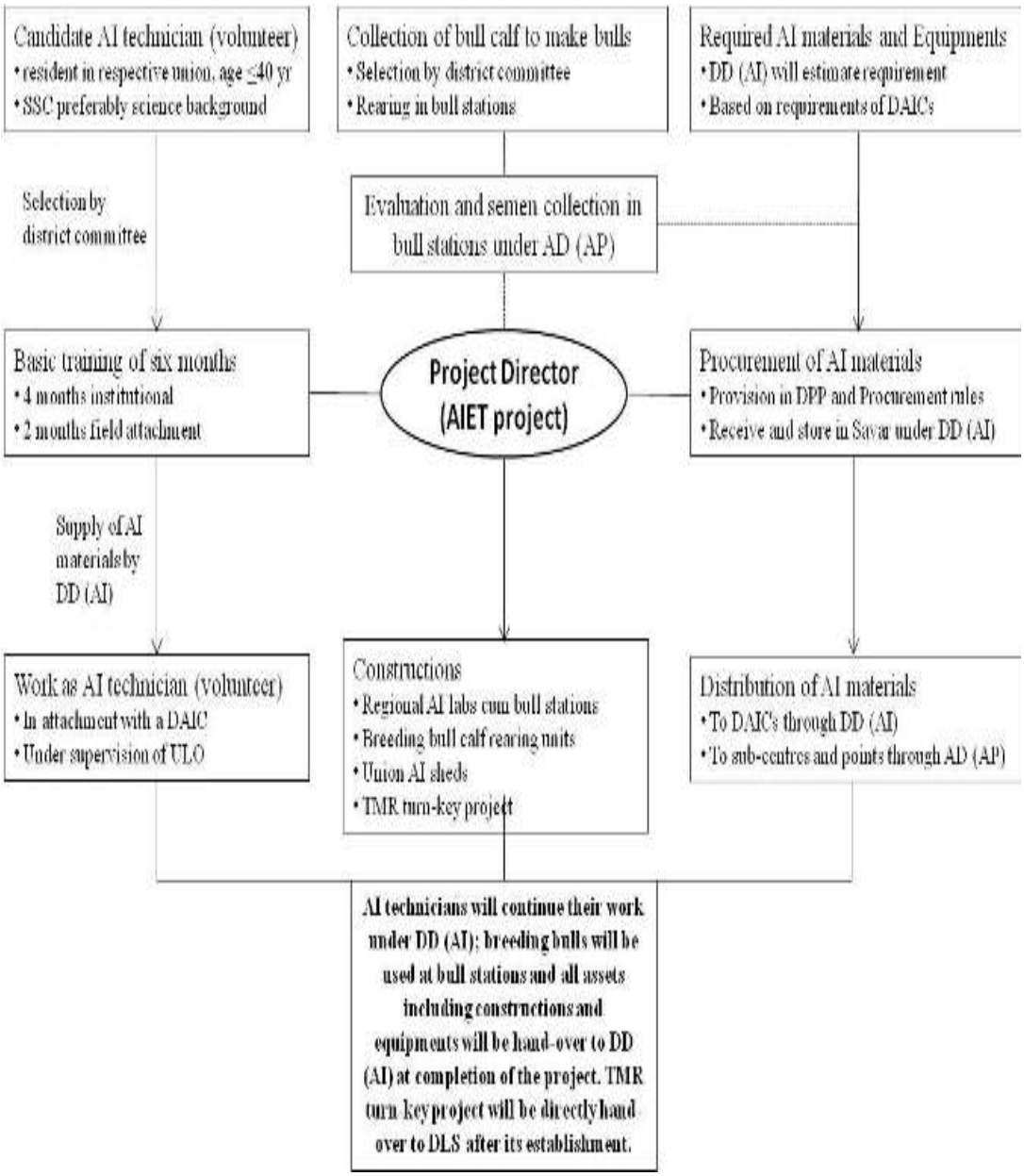


Figure 1. Overview of the implementation arrangement of the AIET project.

12. Exit Plan:

The proposed project is to increase the number and quality of AI in cattle. Therefore, after completion of the project, the all assets and liabilities will be merged under the administrative control of DD(AI) within overall control of DLS. The AI technicians (volunteers) trained through the project will work at the union AI points as volunteer under the direct supervision of DD(AI) of DLS. The volunteers will not be eligible to claim pay/allowances for their activities.

Each year some bull calves will be purchased from different districts on the basis of their phenotype, performance and pedigree history. After a series of test and trial of these bull calves, some will be selected as breeding bull. After completion of the project, collected breeding bulls will be reared in Central AI Lab Savar Dhaka and Regional AI Lab in Rajshahi and also in the AI Labs those will be newly established under this project. Semen from the breeding bulls will be collected and preserved by the above mentioned Labs as their routine works.

The proposed bull stations and rearing units from this project will be hand-over to DLS to run them under revenue budget after completion of the project. The procedure of manpower appointment under revenue budget will be initiated one year before the completion of the project.

13. List of good practices in Extension:

a. Need based planning and demand driven extension.

c. Linking farmers with local extension workers.

f. Integration of gender into extension.

14. Why is this approach considered a good practice:

a. Helps in the implementation of the national policy related with nutrition security by increasing production of milk and meat.

b. Sustainability of the extension services. The extension workers live in the farmer community. So it is easier for the farmer to get the services.

c. Reduced extension officer burdens as there is no need for restructuring government extension plan. The extension workers are developed through the project. Famers pay themselves to the extension workers for the services.

d. Increased knowledge of the farmers about increasing production. The farmers are trained through the project about cattle rearing techniques. The extension workers facilitate farmers for further implementation of the technologies by the farmers.

National Agricultural Technology Project (NATP-2) Extension Approaches of Department of Fisheries (DoF)

Approaches:
-Formation of Common Interest Groups (CIGs) and Mobilization
-Training: CIG and service providers LEAFs (Local Extension Agents for Fisheries)
-Establishment and use of FIACs (Farmer Information and Advice Centers) at Union level
-Demonstration of aquaculture technologies and Field Days
-Farmers' exposure visits
-Formation and utilization of Producers' Organizations (PO) to facilitate farmers' access to market
-Involvement of ICT in establishing Research-Extension-Farmer-Market linkage

DEPARTMENT OF FISHERIES (DoF): It is the apex body to implement and coordinate all the fisheries extension activities being carried out in the country.

Vision of DoF: Meet the demand of animal protein, alleviate poverty and promote foreign earnings.

Mission of DoF: To support sustainable growth of fish and shrimp production with other aquatic resources for domestic consumption, and exports, and management of open-water fisheries resources through community participation leading to equitable distribution of the benefits for optimal economic and social growth in Bangladesh.

Mandate of the DOF:

To disseminate improved aquaculture technologies through training and demonstration and to extend advisory services to the farmers. To enhance fisheries resources through facilitating conservation and management measures. To assist the administrative ministry in formulation of policies, acts, etc. To enforce quality control measures and issuance of health certificates for exportable fish and fish products. To conduct fisheries resources survey and assessment of stock to develop fisheries database for proper planning. To facilitate arrangement for institutional credit for fish and shrimp farmers, fishers and fish traders. To facilitate alternative income generating activities for rural poor and unemployed people towards poverty alleviation. To formulate and implement development projects towards sustainable utilization of fisheries resources to ensure food security.

Production Technologies

There is a scarcity of agricultural land to achieve required production target. It implies that only good technologies capable of producing more are to be extended throughout the country, provided they are farmer and environment friendly and socio-economically viable. More ever, even a better technology will not be equally suitable for all parts of the country. Also there is non-uniformity in the socio-economic condition among the farmers of even a particular region making many of them unable to use a particular technology to the full extent. Therefore, it is important to select technologies for extension considering all these factors. A basket of technologies are therefore needed to choose from.

Considering all these, Department of Fisheries is extending 26 technologies, developed through research, in the country. Followings are mostly in practice:

1. Carp poly-culture;
2. Mixed culture of *galda* and carp;
3. Monoculture of Galda*;*
4. Culture of *Bagda*
5. Culture of *Tilapia;*
6. Culture of *Pangas;*
7. Culture of catfishes like *Koi, Shing and Magur*; *Pabda, Gulsha*
8. Culture of Cuchia
9. Cage culture of fish;
10. Pen culture of fish;
11. Crab farming;
12. Nursery and hatchery of different fishes;
13. *Beel* nursery;
14. Fish sanctuary; etc.

Successful application of appropriate technologies and desired agricultural development – these two do not depend only on extension activities. Successful application of appropriate technologies also depends on timely availability of quality inputs. For example, availability of quality fingerling and fish feed is important prerequisite to ensure successful application of appropriate aquaculture technologies. Maintaining a sound supply chain of inputs for effective backward linkage is equally important. Supply chain involving value addition, if and where necessary, during the phase of post-harvest handling, transportation and marketing of fish is also equally important for maximizing the utilization of production. Since its inception, Department of Fisheries has taken up a series of aquaculture extension projects.

Technology dissemination is the main tool used by the Department of Fisheries to accelerate the aquaculture production of the country. Conservation and development of natural inland capture fishery also have been done through sensitization and motivation of the concerned stakeholders. Before independence and also during 70s, some aquaculture were over there, but very traditional and the major source of fish was inland capture fisheries. Due to degradation of water bodies, flood control structures, overfishing, uncontrolled use of pesticides and some other reasons, fish from natural resources continue to decrease day by day. To meet the fish demand of the increasing population, it was necessary to boost up fish production through aquaculture. Successful induced breeding of major carp by DoF was a milestone in aquaculture of the country. Aquaculture was becoming familiar as a rural profitable enterprise in late 80s and early 90s and a revolution happened in aquaculture production. This was done by DoF through different extension activities. Mass media (Specially BTV) played an important role to make aquaculture familiar to the people. With the horizontal expansion of aquaculture, private sector came forward with input (Fish seed, fish feed and others) support and to some extent with marketing of the aquaculture produces (Especially shrimp).

National Agricultural Technology Project (NATP)

The last one is especially important as it is planned to be implemented all over the country in three phases. First phase of implementation of this project successfully

(flagship project declared by World Bank Dhaka office) concluded in 2014. Project achievements have successfully passed all the standard measurement points of impact assessment, such as, environment friendliness, technology acceptability by the farmers and socio-economic viability. A total of 53,400 farmers (including 18% female farmers) were organized into farmer groups called Common Interest Group (CIG). Some important achievements of NATP-1, which were possible due to successful implementation of extension activities, are mentioned below:

1. Technology adopting farmers (outside CIGs) = 1, 93, 603 nos. (Target- 1, 44,000 nos.)
2. Increase in pond productivity – 43.45% (Target- 10%)
3. Total production increase in project period (6 years)- 2,79,710 MT
4. Annual average production increase (quantity)- 46,618 MT
5. Average income increase of farmers from aquaculture- 34% (Target- 20%)

All these achievements have inspired the farmers to remain in aquaculture more intensively and sustainably.

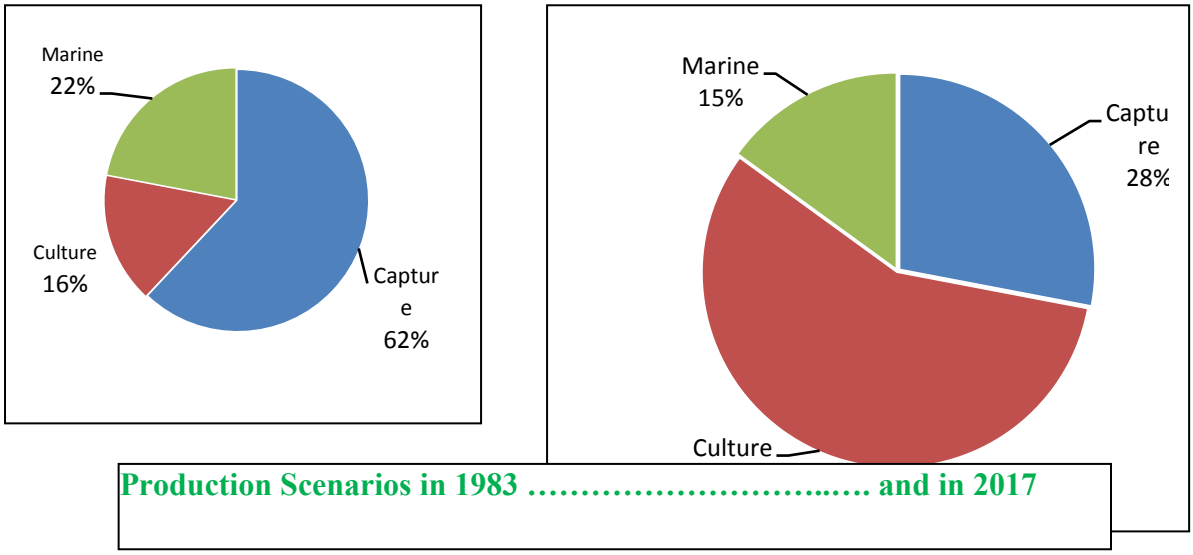
Second of the three-phase series of National Agricultural Technology Program-Phase II (NATP-2) is now being implemented (2016-2021).

NATP Extension approaches: Both NATP-1 and 2 essentially apply the following fundamental approaches in fisheries extension in the country:

- Formation of small farmer groups: Common Interest Groups (CIGs)
- Mobilization of the CIGs (Formation of leadership Executive Bodies, registration, opening of bank accounts to facilitate group savings and reinvestment, etc.)
- Training: CIG farmers as well as service providers including LEAFs (Local Extension Agents for Fisheries)
- Establishment and use of FIACs (Farmer Information and Advice Centers) at Union level
- Demonstration of aquaculture technologies
- Farm visit and advise
- Observation of Field Days based on demo-results
- Farmers' exposure visits
- Formation and utilization of Producers' Organizations (PO) to facilitate farmers' access to market
- Research–extension linkage: a unique collaboration with the Bangladesh Fisheries Research Institute for the production of quality fingerlings (Pure Line Brood: line development program) of some selected species, and their field extension.
- Involvement of ICT in establishing Research-Extension-Farmer-Market linkage: particularly mentionable is equipping LEAFs with tablet PC (with internet access) to facilitate information exchange between the farmers and Upazila Fisheries Office. Video preparation by the project and use in extension activities is another example.

Impact on aquaculture:

- From no culture to extensive to semi-intensive to intensive and even highly intensive.
- Culture species: from (when started in true sense of the term aquaculture) indigenous carps to exotic species to present day SIS, *Kuchia*, crab farming, *parshe* and counting.
- Productivity per hectare in pond (fin fishes):735 Kg in 1983 to 4,765 Kg In 2017 (a 6.5 times increase) and (shrimp), per hectare,: 16 kg to 478 Kg (a 30 times increase).



Production Scenarios in 1983 ……..…. and in 2017

On self sufficiency

Self sufficiency in 2018. Ministry of Fisheries and Livestock recently (February 2018) announced the country's achievement in reaching self sufficiency in fish. Against a production demand of 40.50 lakh MT, in 2016-17 country has produced 41.34 lakh MT of fish.

Extension Challenges

Due mainly to changing socio-economic situations, the extension approaches can never remain unchanged. It is evident from the chronological evolution of agricultural extension system in Bangladesh (Section A 1 to 4 above). To be effective, extension approaches should not be a static one. It should always be capable to enrich itself by assimilating the challenges that keep coming. Only then the extension approach would be more effective as well as useful. Following challenges are worth mentioning that require careful consideration and incorporation into the system to strengthen the process of sustainable growth of fisheries production:

1) To ensure effective linkage of research-extension-farmer-inputs supply and market with the help of ICT.
2) To ensure availability of adequate quality fish seed and safe fish feed (safe for human consumption and at the same time cost worthy).

3) As there are more than one GoB and non-GoB extension projects operating in the country, to minimize wastage of time and resources, it is important to avoid bringing in different extension methods at the same place and time.

4) To bring the total culture system under 'Good Aquaculture Practice'.

5) To ensure development of a complete cool chain from the time of harvest until it reaches the kitchens of the consumers via retail and wholesale markets. To accomplish this, proper post-harvest handling, improved transportation system and finally the marketing channels are to be well integrated.

6) To develop skilled manpower in the fields of research and extension, adequately capable of present day extension needs, in both policy making and implementation levels.

7) In order to achieve the SDG (Sustainable Development Goal) by 2030, it is of utmost importance to successfully follow the three factors of attaining sustainability: technologies should be (1) environment-friendly, (2) farmer-friendly, and (3)socio-economically acceptable.

8) Above all, to integrate people's participation in the process by raising their awareness in all the relevant fields.

Conclusion

Our socio-economic background 'Fish and Rice make a Bengali' (মাছে -ভাতে বাঙালি) is a good statement of the fact that as a nation we are aware of the importance of fish in our diet. Unfortunately, this is not always correct when it comes to doing enough in conserving the natural fisheries resources. We have to use the extension tools effectively in that field as well. Then only sustainable growth of fish production will be ensured through maximum utilization of both capture and culture fisheries resources of the country.

Good practices in Extension-
Culture of Cuchia (Mud Eel) and Crab in the Selected Areas of Bangladesh and Research Project

Approaches:
-Demonstration of Crab and Cuchia culture
-Training, Refreshers training, Workshop/Seminar
-Exchange visit,
- Project beneficiaries and group formation,
-Construction of Crab hatchery,
- Development of private entrepreneurs and marketing system
-Co-management for habitat

1. Name of the Projects:

Culture of Cuchia (Mud Eel) and Crab in the Selected Areas of Bangladesh and Research Project.

2. Objectives:

- To develop the culture techniques for Crab in coastal area and Cuchia in ponds/rice field;
- To explore of indigenous knowledge on crab and cuchia, and its habitat regarding community based management of resource;
- To develop skills of all stakeholders on Crab and Cuchia culture and management;
- To create employment opportunities for the poor beneficiaries (Ethonic people) to improve their livelihoods;
- To develop ecosystem health of the aquatic resources for better management of crabs and cuchia; and
- To promote export of crab and Cuchia.

3. Major Extension Methodology / Pilot Activities:

Major activities are given below-

- Demonstration of Crab culture
- Demonstration of Cuchia culture
- Enrich the aquatic biodiversity status of the water body.
- Habitat of cuchia and crabs is to be developed;
- Consumption of cuchia and crabs and income of participant households be increased and their livelihood would be improved.
- Co-management for habitat improvement of private resources established and sustained.
- Lessons learning from the demonstration plot disseminated for wider impact.
- Management activities will be monitored by visiting DoF participants and local UFO.

List of Good Practices:

- Training for DoF personnel,
- Training for fish farmers,
- Refreshers training**,**
- Workshop/Seminar,
- Demonstration of Crab culture,
- Demonstration of Cuchia culture,
- Exchange visit,
- Project beneficiaries and group formation,
- Data collection and data bank development,
- Construction of Crab hatchery,
- Development of private entrepreneurs,
- Development of the marketing system.

Causes of Good approach:

Cuchia fish and Crab has a high export value. Export potentiality of Cuchia fish and Crab mostly enhances the rapid expansion of aquaculture activities through the adoption of recent aquaculture technologies as well as encouraged private investment in fisheries sector. The participation of different stakeholders in the chain of inputs supply, production, transport, handling, preservation, processing and export of Cuchia fish and Crab ultimately creates a sustainable diversified way for investment, employment and agro-business enterprise development.

Project beneficiaries and group formation:

The targeted beneficiaries for the cuchia fish culture and crab fattening will be the poor farmers and fishers and landless people of the bank of the water bodies. The beneficiaries of this project such as poor farmers/fishers living around the water bodies will be organized in groups as for the Cuchia fish culture and crab fattening, but the criteria of the beneficiaries for crab fattening may be relaxed based on the availability of the suitable water resources. Initially the project will promote financial support and inputs. The group will create fund by themselves through regular savings so that they can be self-sufficient in future if outside financial assistance withdrawn gradually. The groups are expected to use this fund for the management of their water bodies and related enterprises. All the stake holders of particular unit of Cuchia fish culture and crab fattening group will be trained up to maintain accounts and their activities. Beyond the target group, the project will encourage non-target members of the local communities to cooperate in resource protection and support project efforts in group-based Cuchia fish culture and crab fattening activities.

Time line of the activities:

The project activities runs between July 2015 to June 2018.

Key Findings:

Eel culture method

The fish were fed with 3% bw (1% dead fish, 1% dry fish, and l% earthworm, snails and bivalve) at every alternative day. In addition live carp fry, was also supplied to the system at 15 days interval. These studies indicated gross production of mud eel was recorded 7892.0 kg/ha (aquaculture method) in pond and 268 1.0 kg/ha (natural resource management method) in rice field. Habitat of aquaculture method and natural resource management method (Rice field) was developed by installing Plastic and tripal, mud-compost hips, bamboo roots; plastic pipes and aquatic vegetations. An intensive or semi-intensive sustainable aquaculture method of cuchia fish in small pond and rice field is a good proposition as an aquaculture technology to save the mud eel from declined and enhance the export item, nutritional status and socio-economic improvement of the people.

On the otherhand, three technology of crabs are practiced in the coastal area of Bangladesh.

Crab culture

1. Young crab culture technology: This is a completely new technology in Bangladesh. The crabs were fed with 3-4% bw of trash fish. This study indicated gross production of mud crab was recorded 4491.0 kg/ha. Habitat of crab culture method was developed and released 50 g weight young crab in the pond. A semi-intensive sustainable aquaculture method of crab in small pond is a good aquaculture technology to habituate in the field level and enhance the production, nutritional status and socio-economic improvement of the people.

2. Crab fattening: Crab fattening is a technology which is practicing by traditional method. But this culture technology is practiced by semi-intensive method. The crabs were fed with 3-4% bw of trash fish. This study indicated gross production of mud crab was recorded 2422.5 kg/ha. Habitat of crab fattening method was developed and released 180 to 200 g weight of crab and is developed only gonad in the pond. A semi-intensive sustainable aquaculture method of crab fattening in pond is a good aquaculture technology to practice in the field level and enhance the production, export item, nutritional status and socio-economic improvement of the people.

3. Cage culture crab: Cage culture of crab fattening or soft sell change is a good technology which is practicing in the coastal region. But this culture technology is practiced by intensive or semi-intensive method. The crabs were fed with 3-4% bw of trash fish. This study indicated gross production of mud crab was recorded 2522.0 kg/ha. Habitat of cage culture of crab fattening or soft sell change method was developed and released 180 to 200 g weight of crab one crab one cage and is developed gonad or changed soft sell of crab. A semi-intensive sustainable cage aquaculture method of crab fattening or changed soft sell of crab in cage is a good aquaculture technology to practice in the coastal area and enhance the production, export item, nutritional status and socio-economic improvement of the people.

Adoption Status:

The proposed study will highlight National Strategy for Accelerated Poverty Reduction (NSAPR) regarding increase of production of mud crab and mud eel (Cuchia) as well as employment generation, livelihood up gradation and foreign currency earning.

Constraints and limitation:

In cuchia fish culture and crab fattening, risk is not much as other activities. However, there would have some risks during the implementation of the proposed project. The selection of water bodies and beneficiaries' group formation and mobilization is important for the successful implementation of this kind of projects. If the selection of sites is not suitable and the local people also are not motivated then it might create local conflicts, at the same time desired production would not possible. As the success of the proposed project mostly depends upon the positive and active participation of the local community. To overcome these risks, measures have to be taken well ahead regarding selection of the sites and beneficiaries by the assistance of local government and local community. Local people, fishers, farmers should be well motivated and organized and they will work for their well-being to overcome this problem.

In addition, heavy storm and cyclone, exceptionally high tide during the project period would be affecting the management of cuchia fish culture and crab fattening. Therefore, measures should be taken during the selection of sites.

The project will plan on a regular program of visits and other awareness raising events targeted at officials of all levels throughout the project period.

Extension opportunities:

The project activities will be sustained by the beneficiaries at field level. However, DoF field officials will provide all necessary technical supports.

Linkage and collaboration:

The activities of the proposed project commensurate the strategic goal of the National Strategy for Accelerated Poverty Reduction-II (NSAPR) of the government. In the NSAPR strategic goal-14 of the policy matrix-3, it is stated to increase productivity of inland aquaculture. In the strategic goal-15 and 16 of the NSAPR policy matrix-3, it is also stated to increase productivity of inland capture fishery and raising income of the poor fishers. Through the different activities of the proposed project attempt might be taken to develop and manage open water bodies by the poor community so that fish production as well as the income of the poor fishers/farmers might be increased.

The proposed project will also have linkage with Six Five Year Plan and the Fisheries sector Road Map. In the Six Five Year Plan it is targeted to increase 25% aquaculture production; raised export earnings to US$ one billion from fish and fisheries product and income of fish farmer raised 20% by 2015. In the road map, it is targeted to produce 760,000 MT fish from flood plains, 75000 MT from Beels and 1986000 MT from aquaculture by the year 2015. To achieve that target different initiatives have been taken through different projects and programs. The proposed project will also contribute to achieve the targeted fish production by 2015. Through the implementation of this project productivity of inland aquaculture will be increased. The poor fish farmers will get more earning as they will harvest more fish. This particular project will contribute to achieve that target.

Lesson learnt from similar nature of project:

In 2010, Bangladesh Fisheries Research Forum, Worldfish Center and Department of Fisheries, Bangladesh has undertaken an experimental action research project To investigate the technical and co-management aspects of mud eel *(Monopterus cuchia)* culture *by* ethnic *(Adivasf)* communities in the northern Bangladesh to develop a sustainable culture practice of aquaculture and natural resource management of cuchia. The current study was undertaken to observe production potential of mud eel in participatory semi-intensive culture systems in Noukuchi rice field (treatment T_1, Sherpur and Gohalidew Ponds (treatment T_2), Netrokona with an area of 0.20 and 0.06 ha, respectively. The water bodies were stocked with Cuchia fingerlings (95.96 and 95.45 g) at a density of 5187/ha. and 12866/ha, respectively in treatment T_1 and T_2 for a period of 150 days. Rice field and pond habitat was improved by installing mud-compost hips, bamboo roots; plastic and bamboo-made hollow pipes, and aquatic vegetations. The fish were fed with 3% bw (1% deadfish, 1% dry fish, and I% & 1% flesh of snails and bivalve) at every alternative day. In addition live carp fry anf fingerlings was also added to the system at 15 days interval. In the rice fish system, the individual final weight was 310.63±17.59 g in 150 days of culture period. Comparatively, lower growth performance of *M. cuchia* was observed in ponds (T_2). These studies indicated gross production of mud eel was recorded 1440.0 kg/ha in pond and 2681.50 kg/ha/150 days in rice field. The physico-chemical factors were found to be suitable for mud eel culture. *M. cuchia* semi-intensive culture in rice field and ponds is a good proposition as an aquaculture technology to save the mud eel from declined and enhance the nutritional status and socio-economic improvement of the Adivasi people.

Recommendation:

Mud eel (cuchia) and Crab are the targeted species for nutritional and livelihood aspect of poor people and Adivasi people. Crab is a popular food item to the people of coastal region and Cuchia for *Adivasi* people; and they are habituated to handle it. It is important to investigate local knowledge of Cuchia i.e., its habitat, feed, behavior, breeding and identification of habitat to develop its habitat and culture management technology by declaring some parts of water body as a sanctuary. Considering this, the project can increase productivity of under used aquatic resources for cuchia and native fishes. The lessons learnt from the project will be shared and disseminated for adoption in wider areas. The specific research outputs are outlined below:

- Easy to enrich the aquatic biodiversity status of the water body.
- Habitat of crabs is to be developed; and consumption of crabs and income of participant households be increased and their livelihood would be improved.
- Habitat of cuchia is to be developed; and consumption of cuchia and income of participant households is to be increased and their livelihood would be improved.
- Co-management for habitat improvement of private resources established and sustained.
- Lessons learning from the demonstration plot disseminated for wider impact.
- Management activities will be monitored by visiting DoF participants and local UFO.

Good Practices in Extension: Agriculture Nutrition, and Gender Linkages (ANGeL) Project

Approaches:
- Base line survey
-TOT & Refresher training of SAAOs and APKs
- Farmers training
- Monitoring
- End line survey

Agricultural Policy Support (APSU) of Ministry of Agriculture in collaboration with Department of Agricultural Extension (DAE) implements the pilot project Agriculture Nutrition, and Gender Linkages (ANGel) with technical assistance from IFPRI. Financial supported by USAID. Works closely with other GOs &/ Ministries, NGOs, I-NGOs & Development partners .Act as a hub in an ICT-based network connecting various agencies and decision makers in the MOA.

APSU is a kind of "situation room" for agricultural policy planning
Collect data, analyze policy issues, offer policy options, and evaluate the impacts of policies —within the MOA. Promote important policy reforms to increase incomes of smallholder farmers and develop a nutrition- and gender-sensitive agriculture sector in Bangladesh. To fill knowledge gaps on critical food security and agricultural developmental issues through policymaking process, stimulate policy dialogue, and communicate evidence-based research findings to relevant Ministries .IFPRI team helped APSU select and prioritize the Ministry of Agriculture's development program priorities for the next five years by classifying 246 programs and projects submitted for consideration by 16 different departments within the Ministry.

APSU & IFPRI collaborative aspects to create evidence

- Women's empowerment: assessing women's role in agriculture
- Safety nets: transfer modality research initiative
- Stabilizing rice prices and trade with public stocks
- Surging onion prices: a situation analysis
- Marketing and pricing fertilizer
- Informing and improving the seed sector
- Studying the fish value chain
- Positioning agriculture to improve nutrition and women's empowerment
- Government capacity strengthening: the agricultural policy support unit
- Strengthening linkages between research and policy

- Agriculture, Nutrition and Gender linkages (ANGeL)
- Assessing the impact the BT-Brinjal technology in Bangladesh

Orienting Agriculture Toward Improved Nutrition and Women's Empowerment (ANGeL)

Motivation

Using IFPRI's 2011-12 Bangladesh Integrated Household Survey (BIHS) found that:

- **Agricultural diversity increases** household and child **dietary diversity**, and hence, diet quality, *after controlling for income effect*
- **Women's empowerment** (measured by the Women's Empowerment in Agriculture Index – WEAI) improves household, child, and maternal dietary diversity
- **Women's empowerment** increases agricultural diversity

IFPRI-PRSSP research also shows that nutrition behavior change communication (BCC) training imparted to women and men in rural households in Bangladesh leads to significant improvements in child nutrition (TMRI, Alive & Thrive).Minister of Agriculture, Honorable Matia Chowdhury, confirmed her country's commitment to addressing malnutrition, saying, "the government of Bangladesh considers agriculture, food security, and nutrition as its top most priorities." in Washington DC of IFPRI 40th anniversary event .In the Second International Conference on Nutrition in Rome, she took the opportunity to announce the ANGeL initiative directly to be implemented by MOA with a view to shape the design of a national program from the evidence

Overall objectives

- Identify actions and investments in agriculture that would lead to agricultural development for improved nutrition
- Make recommendations on how to strengthen pathways to women's empowerment—particularly within agriculture

Specific objectives

1. Increase farm household income;
2. Stimulate agricultural production diversity;
3. Promote dietary diversity of pre-school children, child-bearing-age women, all household members;
4. Improve infant and young child feeding practices;
5. Promote intakes of calorie, protein, iron, zinc, and vitamin A;

6. Improve nutritional status of pre-school children and child-bearing-age women; and

7. Advance women's empowerment and gender parity between adult male and female.

Project design

The project implements and evaluates (using RCT) the impact of three alternative modalities for nutrition and gender sensitive agriculture. The modalities are: *Agriculture Production:* Facilitating the production of the high-value food commodities that are rich in essential nutrients. *Nutrition Knowledge:* Conducting high-quality behavior change communication (BCC) training to improve nutrition knowledge of women and men. *Gender Sensitization:* Undertaking gender sensitization activities that lead to the improvement in the status/empowerment of women and gender parity between women and men.

Treatment arms and control

ANGeL has 5 treatment arms and a control arm:

- T1: Nutrition BCC (SAAOs)
- T2: Nutrition BCC-(APKs)
- T3: Agricultural Production (SAAOs)
- T4: Ag. Production + BCC (SAAOs)
- T5: Ag. Production to + BCC + gender sensitization to women and men
- C: Control

Linkages and partnership

- Agricultural Policy Support (APSU) of Ministry of Agriculture in collaboration with Department of Agricultural Extension (DAE) implement the pilot project with technical assistance from IFPRI
- Bangladesh Rice Research Institute (BRRI)
- Bangladesh Agricultural Research Institute (BARI)
- Bangladesh Agricultural Development Corporation (BADC) Bangladesh Institute of Research and Training on Applied Nutrition (BIRTAN)
- HKI provides training of trainers (SAAOs/community women) on agricultural production, nutrition BCC, and gender sensitization activities.
- DATA : base line and end line survey
- m STAR (Mobile Solutions Technical Assistance and Research Activity) DBBL

Major activities: Base line survey, Training materials development, TOT & Refresher training of SAAOs and APKs, Farmers training ,Monitoring and End line survey

Implementation note of ANGeL project

Base line survey (Total 4000 (3125+ HHs have been selected under 16 upazilas covering 125 blocks).TOT provided by HKI(Selected 100 SAAOs (100) and 25 ANGeL Pusti Karmi (APKs) received TOT for 5 Treatment arms .T1:Nutrition BCC training by SAAO,T2: Nutrition BCC training by APK,T3: Agriculture training by SAAO,T4: Nutrition BCC & Agriculture training by SAAO and T5: Nutrition BCC, Agriculture & gender training by SAAO. Coverage of farmers by SAAO & APK. Each SAAO & APK are to provide training for 25 HHs. Sub group formation: Formation of 2 sub groups from 25 HHs (identified through base line) under each SAAO/APK are being under processed by SAAO & APK. Each sub groups tentatively contain 24-26 members from 12 to 13 HHs. Thus from each HH, 2 members need to be included. Mother of under two child (youngest children) from the selected HH. Father of under two child. If father is missing (gone to abroad/died/separated then other male member of the same HH need to be included in the group. No member can be selected from the HHs that are not in the HHs list. Need to send 2 sub group list (provided by IFPRI) to IFPRI mentioning training site information. Account name: Mother of under two child. Pre-registration & fill up of account form. Submission of image & NID/birth certificate to DBBL bank. After activation of the account refill of the sim. Need to send mobile account information for 25 HHs (format provided by IFPRI) to IFPRI Orientation session on mobile cash transfer. Farmers training for 2 sub groups at 3/4 Weeks interval. Need to SMS for absent notification to ANGeL cell (01992682369) and hard copy of attendance sheet after completion of training for 2 sub group for each session

ANGeL Project Modalities

Agriculture Production: Year-round production and high-nutritive value crops, Bed and pit preparation, Soil health management, Intercropping, Quality inputs, Pest control management, Postharvest management and marketing ,Goat, cow, poultry rearing; fish farming.

Nutrition BCC: Food and nutrition, Micronutrients (iron, iodine, zinc, vitamin A, etc.),Breastfeeding, Complementary feeding, Women's nutrition and care, Hand washing, Safe food

Gender Sensitization: Building trust, Communication skills, Discussing gender norms, Intra-household food distribution, Working together to create communities of care, Exploring power relations, Joint decision making

Features of ANGeL

Knowledge and networking for uses of market opportunity: Contact information of seed vendors and agri-input dealers (e.g., fertilizer, insecticides, market cooperatives, wholes seller, retailers, animal feed and animal's medicine seller) to the farmers to have best market prices for their produce.

Adaptation to climate change: Farmers were introduced resistance varieties; sorjon technique and floating technique, vegetable gardening using sac garden, clay basket, plastic basket. preparation technique and importance of organic compost and pesticides.

Mainstream gender in nutrition and agriculture component : Men, women & Mother in laws are participating in the porgramme. Gender and position-based inequalities on nutritional status, focus on gender decision making-nutrition and agriculture

ICT in ANGeL: The project disburses training allowances using DBBL and the USAID-(mSTAR) to 3125 ANGeL beneficiary households of 125 blocks across 16 districts in 16 Upazilas

ANGeL implementation challenges: Attendance of female farmers is nearly 100% in most of the training sites. However, regular attendance of the male farmers in the ANGeL training programs is a challenge. Inputs demand from the farmers

Way forward

Completion of 3rd phase training ,End line survey

Agriculture Information Services- Friendly media for agricultural information dissémination

Approaches:
- Electronic media: Betar (Radio) Activities, Community radio, Television programs, Television Daily programs, Mobile Cinema Van show by the regional offices
- Print media: Leaflet, Booklet, Krishikotha, Samprasharan Barta, Production technology handbook.
- ICT media: Website, AICC, Krishi Call Centre, E-Book, Community Radio, Finger touch Kiosk, ICT labs and Mobile Apps

About the organisation-AIS

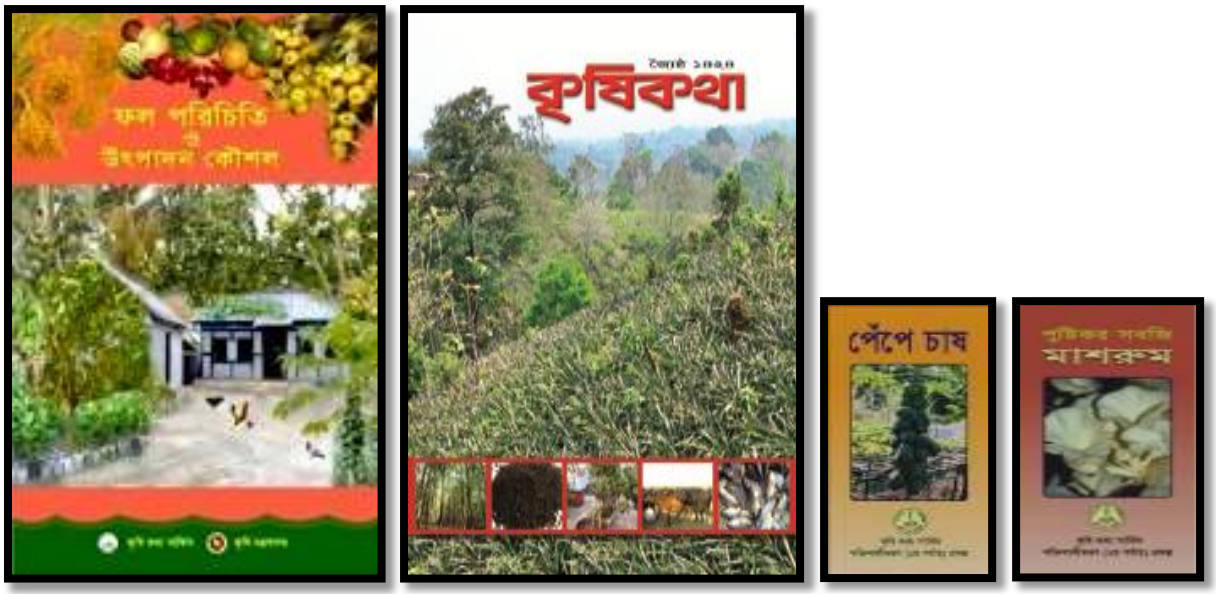
The Agricultural Information Service (AIS) is the ***'Institutional memory'*** of the Ministry of Agriculture; It is entrusted with responsibility of providing mass media support to the agriculture sector in general and transferring agricultural technology from research station/other authentic sources to the rural people of Bangladesh; Incepted in 1961. Prime objective to disseminate information/tech. through all possible mass media PRINT, ELECTRONIC and ICT are the major means; Having 11 regional offices with 243 employees; AIS is playing an important role in changing the traditional practice of the rural farmers that contributes to improving their livelihood.

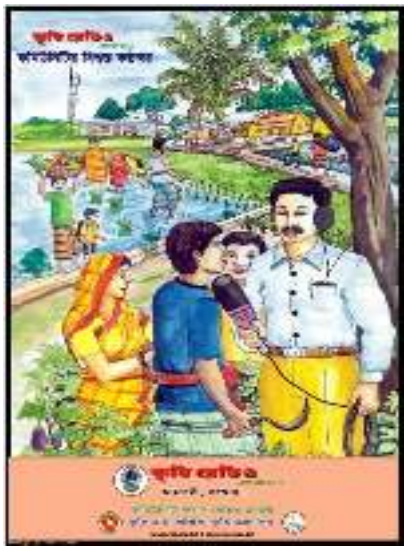
Core media activities of AIS: Electronic media, ICT media and Print media

Agro information dissemination process: Transformation, Research, University ,Extension.

Knowledge centers
↓
Mass-media
↓
Farmer

Print Media materials





Electronic media activities

Betar (Radio) Activities

Experience of 5 decades in radio based program preparation and broadcasting with the BB.14 consecutives hours/day radio programs are being broadcasted by regional and national stations of the BB with the assistance of AIS. Morning, Noon, Evening time

Community radio: Only government owned CR, Established in 2012 at Amtoli upazila in Barguna district, FM 98.8 band, Daily 8 hours program broadcasting, Nearly 2 lakh listeners, News 3 times ;My Radio My Voice

Television programs: *Mati-o-Manush*, a popular TV program, is being broadcasted in the BTV since 1978 with the assistance from AIS;5 days in a week;The 2nd Popular program in BTV;

Television Daily programs: *Banglar Krishi*, a well-liked TV program, is being Telecasted in the BTV since 1st March 2014 with the assistance from AIS,Day to day advices, Daily at 7.25 am 15 mins duration with integrated Ag,7 days in a week,Up to till 1185 episodes telecasted

Mobile Cinema Van show by the regional offices

ICT interventions : Website, AICC, Krishi Call Centre, E-Book, Community Radio, Finger touch Kiosk, ICT labs and Mobile Apps, Production technology, Contemporary advices, Agri news, Important information, Print, Audio and video materials. Weather news etc.

Mobile Apps (available in Google Play store)

Website: www.ais.gov.bd

Agriculture Information and Communication Centre (AICC): Selected from IPM/ICM club. Operated by the farmers at village level. Equipped with different ICT devices,499 centers. Reduces 'digital divides'. Each upazila is covered and18-20 persons/day/AICC get benefits

Multi media E-Book

Kirshi Call centre 16123

- Short coded 16123,5000 validated Q/A,6 days/week, 9 am-5 pm,Crops, Livestock, Fisheries experts,Daily 200-250 calls

Finger Touch kiosks

ICT labs

Good Practices of Cotton Extension by Cotton Development Board in Bangladesh

Approaches:
-Result and block demonstration
- Field and farm visit
-Formation of farmer's group, Group meeting and farmers training
- Printing materials like- poster, leaflets, booklets etc.
- Field days, farmers rally
- Research-farmers-extension linkage
- Involved ginners, spinners and other stakeholders
- Use of ICT

Brief Introduction of Cotton Development Board:
Cotton Development Board (CDB) was established in 1972 by the father of the nation Bangabandhu Sheikh Mujibur Rahman under the Ministry of Agriculture to boost up cotton production in the country. The major activities of CDB are- conduct cotton research, cotton extension activities, Seed production and distribution, marketing and ginning, provide small credit to the farmers. Currently CDB operates it extension activities through 4 regional, 13 zonal and 190 unit offices in 39 districts in the country. Cotton research activities also conducted in 5 Research Centres/farms and 3 sub-centres. The main focus of cotton extension and research in the country is to expansion of cotton cultivation in less productive- Char land, Drought, saline affected areas and Hill valleys and slopes in the Chittagong Hill Tracts without hampering food production.

Mission and Vision of the Organization:
The vision and mission of Cotton Development Board are as following-
Vision:
- Increasing cotton production and its by-product

Mission:
- Invention of climate resilient and need based cotton production technologies
- Distribution of quality cotton seed to the farmers
- Expansion of cotton cultivation in less productive areas along with the existing cotton production areas in Bangladesh
- Facilitate marketing and ginning activities to promote cotton production.

Name of the projects: Expansion of Cotton Cultivation Project (Phase-I)
Duration: May 2014 to June 2018.
Broad Objective:
- To increase cotton production in the country through technological intervention and area expansion by improving capacities and capabilities of Cotton Development Board.

Specific Objectives:
- To extend cotton cultivation in the above flood level Char land and river bank areas; drought and saline prone areas; Hill slope and Hill valley's; and other less cropping intensity areas of the country
- To expand cotton cultivation in the agroforestry system and tobacco cultivation areas in the country
- To popularize cotton based profitable cropping pattern, intercropping and other cropping system

- To ensure supply of quality seeds to the farmers by producing foundation and truthfully level seeds of HYV and modern cotton varieties
- To strengthen extension services through disseminating modern technologies of cotton cultivation by implementing demonstration, block demonstration, field day, farmers rally, exchange visit etc
- To disperse silk cotton (*Shimul Tula*) plantation in the homesteads across the country

Major extension methodology or pilot activities:

Cotton development Board (CDB) is a unique department that operates cotton extension, research, seed production and marketing and ginning activities within same umbrella following research-farmers-extension linkages. CDB provide modern cotton production 3 technologies to the farmers through different extension methodologies by the root level offices of Cotton development Board namely Cotton Unit Office at the Union level. Every Unit is divided into different blocks and each block comprises more than one villages in cotton growing areas of the country. Each block or villages have one or more contact or trained cotton farmers to disseminate cotton production technologies. There are few numbers of cotton farmers associations in the major cotton growing areas of the country. Cotton Development Board also provides input support to the cotton farmers through small credit from its own fund for growing cotton. Supply of quality cotton seed is another major activity of cotton Development Board. To achieve the objectives CDB produces Breeder, Foundation and Truthfully Labeled (TLS) cotton seed of CDB released cotton varieties. Recently, CDB is producing Hybrid cotton seed in a small scale of its own released variety CB Hybrid-1. CDB also get involved in marketing and ginning of seed cotton produced in the country to ensure reasonable/fair price to the cotton farmers and facilitate private sector to improve quality of cotton fibre and promote cotton by-product based industries. Cotton picking and other post-harvest operations are mainly done by the rural women and have wide scope to empower rural women and poverty reduction. The extension mathodologies commonly followed for cotton expansion are as follows-

- Establish result demonstration and block demonstration on modern cotton technologies
- Frequent field and farm visit of cotton farmers by the extension staff and officers
- Conduct group meeting to solve the local problems
- Conduct farmers training at the unit level and contract farmers training at CDB research farm located at different places in the country
- Use of multimedia, audio and visual training materials for better understanding the subjects matters
- Circulate printing materials like- poster, leaflets, booklets etc. on specific cotton production issues and use of mike to get aware cotton farmers during sowing period
- Conduct field days, farmers rally to demonstrate result on modern cotton production technologies
- Involvement of farmers in research activities through participatory research in the farmers field to create research-farmers-extension linkage
- Involved ginners, spinners and other stakeholders in commercial farming and facilitates private initiatives in cotton ginning, seed marketing, cotton oil production
- Use of ICT to disseminate cotton production technologies and cotton related information to the cotton farmers quickly and easily.

List of good practices:

1. Establishment of research-farmers-extension linkage
2. Formation of farmers group
3. Demonstration, field days and farmers rally

Why the approach is considered a good one:
The main objective of cotton extension is to disseminate modern cotton production technologies to the farmers and minimize yield between research station and farmers field. In this regard establishment of research-farmers-extension linkages are most important where researcher can directly linked with the farmers and extension workers to identify the problems and taken necessary measures. This linkage can be easily established through participatory research plot and regular consultation. Also target based farmers group can play vital role in agriculture extension activities in the locality. Demonstration, field day and farmers rally still a good approach for disseminating modern cotton production technologies.

Number of groups/beneficiaries involved with good practices
Most of the cotton farmers get involve in those extension approaches.

Supportive study/Survey/FGD and key findings:
Adoption status:
These approaches of cotton extension have been practicing in most of cotton growing areas of the country by the cotton extension workers and researcher successfully. So, adoption rate is more than 80%.
Constraints and limitation:
The major limitations of the extension approaches are-
- Availability of funds and manpower
- Involvement of all stakeholders in time and place
- Flood, storm, cyclone and other climatic constraints
- Market stability and development of value chain of agriculture products

Experience and lesion learnt (in terms of sustainability)
These extension approaches have found sustainable for dissemination of cotton production technologies to the farmers, where farmers have sharing in problem identification and decision making process.

Good practices in extension: Bangladesh Rural Advancement Committee (BRAC)

Approaches:
- **Group Formation**
- **Farmer's Training**
- **Quality Input Support**
- **Refresher's Training**
- **Result Demonstration and Field day**

Mission and Vision of the Organization: BRAC's mission is to empower people and communities in situations of poverty, illiteracy, disease and social injustice. Our interventions aim to achieve large-scale, positive changes through economic and social programmes that enable women and men to realize their potential.BRAC's vision is 'A world free from all forms of exploitation and discrimination where everyone has the opportunity to realize their potential'.

Name of Programme: Agriculture and Food Security

Goal: Contribute in achieving food and nutritional security through developing and fast track diffusion of diverse agricultural technologies for two million people in climate vulnerable regions by 2020.

Objectives: Specific objectives of AFSP are given below:

1. Development of crop varieties and production technologies adaptable to climate vulnerable areas with higher yield and nutritional values;
2. Promotion of higher productive and climate resilient agricultural technologies through farmer's participatory demonstration and training;
3. Expansion of integrated aquaculture in pond and seasonal floodplains with diffusion of technical knowledge on adaptive and diversified fish culture practices;
4. Promotion of nutri-gardening and dyke farming for organic and safe food through women participation
5. On-farm conservation of biodiversity of rice and indigenous fish species

Major extension methodology:

Survey → Site and Farmer selection → Group Formation → Suitable Cropping Pattern Selection → Farmer's Orientation and Training → Quality Input Support → Refresher's Training → Regular Follow up → Crop Cut and Field day → Data Analysis and Reporting

Name of good practice:

System of Rice Intensification (SRI):BRAC Agriculture and Food Security Programme initiated a validation and dissemination of System of Rice Intensification (SRI) method for sustainable rice production through active participation of farmers from dry season 2012. A block approach was followed where every SRI block consisted of around 20 to 35 acres of land. Each block contained 50 to 80 farmers. A number of demonstration trials were conducted by BRAC across 12 districts of Bangladesh. A benchmark survey was carried out in each location, based on rice cultivation and the feedback from farmers. Focus group discussions (FGD) were conducted to identify the problems faced by the farmers and their interest in the SRI method. The following table shows the SRI coverage during the last three dry seasons.

Table 1: BRAC SRI coverage from dry season 2013 to dry season 2015

Year	District	Upazila	Block	Number of farmers	Area coverage (acre)
2012-13	5	15	16	1,105	441
2013-14	11	31	45	2,830	1,335
2014-15	8	27	52	2,758	1,514

BRAC advocates six basic principles of SRI:

- Transplanting younger seedlings (15 to 20 days old seedlings)
- Transplanting single seedling per hill
- Transplanting in wider spacing (25x25 centimeters)
- Providing organic matter as much as possible
- Following alternate wetting and drying method of irrigation
- Practicing mechanical weeding

Fig. SRI field

Besides SRI blocks, there were non-SRI blocks where the method was not practiced. In the non-SRI blocks, farmers usually followed BRRI (Bangladesh Rice Research Institute) recommended rice farming methods. The data on the commonly followed farmers' practices were collected from the adjacent fields for comparison.

A comparative study of SRI, non-SRI and farmers' practices

From dry season 2013 to 2015, a total of 6,693 farmers were brought under validation and dissemination of SRI by BRAC's agriculture and food security programme. In dry season 2013, 1,105 farmers practiced the SRI system. About 16 different locations were selected in five districts. BRRI dhan28, two BRAC-released hybrid varieties, Sakti2 and Sathi were cultivated. Through the SRI method, BRRI dhan28 produced a 16 per cent higher yield than non-SRI, and 52 per cent higher yield than the farmer's practice. Hybrid dhan Sakti2 showed a five per cent higher yield in SRI than non-SRI, and 17 per cent higher yield than the farmer's practice. Hybrid dhan Sathi also yielded higher in SRI practice than non-SRI and farmer's practice. In SRI, this variety yielded five per cent higher than non-SRI, and 41 per cent higher than the farmer's practice (as shown in the chart below).

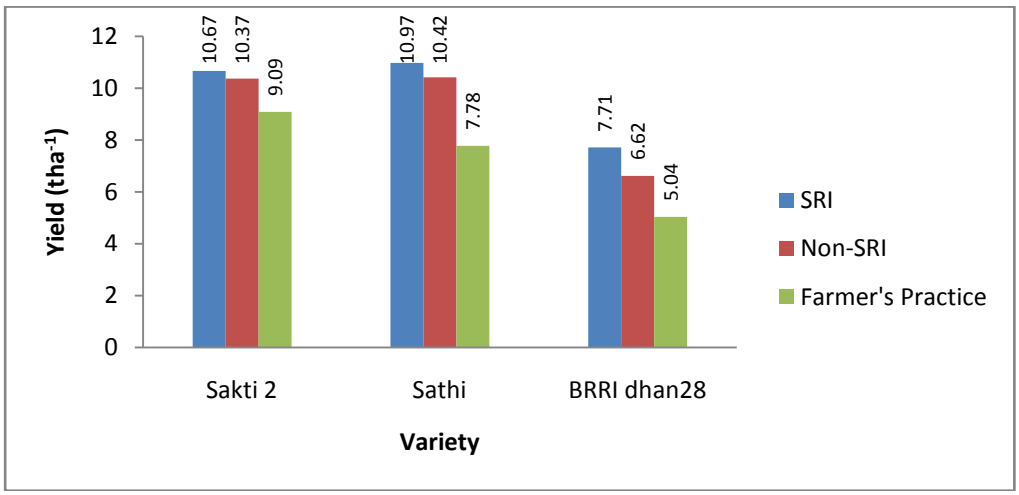


Fig 1. Yield performance of different varieties at different management practices during dry season 2013

During dry season 2014, a total of 2,830 farmers practised SRI in 11 districts of Bangladesh. Two varieties, Hybrid dhan Sathi and BRRI dhan28 were cultivated in that season. Both varieties produced comparatively higher yield in SRI method than non-SRI and farmer's practice. Hybrid dhan Sathi showed seven per cent higher yield and BRRI dhan28 showed five per cent in SRI practice than non-SRI. They also produced 29 per cent and 27 per cent higher yield respectively, in SRI than traditional farmer's practice.

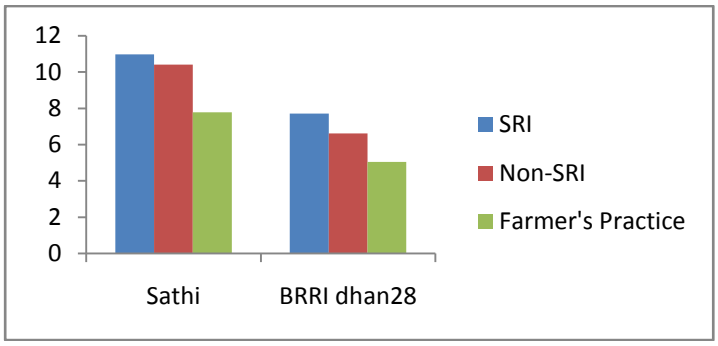


Fig 2. Yield performance of two varieties using different practices during dry season 2014

A total of 2,758 farmers practiced the SRI method during dry season 2015. BRRI dhan28, Hybrid dhan Sakti2 and Hybrid dhan Sathi were cultivated, and produced eight per cent, 11 per cent and 11.5 per cent higher yield through SRI than non-SRI, and 21 per cent, 13 per cent and 20 per cent higher yield, respectively in SRI than farmer's practice (shown in the chart below).

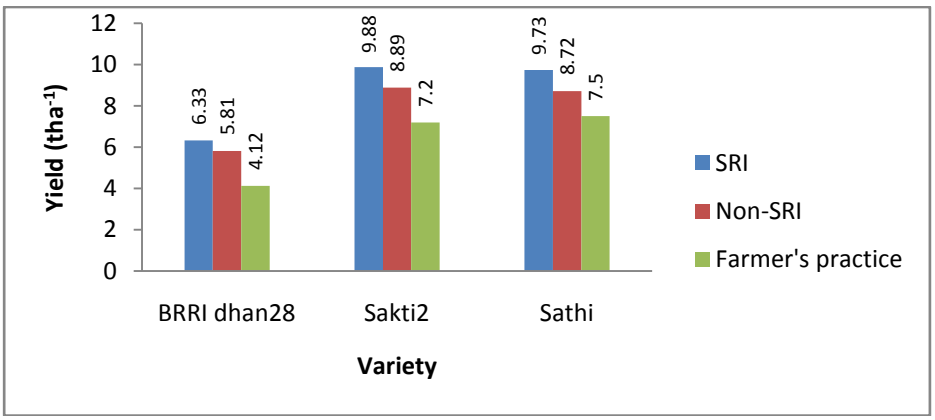


Fig 3. Yield performance of three varieties using different practices during dry season 2015

Benefit-cost ratio (BCR) of different methods

Comparisons have indicated that farmers practicing SRI method show more benefits than those depending on the commonly used farmer's practices and other non-SRI method. The yields do not vary significantly in between SRI and non-SRI, but the benefits are higher when SRI methods are implemented. This is due to lower seed rate, lower irrigation costs, less pest infestation, and less labor requirement for weed management. The increase in production with reduced costs is the most important trait of SRI. During dry season 2013, the SRI practice showed higher BCR in all districts

than non-SRI and farmer's traditional practices. Similar results were seen during two other dry seasons.

Table 2: BCR of rice production under different methods and locations

Management practices	Location	BCR		
		Dry season 2013	Dry season 2014	Dry season 2015
SRI	Bogra	2.73	1.76	2.79
Non-SRI		1.98	1.44	2.00
Farmer's practice		1.63	0.76	1.3
SRI	Kurigram	2.97	1.36	2.42
Non-SRI		2.45	1.21	1.93
Farmer's practice		2.44	0.64	1.79
SRI	Lalmonirhat	2.40	2.24	2.44
Non-SRI		2.20	1.93	1.98
Farmer's practice		1.56	1.64	1.43
SRI	Rangpur	2.48	2.00	2.59
Non-SRI		2.12	1.77	1.81
Farmer's practice		1.71	0.99	1.73

** Data is averaged over varieties

Adoption status

Small and marginalized farmers usually show less interest in adopting new agronomic practices. BRAC works to motivate these farmers to accept new technology by providing counseling, training and demonstrating its potential. The farmers then implement the new methods and continue the process with their own responsibility.

Constraints and limitations

- SRI is more labor intensive especially for manual weeding.
- SRI requires good water control to get better result. Sometimes it is difficult to maintain irrigation system in farmer's field.
- SRI requires good knowledge and skills from farmers to become better decision maker and manager.
- Sometimes it is difficult to maintain young seedlings in Boro season.

Extension opportunities

SRI practice gives higher yields, reduced water requirements, little capital expenditure, no agrochemical inputs, protection against climatic, pest, and disease stresses, better grain quality and lower cost of production which gives farmers higher income. So, awareness building and regular field demonstration is needed to extend this method properly. In this case, community approach will be more effective rather than individual initiative.

Linkage and collaboration

A good collaboration with different research institutions like BRRI, BINA, different extension agencies like DAE and other stakeholders and local representatives are the key to success in disseminating the SRI method.

Conclusion

Results from the demonstration in selected areas during 2013 to 2015 showed that the cost of production can be minimized by using the SRI method. It can increase the average yield and economic profitability of rice production in Bangladesh. The benefit-cost ratio was the highest in case of the SRI method. Farmers after having practiced the SRI method are found to be continuing it in the next season.

The primary objective of BRAC was to disseminate the SRI method among farmers to make rice production more profitable and sustainable rather than simply evaluating the performance of the SRI method. Further demonstration trials on the method could be carried out at different agro-ecological zones (AEZ) in Bangladesh to disseminate the practice and validate the benefits of the SRI method.

Recommendations

1. Better water management is necessary for successful SRI dissemination.
2. A community based approach much effective rather an individual approach for SRI.
3. SRI may be recommended as an environment friendly sustainable rice production system for resource poor marginalized farmers.

Christian Commission for Development in Bangladesh (CCDB): Good Practices in Extension

Approaches:
-Farmers training
-Seed distribution
-Demo setup
-Demo monitoring
-Farmers Field day

Mission and Vision of the Organization:

Mission: CCDB is mandated to work on the basis of ecumenical principles, to create a society, where the poor, marginalized and vulnerable people can claim and enjoy their rights and seek justice for a sustainable livelihood.

Vision: CCDB envisions a just and caring society, where poor people live in peace, with dignity and harmonious relationship with all of God's creations.

Name of Program (Goal and specific objectives): CCDB Agriculture & Seed Promotion Program. CCDB established partnership with National & International Organizations for agriculture & seed promotion and extension of new variety seeds among farmers at the community level.

As Bangladesh facing climate change impacts, CCDB wants to play and active role in Climate Adaptive Agriculture, such as, smart/stress & cold tolerant, such as drought/heat, saline, submersible resilient varieties extension and demonstration for ensuring food security, by engaging farmers to produce quality seed.

CCDB works to preserve and purification of indigenous varieties of seed with adaptive trial basis in different farmers' field.

Major extension methodology or pilot activities: Farmer selection, Farmers training, Seed-bed preparation, Seed distribution, Demo setup, Demo monitoring & data collection and Farmers Field day

Farmer's Group Initiative: Name of Farmers Group: Shibalaya Farmer's Group Enterprise.

1. Quality seed production, processing, preservation, branding, packaging & marketing;
2. Family approach farmers trainings assisted by CCDB & Department of Agriculture Extension;
3. Product quality control by Seed Certifying Agency, Ministry of Agriculture;
4. Quality seed production, processing, preservation, branding, packaging & marketing is maintained by Farmer's organization Shibalaya Farmer's Group. They also maintain their administrative and banking and financial activities. They regularly perform their need-based meetings and Annual General Meeting.

Addressing nutrition through extension: To address nutrition through extension CCDB perform: To disseminate Zinc enriched rice, To create awareness, To make available seed for future use, To improve food and nutritional security.

Adaptation to climate change: As Bangladesh facing climate change impacts, CCDB wants to play an active role in Climate Adaptive Agriculture, such as, smart/stress & cold tolerant, such as drought/heat, saline, submersible resilient varieties extension and demonstration for ensuring food security, by engaging farmers to produce quality seed.

List of good practices:

- Farmer's Group Initiative
- Crops: Zinc rice extension & dissemination; Indigenous rice variety purification & preservation; Stress tolerant varieties extension & demonstration.
- Dissemination of newly invented technology to the farmers.
- Conservation of agriculture practices.

Why the approach is considered a good practice?
Government, NGOs and private companies meet only 25-30% of total demand of quality seeds in Bangladesh, and the rest of the seeds come from the farmers. In many cases the farmers fails to maintain the quality of seed. CCDB through this program assists farmers with knowledge and skills, for producing and preserving good quality seeds to ensure better yield and food security. CCDB also strengthen financial and alternative business capacities of the Farmers' Seed Companies. CCDB also plays active role in Climate Adaptive Agriculture through these stress tolerant varieties. This approach is also considered a good practice for safe environment and ensuring nutritious food too. With this approach farmers can entablish their rights on seed.

Number of groups/beneficiaries involved with good practices: About nine thousands and six hundred beneficiaries within Agriculture and Seed Promotion Program of CCDB per year.One thousand household economically benefitted and two thousands five hundred are partially benefitted within the Shibalaya Farmer's Group.

Number of Resource Sharing Partners and Research Institute involved with the Program: In these vast activities, BRRI, BARI, BINA, BADC, SCA, CIMMYT, IRRI, IFRI and MoA are providing technical assistance to CCDB.

Timeline of the activities: From 2000 till now.

Supportive study/survey/FGD and key findings: Scarcity of quality seeds; In availability of new and stress tolerant seed at the local market; The farmers are getting cheated with buying seed from different seed companies; The farmers don't get agricultural advise timely; Scarcity of reliable seed source;

Adoption status: The farmers use their own seed in farming.

Constraints and limitation: Scarcity of good seeds timely; In availability of electricity and irrigation on time; Sometimes fertilizer doesn't work for impurity; Cheating of the seed companies.

Extension opportunities: This approach has an extension opportunity as because our country is an agriculture-based country. We need stress tolerant varieties, we need Zinc rice for nutrition of the children and women; again we need to produce and market quality seeds for the benefit of our farmers. So we think that we can go far with this approach.

Linkage and collaboration: We have linkage with GO and INGO, NGO, DAE, BADC, BRRI, BARI and IRRI.

Experience and lesson learnt (in terms of sustainability): This is our learning that with this approach the farmers get assured and get interest to purchase seed produced locally from the local organizations. Again the farmers want to have newly introduced rice seed; so as they didn't get these they will have to use the traditional seeds.

Remarks/recommendation: Setup demo of new and stress tolerant varieties in farmer's field. Establish farmers group in agriculture and seed business. Arrange family approach training and workshop to capacitate the farmers. Ensure availability of new and stress tolerant varieties of seed to the farmers.

Good Practices of Extension: Climate Resilient Ecosystems and Livelihoods (CREL) Project

Approaches:
- Co-management models to conserve natural resources
- Knowledge and capacity building of stakeholders
- Climate-resilient natural resources management and adaptation
- *L*ivelihoods diversification

Name of the Organization: Winrock International.

Mission and vision of the Organization: Winrock International is a recognized leader in U.S. and international development with a focus on social, agricultural and environmental issues. Inspired by its namesake Winthrop Rockefeller, Winrock combines scientific and technical expertise with entrepreneurial innovation to deliver market-based solutions that improve lives around the world. Winrock's mission is to empower the disadvantaged, increase economic opportunity and sustain natural resources across the globe.

Name of Projects/Program (goal and specific objectives): The USAID-funded Climate Resilient Ecosystems and Livelihoods (CREL) Project.

The CREL project is designed to develop then scale-up and influence adoption of successful co-management models to conserve ecosystems and protected areas and improve governance of natural resources and biodiversity through improved planning and livelihoods diversification within the context of building resilience to increasingly negative impacts of climate change. CREL has four (4) intermediate results which are addressed through a number of key activities:

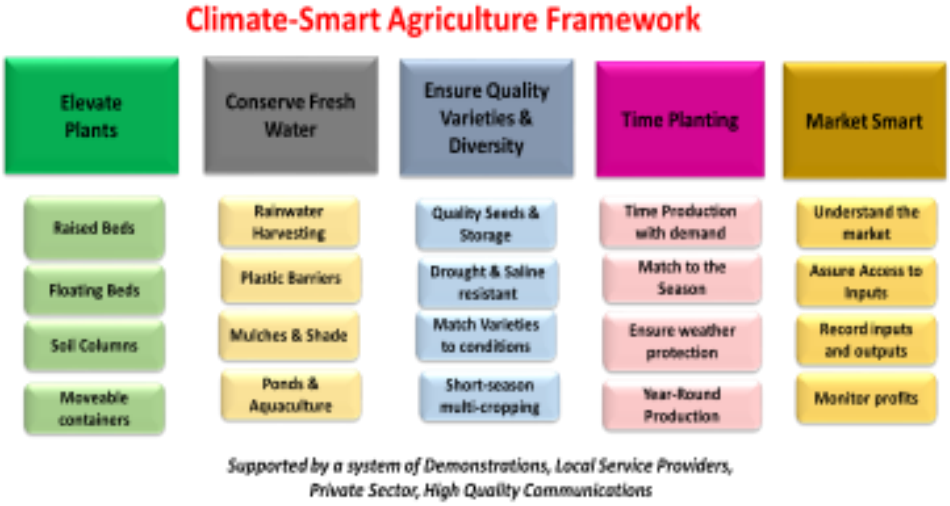
1: Improved governance of natural resources and biodiversity
2: Enhanced knowledge and capacity of stakeholders
3: Strengthened planning and implementation of climate-resilient natural resources management and adaptation
4: Improved and diversified livelihoods that are environmentally sustainable and resilient to climate change

The CREL project is operational in three (3) regions of Bangladesh: the Northeast Region haor and forest region (based in Srimongol with expansion into other districts), the Southwest region's mangrove forests represented by the Sundarbans (based in Khulna), and the Southeast region's forests and coastal wetlands (based in Chittagong and Cox's Bazar).

Major extension methodology or pilot activities (may be in the area of application of ICTs in extension, ways of reaching women effectively , linking farmers to markets, capacity development of farmer and extension workers, role of farmer organizations, addressing nutrition through extension, adaptation to climate change)

Extension methodologies and information as described below relate only to the agricultural components of CREL.

Crops: Initially the project undertook a process of identifying the highest potential horticulture crops that farmers with small amounts of land would benefit from financially. From the short list of potential crops a number of value chain studies were undertaken and the most high potential crops were selected to focus on. Training was accomplished via a schedule of a number of sessions with annual refresher training. Most farmers involved in this were women.



Demonstration farmers: were selected to demonstrate the potential of these crops. In addition, training of farmers in the surrounding areas on these crops as well as overall technical approaches was provided. Because the project is climate change focused, many of the techniques promoted in training were related to climate change. A climate smart agriculture framework was articulated for the project and is presented here, with the good practices articulated. Note that the CSA framework has five key categories with specific practices identified. Demonstrations are provided high quality support to ensure that anything being demonstrated has a goal of achieving a minimum of 2X the normal production rates by other farmers. These demonstrations should be so good that farmer really take particular notice of them. They are associated with signs also providing consistent and specific CSA messages. When possible, we linked demonstration to private sector support.

Local Service Providers: The Project supported a system of LSPs by means of providing business training, technical training and market linkages. LSPs were developed in areas where agriculture services were considered to be insufficient. LSPs who were already providing such services and further strengthened were successful in increasing their businesses and being sustainable. Those individuals where were not actually entrepreneurs but rather, farmers who were good farmers, did not perform as well as LSPs. Many only acted as LSPs when they had project support, but were not fully committed to their businesses.

The project connected all three of these components: CSA training for farmers, Demonstration Farmers and LSPs. This “triangle” is a very effective approach and is strengthened by the use of high quality signs that promote specific CSA messages (coming from the matrix provided above). Farmers see and hear one consistent message about CSA from the signs, the demonstration farmers, in the training and by the LSPs.

Aquaculture: The Project promotes two types of aquaculture practices. The first is a typical aquaculture polyculture system with basic training to farmers on stocking rates, feeding and pond management. For farmers with resources for such a system this works well and is profitable. Many smaller farmers, especially women, have micro-scale ponds measuring only a few decimals in size and are often shaded. And their objectives are not profitability but rather, food. For such ponds we promoted an ecological pond approach that focuses on managing healthy, diverse, habitats that support a diversity of fish species. Little if any additional food is added and the pond water fertility is managed by adding organic fertilizers. During the monsoon season farmers are encouraged to stock their ponds with "excess" fish from the rice field environments, some of which will reproduce in the ponds and some which do not. Farmers are encouraged to regularly harvest fish for consumption, especially small fish resulting from successful reproduction.

Livestock: A limited number of farmers were supported with cattle, chickens and ducks. Ducks were particularly popular in the NE haor basin. Where possible, livestock feeding practices were based on cut and carry particularly because project participants lived next to protected forests.

HELVETAS Swiss Inter cooperation: A model to make agricultural services available at the doorstep of farmers

Approaches:
- Capacity building of Service Providers' Associations (SPA) and Local Service Providers (LSP), traders and inputs providers
- Value addition at producers' level and chain performance improvement
- Capacity building of rural producers' groups and their networks in business management , Markets Work for the Poor (M4P) approach

HELVETAS Swiss Inter cooperation (HELVETAS) is a specialized non-profit oriented development association, denominationally and politically independent, which dedicates its expertise since more than five decades towards the elimination of the causes of poverty and marginalization in the South and the East of the world. In Bangladesh, HELVETAS Swiss Interco operation is present since 2000, till June 2011 under the name of Interco operation (IC), and has specialized in rural economy, natural resource management, local governance and disaster risk reduction. HELVETAS Swiss Interco operation Bangladesh believes that sustainable agriculture and a thriving rural economy are crucial for improving rural livelihoods. Therefore, HELVETAS implements different development projects in line with sustainable agriculture, food security, value chain and market system development, private sector development and rural finance in Bangladesh with the financial support from different partners like Swiss Agency for Development and Cooperation (SDC), UKaid, EU etc.

HELVETAS's **vision** is "Poor and disadvantaged individuals, households and communities enjoy improved livelihoods, well-being and resilience through social, economic and organizational empowerment and through better access to more responsive private and government services in an increasingly facilitative environment". At present, HELVETAS Bangladesh works for the following thematic areas:

- Rural economy
- Governance and peace
- Environment and climate (including water aspects)
- Cross cutting (gender and social equity, capacity development and partnership, learning & innovation)

Under the rural economy domain, HELVETAS implemented ***Samriddhi*** (rural prosperity) project in Northern Bangladesh, benefiting over 1000,000 poor producers (50% female) through used Rural Private Service Provision Model.

1. Brief of Samridhi Project and Best Practice (Rural Private Service Provision Model)

*Samriddh*i project started in August 2010 with the **goal "**to contribute to sustainable well-being and resilience of poor and extreme poor households of Rajshahi and Rangpur Divisions and Sunamganj District through social and economic empowerment" and **overall objectives** "to ensure poor and extreme poor men and women make use of enhanced employment and income opportunities through the processes of market

systems, and benefiting, managing and secure a more enabling environment for their well-being". Project ended on February 2015. The geographical areas that the project is active have relatively the highest concentration of poor and extreme poor people, who, in turn, are highly vulnerable to natural disaster and economic shocks.

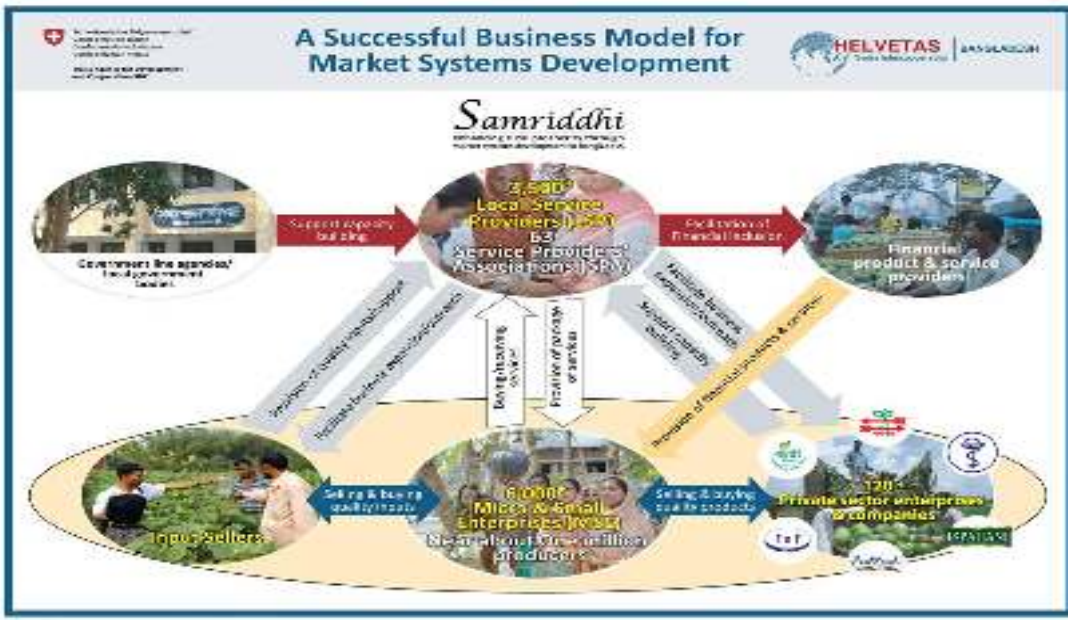
Samriddhi is based on the **impact logic** that, if public and private services for business development are available, the poor are empowered and capacitated to access these services, and an enabling environment for pro-poor economic growth exists, the poor can generate additional income and overcome their poverty in a sustainable manner. The project facilitates three lines of interventions in 12 value chains (livestock, crops, fisheries, and crafts), i.e. value chains development, service market development, and enterprise development. The underlying objectives include:
- Enhancing private rural local service provision through capacity building of upazila based Service Providers' Associations (SPA) and member Local Service Providers (LSP[1]), and other traders and inputs providers through functionally engaging private companies and public agencies
- Strengthening competitiveness of rural products, value addition at producers' level, and chain performance improvement through quality, accessible, and affordable services
- Enhancing the capacity of rural producers' groups and their networks in business management and the acquisition of adapted financial capital

Samriddhi used the Making Markets Work for the Poor (M4P) approach. It directly reached 672,000 and indirectly 389,000 households by December 2015. The project conducted thorough assessment of the sub-sectors and identified core systemic constraints/ obstacles at the producers, service providers, private companies, and public agencies levels to better performance of the market systems in terms of growth and inclusiveness, and showed what should be done to get them work for all, specifically for poor and very poor men and women. Obstructive factors were found at various levels. In the **private sector**, the areas of market penetration, product development and outreach with low transaction cost were given special attention. In the **public sector**, weaknesses were revealed in outreach for sufficient human resources and finance. At **enterprise** level, there was a lack of quality inputs, market access, finance, technical knowledge and skills, organised production and marketing. Based on this, the following interventions were identified to get market systems working for all:

- facilitating competitive value chains for better functioning market systems
- improving the engagement of private sector enterprises
- ensuring equitable benefit for poor and very poor man and women
- enhancing gender inclusive (inclusion of female) value chain development, and
- strengthening advocacy for a better enabling environment.

Figure 1: Rural Private Service Provision model of Samriddhi project

With the facilitation of project, a cadre of 3,500 competent LSPs in agriculture (fruits, vegetables, medicinal plants), livestock(chicken, duck, goat, dairy, bull fattening), fisheries and craft sectors and upazila based 63 SPAs was built up. In the initial stage, the farming communities selected the potential LSPs from the villages. Later on, the project, with the involvement of the public extension agencies, selected the LSPs based on the interest and commitment from the provisional list. At the beginning, the project in collaboration with public extension agencies such as DAE, DLS and DoF and private companies (e.g. Lal Teer, ACME Laboratories Ltd., FnF organised several capacity building events (training, workshop, learning visit, field based accompaniment, etc.) for the selected LSPs.The project also facilitated LSPs to establish business relationships with public extension agencies and private sector entities. Today, the LSPs/SPAs offer poor producers a service package comprising both technical service and business development and market access support. In case of agricultural technical services, LSPs are disseminating agricultural environmental friendly modern technologies such as sex pheromone trap to control fruit fly of vegetables and fruits, vermi or organic



compost to keep good soil health, hand pollination, bagging of fruits and vegetables, use of organic pesticide, proper application of pesticides, demonstration of improved

variety and technology etc. In case of livestock, native chicken rearing and management, vaccination, identification of male and female duck, duck disease management, goat rearing and management, milking cow rearing and management, beef fattening etc, and in fisheries domain pond fish culture, disease management, water quality testing, quality fingerling etc. LSP also make available quality inputs (seed, breed, fertilizer, fingerling etc.) to the producers. Other traders and input providers also sell quality inputs and buy products. Accessible, affordable, and quality services address the systemic constraints of the producers. When the capacities and linkages of the service providers are enhanced, they serve as "triggers" for sustainable and inclusive market system changes (see figure 1).

Samriddhi used institutional analysis to strategically guide its facilitation in terms of "who is doing what/who will do what" and "who is paying/who will pay" for each intervention. As shown in the above model, producers, producers' groups, and their networks involved in value chains are important as business "generators". However, they have systemic constraints for increasing their production and productivity, and thereby improved employment and income opportunities. A total **6000** producer' groups were organized, developed their production and marketing plan; used LSP's services and linked with both inputs and output market through the facilitation of SPA/LSP.

More than **120** large and medium private companies work with SPA, LSP, traders, and inputs providers because they have difficulty of reaching millions of producers and getting continuous/reliable supply of quality and large volume products. They provide training to service and inputs providers. Due to their investment and capacity, private companies play the role of "drivers" through job and income generation, and expansion of the different value chains.

Public agencies provide extension services to producers. They also improve the enabling environment for market actors as influencers. These include, among others, the Department of Livestock Services (DLS), the Department of Agricultural Extension (DAE), and the Department of Fisheries. However, they have limited staff and finance to reach many producers, which SPA and LSP complement through their "gap-filling" role.

Samriddhi has been effective in ensuring its interventions are increasingly market rather than project-driven. Its service market model is highly innovative as LSP and SPA are increasingly embedded with public and the private sector extension system, making the model the most promising element of the project with the best scalability and sustainability potential.

An appraisal of the model based on the CORRECT[2] attributes shows there is compelling evidence that the model is appealing to producers and in particular poor and extreme poor men and women. Value chain development resulted in improved process, product and functional upgrading due to better access of producers to markets and

[2] These criteria include to what extent the model is ***C***redible with sound evidence; ***O***bservable in results/impacts; ***R***elevant to addressing a problem; has ***R***elative advantage compared to other existing models; is ***E***asy to understand and implement; ***C***ompatible to the objectives of potential adopting agents; and ***T***estable by potential adopting agents in a pilot prior to large-scale adoption.

increased provision of public and private business development. The size of the market has expanded as a result of the growing active role of large and small-scale private companies. Producers and producers' groups in the value chains have been thriving and are on growth curve. Consequently, before-after analysis showed that all clients and client groups, including in areas such as Sunamganj which are remote and vulnerable, showed high degree of satisfaction by the usefulness, quality and availability of services.

2. **Observations and Key findings:** HELVETAS captured it's experiences through the extensive study on Private Rural Service Provision System (for detail see https://assets.helvetas.org/downloads/lsp spa capex august 2013.pdf). The major observations and key findings were as follows-

2.1 **Sustainability of the SPAs/LSPs system** The following observations are indicators for the vigour present within the SPAs that could be sensed during discussions with SPAs and LSPs, and for the sustainability of their organisations as well as rural private service provision model

LSPs provide feed based service package (organisational development, business plans for producer group, the supply of quality inputs, technical advice, and linkages with output markets) to both male and female producer which is geared towards ensuring economic and financial success of producers' group.

SPAs operate 238 service centres in market places. The service centres are points where services (inputs, brief advice) are delivered and where contacts and linkages for future service delivery are developed. SPA facilitated producer's organisation to establish selling centre to producer proximity and reduced their transaction cost. A total 177 women producer's friendly selling centre were functional in providing the facilities for bulking, collective, selling and continuing production.

SPAs have invested money to obtain a regular return. SPAs use for instance part of the money they get as saving contributions from LSPs and invest it in buying farm implements. The equipment is leased to farmers; the fees earned from leasing are a significant income for SPAs.

Private sector companies, both from input and output markets, increasingly recognise the value of the SPAs to their business. By linking up with an SPA, companies are able to reach a large number of producers; this will reduce their transaction costs very significantly. One LSP reaches on average 300 producers per month; 40 to 60 LSPs are organised in one SPA.

Government Line Agencies too have recognised the value of SPAs. By working with them, they can have a much larger outreach. A total 32 SPA were registered by government department.

2.2 Service delivery for the poor at an affordable rate

The explicit target groups of LSPs and SPAs are poor and extreme poor. These groups cannot access services of other service providers. Social networks of poor and extreme poor with input and output markets are weak. Therefore, poor people highly appreciate and seek the services of local service providers. Many of the LSPs themselves used to belong to the group of poor and extreme poor in their community. Their work as LSPs

has lifted them out of poverty. As they live in the community, they are easy to contact by producers' group and their members.

2.3 Facilitating systemic changes and impact on poverty

The Private Rural Service Provider System has been essential in addressing and overcoming systemic constraints of markets such as skills and capacities, access to financial products and services, access to markets, market infrastructure, organisational capacities of producers, availability and access of improved/new technologies and quality inputs, access to resources and existing rules and regulations on enterprise development. Approximately 100,000 poor and extreme poor are currently demanding for and receiving services from LSPs. Those reached by LSPs have significantly increased their income and increased their household savings.

2.4 Clarity of roles of LSPs

LSPs assume different roles in their work. They include for example: Independent technical advisors to producer group; extension workers for companies, input suppliers, local aggregators (under contract of an output market actor), head of a producer group, and facilitator of links with input and output markets. The strength of the LSP / SPA system has been its effective support for poor and extreme poor as independent service providers. LSPs are by and large independent service providers and have their prime focus on the benefits for the poor and extreme poor. In this situation it is important that LSPs and SPAs are aware of the different roles and the potential implications.

2.5 Unique approach to access doorstep services for the poor producers

The following points are the crucial factors responsible for access to doorstep services for the poor producers in the Private Rural Service Provision model.

- SPAs offer a relevant service packages in support of the enterprising activities of producer group
- SPAs are run with clear goal to access services for the poor
- SPAs are well networked with many of the market actors
- SPAs are a crucial element to achieve win-win situations
- Service providers are local people and accountable to their neighbour.

2.6 Inclusion of Women in Rural Private Service Provision Model

In this model gender mainstreaming were consider as an important task of SPA. SPA's client was 50% women. SPA also promoted women LSP in their organization.

3. Adaptation of rural private service provision model by other organizations/projects

This innovative model/good practices has been adapted by other projects of HELVETAS such as Community Based Sustainable Management of Tanguar Haor Project at Sunamgong district, SIEERC (Social, Institutional and Economic Empowerment of Rural Communities) project in Chittagong Hill tracts, IFSL(Improve

Food Security & Livelihoods) project at Giabandha and Jamalpur district, SEPO (Strengthening Entrepreneurship of Producers Organisations) project at Naogaon district, Unnoti project at Sunamgong district, Panii Jibon project at Bhagerhat district and Cross borer project at Assam, India. Other organizations such as Stromme Foundation, Blue Gold, Concern Universal etc. visited this best practice.

4. Limitation

4.1 **Continuous upgrade of know-how and skills to fight against new technology/diseases:**In 2012 Samriddhi conducted an assessment of the performance of SPAs. The result showed that SPAs varied in their capacities to manage their business as a social enterprise. Some of the SPAs had reached a level at which they do not need any more support; while other SPAs showed comparatively weak performances.

4.2 **Ensuring women LSPs income comparable to men LSPs:** Due to less outreach and family workload women LSPs have less movement as well as low income.

5. References

Additional and detail information on the model is available in the following experience capitalization documents. The documents are available in the following links.

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Good Practices in Extension : Green Bangla Foundation

Approaches:
- Farmers training on organic agriculture and value chain development
-Group Sms, voice Sms, e-book & call center
-Learning by doing and experience, exchange field visit
-Role play, folk song, competitive game and debate
-Demonstration, and observance of field/Green Chashe School day
-Green Chashe School

GREEN BANGLA FOUNDATION is a non-government & nonpolitical organization in Bangladesh established in the year 2010 at the invite of some social activists with the aim to develop innovative tools techniques and strategies for the conservation of environment dissemination of renewable energy options, promotion of appropriate technologies and thus contribute to the alleviation of Poverty, creation of job opportunities and build up a happy and prosperous Bangladesh.

Vision:

Green Bangla Foundation spires for a society free from poverty & created self-employment where every individual will live in peace & communal harmony by enjoying rightful share of the resources belonging to the society through self-actualization and empowerment.

Mission:

People are the decision maker of their own progress and prosperity but they need support not relief but release their latent potentialities for ensuring participation in development process.

Green Bangla Foundation is working with the following projects i) Green Chashe School Program ii) Green Agro Development Program iii) Green Bangla Social Business iv) Value Chain Development Program v) Green Bangla Women Entrepreneur.

Foundation is now comprehensively going on implementation of a project called “Green Chashe School Project” at village level to improve disadvantaged farmers’ present situation by introducing modern agricultural technologies through social business.

Goal of Green Chashe School Project:

To improve the farmers’ socio-economic condition is the main goal of this project.

Objectives of the project:

i. To increase the agricultural and toxic free food production under friendly environment condition;

ii. To increase the use of organic fertilizer, and reduce the production cost by introducing and extension of modern and innovative practices.

iii. To implement digital agriculture intervention (group sms, voice sms, e-book, video conferencing and training, video show & call center) for better service among farmers.

iv. To reduce use of chemical fertilizer by increasing use of organic fertilizer.

Major extension methodology/ pilot activities: Capacity building of farmers on organic agriculture and value chain development. Digitalization in agriculture (Group sms, voice sms, e-book & call center).Learning by doing and experience exchange field visit. Application of recreational methods like role play, folk song, competitive game

and debate for skill development and awareness raising. Demonstration, and observance of field/Green Chashe School day.

List of good practice:

Green Chashe School for extension of organic agriculture: Increase use of organic fertilizer reducing excessive use of chemical fertilizer and pesticide. In a village where three cropped land is more available, one Green Chashe School is established enrolling 150 farmers emphasizing equality of gender. Five groups of farmers are formed in a school while each group gets an hour session on organic agriculture practice as per standard module of specific crop growing well in specific area in a week excluding Friday. Session holds in leisure period of farmers either at afternoon or evening. Teachers are selected from educated interested farmers who passed at least class eight and engaged in agricultural production practice and are provided ToT following standard model. Retired field level agriculture officers (SAAO) who are interested to teach farmers are prioritized. Crop field visit to be paid by Teacher is ensured for necessary suggestion.

Why the approach is considered a good practice
Green Chashe School is a learning and technology dissemination center where farmers learn by doing and recreational practice. Both male and female farmer can get admission in the school. Each learner will be a researcher as well as can increase social status involving him in producing toxin free agro-food and socioeconomic empowerment process. For increasing income, farmers will be trained up on producing and marketing high yielding and value crops like papaya, drumstick, aromatic rice, thai leaf, grass, squas, flower and vegetables. As a whole each farmer of the school will be an ideal practitioner of organic agriculture and be able to teach other farmers on organic agriculture. Teachers will be selected from educated farmers and then get ToT for providing training to the learners of the Green Chashe School. Teachers will also suggest farmers visiting crop field and even involve themselves in social business for supplying good inputs and value chain development so that farmers can prodce high quality nutritious toxin free food products and high price of their produced products.
Number of groups/beneficiaries involved with good practices: Current number of beneficiaries-37500 farmers, Target number of beneficiaries within five years-2250, 000 farmers

Implementation Process/ Methodology:

15000 Green Chashe Schools under the Project will be implemented through 30 Project Partners within 5 five years and then it will be extended for next 05 years. To implement the above mentioned project, one Project Partner will select 20 (Twenty) Stakeholders under each of whom 25 Entrepreneurs will establish 25 Green Chashe Schools (Farmer Schools) in 25 villages. In a village one school will be formed where 150 farmers (Male/Female) will get admission and five groups each consisting of 30 farmers will also be formed in each school. Each group will get one session of an hour a week based on a standard training module. Each Entrepreneur (Retailer) will be responsible for supplying organic agriculture inputs like organic fertilizer with reasonable price rate to 150 farmers of a school after completion of a training course each month. However, as a whole, a total of 2250000 farmers will get service through social business ensuring active involvement of 30 project partners, 600 stakeholders and 15000 entrepreneurs and 15000 school teachers. Under the project there is also provision to provide support

the farmers to get general loan from Bank/ other MFI. It may be of reference that recently, we have started to implement the project with some Partners/Stakeholders in different districts like Satkhira, Magura, Tangail, Bogra and Khagrachhari. To ensure rapid and quality service like training, awareness raising, input support, transaction & monitoring etc to be provided to the target farmers, ICT services like video conference, voice sms, text sms and mobile phone call services etc will be made easily available among the farmers. In view of ensuring the ICT services, GBF will provide training to ICT Entrepreneurs/Business and financial support for promoting Digital Agriculture.

By this project local NGO's / Dealers / Women Entrepreneurs / Teachers / Self Entrepreneurs will run a school called "Green Chashe School" through Social Business. Under this project, for the next five years, perfect implementation of "Green Chashe School" under the banner of Social Business will be ensured through following activities:

- develop the awareness among the farmers
- increase the use of modern agricultural technologies
- give training and financial support to local NGO's / Dealers / Women Entrepreneurs / Businessmen / Members of Chamber / Teachers / Self Entrepreneurs.

Timeline of the activities under Green Chashe School Project:

Sl #	Activity	Target	Time Frame	Responsibility
1	Recruit new "Project Partner"	1	One month	GBF
2	Office set-up and recruitment of 06 ATMO for partner	6	Within one month after PP recruitment	Project Partner
3	Recruit new "Stakeholder"	20	within 2nd month after PP recruitment	PP &GBF
4	Office/warehouse set-up and recruitment of 05 FDO for each stakeholder	100 FDOs & 24 office/warehouse	Do	24 Stakeholders
5	Recruitment of "Entrepreneur"	500 (25 x20)	Third month after PP recruitment	Stakeholders & GBF
6	Establishment of "Green Chashe School"	500 nos	Fourth month after PP recruitment	600 Entrepreneurs
7	Select & recruit school teacher	500 nos	Do	600 Entrepreneurs & 24 Stakeholders

8	Students (Krishan/ Krishani) admission	75,000 nos	Do	Entrepreneurs & School Teachers
9	Arrange one day long ToT on Organic Agriculture and School Management for all Stakeholders & Entrepreneurs including 500 School Teachers	30 persons x21 batches=630 persons	Within one month after recruitment of Partner, Stakeholder, Entrepreneur and Teacher	GBF
11	Start 2 hours session in each of 500 Green Chashe Schools	500	Just after establishment of school.	Teachers
12	Initiate "Krishi loan" for the Krishan/Krishani	Need based	As per Need	GBF
13	Supply and use of organic fertilizer among the Krishan/Krishani	300/school	Each month/Season after establishment of school.	Teacher, Entrepreneur, Stakeholder, Partner Organization & GBF
14	Field visit for monitoring project activities	At least once to all established schools/month	Do	Project staffs of GBF, ATMO, FDO, and entrepreneurs

Supportive study/Survey/FGD and key findings: N/A

Adoption status: Very good

Constraints and limitation:

- Promotional activities of chemical fertilizer suppresses organic practice
- Discontinuation of organic practice in same land hampers to evaluate the final effectively of organic practice
- Lack of sufficient number of organic manufacturing organizations as well as less production of organic fertilizer is the main factors for sustainability of Green Chashe School Project on organic agriculture practice.

Experience and lesson learnt (in terms of sustainability):

- Farmers know well that organic fertilizer is better than chemical fertilizer for sound health of soil but quick rapid action of chemical fertilizer attracts farmers to use it more than organic fertilizer.
- Continuous follow-up and monitoring is helpful for increasing organic practice.
- High market price of products produced under organic agriculture practice is encouraging for increasing organic practice.
- All farmers under Green Chashe School will be able for learning by doing.
- Target farmers become able to produce toxin free agri-products through reducing use of chemical fertilizer and pesticides.
- Employment opportunity of educated persons is created for improving agro-based production system.

- Income earning as well as socio-economic status of farmers is increased.
- Toxin free crop production is increased.
- Soil fertility, crop production and food security are also increased.
- CO_2 resolution status has improved resulting in disaster risk reduction

Remarks/recommendation:

- Policy advocacy is needed to include the message like 'organic fertilizer is better than chemical fertilizer' on chemical fertilizer bag.
- Integration of FFS with Green Chashe School is essential for better services like training and necessary technical support in promoting organic agriculture practice.
- Participatory market chain/ value chain development approach should be strengthened for ensuring the sustainability of Green Chashe School.

Photo Gallery

Image: Bio-gas Plant Established in Faridpr

Image: ToT for School Teachers at chapai Nawabgonj

Good Practices in extension of Basic Unit for Resources and Opportunities (BURO) Bangladesh

Approaches:
-Farmers training
-Farmers group meeting
-Field visit
-Field demonstration and Field day
-Mobile apps (KrishokerJanala)
-Use call center service 16123

Mission: An independent, sustainable, cost-effective micro finance institution that provides diverse, appropriate and market responsive, quality financial and business development services at competitive prices along with other social development programs to very poor, poor and vulnerable non-poor customers.
Vision: A happy, prosperous and pluralistic democratic society that meets the basic needs of the people in Bangladesh.
Project title: Small and Marginal Farmers Agricultural Productivity and Diversification Financing Project (SMAP) Funded by-JICA, Bangladesh Bank. Stakeholders :Small and Marginal farmers, SMAP operated with two factors. Credit support on crop production, Livestock and Agricultural Machineries. Technical Support Service (TSS)
Objectives of the project:

- To increase agricultural productivity and diversity of the small and marginal farmers of Bangladesh by financing agricultural loan and providing agricultural training service to farmers.

- To contribute to the sound development of agricultural finance and the agricultural sector of Bangladesh.

Activities of SMAP project:
Provide credit support to small and marginal farmers ,Farmers training, Provide technical support. Linkage development ,Technology dissemination through demonstration, field day and exposure visit.

Methodology of extension activities :
Farmers training, Farmers group meeting, Field visit, Field demonstration and Field day ,Mobile apps (KrishokerJanala) ,Use call center service 16123 .

Good practices of SMAP farmers
Crops: In progress to use organic fertilizer, Using balance fertilizer ,Adopted to IPM and ICM system, Conscious to uses of pesticides ,Maintain regular communication with SAAO.
Livestock: Improve housing system (animal shed),Practice to improve feed management of beef fattening and cow rearing, Ensure de-warming and vaccination in time, Linkage development with veterinary field assistant. Regular knowledge and information sharing on livestock activities
key findings: Trend to diverse credit to non agricultural activities. Female members are less interested to attend training and meeting, most farmers do not work directly on field. Lack of artificial incimination at union level but demand is high. Lack of quality

seeds in rural area specially vegetables seeds and Lack of proper knowledge on farm machineries.

Extension opportunities: Demonstration of agro-machineries Fruit tree management Modern agro forestry practices (Fruit tree–crops)Soil nutrient management Commercial fodder crops.

Constraints and limitations:
No budget allocation from donor's for farmers training, demonstration and field day. Difficult to ensure female members participation in training Fisheries is not include in project activities. Lack of technical person at branch level to provide adequate technical support to borrower farmers. Lack of manpower of DAE and DLS to provide field level extension service

Experience and lessons learnt: The 15-20% farmers misuse their allocated loan by investment to other functions like business and non agricultural activities. Lack of sufficient extension activities and have not enough demonstration activities on effective agro machineries at farmers field. Consider on labor shortage; Harvester, Power tiller operated seeder (PTOS), Bed planter, Walking type rice trans planter, Reaper etc. is very potential agro machineries but machineries sale center is not available at most of districts. Lack of skill person to operate this machineries. Most of farmers do not know about union level agricultural support service .

Outcome / **Impact:** Increase crop diversification in the project implementing area. Many youth farmers are involved in beef fattening and milking cow rearing. Reduced intensive use of pesticides. Farmers are now following IPM system and increasing the uses of pheromone trap in vegetable fields. Some farmers are started to use modern agricultural technology and agro machineries.

Good Practices in Extension: World Vision Bangladesh

Approaches:
-Capacity building
-Value Chain, Savings Group, Graduation Approach

Vision: Our vision for every child, life in all its fullness; Our prayer for every heart, the will to make it so.
Mission: World Vision is an international partnership of Christians whose mission is to follow our Lord and Savior Jesus Christ in working with the poor and oppressed to promote human transformation, seek justice, and bear witness to the good news of the kingdom of God.
Name of Program: Food Security and Economic Development (FSED) program
Goal: Increase community resilience through increasing economic well-being of poorest households and community resilience to disasters and climate change.
Objectives:

- Diversify agricultural production, expand non-farm microenterprises and improve market access
- Increase resilience to Disasters and Climate change

Major Extension Methodology:
Crop production, particularly high-return and/or nutrition-rich horticultural crops such as vegetables, fruits and spices through adoption of varieties and technology packages resilient to climate change;
Small-scale livestock production through adoption of climate change resilient feed production technologies and feeding practices, improved genetic make-up and improved management practices;
Aquaculture through production system design, seed selection, stocking, bio-security, feeding management, fish health management and harvest and post-harvest management
Climate adaptive livelihoods through adopting and practicing positive coping strategies such as cultivating saline, frost and drought tolerant crop varieties, flood resistant crop varieties. This also includes the proportion of HH that are rearing resilient livestock breeds, well adapted to their local environmental conditions along with innovative and alternative livelihoods or diversified sources of income.
These extension methodologies implemented through Capacity building, adopting different project model and approaches (Value Chain, Savings Group, Graduation Approach etc.)
List of Good practices: Local Improved variety/Indigenous Chicken Rearing (Practiced in Bogra, Sherpur and Bandarban districts),Vegetable Value Chain Development (Practiced in Dinajpur and Sherpur districts),Duck-fish integrated farming (Practiced in Barisal district),Vermi composting (Practiced in Dinajpur and Mymensingh).
Why Good practice:
Considering the following aspects initiatives are considered as good practice in the targeted community. **Program efficiency:** The mentioned practices produced results with a reasonable level of resources and time. **Program relevance:** Mentioned practices addressed the child malnutrition problems in the target area. This practice very much helpful to increase income of poor and ultra-poor families which contribute to child well-being. **Program sustainability:** Community people continue these good

practices and also is going to replicate in other areas. **Partnerships:** The said practice involved participation of the government DLS departments, private sectors and local service providers.

Number of Beneficiaries Involve: Local Improved variety/Indigenous Chicken Rearing (Practiced in Bogra - 200 , Sherpur- 113 and Bandarban- 65).Vegetable Value Chain Development (Practiced in Dinajpur- 8 group, 227 members and Sherpur- 200 members).Duck-fish integrated farming (Practiced in Barisal-100).Vermi composting (Practiced in Rangpur- 285 and Mymensingh- 100).

Local Improved variety Chicken Rearing in Bogra:

1.Timeline of the activities: June 2014 to March 2016 (Continuing…).Starting from: June 2014 (2 producer groups with 40 beneficiaries).In following fiscal year: 2015 (3 producer groups with 60 beneficiaries).In following fiscal year:2016(3 producer groups with 60 beneficiaries)

2. Supportive study/survey/FGD and key findings: Study/Survey/FGD key findings: The targeted poultry farmers able to increase average monthly net income up to Tk. 4,724 from the flock size 20 over the baseline status of Tk.200.The poultry farmers were able to increase their average net income by Tk. 6,180per month from the flock size 30.Targeted families children's eggs consumption was increased by 25 eggs per child per month. Now, their parents are providing child's educational expenses such as stationeries, tuition fees, purchase school dress, nutritious foods etc. from additional incomes. As per periodical survey report it was found that 37 participants (74%) out of 50 program participants able to expanded their poultry farm by average 107 chicken (day old chicks). All participants (100%) saving money at Community Based Organizations (CBO) and individually for creating productive assets.

3. Adoption status: A total 57 new adapter farmers started mini chicken farming in the same cluster of the targeted community. Established three eggs sales center in the target community (Khamarkandi, Kurshapara and Bujrukbaria) under adarUpazilla. Three trained Para-vets providing services (Vaccination, treatment). Linked with four input sellers in the locality. Established three Community Livestock Information and Service Point(CLISP).Eggs marketing linkages with two hatcheries through value chain model

4. Constraints and limitations: Eggs price fluctuation in markets, Low quality feeds in the local market, Some medicine & vaccines cost is high which is not affordable for poor and ultra-poor beneficiaries. Private sector contribution also not significant in vaccine coverage, only one local vaccine company FnF is producing 5 poultry vaccines (Bangla BCRDV, Bangla RDV-Vac)

5. Extension opportunities: Mini chicken farming cost is affordable for poor and ultra-poor community people. So, it has a potentiality to promote cross breed Sonali chicken rearing in the target community.Have opportunity to strengthening of Sonali Poultry Value Chains in Rajapur Cluster. The local DLS (Department of Livestock Services) will be provided extension services(Advisory services, vaccines, chicks selection and medicines).Private company will be provided services (Vaccines, feeds and equipments)

6. Linkage and collaboration: Local livestock and poultry products marketing still follow traditional marketing chain where no substantial linkage has been evolved. Linkage and collaboration between producer groups and government/private hatcheries for hatch able eggs(Sonali)Linkage with private sector (ACI Agro Vet, FnF, Jayson, etc.) for quality vaccine and other livestock and poultry medication support. Linkage and collaboration with local DLS (Department of Livestock Services) for registration of livestock and poultry farm for getting benefits (Vaccines, medicines from government end.

7. Experience and lesson learned: Continuous monitoring and follow up is the key to success the chicken farming program and quick address the problem when arise an unwanted situation (Disease, feed and egg price etc) Have scope to expand this chicken rearing program in new areas. Refresher training on chicken rearing is very much helpful to run the farming well. The chicken rearing farmers have equipped with skill, knowledge, ideas that now can be spread over from farmer to farmer which speed up the process of innovation and development in the target community. Cross learning visit is a highly effective means of facilitating, sharing of ideas and improved practices among farmers and community members.

8. Remarks and recommendation
In the target area hatching eggs has an unmet market demand, potential to increase income, potential to increase employment, have skill and technology to produce eggs, Chicken value chain that work better for poor and ultra-poor. Moreover, through these good practices, the project is ensuring child nutrition and increasing family income that will contribute to child well-being.

Vegetable Value Chain in Goraghat, Dinajpur:

Supportive study/survey/FGD and key findings: The small study, cost-benefit analysis, value chain analysis and FGD's major findings are given below. The sub-sector analysis of Ghoraghat Upazila shows that vegetables value chain sub-sector possess the first ranking ,cow rearing and beef fattening are 2nd and third position respectively. The monthly income of producer groups farmers increased by Tk.1605 per. The cost benefit analysis shows that they have been benefited more than their expenditure. Profit margin for bottle gourd (Fiscal Year(FY)-13) Tk.78901 for first yearTk.360,000 for 2nd year. For taro- in FY-14, profit-Tk.423420 and in FY'15 Tk.490420.For the same session against maize and rice production, taro production gets 5 times more benefit. A study conducted in September 2015 revealed that 45% of increased income are spend for child well- being purpose (health, education, clothing etc).An observation compare with local market price shows that farmers are getting more money (Tk.3-5 for per unit, kg/pcs) by selling in group approach. Farmers in the community are motivated and interested to engage with the groups.

Adoption status: 250 farmers have adopted with approach.
Constraints and limitation: Lack of capital. Need quality inputs. Sometimes irrigation, flood and nor-west storm hamper the production. Sometimes raise conflict among groups.

Extension opportunities: Have opportunity of private company engagement and develop service market.

Linkage and collaboration: The producer group has strong linkage with DAE and resource farmers.

Experience and lesson learned: If the farmer can make profit they are motivated more. Group approach has huge benefits. Staffs should provide more time and commitment. Sometime vegetable market price is fluctuate; it was difficult to getting better price for the producer .Private and public sector are not interest to continuous support to the producer group for increasing the business and profit. Producer group management capacity building; if not appropriately strengthen the producer group it will have difficult to functioning the value chain development approach

Remarks and recommendation: Service market for frequent support should be developed or ensured. Intensive training for market analysis for producer group farmers. Establishment of collection Centre(structure) and aware the community and market player. Access of capital or loan for production especially for poor farmers.

Good practices in extension: Oxford Committee for Famine Relief (Oxfam) Bangladesh

Approaches:
- Community Based Organization (CBOs)
- Women-led Producer Groups (PGs)
-Training for all beneficiaries and facilitator
- Ensure local duckling and vaccination
- Replicated in other place
- Market linkage at local level and upazila level

Mission and vision of the Organization: A just World Without Poverty

Name of Projects/Program (goal and specific objectives): REECALL- Resilience Through Economic Empowerment Climate Adaptation Leadership and earning.

Major extension methodology or pilot activities- may be in the area of application of ICTs in extension, ways of reaching women effectively , linking farmers to markets, capacity development of farmer and extension workers, role of farmer organizations, addressing nutrition through extension, adaptation to climate change etc With the help of DFID, 1, 28,055 ducks distributed among 8537 REE-CALL SUE beneficiaries under technical guidance of OXFAM. With the help of regular vaccinations, keeping 80% of the duck in good condition and production ret is high and its increase the house hold income. With the natural food, the poor people provided Paddy, cooked rice, chickpeas and natural herbs for ducks.

Successes of private farmers: There are several poultry ducks by making private farms in different areas of Barguna Patuakhali District. Each of them is in a profitable position, providing regular vaccine and providing the necessary food. An example of this is; Mohammad Ansar Ali Bepari, father: Mohammad M Hamid Bepari village Khajurtala, Union: Gourichanna under Barguna Sadar Barguna; Inspired by the advice of JAGO NARI project area.
Profit calculation:
One of successful beneficiaries named Ansar Ali . He builds a good house and ducks keep it there. He gave Vitamin medicine with only wheat feeding. He feed 100 grams wheat for each duck for each day and most of time ducks kept in Bill for natural food . Now a days he is getting on an average 720tk per day.
Cost Calculation:
1 wheat: 180 ducks * 100 grams = 18 kg * 20 TK = 360 Taka
2 Vitamin: 1 duck for 1 taka * 180 ducks = 180 Taka
Total = 540 Taka
He gets daily 140-145 eggs from duck. The traders collect one eggs from his house at 9 taka. Per day expenses is 1 tk per duck (feed cost and own labor)
Profit Calculation:
140 eggs * 8 taka = 1220 taka per day
Methodology:
Formation and strengthening of Community Based Organization (CBOs).Formation and strengthening of Women-led Producer Groups (PGs).Organize training for all beneficiaries and facilitator was government staffs of livestock department on duck

management. Ensure local duckling and vaccination. Replicated in other place Established market linkage at local level and upazila level.

List of good practices (crops/ livestock/ fisheries): Duck rearing, Hatching and egg sealing

Why is the approach considered a good practice: Women-led IGA- Traditionally in coastal area people more the 70% HH used to rearing Duck and one of the most income sources of women comes from selling egg and duckling. It also related women economic leadership. They are skilled on it and market demand is too high. As it is traditionally income generating activates, all are interested to do this business if they got financial support.

Food and medicine: Food and medicine is available in local market. Some of the beneficiaries have good linkage with government livestock department. Many of the organization trained local people on vaccination. So in rural area vaccinator is available.

Linkage with Local duckling suppliers: Few of potential duckling supplier collect duck form Khulna and Dhaka and they do countam at local level. So mortality rate and duckling is available in local market.

Number of groups/ beneficiaries involved with good practices: Project supported individual house hold for duck rearing. A total 4537 beneficiary's received 15 to 25 duck (12- 6 month age) as a business support

Timeline of the activities: September 2011-August 2017.

Supportive study/Survey/FGD and key findings: One consultation was appointed for developing a guideline on Duck management including feeding, housing and vaccination information considering coastal context.

Adoption status: Around 80 % of the beneficiaries are taking care of duck as per instruction given by project.

Constraints and limitation: Even in Barguna and Patuakhali district is potential for duck rearing but some obstacle makes it difficult: Duckling not available round the year Vaccine is not sufficient at government Lack of business capital Less Technical support by Government and NGOs because of less staffs

Extension opportunities Making linkage with national level buyer for sealing eggs and meet. Introduce new verity of duck for meet

Linkage and collaboration Upazila and District Livestock Offices conducted 1 day training for all beneficiaries who receive Duck form project. At the end of the training DLO provided his contract numbers among all.

Experience and lesson learnt (in terms of sustainability and scaling up) Duck rearing is a very potential business for women in costal are and it's not time consuming for women. Huge market demand of meat and egg .Many people in the area will be employed, fulfilling the nutritional needs of the people and economically many families will be solvent.

Outcome / **Impact:** Household Income increased up to -10%. Meeting Nutritional value of family members Increased access to mainstream dairy markets. Profit started with in very short time and project participants could re-invest money in another IGA
Increased women agency. Reduced Women Care Work burden.

Good practices in extension: Practical Action, Bangladesh

Approaches:
-Gyaner Haat (Local Knowledge Centre):
-Krishi Call Centre
-Online or digital means:

Vision of the Organization : Practical Action's vision is one of Technology Justice - a sustainable world free of poverty and injustice in which technology is used for the benefit of all

Mission of the Organization: To contribute to poor people's wellbeing using technology to challenge poverty by: building the capabilities of poor men and women, improving their access to technical options and knowledge, and working with them to influence social, economic and institutional systems for innovation and the use of technology

Name of Projects/Program (goal and specific objectives):

Food Agriculture and Markets Programme

The Bangladesh Agriculture programme has been working for improving the small-holder farmers' (SHF) access to critical agricultural inputs (mainly seeds, fertilizer and pesticides, technology and machineries) and services which remains one of the biggest challenge facing efforts to expand agricultural productivity and enhance food security of SHF. In this context, our goal is resilient smallholder farmers who are adapting in changing climatic condition to increase food and income security and reduce poverty. The overall objective of the programme is to establish an agriculture system that is sustainable, diverse and improving productivity, food security, financial and nutritional needs of smallholders.

The programme's main vehicle is to achieve scale through influencing government and donor policy and that all our other knowledge and project work contributes to that. Rather than only thinking about our policy work after all the other activities/strategies are in place! The policy influencing work will focus on farmers' access to organic fertilizer and actively engage in review and conducting of policy dialogue with decision makers on promoting private sector having incentives for organic fertilizer manufacturing and distribution. It will promote organic fertilizer as good, cheap and available alternative for the chemical fertilizer which can increase the agricultural production as well as help in retaining the fertility of the land.

Our core capabilities lie in facilitation of increasing productivity, food security; input supply and small farm services; asset transfer and value chain development and access to finance. We believe if private sectors can be engaged in more inclusive business, they can contribute for technology justice inputs and services that benefit small holder farmers who are struggling to identify business model, develop business partnership, secure reasonable profits and adapt climate shocks and ensure family food security.

The programme will follow PMSD approach for engagement of private sectors, work for scaling innovation of best practices or models like Sales and Service Centre, producer groups, and facilitate innovation in information dissemination through call centre and other communications media. The programme will capacitate local inputs and service providers to reach more women farmers.

Disaster Risk Reduction and Climate Change Programme:

In Bangladesh, this programme concentrates on food security and disaster management activities through: Increasing poor people's access to technologies and skills for sustainable agriculture production and managing natural resources, such as soil, land and water; and Helping people to assess risks and find ways of coping better with hazards; including drought, flood and conflict.

Urban Service Programme:

Urban Service Programme aims to increase poor people's access to, control over and choice of appropriate and sustainable infrastructure services through building effective partnerships between marginalized people and the public and private sectors. The programme promotes innovative models of pro-poor service delivery, having a positive impact on livelihoods. The programme also advocates to policies, regulations and finance models for infrastructure services to make them more accessible for the poor.

The priority areas of interventions are: Housing and shelter, Technology for solid waste management, Rural transport, Clean, sustainable renewable energy, Water and sanitation services, Technology for locally managed communication services

Extreme Poverty Programme:

Practical Action deliver significant water supply, sanitation and hygiene (WASH) programmes and we are ambitious to do more. We promote the community-led total sanitation approach with partners and local governments, demonstrating best practice and developing innovative technologies for clean water and waste management. And we work with national and city governments to ensure that poor people are included in sanitation planning.

Major Extension methodology or pilot activities-

Gyaner Haat (Local Knowledge Centre):

De-centralsied knowledge service is vital for empowering the knowledge deprived poor people. Practical Action's knowledge management programme is more about creating the provision of contextualized and localized knowledge for the poor communities and developing a channel of reliable information and knowledge from the grass root to policy makers about real needs for technical assistance in poverty reduction program. Aiming to create diverse entities for de-centralized knowledge service Practical Action-Bangladesh promotes grass root Knowledge Centre in various locations called Gyaner Haat. Based on its experience on working with rural technology extensionist, rural ICT or technology centre and managing farmers technical inquiry service for many years Practical Action adapted a model of grass root knowledge centre attached with NGO, Union Council and high school.

Krishi Call Centre:

Krishi Call Centre runs jointly with the Ministry of Agriculture's Agricultural Information Service. It offers advice on agriculture, livestock and fisheries. It is unique because it is the only call centre in Bangladesh offering the lowest call rate service across all mobile operators. With the commercialization and diversification of farming, change in climate, increase in use of farm inputs framers traditional knowledge is no longer sufficient to find solutions in their farm. They need advanced and real-time faster, both external and local knowledge and support to solve their problems and reduce losses of crop and

animal production.Farmers used to go to the experienced farmers, NGO or Government promoted farmer clubs or schools and extension agents, input dealers and service providers, local knowledge information centers or sub-district level hubs to get guidance and ask solutions of their emerging problems particularly before, during and after the flood, cyclone and other disasters. But with the diversified use of farm inputs, improved varieties this system of accessing knowledge information even need a quick updating process and external experience and knowledge to face new problems. On the other hand our agricultural extension support system has got huge wealth of agricultural experience and expertise but need further improvement and investment in an advanced, ICT enriched knowledge information system.

Nowadays, there is no doubt that ICT can play a vital role in giving better access to information in a cost effective way to the millions of poor and smallholder farmers and entrepreneurs. Particularly, mobile phone based call centers already started to play a potential role in many agribusiness and small-scale farming.

Online or digital means:
Practical Answers Bangla website http://answers.practicalaction.org.bd: It is a Bangla site of Practical Answers, Bangladesh. Practical Answers is the Technical Information Service of Practical Action. We provide information on appropriate, small-scale technologies that improve the lives of people living in poverty. We enable access for all to the wealth of technical knowledge within Practical Action, as well as that of our partners and other people working to reduce poverty. At our core is a technical enquiry service where anyone working in poverty reduction, or on small-scale technology projects, can ask a question and receive a response from our local experts free of charge. Find out more about what we do.http://answers.practicalaction.org.bd/QnA: The site provide more than 2000 questions and answers on Agriculture, Livestock, Fisheries and DRR issues. Which is actually the Content Management Software (CMS) of our Krishi Call Centre. We also provide international enquiries which produce in our global website (http://answers.practicalaction.org/submit-a-question) and facilitated from our Nepal office. From this different organization and individuals can get answers for their enquiries.
List of good practices (crops/livestock/fisheries)
Alternate Wetting And Drying (AWD),A reaper for harvesting paddy and wheat Local green packaging of banana, Floating garden. Sand bar cropping, River Bed irrigation technology, Sheep raring in char areas, Participatory Market System Development (PMSD),Promoting organic fertilizer, Cage fish culture
Why is the approach considered a good practice: Environment friendly, innovative and proven with real time need technology that increase production, reduce damages and increase income
Number of groups/beneficiaries involved with good practice: Extreme poverty: 31000 HHs, Food, Agriculture and Markets program as Participatory Market System Development support: 25000 HHs, Krishi Call Centre: 31082 HHs, GyanerHaat: 6000 HHs, Practical Answers Bangla website (http://answers.practicalaction.org.bd): 12176
Timeline of the activities: The above numbers of HHs are calculated last financial year 1 April 2015 to 31 March 2016.
Adoption status: Sand bar cropping promotion is being promoted by Department of Agriculture Extension Services. Floating garden has been declared Global Agriculture Heritage by Food Agriculture Organization (FAO), Participatory Market System Development was acknowledged by PKSF and other INGOs both home and abroad to promote agricultural products and technology for poverty reduction.

Constraints and limitation: Formal validation from the respective authority and continuation till to scale at national level.
Extension opportunities: Low cost, maximum reach, sustainability, more return.
Linkage and collaboration: Linkage with Agriculture Information Service (AIS), Department of Agriculture Extension (DAE) , Access to Information (a2i), International Rice Research Institute (IRRI), Bangladesh Agriculture Research Institute (BARI).
Experience and lesson learnt (in terms of sustainability): Innovative and low cost having high acceptance by the marginalized farmers.
Remarks/recommendation (if any): Joint initiatives among development agencies, public institutions and donors are required for promotion of validated extension model.

Alternate wet and drying

Two storied livestock rearing shed

Floating garden

Farmers and GyanerHaat at an Union Council

Pumpkin against poverty

Green packaging

Good practices in Extension: USAID Agricultural Extension Support Activity

Approaches:
- Learning sessions
- Demonstration and field days
- Group meeting and extension visit
- Collective action for input marketing
- Farmer producer groups (FPGs) and linked with the market
- ICT application
- Agricultural Extension Service Centers (AESCs) as "One-stop shop"

Name of the Organization: Dhaka Ahsania Mission

Mission
Dhaka Ahsania Mission (DAM) provides high quality services towards unity, peace and development of social and spiritual life for the human community in general and for the disadvantaged and suffering humanity, in particular.

Vision
DAM visualizes a society that foster humanity, spirituality, humility, equality and caring the nature.
Name of Projects/Program (goal and specific objectives)

Name of the project: USAID Agricultural Extension Support Activity (AESA)

Goal
The goal of the project is to "Strengthen the existing agriculture extension system in southwest and central Bangladesh to sustainably improve food security and nutrition for smallholder farmers with an emphasis on women"

Project objectives

- To enhance access to, and utilization of agricultural extension services by smallholder farmers – both men and women;
- To expand and strengthen ICT mechanisms to increase access to agricultural market information, knowledge and technologies;
- To strengthen capacity of agricultural extension service agents (public and private) to respond to the needs of small holders farmers.

Major extension methodology or pilot activities - may be in the area of application of ICTs in extension, ways of reaching women effectively, linking farmers to markets, capacity development of farmers and extension workers, role of farmer organizations, addressing nutrition through extension, adaptation to climate change etc.

Major extension methodology:
The project enables smallholder farmers for better access to extension services. They may have improved access of the agricultural input market through "collective action" approach. It has as a result helped them to form farmer producer groups (FPGs) having

each group focusing on one of the six value chains (jute, chili, mung bean, beef fattening, dairy, fish). The events of group extension methods are: learning sessions, demonstration, field days, group meeting, and extension visit;The project provides capacity building supports to the public and private extension agents to deliver improved extension services; Introduces information and communication technology (ICT) application and approaches to make agriculture information available in new ways to extension agents and farmers; Provides demonstrations of improved agricultural extension service delivery by supporting 129 Agricultural Extension Service Centers (AESCs) in 4 upazila, each serving as a "one-stop shop" for farmers seeking advice and assistance.

Agriculture Extension Service Center (AESC)- Pilot activities

The main objective of the AESCs is to establish a "one-stop agriculture service centers" for providing information/advice to the farmers on field crops, horticulture and livestock based upon their requirements or inquiries. In collaboration with the Department of Agricultural Extension (DAE), the projecthas established agricultural extension service centers (AESCs) in four selected upazilas: i) Kalia, Narail, ii) Jessore, Chowgachha, iii) Faridpur Sadar, Faridpur, iv) Barisal Sadar, Barisal with necessary equipment and logistic supports. Some basic information of the Agriculture Extension Service Centers are as follows:

Photo: Md. Hamidur Rahman, DG of DAE (at left) checking onrecord keeping of AESC in Barisal Sadar

1. The AESC is an initiative to demonstrate an improved agricultural extension service delivery system;
2. Core of the initiative is the establishment of 129 AESCs operated by block level Sub Assistant Agriculture Officer (SSAO);
3. The AESCs are equipped with technical resource materials, equipment, office supplies and ICT devices.

From the AESC centers, farmer's benefits are given below:

- Farmers could visit AESCs for technical advice;
- Farmers can reach to SAAOs easily and request them to visit their farms and fields;
- Farmers get support through grain moisture meter, P^H meter, soil testing device, ICT apps, technical and knowledge materials etc.

A-card: Smallholders' access to finance through bank

The 'A-card' model partners with a private commercial bank, MFIs and another USAID project supporting agricultural inputs retailers, currently operational in the Feed the Future zone in Bangladesh. A commercial bank provides agricultural loans to the smallholders at a 10% interest rate on the used amount and with a six-month payback period, which may be paid off in single or multiple installments. This will help the

farmers to access the microfinance for agricultural lending purpose at lower rate with longer payback period. Thus farmers will receive access to microfinance support in time with low interest rate to purchase quality inputs for growing crops, increase yields and household incomes, and reduce hunger and poverty, both their own and that of others. The current service offered by MFIs in the project intervention area is a one-year working capital loan with weekly installments that comes with little or no grace period. Many clients, however, do not have Income Generating Activities (IGAs) producing a regular pattern of income that would enable them to meet a weekly repayment schedule.

The A-card model is designed to use cheap and simple mobile technology paired with automated payment and transactions. The model will issue digital debit cards containing Near Field Communication (NFC) microchips to the smallholders. Agro inputs retailers are required to possess a NFC-enabled smartphone in order to open a bank account through an MFI-operated agent banking branch.ICT platforms could enable account to account bank transfers using a combination of the customer's NFC card and mobile device.

List of good practices (crops/ livestock/ fisheries)

DAE- AESA Joint Monitoring

For smooth and effective functioning of the field level activities of DAE, a joint monitoring tool has been developed by DAE and the Ag Extension Project to initiate the digital monitoring systems of the upazila based activities.The orientation of DAE-AESA joint monitoring activities for 12 DDAEs has been conducted on last June 02, 2016 at BRAC center, Jessore.

Furthermore, the orientation of DAE-AESA joint monitoring activities for 26 UAOs has been conducted on last June 21, 2016 in Dhaka having the Director General, DAE as the chief guest. The joint monitoring activities reporting have been started from July 2016. An Excel based simple reporting format is used for quick reporting. Data collection has already started at the upazila level. On monthly basis, UAO/AEO collects data from the SAAOs using the prescribed format. Then upazila level aggregated data using Excel format is sent to the district offices via email. Next, in the district offices, DDAE combines the upazila reports in Excel format and sent them to Dhaka level Project Focal Person. Finally, Project Focal Person combines all the 12 districts' reports and send it to the Director, FSW-DAE and AESA Head of M&E, AESA project, for providing necessary technical supports for this digital monitoring activity.

Photo: Launching Workshop on DAE-AESA joint Monitoring Activities at Jessore

Use of ICT to access Agricultural Information

The overall objective of the usage of ICT is to expand and strengthen ICT mechanisms in order to increase access to agriculture market information knowledge and technologies. The main target group for intervention is public service provider and private service providers with selected FPG duty bearers. The following outputs of the intervention are as follows:

1. To develop a strategy for expanded use of ICT in extension services;
2. To utilize ICT tools to increase farmers' and extension agents' access to agricultural production and market information by :
   - Developing ICT applications and make these available to farmers and extension agents;
   - Developing audio visual products and make these available to farmers and extension agents;
   - Providing support to farmers through a phone call, SMS orvoice messages after verification of the problems.

Photo: FPG members using smart phone as ICT

Why is the approach considered good one?

A-card: Smallholders' access to finance through bank: The A-Card initiative aims to help foster farmer demand-driven agricultural extension by improving access to financing and increased market opportunities. The need for larger loans often drive smallholders to borrow from multiple MFIs with short repayment periods, at high interest rates. To meet repayment deadlines, many have to sell their harvest at very low prices, hence trapping themselves in a vicious cycle of debt. Commercial loans are avoided due to long, complicated processing times and difficult repayment schemes. Thus, there is a demand for easy, inexpensive commercial credit. On the supply side, commercial banks, local MFIs and agricultural input retailers grow their client base in a low cost way. It is envisaged that the model will ensure high recovery rates (due to low interest rate at 10% and repayment only on used credit after six months), that registered farmers will continue saving with MFIs, improve market linkages and strengthen collaboration between farmer communities, local MFIs and larger commercial banks. As farmers continue using and building their credit records by continuing the use of digital card, the ICT platform, agent bank and hold a bank account, their self-confidence and preparedness for future commercial endeavors is envisioned to develop. Earnings from the interest rate is expected to pay for operational costs and upkeep of the ICT platform. This market-driven approach and collaborative sustainability plan envisions the solution can grow in the target market without continuing donor support.

DAE-AESA Joint Monitoring: The joint monitoring is an effective tool to find out the gaps at field level activities with minimum efforts. The following causes could be considered as good practices: To Digitalize the DAE activity monitoring that helps to make plan accordingly; To strengthen ongoing AESA activities that contributes to achieve the results; To increase collaboration through DAE and AESA joint monitoring; To increase DAE ownership in AESA activities that may bring positive outcomes for the project.

Use of ICT to Access Agricultural Information: The approaches are considered as best practices on the following aims. To ensure timely and effective digital extension service where there is scarcity of extension agents in the field; To contain information with real images about various diseases that can occur at different stages of the development of the crop along with solution(s) at the end;To help users/farmers to attain emergency agriculture extension service; To have a smart phone application which saves time and money of the farmers in attaining agricultural information from the extension workers.

Number of groups/ beneficiaries involved with good practices: A total of 100 smallholder farmers received Agriculture card and 1,000 farmers are waiting to receive A-card; A total of 4 upazila Agriculture Officer using the dash board of demo upazilas in southern region A total of around 50,000 solutions on Ag. problem provided to the farmers through using ICT;A total of 27,000 farm visited by the SAAO as part of joint monitoring from June-September/16.

Timeline of the activities October 2012 – October 2017

Supportive study/Survey/FGD and key findings: Based on the Midterm evaluation report submitted by an outsourced international consultant team, key findings of the project are: Around 75% Farmer Producer Groups (FPGs) contacted with extension agents for service; Approximately 92% FPG members cited to improve their production; Around 96% FPG members attributed to learn new improved practices and nearly 100% farmers received information from Farmer Leaders.

Adoption status: Around 75-80% stakeholders: LSPs, SAAOs, teachers, students and ICT leader/champions are using smart phones along with mobile applications in it; Around 100% user (UAOs) of demo upazila are using dash board. And about 20-25% farmers have adapted ICT technology to get solutions on agricultural problem;10,000 farmers will use A-card by next two years in 12 southern districts of Bangladesh.- Constraints and limitations Due to low speed of internet at Upazila and union level, users could neither upload nor send the images to the experts for solutions; hence, resulting into frustration and demotivation on using the ICT tools; In case of DAE-AESA joint monitoring, lack of knowledge/experience in operating MS Excel/e-mail make officers feel discouraged in using them which often results into late submission of the reports. The production system is hampered to a great extent due to untimely supply of adequate quantities of quality seeds at fair prices.

Extension opportunities: The above stated innovations have high demand among farmers/stakeholders at mass level. So, these approaches might be extended to other non-project areas keeping the constraints in mind as best practices. Hence it would have positive impact on overall extension system in Bangladesh to enhance agricultural production.

Linkage and collaboration

Organizations	Major Objectives / Scope
DAE	Strengthening existing capacities of DAE to deliver effective extension services to the farmers;
AIS	Supporting AIS for capacity development and improvement of Krishi call centers, agro knowledge portals and Agricultural Information

	and Communication centers (AICCs);
WinMiaki Ltd	Collaboration for ICT activities related to the farmers' query systems and other initiatives;
Lal Teer	As part of collaborative actions, establishment of joint demonstration plots with project farmers as an extension tools;
Spectra Hexa Feeds Ltd. (Mega Feed)	Strengthening private aquaculture extension services, disseminating improved farming technologies and supplying improved quality feeds to the farmers;
ERAS	Awareness raising among farmers about the benefits of soil testing; supporting private sector's engagement to provide soil testing services to the project's farmers through establishment of temporary soil testing labs in demo upazilas.
Bank Asia	Signed MoU with the project for implanting A-card in project area

Experiences and lessons learnt (in terms of sustainability): Many smallholder farmers residing in remote areas, consequently are unable to avail information about market intermediaries, media and so on. Thus, the introduction of ICT to the extension agents on providing up-to-date knowledge on improved farming practices and to provide the farmers their required services on time has proved to become highly advantageous. In terms of sustainability, engagement of ICT leaders/ Champions/Farmers have been increased possessing sound knowledge over smart phones &the usage of applications to provide better extension services. Besides, Agriculture information center of DAE could adopt these ICT tools and would promote other areas; In terms of sustainability, partnership is a good approach that can contribute in operating the activity of this project smoothly. AESA project has a partnership agreement with DAE and FPGs currently receiving various supports from them, which will continue and remain permanently till the end of the project. Private led extension is a good idea to provide extension services through capacity building.

Good Practices in Agricultural Extension: Bangladesh Institute of ICT in Development (BIID)

Approaches:
- **Zero Cost EAS**
- **Help Desk Service Charge**

About BIID

BIID is a private sector initiative that offers a range of services aimed at development and promotion of ICT based information and services market in Bangladesh. It's distinction lies in clear understanding of issues & opportunities to benefit the poor with the use of ICTs and consider local dynamics. BIID envisions in becoming a reliable and leading enterprise offering strategic planning, implementation assistance and consulting services to public, private and other initiatives in ICT based services market of Bangladesh and in other developing countries. BIID's key strategy is to ensure *Making ICT works for poor* as an effective tool & cross cutting issue. And build on the existing system and available as well as emerging technologies and potential users

Different Models of EAS

Govt. led traditional extension services, Private sector led extension services e-Krishok a services BRAND– High-breed EAS model ,Partnership Based Govt., NGO and project driven extension services, ICT enabled EAS by using mobile phone and tele centres

e-Krishok Guiding Principles

Think Outside The Box, Consider social benefits ,Private Sector led approach, Farmers are Entrepreneurs

e-Krishok : A service basket approach: e-Krishok – Extension, Business Planning (Farm book) ,**eXtension Portal**: Knowledge Repository ,Zero Cost EAS,SME Portal for agro-businesses ,**Batighar** : Shared Access Points for all ,16250 Short Code : Voice and SMS service ,Market Linkage Program (MLP)

Evolution Phases of e-Krishok: Phase I Inception of the concept as Service Campaign. Phase II Proof of Concept (ICT for EAS), Partnership and widening scopes. Phase III Transformation as Service Basket and Business Model. Scale Up Offering services through private sector led partnership model.

360 degree solution for Farmers: Pre -Production Crop Selection & Management, Land Preparation, Business, Production Extension Services (Training, Information) ,Post-Production Post Harvest Management, Market Linkages

What went wrong? Farmers are still not using the e-Krishok EAS ,Partners yet to adopt the model ,Both transacted / free ICT enabled EAS model also not scaled up ,Keep the innovation process and advocacy continue …

Innovation Process for new EAS service model to serve farmers sustainably: BIID conducted research on the existing models practiced private sectors (globally and locally) to facilitate EAS to farmers and framed a new model. Initiate consultation with

the input suppliers and other stakeholders like business associations. Bangladesh Seed Association (BSA) expressed their interest to collaborate with BIID on new EAS model
The Concept - Zero Cost EAS: Facilitate free extension related information and advisory services for the clients (farmers) which is bundled with input packages (like seed, pesticide, fertilizer, credit etc.)

Major Features of Zero Cost EAS: The information package is delivered according to the input package purchased by the customer. Thus, every farmer who buys an input package is entitled to receive the information package. Service package (Talk time and no.) depends on the value of products. While serving the clients, BIID also ensure promotion and R&D support to the input company by providing different customer experiences on their products as well as markets

Business Model: BIID Innovation Help Desk Service Charge , Input Supplier Customer Service, Increased Sale Business Intelligence Data Branding ,Farmer Buy Inputs, Register FREE EAS

Present Status: Launched jointly with Bangladesh Seed Association (BSA),35,000 farmers served within 6 months till date (Pre-Testing, ongoing),4 Seed companies will partner during the pre-testing phase, Proof of concept by BIID, BSA and input companies in 2015 and finalize business model

Challenges
Input suppliers are not optimistic to offer EAS. Social behavior of farmers to towards using ICT enabled EAS and Low awareness on using updated / specific technical information. Availability of mobile phone while buying inputs. Retailers incentive to promote the service. Cost sharing by input companies yet to finalized and Financial model needed to re-visit.

Good Agricultural Extension Practices : Bangladesh Academy for Rural Development (BARD), Comilla

Approaches:
- Group formation
- Co-operative Society

MISSION

Promote people-centered sustainable rural development and provide policy support

VISION
To be a think tank for rural development in Bangladesh**.**

Name of project: Comprehensive Village Development Programme

Major extension methodologies: Organize a village based Comprehensive Village Development Co-operative Society (CVDCS) for total development of each village; Create self-employment and enhance income in a planned way to the ability and potentiality of the youths, adolescents, women and men of all families in each village, Improve the standard of living and reduce poverty

List of good practices : Village institution (society) acts as common platform for all farmers, Extension of any modern agricultural technology through CVDCS quickly

Why is this approach considered a good practice: As all the family members of the village are the members of the society, they serve the common interest and benefit goes to the society .Male, female and Minors are made aware of the development interventions in the village
Number of groups/beneficiaries involved with good practice: Above 4 lac members of 4275 villages of 66 Upazilas of Bangladesh

Timeline of the activities :July 2009 to December 2015

Supportive study/survey/FGD and key findings: Project document, Study report, Survey report

Adoption status: Most of the modern technologies available for agriculture are practiced by the farmers of the society
Constraints and limitation: Land-fragmentation discourages wide adoption of modern agricultural technologies through CVDCS. Not all the family members are the members of the society
Extension opportunities: Available
Linkage and collaboration: BARD, CVDP Project
Experience and lessons learnt : Practicing farmers are highly benefitted through this extension system as it bridges the receiving point at village and service providers from the upper level.‘ One village, one institution’ policy works where all the members are having the common interest

Remarks/recommendations: CVDP is an effective approach for community development and poverty reduction in Bangladesh

Name of project: Ecological Sanitation: An Intermediate Technology for Environmental Management

Major extension methodologies: Construction of environment friendly eco-toilet
Develop human excreta management

List of good practices : Use and maintenance of eco-toilet, Use of human excreta (specially dried feces) in the crop field
Why is this approach considered a good practice: This is an innovative technology and processed human excreta as a form of bio-fertilizer is being used in the crop field.

Number of groups/beneficiaries involved with good practice: 200 Eco-toilets have been set up in six villages. Moreover, an experimental eco-toilet has also been established in Shahbazpur Tea Estate in Moulvibazar. Moreover one NGO with assistance from JADE is also establishing few eco-toilets in different parts of the country.

Timeline of the activities : July 2001 to June 2002

Supportive study/survey/FGD and key findings: Project document, Using the urine and feces of eco-toilet the production of cauliflower and cabbage has increased. As human feces contain phosphorus, potassium and organic matter, it creases the fertility of the soil to a some extent.

Adoption status: Use of eco-toilet for urination and defecation ,Use of processed human excreta as bio-fertilizer by the practicing farmers

Constraints and limitation: Needs behavioral change of the users, Need financial involvement in making the proper designed toilet, Willingness to use the eco-toilet fertilizer in the field

Extension opportunities: Available

Linkage and collaboration: BARD, JADE

Experience and lessons learnt : Farmers should be willing to construct and use the eco-toilet, Processed eco-toilet feces enhances the crop/vegetable production and increases the soil fertility, Saves the fertilization cost of the farmers

Remarks/recommendations: This technology can be applied for any agricultural production specially in flood-free zones of Bangladesh

Agricultural Extension Approaches followed by BARD

Model Farmer Approach Concept: In 1961 Enlightened Farmer Approach shifted to Model Farmer Approach. Model farmers were usually early adaptor and other farmers

relied on their performances. Almost all type of field trials were supposed to be demonstrated through them for extension purpose.

Organizational Arrangement of the concept : Each village co-operative society would select model farmers on the basis of some criteria. The model farmers will attend weekly training classes at the Thana Training & Development Center (TTDC- a component of Comilla Model). The model farmers in their turn will discuss in the village weekly meetings that they have learnt. Model Farmer concept was introduced in Two Tier Co-operative System (Another component of Comilla Model). Two Tier Co-operative System was implemented with the creation of a department-Bangladesh Rural Development Board (BRDB).

Introduction of New Crop Varieties: Established 5 acres demonstration farm,1961-62 under Colombo Plan, Japanese Agricultural Expert posted at the Academy.Aus, Aman, Boro rice tested with improved techniques. Confidence developed among farmers.In 1965, an expert of International Rice Research Institution (IRRI), Philippines delivered 302 numbers of seed packets of 302 strains. In 1966, in Aus season demonstration trials were conducted on- i) 302 strains of IRRI, ii) 7 varieties of local collection iii) 3 varieties of Japanese collection. IR-8 was found more suitable in Boro & Aus season. IR-5 suitable for Aman season. Japanese variety Taipei-177 was widely accepted by farmers. Another variety Pajam- 2 also got popularity. In 60s demonstration on varieties of various vegetables e.g cabbage, cauliflower, broccoli, carrot, turnip, china cabbage, long bean, radish, squash, beet, tomato etc. were conducted and extended in farmers field through co-operative societies. Japanese Water Melon (Black color) extended widely & rapidly after demonstration. With the trial of Holland & Burma varieties of potato in 60s was the starting of introducing high yielding varieties. In this five acre farm even maize, wheat & fodder crops were demonstrated.

Experiment on Mechanized Irrigation Management: In 1951-52 under the Mechanized Cultivation and Power Pump Irrigation Scheme Department of Agriculture (E. Pakistan) initiated to grow Boro rice by lifting water through Low Lift Pump (LLP) in haor & beel areas of Mymensingh, Dhaka, Sylhet & Comilla.

Use of Surface Water through LLP: At the end of 1959 BARD observed that drought could be faced lifting water from rivers canals & tanks.First received 7 LLPs and demonstrated during Aus season of 1960, then in Boro season. Demand increased & received more pumps from Agri. department. Around 1961 under the Rural Works Programme (RWP- another component of Comilla Model) re-excavation of the existing canals were executed for preserving water for Boro & vegetable cultivation. In 1951-52 under the Mechanized Cultivation and Power Pump Irrigation Scheme Department of Agriculture (E. Pakistan) initiated to grow Boro rice by lifting water through Low Lift Pump (LLP) in haor & beel areas of Mymensingh, Dhaka, Sylhet & Comilla.

Use of Ground Water through Deep Tube Well (DTW): Experienced that not enough surface water available during winter. Mr. Robert Burns, Peace Crops Volunteer, working as project Engineer of KTCCA conducted 25 test boring.The drilling of first DTW of 6” diameters in the village South Rampur was done in 1962. The KTCCA and BADC (Bangladesh Agricultural Development Cooperation) jointly speed up DTW sinking in Comilla Sadar Thana & seven other thanas of Comilla district and also Natore, Gouripur, & Gaibanda. A scheme for establishing DTW research and training unit was submitted by KTCCA which was approved by Agriculture Department in March 1963.

Replication of Comilla Model of Irrigation:
The success of Comilla model of irrigation drew the attention of Policy Makers. The Agriculture Policy Committee of the then East Pakistan decided in 1966 to test the model in selected thanas as a pilot program. In the light of experiences of PARD (BARD), findings and recommendations of evaluation committee the province- wide Thana Irrigation Progrmme (TIP) was launched in 1967-68 PARD (BARD) was given the responsibility of training the officers of the whole province connected with the programs and its evaluation.
Bamboo Tube well (1975-76) 14 Tube wells were sank

Use of Deep Tube well Water (DTW) for Domestic Purposes (1989-90): Water tank and pipe line were installed to supply water on experimental basis to the 100 households.

Seed Test: With the initiative of the Academy the KTCCA started a seed certification programme. A Seed Expert was appointed to manage the multiplication, Procurement and supply of certified seeds specially rice & potato.Well equipped laboratory started in February 1969. Here mainly purity, germination capacity & moisture content were tested. After Bangladesh Agricultural Development Corporation (BADC) took up procurement, production and distribution of seeds KTCCA discontinued this programs. KTCCA started testing the soil of farmers' field with the help of Union Agriculture Assistants and Inspectors by using Japanese instruments
Accelerated Rice Programme (ARPP): ARPP was initiated in 1970-71 with emphasis on intensive cultivation of IR-20. The programme was implemented through Agricultural Extension Committee (AEC). Which was constituted with the members of Agricultural Co-operative Federation (ACF), KTCCA, BARD and Thana level officers. Abhoy Asram (previous BARD campus) and Chisty farm (outside Abhoy Asram) were used as the venue of multiplication of improve rice varieties, demonstration of application of new techniques, and training of the managers and model farmers of agricultural co-operative societies.
Marketing and Processing of Agricultural Product: Attempts were taken to develop different marketing and procession units to provide necessary support to the farmers. Units are- i) Two cold storages ii) one creamery iii) one modern rice mill
Cold Storage: 1st cold storage established in 1965 and 2nd in 1968. Here potatoes were stored and credit was linked with the societies by KTCCA. Later handed over to Comilla Industrial Co-operative Society (CICS) .

Creamery: It was established in 1962. The milk intake capacity of the creamery plant was 39,60,00 Pound Initially KTCCA formed a Dairy Co-operative in 1964 with the farmers in the village. Loans in cash were also provided to purchase cow. Farmers found high price in the market so they became less interested to sell at creamery unit. In 1967 the Dairy Co-operatives were disbanded. The unit started buying milk from other sources.
Poultry Marketing and Processing: Broiler and layer marketing. Supply of chicken by Deep Freeze and Refrigerator Van
Beef Fattening meat marketing: Supply of meat by Deep Freeze and Refrigerator Van.

Mechanized Paddy Drying In 1975, 13 mechanized paddy drying mills were established in 12 different locations.

Modern Rice Mill: A small rice husking mill was started by KTTCA ltd. in may 1964 in Abhoy Asram to support the primary societies. The need for a bigger and midernized rice milling operation became rice evident with the increased production of paddy in the area. A modern rice mill with two tons per hour capacity construction work was taken up in 1969-70 & installation was completed in March 1973. Japanese and British Volunteer assisted in the work.

Fishery Development: Fish Nursery In 1961-62 two nursery units were developed, where fish spawn collected from Chittagong and then reared in the nursery up to fingerling and those supplied to farmers.

Induced Spawning of Fish The experiment was initiated to develop a method of artificial propagation of the species of fish and to learn more about their habits. This experiment was started on 8th June 1966 and was completed on 18th July 1966. Pituitary hormone solution was used during experiment. About 5 lakh fries were hatched and produced and about 50,000 fries sold to local farmers.

CVDP and Agricultural Extension Approach: BARD thought of working in a more comprehensive way in rural development and launched a scheme under the title "Total Village Development Program" (TVDP) for five years (1975-1980). Later having experience from the scheme it was modified and renamed as Comprehensive Village Development Program (CVDP). It is now working with its own identity in an extended way. While the CVDP was the project of BARD there was responsibility of Faculty members of BARD to work in the village through the societies under CVDP. In the year 1992-93 some special attempts were taken to expedite agricultural activities in 40 villages under CVDP. Here mostly training was main part followed by some small demonstrations and trying to strengthening linkage with nation building departments. In Rabi & Kharif season of 1992 forty agricultural voluntary worker of the societies were given training on technologies of different crops. In 1993 in Sylhet subproject area of CVDP demonstration of deep tube well to cultivate BORO rice was done and the Model Farmer Abul Rashid from Joypur village, Comilla was taken there for practical demonstration. In 1994 not only agriculture worker but also farmers of the societies of Comilla district was given training and seedlings of Brinjal (Tarapuri), Cabbage (Pravati) & new varieties of tomato radish were distributed. Along with this some farmers were supplied with maize, sunflower, soybean and potato seed (TPS). Other component like livestock, fisheries also contributed in these villages.

Institutional Approach for Rice Technology Dissemination (Phase II)(PETRA, IRRI). The village co-operative societies are the excellent receiving point at village level. There exists acceptable form of training facilities in the premises of almost all societies. There exists leadership, accountability, participation and access of all class of farmers. Dissemination process is quick. Pilot Testing of BRRI Hybrid- 1 in Comilla Region Adoption and Extension of Low Cost Paddy Thresher (AELCPT) (Phase I & II) (DFID, REFPI, BAU).Performance of Direct Seeded Rice Production Using Drum Seeder. Use of Leaf Colour Chart Ecological Sanitation .Sustainable Intensification of Rice-Maize System in Bangladesh

Good Agricultural Extension Practices of Climate Resilient Agriculture and Food Security (CRAFS) project

-Farmers Meeting cum Training.
-Demonstrations and Field Davs.

Objectives of the project: Improvement of climate risk management capacity of agribusiness companies;Capacity building and training of farmers and agricultural supply chain members, and piloting of innovative practices and technologies

Outcomes of the project (Pilot and scale up phase): The project is expected to reach 75,000 farmers (7,500 in pilot phase and 67,500 in scale-up phase)of which: 7,500 are women farmers,45,000 farmers will have adopted CS Agri practices (4,500 are women);

The overall project impact targets are to: increase cropping intensity by 150%; increase lead firm revenue by 13%; increase farmers crop yield by 20%;translating to farmer revenue increase by 15%.
Components : Component 1- Capacity Building of Lead Firms, Component 2- Capacity Building of farmers
Overall project interventions: SSCL and ACI Ltd Officials received ToT on Climate Smart Technologies. Capacity development of Farmers (male & Female):Farmers training, demonstrations and field days.Farmers Meeting cum Training. Set up Demonstrations plots (Rice, Vegetables, Watermelon, potato and Soybean. Organized Field Days.
Identified and developed 12 climate smart agriculture technologies for crop production in coastal areas: Crops/varieties tolerant to various stress (Salinity, submergence, water logging, drought, high temperature, etc.),Suitable stress tolerant crop varieties in existing cropping patterns. Fresh water preservation in canals, ponds and ditches for irrigation. Raised bed planting method in saline areas. Mulching with crop residues, plastic, etc. to control salinity. Sarjan method of alternate ditch and dykes. Floating garden for vegetable production in water-logged areas. Homestead gardening for vegetables, nutrition and income. Soil fertility management through use of vermi-compost & other practices Pyramid cropping to plant early in areas with delayed drainage. Zero tillage, dibbling or relay cropping to avoid salinity. Alternate Wetting and Drying (AWD) in boro rice for non-saline areas to save scarce irrigable water.Published desk and wall calendars with description of 12 climate smart agriculture technologies for distribution amongst the staffs of the LFs, dealers, retailers, farmers and other stakeholders. Two self-learning materials (primers) one on CSA technologies and another on homestead gardening were written in simple Bengali for easy understanding of the farmers. Monthly coordination meetings were held with both the LFs**.**

Four articles/case studies were developed. These are as follows: Climate resilient agriculture and food security in coastal area, CRAFS project activities in polder areas, Private seed companies promote business in coastal polders, Watermelon cultivation at coastal areas in changed climate

Lessons Learnt: Climate induced problems related to salinity and water management can be addressed to a great extend through CSA technologies. Lead Firms gradually shifted their mind set to adopt CSA technologies and invest more in business promotion of climate resilient seeds and other agro inputs. ToT course improved the knowledge and skills of LFs officials in field crops, vegetables production and adoption of CSA technologies. LFs trainers improved the climate resilient capacity of farmers through training, demonstrations, field days and exposure visits The TSP team contributed to improve the understanding of and raise awareness among the LFs personnel about vulnerabilities and their impact in the polders. Extension of the CSA technologies relating to seeds and other agro inputs can be improved through training of dealers and retailers of the LFs as farmers normally contact with them for advice of appropriate technologies. Extension and adoption of CSA technologies were slow in the polder areas due to shortage of field staffs of LFs and the CRAFS project team. The arrangement of regular coordination meetings with the LFs helped better understanding for proper implementation of CRAFS project activities.

Progress of the project activities:

Conduction of Seminar:: **"Recent Advances in Water and Salinity Management in the Coastal Areas"** held on 13th July 2016 at Hotel Lake Shore, Gulshan-2, Dhaka. Objective is to Share the most recent developed technologies on salinity and water management for crop cultivation in coastal areas with 50 different stakeholders.

Refreshers ToT program: SSCL organized a day long refreshers training for their 21 officials on 28 July, 2016 at Uttara Dhaka on Climate Change, resilient, salinity and water management.

Farmers Training:, Demonstrations:

Project Coordination and Linkage: TSP team had coordination meetings with LFs concerned officials to review the project activities.CRAFS Field Officers are regularly communicating with the field officers of LFs (Supreme Seed Company Ltd and ACI Ltd) in 12 polders and providing technical assistance to implement the activities of CRAFS project.TSP team facilitated the SSCL in establishing linkage to procure salt tolerant potato variety (BARI Potato-72) from BARI and salt & heat tolerant wheat variety (BINA Gom-1) from BINA.

Development of video training materials: Video Training Materials Developed on Bed Planting, Pyramid, Floating Garden, Sarzan method, Vermi compost, Zero tillage, Mulching, Homestead gardening, Fresh water preservation, Alternate Wetting and Drying (AWD)

Homestead Vegetable Cultivation Booklet 10,000 booklets in Bengali on homestead vegetable cultivation were printed. So far distributed 4350 copies to ACI, 800 to Supreme Seed Company Ltd, 50 to IFC, 200 to CRAFS field officers and 100 copies to various stakeholders.

Information of PPCR project: As per supplied format by the Ministry of Environment and Forest through IFC, CRAFS TSP team prepared detail progress on the CRAFS activities highlighting the activities private sector engagement, lesson learnt and challenges in main streaming climate resilient

Good Agricultural Extension Practices of Helen Keller International (HKI): Improve food security and nutrition through nutrition sensitive agricultural practices

Approaches:
EHFP Approach

HKI's approach to EHFP has an equal focus on: production of diverse, nutritious foods, consumption of diverse, nutritious food and gender equitable access and utilization of diverse, nutritious foods. Evidence shows the Enhanced Homestead Food Production approach significantly improves anaemia, dietary diversity, micronutrient consumption, and women's empowerment, in addition to generating income and access to food to address food security.

eHFP: 28 years in Bangladesh:1988 - HKI's flagship Homestead Food Production program started in Bangladesh.1988-1992:Home Gardening Pilot Project for preventing nutritional blindness through increased Vitamin A consumption.1993-2003: Scale up → NGO Gardening and Nutrition Education Surveillance Project (NGNESP) .887,946 households nationwide .51 partner NGOs.
Enhanced Homestead Food Production: GENDER TRANSFORMATIVE APPROACH: Nutrition Education, Animal source foods and income generation, Horticultural inputs and training. Surplus sale: Integral components of HKI's programs are the approach to transformation of harmful gender norms, the promotion of high value, high-nutritive crop diversification for diversified consumption and income generation,post-harvest processing, and sustainable,climate-smart agriculture methods. We are now exploring bio-fortification of rice and potatoes with zinc foliar spray.

Some of results: PLB Monthly vegetable Production over lop
Baseline = 10 Kg,Year 1 = 17 Kg,Year 2 = 24 Kg,Year 3 = 33 Kg,Year 4 = 40 Kg,400% increase.**Income from HFP :**Average monthly income garden and poultry 12 to 15 USD.Women's consumption of inadequately diverse diets were declined gradually from 2011 (61%) to 2014 (54%) but increased to 66% in 2015.

Dietary improvements: Baseline - 76% female beneficiaries with inadequate diet reduced to 23% at end line! compared to 54% nationally (FSNSP).Women's mean dietary diversity pattern has shown remarkable improvement over the middle of project period. Mean dietary diversity score from 3.7 to 5.02 increased in two years.
Women's Decision making

	Baseline	Endline
Control over earning	8%	77%
Own health care	20%	67%
Major household purchases	19%	56%
Purchase daily household needs	34%	88%
Visit to your family or relatives	16%	65%
Child health care	43%	86%

Baseline – 10-40% decision-making

Endline – 60-90% decision-making

I bought one goat from my income and sometimes I myself buying cloths for me & daughter and now I'm self dependant" - Jahura Begum

Case:
Hosneara is pleased to have her own income and to be able to contribute her efforts with EHFP to her family's health and future."Now we are eating vegetables two times a day, and there are some left over to sell," says Hafiza. "I am getting access to the market for the first time through the sales center…. I am saving the money I make to buy a rickshaw van (taxi)."-Satkhira. Agriculture and Nutrition: The key issue in nutrition sensitive agriculture is NOT "nutrition science", but behaviour change .Here are two possibilities for considering how agriculture and nutrition scientists and practitioners can work together.Nutrition can be simple in ag-nutrition work: eat good food. Eat the eggs, the carrots, the meat, the beans, etc. The challenging and difficult part is behaviour change. But at least that is a common challenge to numerous fields, including agriculture. If in your agriculture projects you have been promoting intercropping or seed saving or improved animal husbandry, etc., you have been working in behaviour change. Now we just need to channel that experience into promoting change in the diet. It is a tremendous challenge, but it is not a "technical nutrition issue" per se.

Challenges: Flow of quality inputs and engagement of input seller/private sectors, Adopt appropriate climate smart agricultural practices, Less agricultural diversity, Less dietary diversity Nutrition challenges (gender inequality, lack of access to basic health, education and WASH services)

What We Know: For agriculture interventions to have a positive impact on nutrition of the participating households they should invest in multiple areas of the farmers' lives, including, but not limited to, nutrition education → multi-sector approach. Home gardening with focus on vitamin A-rich crops can improve vitamin A status .Animal husbandry focused projects can lead to increases in ASF consumption .Incorporating messages and targeted sessions on gender and social inclusion can lead to increased women's empowerment and improved nutrition status for the household

Agriculture Extension and International Development Enterprises (iDE) Bangladesh: Facilitating Innovation in Extension

Approaches:
- Farm Business Advisors
- Local Service Providers
- Creating public private linkages

International Development Enterprises (iDE) is an international non-profit NGO that designs and delivers market development projects in 11 countries. iDE-Bangladesh was the first iDE country program, established in 1984. iDE works to create income and livelihood opportunities for poor rural households using a market development approach. This involves developing links with the private sector to promote the commercialization of technologies and services that work more sustainably and inclusively for the Bottom of the Pyramid (BoP) farmers and consumers. In iDE's agricultural portfolio, projects provide a range of integrated agricultural extension services that aim to reduce the cost of cultivation, improve productivity and provide better market linkages for farmers.

Recent Projects include: Profitable Opportunities for Food Security (2013-2017),Cereals System Initiative for South Asia – Mechanization and Irrigation, with CIMMYT (2013-2018),SUCHANA: Ending the Cycle of Under-nutrition in Bangladesh (2015-2022).Chars Market Development Initiative under the DFID Chars Livelihoods Programme (2013-2016),PROSHAR – Enhancing Market Linkages, under the USAID Programme for Strengthening Household Access to Resources with ACDI/VOCA (2013-2015),EU Agriculture and Nutrition Extension Project (2011-2014).

iDE approach to Agricultural Extension

iDE seeks to act as a *facilitator* rather than a direct provider of agriculture extension services. This means that iDE acts as an agricultural extension bridge linking farmers to a range of service providers, including agricultural input companies, machinery dealers and/or service providers, institutional buyers, financial institutes and public sector actors. To achieve this, iDE applies a "bottom up" approach focusing on improving farmers knowledge and uptake of extension services, whilst also working from the "top down" with public and private sector actors to develop inclusive business models which deliver extension services at the BoP level. This 'vertical integration strategy' promotes demand driven extension delivery, in which iDE catalyzes new and/ or improved relationships between extension service providers and BoP farmers that will sustain beyond project support. iDE facilitates linking farmers to pluralisitc sector sources of extension. Profitability ensures private sector engagement .Sustainable relationships develop.Farmers Groups -Public Sector -Private Sector -Incentive based relationship

Agents of Extension: Farm Business Advisers

iDE has developed the Farm Business Advisor (FBA) role to overcome the last mile distribution gap of agricultural information and technology to small-scale farmers.FBAs

are project identified and trained entrepreneurs who provide access to and information on agricultural inputs, production, and output markets whilst capturing a share of the value created as income. FBAs are incentivised to continue providing embedded service to producers through inputs selling to generate more sales and stay competitive against other market actors, which in turn increases producer's yield and income. Profit from sale of inputs, Increasing customer base, Technical information, Access to quality inputs

Farm Business Advisors: Selection and Training

Process for selecting FBAs: Facilitated by project staff., Beneficiary communities led identification of candidates and voting on FBA selection, Different projects have different requirements for FBA selection (examples- gender targeting, FBAs needing to be from beneficiary group).Project led FBA Capacity Building aims to Increase FBA Business skills and capacity (in areas such as financial management, business planning, sales and marketing techniques).Increase FBAs sources of and access to technical information. Increase FBAs Private Sector linkage skills.Private Sector led FBA capacity building aims to: Increase FBA technical information,Trickle down of information from FBA to producers.

Public and Private Extension Services: iDE aims to link producers to multiple extensions service providers through the FBA. Private sector input and output market actors are incentivized to provide technical information to FBAs as it increases business FBAs are incentivized to embed technical knowledge in sales of inputs/aggregation of outputs as it increases customer base. The FBA model engages the Government of Bangladesh extension officers (SAAOs) to provide support to FBA businesses through attending events and verifying technical advisory information**.** Introduction of new technologies/techniques-Input product Information-Increased Sales-Technical Information-Aggregated Produce-Market/Post Harvest Information-Uptake of new technologies/techniques

Sustainability and Scalability: A sustainable FBA is Able to continue their business in an inclusive manner without project support. Able to maintain linkages with private sector companies to access new information and products to provide to producers. Is earning an income from their FBA business that fairly compensates the time spend on business activities. Since first using the FBA role in project implementation in 2012, iDE has trained over 900 FBAs to date. Once option for scaling the FBA model would involve private companies adopting a FBA type sales agent who operates at the village level, providing information and sales of inputs to small producers. iDE is still piloting and monitoring different typologies of FBAs and the challenges each face. Through learning from and adapting to new FBA experiences, iDE is building an evidence base to provide recommendation to larger companies for scaling the FBA model.

Case Study: Bondona Kobiraj
In PROSHAR EML, iDE designed and implemented activities with poor and ultra poor producers to increase their productivity and strengthen market linkages in Khulna Division. "The role of the FBA seems to be the driving factor in bringing about changes

among PROSHAR-EML and PROSHAR beneficiaries. They are now realizing higher yields and increased market access…There is a greater number of embedded services being delivered from the FBA to PROSHAR beneficiaries"* Networking opportunities through PROSHAR-EML created space for Gongarampur's FBA, Bandona Kobiraj, to develop market linkages with seed companies and overcome fractured input supply chains. Producers are now able to purchase quality seed inputs in Gongarampur through their FBA.PROSHAR EML established gender sensitive extension services for female producers through identifying and training female FBAs. As the FBA works at the household level, female producers are able to access technical and market information within social norms and restricted mobility.

Agents of Extension: Local Service Providers

The CSISA-MI project is piloting Local Service Providers (LSPs) as agents of agricultural extension through the embedded services they deliver to farmers. LSPs are small-scale entrepreneurs who provide agricultural services to other farmers as a business.In the CSISA-MI project, LSPs sell mechanization services such as tilling, sowing and harvesting. For some mechanization, choosing to purchase LSP's services is related the uptake of new agricultural practices, therefore requiring LSPs to market the benefits of those new practices to famers in order to increase their profit. For instance, LSPs providing power tillage services must convince farmers to choose mechanized line sowing over manual broad casting of seeds. This involves educating farmers on the cost-savings and productivity increases associated with mechanized line sowing.The success of the LSP's business is dependant on their ability to deliver extension information to support farmers adopting improved agricultural practices.

Creating public private linkages that enhance business driven extension

iDE works closely with the Department of Agricultural Extension to create linkages between the public and private sector that enhances technology commercialization and business driven extension. In CSISA-MI, project staff connect private sector sales representatives and dealers to SAAOs to ensure there is local level information sharing and understanding on new machines available in the market.

Good practices in Extension of Promoting Agricultural Commercialization and Enterprise (PACE): "COAST Trust"-Coastal Association For Social Transformation

Approaches:
-Skill development training
-Small enterprise management
-Exhibition podium
-Leaflets/Books
-Bill board
-Agricultural/Fisheries fair

Vision:
Fighting for a world of Equity, Justice where Human Rights, Democracy and Dignity are the Social Cultures.

Mission:
COAST organizes activities related to development especially of women, children and disadvantaged population of the coastal areas in Bangladesh

Objectives:

- To facilitate and participate in survival strategies of the coastal and the disadvantaged population.
- To support and take necessary steps to mediate initiatives of the poor.
- To initiate projects protecting and preserving the ecological/natural resources.
- To promote advocacy, lobby and seek alliances for poor and disadvantaged population.
- To undertake disaster preparedness and post-disaster rehabilitation programs.
- To undertake humanitarian welfare services specially for disadvantaged and poor families.

Background of the project: Bangladesh is a densely populated country in the world. About 55% populations live within 100 km of the coast of Bangladesh. It's a matter of great regret that the dry fish producers use various pesticides to produce dry fish in the traditional method which is harmful for human health. Traders want the fish to retain moisture so that they weigh more, but moisture is a good environment for bacteria. Traders use different kinds of pesticides like DDT, Sobicron, Selcron, Setara, Nogos, Rocket and Sumithion to kill the bacteria. These are responsible for many sever disease like cancer.

Introduction of the project: Increase Income and Quality Development of Livelihood of the Entrepreneurs by Pesticides free Dry Fish Production and Marketing Using Fish Drier and Organic Method. Extension of fish drier and organic technology for pesticides free dry fish production.

- Donor: PKSF (Palli Karma-Shahayak Foundation)
- Project Area: Cox's Bazar Sadar, Moheshkhali
- Project Duration: 03 years (February, 2017-Fedbruary 2020)

Aims of the project: Pesticide free dry fish production and marketing to increase healthy food, income and their better livelihood. Technology extension such as fish dryer and organic method technology

Objectives of the project: Pesticide free dry fish dry fish produce utilized organic and fish dryer method. Increased producer's income. Skill development of betel leaves cultivator.

Budget of the project
No. 1 Project budget: 1.37 crore Taka
No. 2 Project budget: 19.95 lacs Taka.
Total budget: 1.57 crore Taka only.
Total Project staffs is 06,Target people of the project -Total people is 5000

Among them,2400 (48%)= Small entrepreneurs, 1865 (37.03%)= Poor, 735 (14.70%)= Extremely poor

District	Upazila	Target People								Grand total
		Small entrepreneurs		poor		Extremely poor		Total		
		M	F	M	F	M	F	M	F	
Cox's Bazar	Sadar, Cox's bazar	1310	1015	820	1020	320	415	2450	2450	5000
	Moheshkhali	50	25	0	25	0	0	50	50	
Total		2400		1865		735		2500	2500	

Project Activities (3 years): Selection of **5000** thousands people through baseline survey. Skill development training on Fish dryer and Organic method for **4000** people. Skill development training on dry fish Byproduct collection, Packaging and marketing for **200** people. Skill development training on betel leaf culture for **100** people. Work-force training on Small enterprise management for **10000** people .**10** Exhibition podium (Macha) set up,**50** Signboard set up for Pesticide Free dry fish available address's, Leaflets/Books for Pesticide Free dry fish production and available places,**210** Dry fish sample quality test, Bill board set up,**4** Plot cross visit of dry fish and betel leaf,**6** betel leaf culture Exhibition plot set up,**3** Agricultural/Fisheries fair participation

Project evaluation and report making : Initial stage report prepare and evaluation, Post-project evaluation and report prepare, Publication at the end of the project

Program analysis in fiscal year 2016-17

Sl.	Activities	Target	Accomplished	Pending	Remarks
01	Baseline survey	5000	4000	1000	
02	skill development training on Fish dryer and Organic method dry fish production	10	10	00	
03	Fish drier set up	02	01	01	
04	Organic fish podium/Macha set up	06	06	00	

Programs in fiscal year 2017-18

Sl.	**Activities**	Target
01	Baseline survey	1800
02	skill development training on Fish dryer and Organic method dry fish production	80
03	Skill development training on dry fish Byproduct collection, Packaging and marketing	04
04	Training on betel leaf farmer's skill development	02
05	Work-force training on micro enterprise management	180
06	Exhibition Macha set up	10
07	Signboard set up for Pesticide Free dry fish available address's	30
08	Leaflets/Books for Pesticide Free dry fish production	02
09	Dry fish sample quality test	120
10	Bill board set up/Fair rent and permission cost	02
11	Plot cross visit of dry fish and betel leaf	03
12	Agricultural/Fisheries fair/Mela participation	01
13	Local networks cabals advertisement	01
14	Video documentation pesticide free production and marketing improvement	01
15	Workshop on market linkage with deferent stakeholders	04
16	Market extension workshop in local or other dry fish market area	12
17	Linkage workshop with feed mill representative and fish byproduct suppliers	2
18	Fish drier set up	11
19	Fish podium/Macha set up	25
20	Exhibition plot of betel leaf	3

Activities	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Total
Training on Fish dryer and Organic method				10	10	10	10	10	10	10	10		80
Training on dry fish Byproduct	2		2										04
Training on betel leaf farmer's skill development				2									02
Work-force training on micro enterprise	10	15	10	15	15	15	15	10	15	20	20	20	180
Exhibition Macha set up			5		5								10
Signboard set up for Pesticide Free dry fish address					10			10				10	30
Leaflets/Books for Pesticide Free dry fish production				1	1								02
Dry fish sample quality test				15	15	15	15	15	15	15	15		120
Exhibition plot of betel leaf			3										03
Bill board set up/Fair rent and permission cost			2										02
Plot cross visit of dry fish and betel leaf					3								03
Agricultural/Fisheries fair/Mela participation						1							01
Local networks cabals advertisement						1							01
Video documentation on pesticide free dry fish						1							01
Workshop on market linkage with stakeholders		1	1						2				04
Market extension workshop in local dry fish market			2	2		3		2				3	12
Linkage workshop with feed mill representative			2										2
Fish drier set up			3	2	2	2		2					11
Fish podium/Macha set up			10	5	5		5						25

Expectations : Enhance livelihoods of the people engaged with dry fish and betel leaf cultivation. Create self employment, business profit, wage security and food security. New micro enterprises will create

Proshika's Extension Network : A Holistic Approach for Human Development

Approaches:
- Group formation
- Training
- Demonstration
- Market linkage

Vision: Proshika addresses that kind of Society which Economically productive and sustainable , Environmentally sound, Socially justice and equity and really democratic.

Mission: The Mission of Proshika is to empower the Poor People through extension and participatory involvement for sustainable development.

Objectives of Proshika

- To work for Poverty alleviation
- To conserve and regenerate of Environment
- To empower the women
- To create more access in the government institutes for the mass people
- To develop strength and access of the mass people for human rights and democracy

Different Programs of Proshika: People's Development Program, Human Development Program, Skill Development Training Program, People's Cultural Program, Universal Education Program, Small Economic Enterprise Development Program, Integrated Multi-Sector Women Development Program.

Environment Conservation and Regenerating Program: Social Forestry and Natural Forest Conservation, Organic Agricultural Activities, Housing Program
Health Program: Health Infrastructure Development, Health Education, Health Services Campaign, Development of Disable People, Information Development and Research Cell, Proshika Media Department, Computer Development Program, Assistance Programs for Other Organizations, Disaster Management Program, Liberation War Related Program, Proshika Legal Aid Services
Other Agricultural Programs: Livestock Development Program, Fisheries Development Program, Sericulture development Program, Irrigation and Agricultural Machinery Development Program
Proshika's Trust: Proshika Computer System Trust, Proshika Human Resource Development Center Trust, Proshika Integrated Agricultural Farm Trust
Proshika Integrated Agricultural Farm Trust: Poultry Production and Marketing, Seed Production and Marketing, Organic Vegetable Production and Marketing, Honey Production and Marketing, Fresh Water Prawn PL Production and Marketing, Carp Fingerlings Production and Marketing, Development Services and Communication Center Trust (DSCCT),Proshika Fabrics Trust, Proshika Plant Tissue Culture Trust

Agricultural Extension Programs of Proshika: Livestock Development Program, Completed 50290 Projects and disbursed Tk. 230 core and 80 lac under micro credit, Trained 5014 vaccinator, 1157 paravet and 199 AI workers around the country.
Fisheries Development Program: Completed 25900 Projects and disbursed Tk. 133 core and 50 lac under micro credit,Re-excavated 680 numbers of ponds ,Established access rights in 183 open water bodies by fishers community

Sericulture Development Program: Completed 2950 Projects and disbursed Tk. 2 core and 97 lac under micro credit, Transplanted 21 lac 50 thousand sericulture plants

Irrigation and Agricultural Machinery Development Program: Supplied 9600 Irrigation pumps, 900 power tiller for cultivation and 800 crop harvesting machinery to farmers. Disbursed Tk. 2 core and 55 lac under micro credit

Poultry Production and Marketing: Three poultry hatcheries in Chittagong, Rangpur and Khulna. All hatcheries have controlled house with parents stocks of broiler and layer. Day old broiler chicks and layer pullets have been distributed around the country through extension network

Seed Production and Marketing: Agricultural seeds have been producing in the tissue culture lab and farm areas. Produced seeds have been distributed to the farmers through extension network

Organic Vegetable and Food Production: Organic vegetables and foods are producing through group members and different farms of Proshika .All the produces are supplying around the country through extension network

Honey Production and Marketing: Organic honey are producing by group members in different places of Bangladesh. Produced raw honey products which are processed in the plant. Final products of processed honey are supplying around the country through extension network.

Fresh Water Prawn PL Production and Marketing: Three fresh water prawn hatcheries in Proshika. Produced One crore twenty lac fresh water prawn Pl per year and supplying among the farmers through extension network.

Carp Fish Spawn and telapia Fingerlings production and marketing: One Carp hatchery and one telapia hatchery in Proshika .Producing 1000 kg carp fish spawn (renu) and 20 lac telapia fingerlings per year and supplying among the farmers through extension network.

Proshika's Fabrics: Produces cloth and used to supply in the market. Produced cloths are high quality due to Azo-free and adding vegetable dying instead of chemical dying

Environment Conserve and Regenerating Program: Social Forestry and Natural Forest Conserve, Organic Agriculture Activities

TRANSITION TOWARDS -INCLUSIVE EXTENSION APPROACHES: SOLIDARIDAD- SUSTAINABLE AGRICULTURE, FOOD SECURITY & LINKAGES (SAFAL)

Approaches:
-Lead Farmers
-Input shops
-Local extension agents
-Producer groups
-Rural SME"S
-Demonstration and Piloting
-Model contract farming

Background: Promoting innovation and the exchange of good practices for widespread copying. Improving nutrition status through education and knowledge building Policy and campaign to enhance efficiency in food supply chain. Smallholders collectivization, knowledge and technology transfer to increase farm productivity. Developing sustainability standards. Transforming the market system and dynamics for greater inclusion and integration of smallholders .Stimulating private sector investment in sustainable and efficient value chains.

Understanding the needs of extension: Lack of availability of quality inputs knowledge (fish and cattle feed, seeds, fertilisers, pesticides, etc.) leading to low agricultural productivity. Limited knowledge of modern practices and technical information on the type, variety and amount of input supplies resulting in low operational efficiency (e.g., in dairy only 6% and in aquaculture only 12% of producers* got formal training) .For cultivation practices, producer either relies on self or its surrounding rather than going to an expert (e.g., in aquaculture, 47% farmer select chemical inputs based on their own understanding).Low proximity of retail shops for buying quality input results in use of supplementary products

Limited information on production techniques leading to widening of demand supply gap in the industry: Lack of knowledge on appropriate usage of agro-inputs and production techniques hampering productivity.Gap in forecasting of production and demand.Poor information of right agricultural practice and possible product mix on the available land leads to low produce hence widening the demand supply gap. Lack of information on the control of crop diseases

Complex supply chain with lot of intermediaries introducing operational inefficiencies in the value chain: Complex supply chain with multiple actor and intermediaries affecting product lead time, quality and price thus creating demand supply gap.Lack of transparency in market functioning owing to intermediaries influencing the value chain. Milk collector and paikers in horticulture force producers to sell at fixed price.Lack of traceability of produce as intermediaries mix the produce from distinct sources .No contract farming for vertical integration of supply chain leads to driving of market by intermediaries

Safal extension approaches: Around 70 officers of Solidaridad operating from Bangladesh.500 Lead Farmers, 86 CNVs, 60 CLPS, 74 Agro INPUT SHOPs are developed as local extension agents advising the farms on best practices management, food safety and market integration;1000 producer groups are transforming their organization through linkage development with the national and international sustainable supply chain actors. Developing Rural SME"S for Promoting Availability and Accessibility of Quality Inputs and Services .Demonstration and Piloting of New technology, Techniques, Farm Practices- Boosting Farm Productivity. Developed model contract farming to link smallholders with the domestic retail chain and export market .Influencing National Leaders from the government, business and farming industry for sustainable trade for safe food market promotion. Supporting a common vision with govt, private sector and development agencies partners are joining forces to refine and implement integrated service system. Market promotion: national retail chain & eu countries