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CAPACITY DEVELOPMENT FOR EXTENSION AND ADVISORY SERVICES IN BANGLADESH

Md. Sekender Ali

July 2016

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Sharing, learning and networking for Innovation
Agricultural Extension in South Asia

Agricultural Extension in South Asia (AESA) is a network of all those who are interested and involved in Extension and Advisory Services (EAS) provision in South Asia (www.aesa-gfras.net). Our vision is to improve food and nutrition security through efficient and effective EAS in South Asia. Our mission is to promote sharing, learning and networking for building effective and efficient EAS.

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Capacity Development for Extension and Advisory Services in Bangladesh

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Abbreviations and Acronyms

ACI	Advanced Chemical Industries
AESA	Agricultural Extension in South Asian
AIS	Agricultural Information Services
AET	Agriculture, Education and Training
AIT	Asia Institute of Technology
APAN	Asia Pacific Adaptation Network
APN	Asia Pacific Network
APO	Asian Productivity Organization
ARED	Adaptive Research and Extension Division
ASA	Association for Social Advancement
ATI	Agricultural Training Institutes
ARD	Adaptive Research Division
BADC	Bangladesh Agricultural Development Corporation
BAEN	Bangladesh Agricultural Extension Network
BARC	Bangladesh Agricultural Research Council
BARD	Bangladesh Academy for Rural Development
BARI	Bangladesh Agricultural Research Institute
BAU	Bangladesh Agricultural University
BAUEC	Bangladesh Agricultural University Extension Centre
BBA	Bachelor of Business Administration
BER	Bangladesh Economic Review
BFDC	Bangladesh Fisheries Development Corporation
BFRI	Bangladesh Fisheries Research Institute
BIID	Bangladesh Institute of ICT in Development
BINA	Bangladesh Institute of Nuclear Agriculture
BJRI	Bangladesh Jute Research Institute
BLD	BRAC Learning Division
BLRI	Bangladesh Livestock Research Institute
BPATC	Bangladesh Public Administration Training Center
BPATC	Bangabandhu Poverty Alleviation Training Complex
BRDB	Bangladesh Rural Development Board
BRDTI	Bangladesh Rural Development Training Institute
BRRI	Bangladesh Rice Research Institute
B.Sc. Ag.	Bachelor of Science in Agriculture
B.Sc. Ag. Economics	Bachelor of Science in Agricultural Economics
B.Sc. Ag. Engineering	Bachelor of Science in Agricultural Engineering
B.Sc. AH	Bachelor of Science in Animal Husbandry
B.Sc. Fisheries	Bachelor of Science in Fisheries

BSFIC	Bangladesh Sugar and Food Industries Corporation
BSRI	Bangladesh Sugar- crops Research Institute
BTD	BRAC Training Division
CARE	Cooperative for American Relief Everywhere
CCA	Climate Change Adaptation
CD	Capacity Development
CDB	Cotton Development Board
CDP	Crop Diversification Programmes
CAN	Capacity Need Assessment
DAE	Department of Agricultural Extension
DAM	Department of Agricultural Marketing
DANIDA	Danish International Development Agency
DLS	Department of Livestock
DOF	Department of Fisheries
DYD	Department of Youth Development
EAS	Extension and Advisory Service
FAO	Food and Agriculture Organization
FF	Farmer Facilitator
FFS	Farmers' Field School
FSD	Field Service Division
FT	Farmer Trainer
FTI	Fisheries Training Institute
GFRAS	Global Forum for Rural Advisory Services
GO	Government Organization
GOB	Government of Bangladesh
GTI	Graduate Training Institute
HRDC	Human Resource Development Center
ICT	Information & Communication Technology
ICM	Integrated Crop Management
IFAD	International Fund for Agricultural Development
IFM	Integrated Farm Management
IGA	Income Generation Activities
IGES	Institute for Global Environmental Strategies
IPM	Integrated Pest Management
JFSD	Jute Farming System Division
LGED	Local Government Engineering Department
LGRD	Local Government & Rural Development
LTI	Livestock Training Institute
MOA	Ministry of Agriculture
MOI	Ministry of Industry
MOLF	Ministry of Livestock and Fisheries

MOLGD&C)	Ministry of Local Government Rural Development & Cooperative
MOYS	Ministry of Youths and Sports
MS	Master of Science
MSTL	Mobile Soil Testing Laboratories
NAEP	National Agricultural Extension Policies
NAES	National Agricultural Extension System
NARS	National Agricultural Research System
NATA	National Agricultural Training Academy
NATP	National Agricultural Technology Project
NGO	Non-government Organization
NPO	National Productivity Organization
NPRRAG	Network for Policy Research, Review and Advice on Education and Training
NRDTC	Noakhali Rural Development Training Center
OFD	On-Farm Division
OFRD	On Farm Research Division
PO	Partner Organization
PDBF	Palli Daridra Bimochon Foundation (Foundation for Rural Poverty Reduction)
PGD	Post-Graduate Diploma
PRA	Participatory Rural Appraisal
PhD	Doctor of Philosophy
PKSF	Palli Karma Sahayak Foundation (Foundation for Rural Employment)
RDA	Rural Development Academy
RDRS	Rangpur Dinajpur Rural Service
RRC.AP	Regional Resource Center for Asia and the Pacific
SAAO	Sub-Assistant Agriculture Officer
SAU	Sher-e-Bangla Agricultural University
SDG	Sustainable Development Goal
SFDF	Small Farmers Development Foundation
SFYP	Seventh Five Year Plan
SHNYC	Sheikh Hasina National Youth Centre
SSC	Secondary School Certificate
SRDI	Soil Resources Development Institute
TNA	Training Need Assessment
TOR	Terms of Reference
TOT	Training of Trainers
TPTTD	Training, Planning and Technology Testing Division
TTTD	Training and Technology Transfer Division
TTMU	Technology Transfer & Monitoring Unit
T&V	Training & Visit

TVSD	Technical and Vocational Skills Development
UNDP	United Nations Development Program
V-AID	Value-Added Investment & Development
VTI	Veterinary Training Institute
WES	Worldwide Extension Study
WB	World Bank

Executive summary

The purpose of this paper is to identify the present status of Capacity Development (CD) for Extension and Advisory Service (AES) providers in Bangladesh. A large number of public and private extension service providing organizations are working in Bangladesh for disseminating agricultural innovations to the farmers. However, a significant proportion of farmers of Bangladesh remain untouched from the development initiatives as they are not getting adequate support and information for mitigating their constraints in agriculture and rural livelihood.

Bangladesh has tried several extension approaches since its independence. These include Training and Visit (T&V) and participatory extension approaches such as Farmers' Field Schools (FFS) for Integrated Pest Management (IPM)/Integrated Crop Management (ICM) and Integrated Farm Management (IFM). Recent years have witnessed focussed extension efforts aimed at promoting crop diversification towards high value crops. The National Agricultural Technology Project (NATP) is being implemented by the Government with the financial support of the World Bank and the International Fund for Agricultural Development (IFAD). The aim of the project is to improve the effectiveness of the national agricultural technology system through strengthening the National Agricultural Research System (NARS) and National Agricultural Extension Systems (NAES) in Bangladesh.

The only organisation having the largest number of extension personnel is the Department of Agricultural Extension (DAE). Similarly, Department of Livestock Service (DLS) and Department of Fisheries (DOF) are responsible for livestock and fisheries extension. However, they have very few extension personnel. Agricultural research organizations in Bangladesh play only a very limited extension role that too focussed on promoting the new technologies developed by them. Agricultural universities demonstrate new technologies and engage in farmer training in few adjoining villages. Most NGOs do provide a much broader support (technical, financial and organisational) to farmers but their presence is limited to select villages they work. Private organizations like input manufacturing and marketing companies are helping the farmers by providing inputs. But, in most of the cases, those are mainly business oriented with high number of marketing personnel and less number of extension personnel. Though there is an increasing pluralism in EAS delivery, there is very little coordination among actors in the different sub-sectors (crops, livestock and fisheries) as well as among different EAS providers providing public, private and NGO sector.

Though Bangladesh has several EAS providers, their capacities need to be considerably enhanced so that they could support farmers in dealing with the emerging challenges. The existing agriculture extension system is not capable enough to meet capital intensive, commercial and specialized quick and technically sound advice based on scientific analysis. The major challenges of the system are: how to increase capability of extension personnel, how to make them available to clients at call, how to make their technical advice reliable, how to make their education activities commercially worthy and how to include business orientation in them.

In Bangladesh, Capacity Development in EAS is quite often understood as enhancing technical capacity of extension personnel. There is very little emphasis on enhancing the functional capacities such as mobilisation, facilitation, negotiation, networking, partnership building etc. EAS personnel also need coaching and mentoring support and there should be a provision for providing this support. Another issue is the lack of proper evaluation of the training programmes.

Ideally, capacity strengthening initiatives should build on the results of a systematic capacity needs assessment (CNA). While the country has several agencies involved in capacity development, lack of systematic CNA exercises has constrained the effectiveness of capacity development initiatives. Apart from these, efforts are also required at several levels. There is a need to recognise the key capacities that already exist and identify those that need strengthening. Exploring new or additional capacities that are required to meet the sector and organisational goals is also critical if EAS has to address the rapidly evolving challenges and to remain relevant to the clients.

1. Introduction

Agriculture remains the most important sector of Bangladeshi economy and one of the major drivers of economic growth. Although Bangladesh is on course for Middle Income Country status by 2021, agriculture remains the largest employer in the country by far; and 47.5% of the population is directly employed in agriculture and around 70% depends on agriculture in one form or another for their livelihood (Planning Commission, 2015). The provisional estimates show that contribution of the broad agriculture sector to GDP in 2013-14 would be 16.33% (BER, 2014). Nearly three-fifth of the agricultural GDP comes from the crop sub-sector; the other contributors in order of magnitude are fishery, livestock and forestry.

The Strategy document for agriculture and water resources of the Seventh Five-Year Plan states that agriculture is overwhelmingly driven by private initiatives. The overall strategy for Seventh Five-Year Plan will be to accelerate the process of transformation from already existing semi-subsistence to commercialization. This strategy will require achieving productivity gains, diversification, value addition, agro processing in commensurate with national environment protection and climate change adaptation strategies (Planning Commission, 2015).

The Government of Bangladesh has undertaken various initiatives to support farmers through dissemination of agricultural information and technology (crops as well as fisheries and livestock sectors) to improve nutritional status of people in all the 64 districts spread over eight divisions of Bangladesh (Table 1).

Table 1. Division wise number of administrative districts and upazillas of Bangladesh

Name of Divisions	Number of Districts	Number of Upazillas (Sub-districts)
Dhaka	13	93
Mymensingh	4	34
Rajshahi	8	70
Rangpur	8	58
Barisal	6	39
Chittagong	11	97
Sylhet	4	38
Khulna	10	59
Total: 8	**Total: 64**	**Total: 488**

N.B. Besides the Upazillas, there are some Thanas in the Metropolitan areas.

(Source: DB. Divisions of Bangladesh, Wikipedia.
https://en.wikipedia.org/wiki/Divisions_of_Bangladesh)

Bangladesh agriculture faces several challenges. The major challenges for Bangladesh agriculture are as follows (Planning Commission, 2015):

- Raise productivity and profitability
- Increase diversification of production in line with consumption diversification to promote nutrition and minimize trade imbalances
- Reduce instability of production
- Increase resource use efficiency

- Reduce loss of arable land
- Minimize yield gap
- Maintain food safety and quality
- Expand irrigation and farm mechanization
- Develop resilience to climate change impacts.

Extension and Advisory Service (EAS) providers can play a major role in supporting the Government in addressing these challenges. Bangladesh has several EAS providers in the public, private and NGO sector. However, their capacity needs to be enhanced to deal with the above challenges. The background paper for preparation of the 7th Five Year Plan noted that "Over time, the role of agricultural extension in Bangladesh as a rural advisory and training service provider has changed significantly. Originally, addressing production concerns of cereals (mainly rice) associated with the green revolution; extension now caters for a diversified demand for services, including a greater degree of advice on questions relating to high value corps, mechanization and value chains/marketing. The paper argues for:

- Updating knowledge base of the extension service providers
- Developing appropriate design of training approaches involving relevant research institutes for the huge grassroots workers (SAAO) so as to bring valued changes in the rural knowledge environment and
- Creating provision for in-country higher studies for extension agency staff to improve the technical quality of extension work, while also linking extension to the education system (SFYP, 2015).

Understanding the present status of Capacity Development (CD) for Extension and Advisory Service (EAS) providers in Bangladesh is very important in this context. This paper is aimed at doing this. The rest of the paper is organised as follows: An overview of different EAS providers in Bangladesh is presented in Section 2. The emerging challenges in Bangladesh Agriculture are presented in Section 3. The role of EAS in addressing these challenges and their capacities are discussed in Section 4 and 5 respectively. Existing arrangements for enhancing capacities of EAS providers are reviewed in Section 6. Existing mechanisms for capacity needs assessment are discussed in Section 7. The paper ends with a broad set of recommendations to enhance capacity development of EAS in Bangladesh (Section 8).

2. Extension and advisory services (EAS) in Bangladesh

A large number of EAS providers are working in Bangladesh. These include organisations in the public, private and voluntary sector. New information, knowledge and skills related to agriculture (including livestock and fisheries) are provided by these organizations through farmer trainings, group meetings, demonstrations, farmers' field school, mass media (radio, television, newspaper and magazine), motivational campaigns, exhibitions etc. and also through farm and home visits. Some organizations are also disseminating agricultural information through call centres and also sending messages through ICT tools such as mobile phones. Some organizations are providing access to complete knowledge on specific crops and services to the user by providing different mobile apps both online and offline. In some cases, extension and advisory service providing personnel including farmers visit different research centres, universities and successful farms for gaining agricultural information, knowledge and skills.

Through these initiatives, Bangladesh achieved a lot in the agriculture sector. But still a significant proportion of farmers of Bangladesh remain untouched from these initiatives as they are not getting adequate support and information for addressing the challenges they face in farming. Katalyst (2014) reported that in Bangladesh agencies responsible for agricultural, livestock and fisheries extension services face resource limitations, both in manpower and finances. Sub-district (upazilla) level officers and their field staff are often unable to meet principal information needs of the majority of farmers within their jurisdiction.

Planning Commission (2015) noted that the main extension services provided by Department of Agricultural Extension (DAE), Department of Fisheries (DoF) and Department of Livestock Services (DLS) are mostly dependent on project funds. The major weaknesses of this project dependency are that certain areas seem to attract repeated projects whereas others get none; duplication of efforts, while similar approaches may be tried repeatedly without success; and the content of the extension may depend on the parameters set by the project rather than a consideration of local need. Interestingly, many important innovations which took place during project period, could not sustain when the project ended.

To address these shortcomings, the Seventh Five Year Plan suggested creation of a database of completed project records, to help identify future project directions. The report also noted that to improve the relevance of extension, it may be considered to revive the previous Upazila Agriculture Extension Coordination Committee and District Committees etc. These were quite effective with bottom-up planning approach with the participation of research and other extension departments, with support from funds allocated at district level. Details of different extension providers are given in Annexure 1.

2.1 Public sector extension providers

Department of Agricultural Extension (DAE) under the Ministry of Agriculture is the largest extension organization of Bangladesh. DAE carries out crop sector extension services around the country employing a large number of professionals. Its main responsibilities are as follows:

- Motivate and help farmers for adopting improved production practices to increase their productivity, meet national consumption requirements, maximize export and minimize import
- Provide farmers with the latest results of

research and farm techniques for their socio-economic betterment

- Develop self-reliance and cooperation by training local leaders for organized group action
- Provide channels for service and information from the MOA and its different departments to the farm people and in turn relay the problems and needs of the farmers that require national level intervention
- Provide an effective linkage between the various research institutes and the farmers so that along with the flow of technology to the farmers, the farmers level problems are also brought to the relevant research institutes for investigation and solution
- Serve as liaison agency between farmers and other organizations, both public and private concern with over-all socio economic development of rural people, including the credit giving and input supply agencies

Bangladesh framed its first agricultural policy in 1996 (New Agricultural Extension Policy of Bangladesh) and this was revised in 2012 (Box 1).

Box 1. National Agricultural Extension Policy (NAEP, 2012)

The goal of the revised policy (National Agricultural Extension Policy (NAEP)) is to “encourage the various partners and agencies within the National Agricultural Extension System (NAES) to provide efficient and effective coordinated services which complement and reinforce each other, in an effort to increase the efficiency and productivity of agriculture in Bangladesh for ensuring food security and business development” (NAEP, 2012). The NAEP is built on nine (9) key principles:

- Increased production (horizontal and vertical) and productivity as a whole
- Cost-effective decentralized demand responsive extension services
- Targeted and mobilized farmers group (FG) and their federations (FO)
- Bottom-up planning and implementation
- Coordinated and integrated extension services through NAES
- Development of agri-business and contract farming for export promotion
- Adoption to climate change and development of specialized extension service for climatically distressed areas
- Broad-based extension support (in-time input support and subsidies, credit, price enhancement etc.)
- Digitalized agricultural extension services (e-agriculture)

In realizing the above mentioned responsibilities, apart from its own funds, DAE is taking support from different donors, especially, FAO, DANIDA and World Bank to develop and diffuse new technologies among farmers. Much of this external support was used to

1. promote Integrated Pest Management (IPM), Integrated Crop Management (ICM), Integrated Farm Management (IFM) through Farmers’ Field Schools (FFS),
2. promote crop diversification cultivation of high value crops, and
3. strengthening and streamlining the decentralized, demand-led and knowledge-based extension through one-stop-service centre at farmers’ level.

Similar public extension organizations like Department of Livestock Services (DLS) and Department of Fisheries (DOF) are responsible for extension services in livestock and fisheries sector respectively. However, DoF and DLS have staff operating

only up to upazila level. (Only the DAE has a network right up to village level).
Under the Ministry of Agriculture, there is another organisation called as Agricultural Information Service (AIS) that is meant to create awareness among the rural people through mass media for practicing modern agricultural technologies to attain food security. Other public organizations like Bangladesh Agricultural Development Corporation (BADC), Bangladesh Fisheries Development Corporation (BFDC), Cotton Development Board (CDB), Soil Resources Development Institute (SRDI), National Productivity Organization (NPO), Bangladesh Sugar and Food Industries Corporation (BSFIC), Department of Agricultural Marketing (DAM), Bangladesh Rural Development Board (BRDB), Palli Karmo Shahayak Foundation (PKSF), Palli Daridra Bimochon Foundation (PDBF), Small Farmers Development Foundation (SFDF), Department of Youth Development (DYD), etc. also providing extension and advisory services in Bangladesh (See Annexure 1 for more details).

2.2 Extension by Research Agencies

Agricultural research organizations in Bangladesh is supporting promotion of technologies developed by the researchers though several means. For instance, BARI organizes “Field-days” at regional stations and sub-stations in which farmers and extension workers participate. Moreover, the Institute has established 26 Technology Villages under different agro-ecological regions of the country in order to transfer BARI developed technologies by establishing greater bondage between scientists and farmers. In addition, the On-Farm Research Division of BARI has been producing different kinds of publications, such as manuals, monographs, leaflets, booklets, pamphlets, reports, newsletter, and journal. Scientists of this institute most frequently take part in promotional, motivational and problem oriented discussion on agriculture in radio and television. BARI also disseminates information through its web site (www.bari.gov.bd).

2.3 Extension by Agricultural Universities

Bangladesh Agricultural University Extension Centre (BAUEC) operates agricultural extension and village development activities in 22 villages of Mymensingh district through 45 cooperatives. Vegetable cultivation schemes are running in 40 primary schools, high schools, madrasas and orphanages under Mymensingh Sadar, Trishal, Gouripur and Phulpur upazilla. Over 8,000 farmers have attended the programs of BAUEC since its inception in 1984 till date.

2.4 Extension through NGOs

NGOs (both national and international) are playing a very important role in supporting farmers with new technology. Rashid and Qijie (2016) reported that in Bangladesh, several thousands of NGOs are working in different sectors. According to the report, until January 2014, there are 2333 NGOs working in Bangladesh (Hamilton, 2015).

However, it is very difficult to say how many NGOs are working in the field of agricultural extension, as some of the NGOs are highly localized and Upazila based (Mujibnagar Portal, 2016). According to Haque (2010), about 400 NGOs are directly involved in agricultural activities. So far, for their capacity, coverage, and program diversity, NGOs are clearly of considerable importance to any knowledge dissemination in Bangladesh. Initially, NGOs concentrated on working with poor, landless and marginal farmers, and hence provide support to small scale vegetable production, livestock rearing, fisheries, agroforestry, social forestry, etc. However, in recent years, focus of NGOs has changed remarkably; large NGOs (e.g. BRAC) are involved with business and extension support in hybrid rice, maize and other major crops.

Many of the NGOs are involved in organising poor farmers into groups and provide a much broader range of services beyond technology dissemination. Prominent among these include, Bangladesh Rural Advancement Committee (BRAC), Proshika, Rangpur Dinajpur Rural Service (RDRS), Association for Social Advancement (ASA), Cooperative for American Relief Everywhere (CARE), Caritas, Helvetas, iDE etc.

BRAC's agriculture programme aims to contribute in achieving food security and reduction of hunger and malnutrition through increased environmentally-sustainable and economically-profitable agricultural production. Applied and adaptive research is conducted to develop better crop varieties and improved production technologies for higher agricultural productivity (Box 2).
Since its inception as a Bangladesh non-government development organization in 1976, Proshika's aim is to create a self-reliant development process among the rural poor by extending support for getting themselves organized, becoming critically conscious of their situation and making united and collective efforts to improve their socioeconomic condition. The promotional organization of the rural poor is recognized as the core activity of Proshika. The activity extends from the formation of primary groups (with an average membership of 20) to the creation of groups' broader organizational structures at the village, union and thana levels.

Box 2. BRAC

BRAC is the largest non-governmental development organization in the world, measured by the number of employees and the number of people it has helped.
Agriculture and Food Security Programme (AFSP) of BRAC is trying to bring available and newly developed agricultural technologies to the farmers' fields. Its approach is to disseminate agricultural technologies through large-scale block demonstration involving farmers' participation. Its technology dissemination strategy is to convert single-crop areas into double to triple-cropped areas, introducing stress-tolerant crops and fish varieties to the cropping systems, and accommodating high-value non-rice crops in the rice-based cropping systems using shorter maturing rice varieties. BRAC organizes groups of 40-50 marginal farmers and provide them with partial grants to cultivate and use modern varieties of crops and fish along with new production technologies and practices. Extension staffs of BRAC provide them with adequate training and up-to-date information on achieving better production.

Agricultural extension services are provided through its trained extension personnel, comprising a diverse group of agronomists, technical assistants and aquaculture experts. BRAC also take advice and expertise from government-owned research and extension institutions to achieve its objectives of technology extension to the farmers' fields. Its approach is comprehensive – with financial services, capacity building and livelihood development as well as health, education and social justice – enabling people to realize their potential.

Proshika extends credit and technical assistance to the groups to take up income and employment generating projects in various fields such as agriculture, irrigation, pond fishery and open water fishing, sericulture, bee keeping, cattle and poultry rearing, homestead gardening, social forestry, handicrafts and cottage industry, etc. Other programmes that Proshika has initiated include popular theatre; participatory research; development support communication through video medium;

health and nutrition education; literacy and women's programmes. To date Proshika has organized 29,726 groups of which 15,370 are women's groups. It currently employs 1,677 staff and 1,133 of them are based at the grassroots level. It operates in 67 project locations called Area Development Centres (ADCs); work is now spread over 4,102 villages of 451 unions under 91 thanas in 32 Districts.

2.5 Extension by the private sector

Organizations, institutions, and individuals offering goods and services to the farmers include individual traders, and stockist of seeds and agro-chemicals, trading companies, seed and agrochemical suppliers, transporters, agro-equipments suppliers, pest control groups, and consultants. In the past, private sector companies were largely involved with importing, distributing and selling agricultural inputs. But in recent years, some companies involved in research, especially in the development of hybrid seeds and high yielding seed varieties. Indeed, the involvement of agribusiness organizations in technology development and dissemination is largely centred to high-potential investment and cash crops/ enterprises. Their extension services usually tied with product sale and hence called "embedded" service (Rashid and Qijie, 2016).

2.6 Farmer to Farmer Extension

Along with the above organizations, farmers themselves act as the extension agents for their neighbouring farmers. Two models of information dissemination by farmers to farmers are presented in Figure 1 and 2 as suggested by Alam (2007).

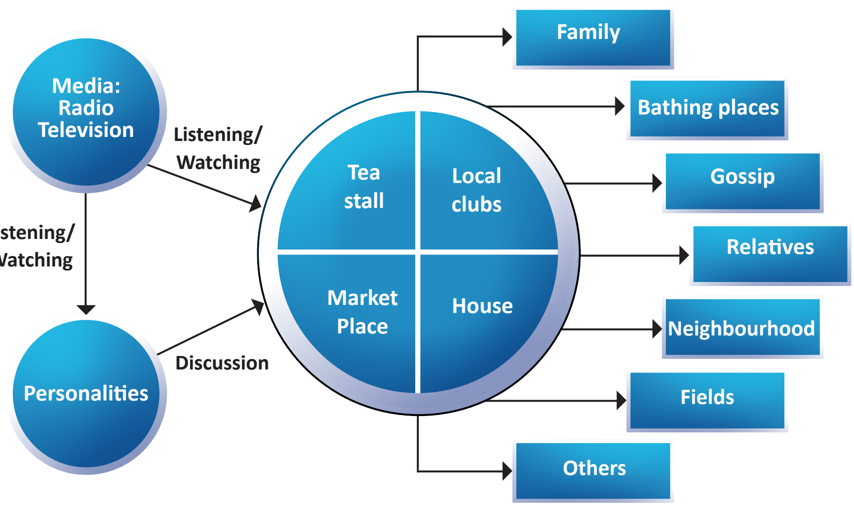

Figure 1. Information Dissemination by Farmers- Model 1

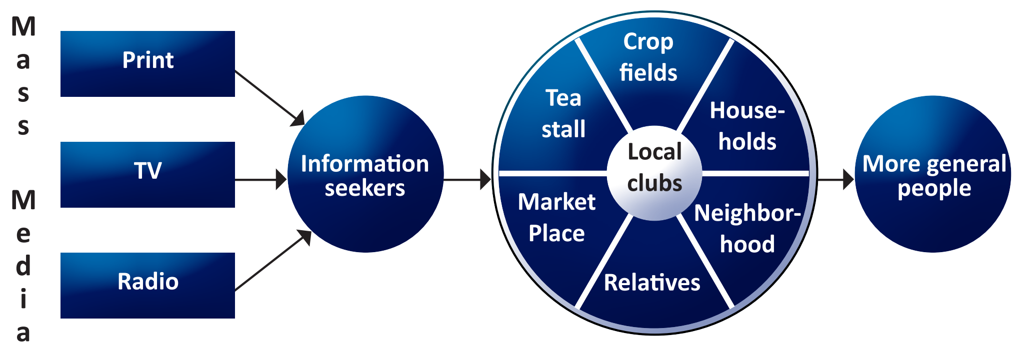

Figure 2. Information Dissemination by Farmers -Model 2

3. Emerging challenges in Bangladesh agriculture

Agricultural growth is a precondition for economic development in Bangladesh. Accelerated and more inclusive growth in the agricultural sector requires significant change and progress in different areas like:

- Increase in productivity at the farm level
- Improved farmer-market linkages, both downward (to sell agricultural produce) and upward (to access agro-inputs)
- Efficiency gains in value chains (eg. post-harvest technologies, logistic, marketing processes and coordination among value-chain actors)
- Effective value chains (i.e. sourcing products effectively in terms of prices, quality, and accessibility to different consumer segments)
- Empowerment and improved access to knowledge and information for producers and small and medium size agricultural entrepreneurs (leading to better income and risk distributions, in particular along value chains).

As discussed earlier, the major challenges for Bangladesh agriculture are to: raise productivity and profitability, increase diversification of production in line with consumption diversification to promote nutrition and minimize trade imbalances, reduce instability of production, increase resource use efficiency, reduce loss of arable land, minimize yield gap, maintain food safety and quality, expand irrigation and farm mechanization and develop resilience to climate change impacts (Planning Commission, 2015). Post-harvest infrastructure is generally poor particularly for perishable high value products. Another challenge is to sustain and further develop the capacity of agriculture to effectively respond to market signals – to ensure that what is grown can be sold at remunerative prices, both to maximize rural income generating opportunities and optimize the use of limited natural resources.

Crop agriculture is mainly operated yet at subsistence level, which needs to be commercialized with high value crops such as aromatic rice, vegetables and fruit production and processing. Good agricultural practices need to be employed for production and post-harvest management. Sustaining agricultural production and developing resilience to climate change will continue to be a key issue.

4. Role of EAS in addressing agricultural challenges

Bangladesh agriculture is still largely dependent on nature particularly weather, hence is full of uncertainties and vulnerabilities. Flood, drought, water logging, salinity intrusion, tidal surge, uncertain rainfall, land degradation, extreme temperatures are common events of vulnerabilities. The small and marginal farmers need to be supported in producing diversified crop suitable for both markets and household consumption to improve their nutritional status. They also need to be supported in selling their products at remunerative prices by developing linkages with domestic and international markets.

Farmers need better access to credit, insurance schemes and other agricultural services such as extension, information and local market infrastructures and services. Considering the important role women play in Bangladesh agriculture, women will require access to information, credit and other business development services in order to capitalize on the new market opportunities along changing or emerging value chains.

Farmers do need an up-to-date extension advice on farming and marketing aspects. They need regular training on production and post-harvest technologies, marketing and value addition processes. Access to weather advisory is a must to deal with the uncertainties resulting from climate change. They also need support for organising themselves into groups and organisations so that they can help themselves and can evolve as an effective lobby for influencing policies and programmes in agriculture.

At present farmers in Bangladesh use a diversity of information sources originated mainly from public, private and NGO sectors. However, the extension service providers have not been able to satisfactorily address the information and knowledge needs of the small and marginal farmers. In addition, farmers are often exploited by input dealers and manufacturers who sell spurious seeds and adulterated fertilizers and pesticides. The extension professionals need more and more practical, need-based training to address the emerging challenges faced by farmers in Bangladesh (Kashem, 2014).

Rashid and Qijie (2016) observed that "farmers' access to formal sources like public and NGO service is still very limited, especially for women and small farmers. Government extension service has countrywide coverage and a sized skilled workforce to provide extension service to all categories of farmers. Lamentably their service provision seems to be more concentrated on large farmers rather than small farmers. NGOs can be credited for creating space for small and women farmer, but their institutional capacity for handling sophisticated extension service is very limited. Nonetheless, their coverage of extension service is limited based on location and number of clients. Private extension service is suffering severely from skilled manpower shortage and often criticized for high concentration in maximizing profit. Although, their service suffers from low efficiency, their service is effective and sustainable in terms of financial capacity".

5. Assessment of existing capacities of extension and advisory service providers

The organizations providing extension and advisory services to the farmers of Bangladesh include public organizations, non-government organizations (NGOs) and private organizations. Together, all these partners comprise the National Agricultural Extension System (NAES). Each organization has its own operational strategies for providing extension and advisory services to farmers.

The Worldwide Extension Study (2011) in Bangladesh revealed that at the national level, public extension was managed by 326 senior staff with a bachelor degree or more and 99% were male. There were 126 Subject Matter Specialists, almost half of which have graduate degrees and 95% of which were male, and they provided backstopping support to the field staff (IFPRI/FAO/IICA, 2011). The field level extension workers constituted the bulk of staff (13,323), with 89% of them holding 2 to 3 year Agricultural Diploma, and only 7% were female. In Information, Communication & Technology (ICT) support services, 130 professionals are involved (Table 2).

As the largest Extension organization, DAE has expert human resources for extension and advisory services for the farmers all over Bangladesh. It has manpower even at the village level. Sub-Assistant Agriculture Officers (SAAOs) are working at the Block level and they are the front level workers of DAE. One SAAO has to supervise 900-2000 farm families. There is a necessity to increase the number of SAAOs to proper supervision of the farming activities of the farmers. In livestock sector, DLS is responsible for livestock extension in Bangladesh. But DLS has Upazilla (Sub-district) level officers including Veterinary Surgeon and has no union or village level worker. Again, in the fisheries sector, DOF is responsible for fisheries extension in Bangladesh. But DOF has Upazilla (Sub-district) level officers without any union or village level worker.

Table 2. Human Resources in the Public Extension Service in Bangladesh (Ministry of Agriculture & Governmental or Ministry-based Extension Organizations)

Major Categories of Extension Staff	**Number of Human Resources**								
	2-3 yr. Ag. Diploma		**B.Sc. degree**		**M.Sc. Agr. Degree**		**Ph.D. degree**		**Total**
	Female	Male	Female	Male	Female	Male	Female	Male	
Senior Management Staff			2	196	1	100		27	326
Subject Matter Specialists (SMS)			6	60		50		10	126
Field Level Extension Staff	800	11,024	102	895	30	447	2	23	13,323
Information, Communications & Technology (ICT) Support Staff			15	20	1	90	1	3	130
Total Extension Staff:	**800**	**11,024**	**125**	**1,171**	**32**	**687**	**3**	**63**	**13,905**

Source: IFPRI/FAO/IICA Worldwide Extension Study, 2011

Most of the first class officers of DAE has at least Bachelor degree in Agriculture, Officers of DLS has at least Bachelor degree in Animal Science or Veterinary Medicine and Officers of DOF has at least Bachelor degree in Fisheries. Some of them have MS and PhD degree. Professionals having similar qualifications are appointed in other extension and advisory service proving organizations of Bangladesh. Private extension providing organizations and Non-governments also appoint similar qualified personnel in their organizations. But in some cases, the personnel of different public, private organizations and NGOs have limited training for performing better in their job. It appears that Bangladesh needs more number of better qualified extension and advisory service personnel. Necessary steps should be taken by the respective organizations to upgrade the capacity of their manpower by arranging training, workshop, seminar, symposium, idea sharing campaign, etc. EAS also need higher allocation of resources to increase the capacity of extension and advisory service providers.

Box 3. New approaches in public extension delivery

From late eighties to present time, participatory learning approaches like Farmers' Field Schools (FFS) on Integrated Pest Management (IPM) was introduced through FAO-UNDP-DAE support. It is still being continued through DAE-DANIDA intervention on Integrated Crop Management (ICM) and Integrated Farm Management (IFM) in most part of the countries. With World Bank (WB) support, participatory learning approach on crop diversification including high value crops and business intervention was also carried out. The National Agricultural Technology Project (NATP) is being implemented by the Government with the financial support of the WB and the International Fund for Agricultural Development (IFAD). The aim of the project is to improve the effectiveness of the national agricultural technology system by strengthening the National Agricultural Research System (NARS) and National Agricultural Extension Systems (NAES) in Bangladesh.

The main activities of all these interventions are as follows:

- Development of Farmer Trainers (FTs) / Farmer Facilitators (FFs) and improving farmers' knowledge and skills through hands on field training and participatory action research with the assistance of farmer facilitators
- Formation of farmers' organizations at different levels
- Improvement of the market linkage of producers through formation and mobilization of producer organization
- Institutionalization of farmers' information and advice centres
- Capacity development of personnel of DAE and other organizations related to the implementation of support for the development of farmers' organizations (DPP, 2013 and APR, 2015).

The installation of one-stop-service centre based on the agricultural ICT is also highlighted in recent digitalization efforts of the govt.

DAE, DLS and DOF are working for extension and advisory services in crop, livestock and fisheries service respectively. However, there is lack of coordination among the activities of these sectors. Same farmers are involving in the activities of crop, livestock and fisheries sectors. Therefore, they need a holistic approach. To address this issue, the Local Government Engineering Department (LGED has taken an initiative in the name of "*Ekti Bari Ekti Khamar* (One home one Farm)" for providing holistic support to the farmers. However, there is a need for establishing a strong coordination mechanism among the agricultural sub-sectors including GOs, NGOs and Private Extension Providers.

The Bangladesh Agricultural Extension Network (BAEN) and the Agricultural Extension in South Asia (AESA) Network organised a workshop on Capacity Needs Assessment of EAS providers in Bangladesh during February 2016. The workshop has identified three most importance capacity gaps at the individual (field, middle and senior management levels; and organisational level) and organisational levels (BAEN & AESA, 20160. These are listed in Box 4.

Box 4. Areas for Capacity Development of EAS providers

Individual Field Level
1. Using ICT skills effectively
2. Undertaking need based training for farmers
3. Developing Farmers' organizations

Individual Middle Level
1. Applicability of ICT skills
2. Leadership skills
3. Networking and partnership development

Individual Senior Level
1. Strategic development and decision making
2. Leadership, organizational development, mentoring
3. Policy development and policy advocacy

Organizational level
1. Resource mobilization
2. Knowledge management (Infrastructure, ICT tools and networking)
3. Result based management (SMART project management, Monitoring & Evaluation System)

6. Existing mechanisms for enhancing capacities among extension and advisory service providers

Several educational institutions are offering graduate and post graduate courses in agricultural disciplines in Bangladesh (Box 5).

Though several of these organisations offer courses in agricultural sciences, their curricula are not reviewed at regular intervals. Recently, Higher Education Quality Enhance Project (HEQEP) of University Grants Commission of Bangladesh (UGCB) started an initiative to update the curricula of the universities of Bangladesh. A Quality Assurance Cell in the universities was established with the financial help from World Bank. The academic programs of universities are overloaded with course credits. At the time of reviewing the curricula, the faculties of Departments usually try to include more credit from their departments. Internship is still absent in undergraduate agricultural courses of Bangladesh.

Box 5. Educational Institutes of Bangladesh having agricultural disciplines

A. Public Universities

- Bangladesh Agricultural University, Mymensingh
- Sher-e-Bangla Agricultural University, Dhaka
- Bangabandhu Sheikh Mujibur Rahman Agricultural University, Gazipur
- Sylhet Agricultural University, Sylhet
- Hazi Mohammad Danesh Science & Technology University, Dinajpur
- Patuakhali Science & Technology University, Patuakhali
- Chittagong Veterinary and Animal Sciences University, Chittagong
- Faculty of Agriculture, Rajshahi University, Rajshahi
- School of Agro-technology and School of Fisheries, Khulna University, Khulna
- Department of Agriculture, Bangabandhu Sheikh Mujibur Rahman Science & Technology University, Gopalganj

B. Private universities/ Colleges

- International University of Business Agriculture and Technology (IUBAT), Dhaka
- Exim Bank Agricultural University, Chapainawabganj
- Fazilatun Nessa Sheikh Mujib Fisheries College, Jamalpur

Extension personnel of crop, livestock and fisheries have at least B.Sc. Ag. (Hons.), B.Sc. AH (Hons.)/Doctor of Veterinary Medicine and B.Sc. Fisheries degree respectively. Some supplementary personnel have B.Sc. Ag. Engineering, B.Sc. Ag.Economics or BBA (Agri. Business) Degree. These bachelor degrees are treated as the pre-requisite degree for the job in extension and advisory services. At least one course of Agricultural Extension is mandatory for the above mentioned degree. Some obtained higher degree like MS and PhD degree for developing their career.

On the other hand, for the frontline of grassroots level workers of crop, livestock and fisheries sector, Agricultural Diploma from Agricultural Training Institute (ATI), Livestock Diploma from Livestock Training Institute (LTI) / Veterinary Diploma from Veterinary Training Institute (VTI) and Fisheries Diploma from Fisheries Training Institute (FTI) is necessary respectively. These 4-year Diploma degrees are offered after passing Secondary School Certificate (SSC). Agricultural Extension is taught in these diploma degrees also. Agricultural Training Institutes (ATIs) are under the administrative support from DAE and academic control of Technical Education Board. Technical Education Board hasn't been updating the curricula of these diploma courses. Recently, internship is included in the 8th semester of the Diploma course of ATI. Students of ATIs are getting internship facility at the grassroots level of DAE.

"Several training institutions teach and train personnel who serve agriculture sector. These institutions are Central Extension Resources Development Institute (CERDI) transforming to the National Agriculture Training Academy (NATA) in Joydebpur, Graduate Training Institute (GTI) attached to Bangladesh Agricultural University (BAU) in Mymensingh and 16 Agricultural Training Institutes (ATIs) located throughout the country; although the training facilities vary considerably among the institutes, they are generally inadequate and need support for overall improvement" (Planning Commission, 2015).

Facilities for in-service training of extension staff are also available at the Rural Development Academy (RDA), Bangladesh Academy for Rural Development (BARD), Sheikh Hasina National Youth Centre (SHNYC) and training centres of different organizations. Many of these organisations provide training on both the technical and functional aspects for staff at different levels (see Annexure 2). PKSF has developed and regular updated training modules on various interventions of poverty reduction and employment creation for POs' staff along with Executive Committee members.

Apart from these, divisions of agricultural research organisations also organise training on the new production technologies (Annexure 3). However, feedback from the trainees is seldom taken for improving the training courses.

BRAC strongly believes that training is a key element of the development approach which focuses on human capacity and their participation. For that very reason, BRAC Training Program commenced since 1973 which was subsequently renamed as BRAC Training Division (BTD) in 1993. Over time, BTD feels the need for further change in its nomenclature and has been appeared as BRAC Learning Division (BLD) since 2011. The strong view of this virtual paradigm shift is its existing learning principles, activities and practices which are perfectly in line with a learning division. This way, BLD emerged and is responsible for augmenting the capacity and professionalism of BRAC staff and program participants through a wide range of training and learning, and also contributing to other organizations as GOs and NGOs over the country and abroad who are working in development arena.

Training plays a crucial role in the Proshika process and through this activity development education is imparted to the people to raise the level of their awareness, confidence, capacity and skills. Two categories of training are organized: human development and practical skills. The subject areas of human development training courses include social analysis, development concepts and approaches, analysis of development constraints, techniques of building organization, communication, development management, leadership and participatory planning. Practical skills training courses provide the skills that are required for making efficient use of the resources and for effective implementation of economic projects.

7. Mechanisms for capacity needs assessment

Before discussion about the mechanism for capacity needs assessment, it is necessary to discuss about capacity development. Capacity development and its process are mentioned in Box 6 according to UNDP (2008).

In Bangladesh, it appears that a systematic approach to identify capacity needs of extension staff is not followed by those organisations engaged in capacity development. The Bangladeshi organizations engaged in training do not try to identify the capacity needs of those organizations or their staffs. They seldom try to identify the training needs of their staff. Identifying topics for trainings seldom occurred in systematic ways. In most of the cases, personnel of administrative level select the training titles and the contents of trainings. However, Halim and Ali (undated) suggested the ways for training needs assessment for Bangladesh (Annexure 4).

Ali (2011) conducted the Bangladesh part of the project "Scientific Capacity Development of the Trainers and Policy Makers for Climate Change Adaptation Planning in Asia and the Pacific" and organised training needs assessment of officials involved in climate adaption in Bangladesh during 2011 (Annexure 5: Experience from CAPaBLE Program). Ali et. al. (2013) further conducted the project entitled "Training Modules for Climate Change Adaptation in Agriculture: Sub-District and District Level

Box 6. Capacity development and its process according to UNDP

United Nations Development Programme (UNDP) defines capacity development as the process through which individuals, organizations and societies obtain, strengthen and maintain the capabilities to set and achieve their own development objectives over time. Capacity development is not a one-off intervention but an iterative process of design-application-learning-adjustment. UNDP (2008) captures this in a five-step process cycle. These steps broadly coincide with the steps of a planning or programming cycle. Approaching capacity development through this process lens makes for a rigorous and systematic way of supporting it, without using a blueprint, and improves the consistency, coherence and impact of UNDP's efforts. It also helps promote a common frame of reference for a programmatic response to capacity development.

The five steps of the UNDP capacity development process are as follows:

1. Engage stakeholders on capacity development
2. Assess capacity assets and needs
3. Formulate a capacity development response
4. Implement a capacity development response
5. Evaluate capacity development

To support the capacity development process effectively requires identifying what key capacities already exist and what additional capacities may be needed to reach objectives. This is the purpose of a capacity assessment. A capacity assessment is an analysis of desired capacities against existing capacities which generates an understanding of capacity assets and needs that can serve as input for formulating a capacity development response that addresses those capacities that could be strengthened and optimizes existing capacities that are already strong and well founded. It can also set the baseline for continuous monitoring and evaluation of progress against relevant indicators and help create a solid foundation for long-term planning, implementation and sustainable results. Capacity assessments can be conducted at different points of a planning or programming cycle.

Agriculture Officers of Bangladesh". Though the project developed training modules, pilot tested and adapted these for wider use, the experiences and outputs of this project are yet to be used in the country mainly due to fund constraints

Getting experience from the above discussion, the following activities can be done for Capacity Need Assessment (CNA):

- Assess
  - Terms of Reference (TOR) or job description of each personnel
  - Available facilities and resources in each organisation
- Conduct survey among the employees to assess their knowledge, skill and environmental areas
- Review capacity development programs
- Identify the ideal knowledge and skill area for extension and advisory services
- Prepare ideal knowledge and skill profile for carrying out satisfactory performance by various target government functionaries
- Map specific organizational practices and analyze in relation with the organizational objectives
- Investigate in-built job description and routine works
- Evaluate performance management system
- Analyze clientele system
- Assess induction, coaching and mentoring system
- Review training modules being implemented by various government and non-government agencies

8. Conclusions and ways forward

Though Bangladesh has several EAS providers, their capacities need to be considerably enhanced so that they could support farmers in dealing with the emerging challenges. Ideally capacity strengthening initiatives should build on the results of a systematic capacity needs assessment (CNA). While the country has several agencies involved in capacity development, lack of systematic CNA exercises has constrained the effectiveness of capacity development initiatives. Apart from these, efforts are also required at several levels as follows.

- Review the curricula of pre-service education, induction and in-service training of EAS providers in consultation with current and potential employers who recruit personnel for EAS functions. Training modules should be prepared and regularly updated by relevant experts. The universities should keep regular contact with the extension and research organizations for coordination among education, research and extension organizations.
- Create a directory of EAS personnel in the country and organise a separate programme or mission (with specific funding) for organising capacity development of EAS providers through all organisations (public, private, NGO, POs) involved in capacity development.
- EAS providers do need enhanced capacities on both the technical and functional skills. Season long trainings need to be mandatorily arranged for the root-level extension workers and newly recruited personnel on production, post-harvest and marketing aspects. Apart from the EAS personnel, many actors in the value chain also need training on post-harvest handling, value addition and marketing.
- Regular training on the post-harvest technologies, marketing processes and coordination among value-chain actors should be devised. Apart from these, EAS providers need functional capacities such as mobilisation, facilitation, negotiation, networking, partnership building etc.
- Apart from organising formal training programme in training centres, EAS personnel should be encouraged to attend workshop, seminar, symposia, brainstorming sessions etc to acquire new ideas, perspectives and knowledge. EAS personnel also need coaching and mentoring support and there should be a provision for providing this support.
- People at all levels need new capacities and so organisations involved in EAS provision should develop a HRD plan for their organisation (based on CNA). Extension agents with high level of formal technical education and adequate social science background should be appointed at the middle and senior management levels
- Evaluation of training should be done properly and feedback of the training should be taken regularly for making continuous improvement in training content and methodology. Design, topic selection and evaluation of training programs should be done by conducting the following steps:
  - Curriculum development workshop
  - Selection of priority areas
  - Problems identification and prioritization
  - Designing problem solving instruments
  - Preparing training schedule
  - Setting indicators for pre and post training evaluation

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10. Annexures

Annexure 1. Main functions, strength and weakness of extension service providers of Bangladesh

Organizations	Main Functions	Strength	Weaknesses
Public Extension Providers			
Department of Agricultural Extension (DAE) under Ministry of Agriculture (MOA)	Carrying out extension services for eco-friendly, safe, climate resilient, sustainable productive good agricultural practices; and ensuring food security and commercial agriculture for socio-economic development of Bangladesh	Having 496 upazilla offices with above 12000 grassroot level workforce for crop sector extension services	One SAAO for supervising 900-2000 farm families
Department of Livestock (DLS) under Ministry of Livestock and Fisheries (MOLF)	Carrying out extension services including treatment, breeding and vaccination for livestock sector all over Bangladesh	Country wide presence of livestock extension services with 496 upazilla level offices	Grassroot level workers cannot reach all farmers
Department of Fisheries(DOF) under Ministry of Livestock and Fisheries (MOLF)	Carrying out fisheries extension services for disseminating improved aquaculture technologies, facilitating alternative income generating activities and sustainable utilization of fisheries resources to ensure food security	Country wide presence of livestock extension services with 496 upazilla level offices	Grassroot level workers cannot supervise all beneficiaries
Agricultural Information Services (AIS) under MOA	Focal point of MOA for transferring agricultural technology through mass media and SMS based information service with the help of a mobile operator 'Banglalink' and UNDP	Training guides, news letters, radio & TV programs, films etc. on agricultural aspects are arranged by AIS for disseminating agricultural information	Only 23 officials at national and 3 regional offices without any field force
Bangladesh Agricultural Development Corporation (BADC) under MOA	Development of Agriculture through supply of inputs and dissemination of technologies among the farmers	Having 6800 workforce including 1700 Officers and 5100 staffs	Lack of workforce and offices at all upazillas

Organizations	Main Functions	Strength	Weaknesses
Bangladesh Fisheries Development Corporation (BFDC) under the Ministry of Fisheries and Livestock	Harvesting fisheries resources; developing marketing facilities; establishing fish harbors, landing and distribution centers, ice plants and processing plants; and supplying safe and quality fish in the domestic market	Having 7 fish landing and wholesale fish market, 15 ice plant, 4 fish processing plant and 12 cold storages	Have only 12 working unit in the country with deficient in workforce
Cotton Development Board (CDB) under MOA	Carrying out extension services including research, seed production, marketing and small scale credit facilities for cotton cultivation in Bangladesh	Moderate number of workforce at 13 Zonal level	Only 179 unit and sub-unit offices in Bangladesh with moderate deficient in workforce
Soil Resource Development Institute (SRDI) under MOA	Appropriate land & soil management for sustainable and environmentally friendly agriculture	Having 6 Regional Offices, 15 Regional Laboratories, 21 District Offices, 2 research centers, 10 Mobile Soil Testing Laboratories (MSTL) for providing on farm soil testing facilities including balanced fertilizer recommendations to the farmers	Have only 21 district offices out of 64 districts of Bangladesh with moderate deficient in workforce
National Productivity Organization (NPO) under the Ministry of Industry (MOI)	Focal point of Asian Productivity Organization (APO)	Applying of productivity increasing strategies in 20 Asian countries including Bangladesh	Only 67 Officials at national level with no field force
Bangladesh Sugar and Food Industries Corporation (BSFIC) under MOI	Carrying out extension activities for Sugar crop cultivation in Sugar- mill areas of Bangladesh and producing sugar	Presence of workforce in Sugar- mill areas of Bangladesh	Absence of workforce in non-sugar- mill areas of Bangladesh
Department of Agricultural Marketing (DAM) under MOA	Contributing on national economy by developing agricultural marketing management from farmers to consumers	Working for improving agricultural commodity supply chain	Having only 26 Officials with absence of necessary workforce in all over Bangladesh

Organizations	Main Functions	Strength	Weaknesses
Bangladesh Rural Development Board (BRDB) under Ministry of Local Government Rural Development & Cooperative (MOLGDR&C)	Organizing farmers into village cooperative groups for providing support facilities aimed at increasing farm productivity and income	Presence of workforce in 496 upazillas of all over Bangladesh with 3 large training centers	Lack of agricultural graduates for extension and advisory service in rural areas
Palli Karma Sahayak Foundation (PKSF)	Enhancing capacity and providing financial and institutional support to partner organizations (PO) for implementing sustainable programs for reduction of poverty through creating productive employment opportunities for the moderate and ultra poor, small and marginal farmers and micro-entrepreneurs	Acts as an apex development organization with 111 partner organizations established by the Government of Bangladesh (GoB) for sustainable poverty reduction through employment generation	Enriched only 150 unions of 143 upazillas of Bangladesh
Palli Daridra Bimochon Foundation (PDBF) under MOLGDR&C	Alleviating poverty and promote the socio-economic development of the poor and the disadvantaged	Presence of activities in 352 upazillas under 52 districts of Bangladesh	Small number of agricultural graduates for extension and advisory service in rural areas
Small Farmers Development Foundation (SFDF) under MOLGDR&C	Helping landless, marginal and small farmer families to enable them for gaining access to resources for their productive self- employment, encourage them in undertaking activities of income generation and poverty alleviation and for the enhancing their quality of life	Working in 120 upazillas of 23 districts of Bangladesh	Small number of agricultural graduates for extension and advisory service in rural areas
Department of Youth Development (DYD) under Ministry of Youths and Sports (MOYS)	Skill Development Training in 74 trades including one long-term (2.5 months) and 12 short term (one month) agricultural training in 54 youth training centres in Bangladesh	Presence of administrative personnel in 486 upazillas under 64 districts of Bangladesh	Trainers are generally hired from other organizations

Extension Activities in Research Organizations			
Organizations	**Main Functions**	**Strength**	**Weaknesses**
Technology Transfer & Monitoring Unit (TTMU) of Bangladesh Agricultural Research Council (BARC) under MOA	Transferring and monitoring technologies among the farmers through different organizations	Mandate to transfer agricultural technology through idea sharing and different organizations	Conduct deskwork at national level only
On Farm Research Division (OFRD) of Bangladesh Agricultural Research Institute (BARI) Under MOA	Transferring technologies among the farmers and conducting adaptive research	Having 9 Farming System Research Division (FSRD) sites and 70 Multi Location Testing (MLT) sites and own online and offline Krishi Projukti Vander (Agricultural Technology Store)	Deficient in nationwide root level coverage for extension activities
Adaptive Research Division (ARD) of Bangladesh Rice Research Institute (BRRI) under MOA	Conducting adaptive research trials at farmers' field to validate rice production technologies in different agro-ecological environments of Bangladesh and obtaining feedback from farmers and extension personnel; disseminating rice-based technologies among the farmers; and Conducting training farmers and extension workers to update their knowledge and skills on modern rice production techniques	Provided training to more than 10,000 extension officers from 9 regional station to enhance their capability to organize and execute short-term training programs on rice technologies at village level extension workers	Deficient in nationwide root level coverage for extension activities
Jute Farming System Division (JFSD) of Bangladesh Jute Research Institute(BJRI) under MOA	Transferring technologies among the farmers and conducting adaptive research	Having technology transferring activities from 6 regional stations and 3 centers	Deficient in nationwide root level coverage for extension activities
Adaptive Research and Extension Division (ARED) of Bangladesh Institute of Nuclear Agriculture(BINA) under MOA	Transferring technologies among the farmers and conducting adaptive research	Twenty one BINA Technology -villages have been developed in the adjacent areas of BINA headquarters and various sub-stations for extension of BINA technologies	Deficient in nationwide root level coverage for extension activities

Organizations	Main Functions	Strength	Weaknesses
Training and Technology Transfer Division (TTTD) and Field Service Division (FSD) of Bangladesh Sugar-crops Research Institute(BSRI)	Transferring technologies among the farmers and conducting adaptive research	Transferring technologies from 2 regional stations and 6 sub¬stations	Deficient in nationwide root level coverage for extension activities
Training, Planning and Technology Testing Division (TPTTD) Bangladesh Livestock Research Institute (BLRI) Under MOLF	Transferring livestock technologies among the farmers and conducting adaptive research	Providing livestock related training to extension workers and farmers	Only 5 scientists in Deficient Training, Planning and Technology Testing Division
Bangladesh Fisheries Research Institute (BFRI) Under MOLF	Transferring BFRI technologies among the farmers by conducting trainings to extension workers and farmers	Organizing regular training to extension workers, farmers and others on improved fish culture management, brood fish and hatchery management for seed production, carp poly culture, culture system for tilapia and cat fishes, farming system research methodologies, backyard shrimp hatchery, fisheries and environment, fish disease diagnosis and health management, fish genetics resources, shrimp culture and management etc.	Deficient in nationwide root level coverage for extension activities

Extension Activities in Educational Institutions			
Organizations	**Main Functions**	**Strength**	**Weaknesses**
Bangladesh Agricultural University Extension Centre (BAUEC)	Operating agricultural extension and village development activities in 22 villages of Mymensingh district through 45 cooperatives; running vegetable cultivation schemes in 40 primary schools, high schools, madrasas and orphanages under Mymensingh district; and participating above 8,000 farmers in BAUEC program from initiation to till date	Have experts on agricultural disciplines including extension experts	Working only in Mymensingh district
Outreach Program of Sher-e-Bangla Agricultural University (SAU)	Transferring technologies innovated by agricultural research institutions and SAU Research System;	Have experts on agricultural disciplines including extension experts	Working only in a small areas of Manikganj district
Extension Activities in International NGOs			
Cooperative for American Relief Everywhere (CARE)	Leading international humanitarian organization fighting global poverty and injustice	Placing women and girls at the centre of work to tackle the root causes of poverty and inequity in Bangladesh; strengthening marginalized, excluded and extremely poor communities in rural and urban areas; reaching millions of beneficiaries; working over 100 partners in government, civil society and the private sector to improve livelihoods and household security, health and hygiene, nutrition and governance, foster small enterprise, reduce disaster and climate risk, and respond in emergencies	Limited number of own extension experts

Organizations	Main Functions	Strength	Weaknesses
CARITAS	Operating Integrated Development, Disaster Management and Human Resource Development	Working in 208 upazilas of Bangladesh in eight regions, but in case of emergencies, it works in any part of the country	Limited number of own extension experts
iDE	Transforming the lives through large-scale market intervention programs Measuring real improvements in income and lifestyle amongst the poorest sections of society	Over 30 years of experience in designing and delivering market based anti-poverty programs; believes that markets can be a powerful force for improving the prosperity of rural communities; and deploying business models, appropriate technologies, and agricultural science to facilitate market systems which work for the poor	Limited number of own extension experts
Helvetas	Initiating in the fields of sustainable land use and natural resource management; improving rural livelihoods through direct support to agriculture, horticulture and animal husbandry; addressing good governance through local government structures, development of value chains and rural markets as well as issues around water like access to drinking water or the reduction of water induced risks (flood, erosion, salinity)	Working in the field of development cooperation, emergency response, promoting fundamental rights of individuals and groups and strengthen governments and other duty bearers in their service provision	Limited number of own extension experts

Extension Activities in National NGOs			
Organizations	**Main Functions**	**Strength**	**Weaknesses**
BRAC	Conducting adaptive research to address emerging challenges in agriculture sector; promoting higher productive, cost-effective and environmentally sustainable agriculture and aquaculture technologies through participatory demonstration and validation; reducing malnutrition through crop diversification and aquaculture intensification; promoting small-scale farm mechanization; and conserving biodiversity	Largest NGO of the world having country wide presence of extension services with root level workforce	Not covered all categories of farmers, high interest rate for credit
Proshika	Raising awareness, confidence, capacity and skills of the people through training	Initiator of ecological agricultural practices in Bangladesh	Poor extension and advisory service at present though there was a glorious history of Proshika activities in the past
RDRS	Working with the rural poor and their organizations in order: to establish and claim their rights as citizens; to build their capacity and confidence to advance their empowerment, and resilience to withstand adversity; and to promote good governance among local institutions and improved access by the marginalized to opportunities, resources and services necessary to fulfil decent lives	Provides development opportunities to the rural poor of 13 northwest districts of Bangladesh	Not covered all over Bangladesh
Grameen Bank	Providing credit to the poorest in Bangladesh without any collateral to fight poverty and overall development of socio-economic conditions of the poor	Reached 8.349 million borrowers in 81,379 villages with 2,565 branches, 97% of whom are women	Not covered all categories of farmers, high interest rate for credit and repayment system don’t consider the income flow

Organizations	Main Functions	Strength	Weaknesses
ASA	Empowering women and developing the capacity of small groups of people to change their fate by themselves and providing microcredit for the underprivileged community	Undertaken development programs like awareness building for social action, training local birth attendants, capacity building of journalists, etc.	Not covered all over Bangladesh
Extension Activities in Private Sector Producer Organizations			
Syngenta, Advanced Chemical Industries (ACI), Lalteer, etc.	Marketing inputs like seed, fertilizers, pesticides, plant growth regulators, farm equipment, etc. for agricultural production	Large number of marketing personnel, sales representatives and local dealers	Lower number of extension workforce and emphasized only agricultural input business without maintaining environmental balance
Extension Activities in Private Sector Producer Organizations			
Bangladesh Institute of ICT in Development (BIID) and Mobile operators	Providing agricultural technology and information through cell phone	Having call centres and rural service centres	Service centres cannot provide all necessary information

Annexure 2: Training courses offered by the Training Institutes of Bangladesh with facilities

Training institutes	Performance and Facilities	Conducted courses
NATA	• Planned to train 5295 staffs in 195 batches during 2015-19 • Manpower -73 • Training class room-04 • Dormitories- 04 • Library-01 • VIP Conference room-01 • Laboratories – 04 • Computer Laboratories -01 • Pest Museum -01 • Cafeteria -01 • Auditorium -01 • Office Building -02 • Farm Machinery Workshop-01 • Farm Godowns -02 • Mosque -01	**For Extension staff - technical** • Computer Fundamentals and Applications • Environmental Change and Sustain-able Development in Agriculture • Food Security • Modern Plant protection Technology and Management • Hybrid Seed Production • Food Processing and Marketing • Post-Harvest Technology of Cereals, Fruits and vegetables • Latest Technology of Cereal Field Crops • Latest Technology of Non Cereal Field Crops • Modern Technology of Horticulture Crops(Flower and Fruits) • Modern Technology of Horticulture Crops(Vegetables and Spices) • Soil Health Management • Irrigation and Water Management • e-Agriculture • Fertilizer Management
	• Trained 600 staff in 10 functional courses and 310 staff in 11 tech-nical courses and large number of beneficiaries during 2015-16 and offered 73 Post Graduate Diploma in 3 batches • Number of Faculty Members-43 • Dormitory -04 (capacity -300+) • Cafeteria-04 (03 air conditioned capacity 400+ and 01 non-ac, capacity 100) • Training room -10 (05 session rooms and 05 air conditioned conference halls having a capacity of 40-50 each) • Conference Room 04 (capacity 250+) • Air conditioned auditorium-01 (capacity - 800+) • Demonstration Farm-01 (Area 29.50 hectares) • Nursery-1(Area 3 hectares)	**For staffs of different organizations – technical** • Production organic fertilizers • Fish culture in rice field • Quality seed production, processing and preservation • Farm level water management **For staff - functional** • Induction Training for Bangladesh Civil Service (BCS) Cadre Officers • Foundation training for BCS Cadre Officers • Training for BCS (Health) Cadre Of-ficers • Skill development for staff • Role of Union Council • Sustainable agricultural development • Planning for poverty reduction • Awareness on green technology of RDA

Training institutes	Performance and Facilities	Conducted courses
RDA	• Computer unit -01 (25 desktop computers with printing facilities) • Audio-Visual Unit-01 (equipped with conference system, overhead projector, microphone, still and video camera, VCR, VCP, P.A. system, cordless P.A. system, cordless P.A system, multimedia projector etc.) • Laboratory School and college-1 • Recreation (football, volleyball, lawn tennis, basketball, squash, badminton, children's park, table tennis, carom, etc.) • Hostel (Double Seated AC Room with Wi-Fi - 18 Rooms & 36 Seats)	**For academic degree** • Post Graduate Diploma in Rural Development (One year duration)
BARD	• Organizes 120 training courses per year on an average • Developed 30 training modules under the broad category of rural development • Number of Faculty Members-44 • Hostel-07 (06 for male and 01 for female, total capacity – 390) • AC classrooms-05 • AC conference halls 04 • IT Lab -01 • WiFi facilities in all hostels and office premises • AC Auditoriums -02 • Library with about 65,000 titles of books • Other (bank, post office, cooperative store, medical centre, sports complex) • Adequate residential quarters for the faculty and other employees. • Two verdant hilltops surrounded by a network of zigzag pacca roads cum walkways in the shade of trees and plants of various kinds. • Area – 62 hectare with green sylvan and eco-friendly campus	**For staffs of different organizations – technical** • Irrigation Management and Land Use Development Planning (2 Weeks) **For staffs of different organizations – functional** • Training of Trainers (TOT) (1 Week) • Advanced Training of Trainers (TOT) (2 Weeks) • Socio-Economic Research Methodology for Rural Development (3 Weeks) • Development Communication (1 Week) • Team Building, Leadership Development and Mind-set Change (1 Week) • Mainstreaming Gender in Development Planning (3 Weeks) • Reproductive Health Rights, HIV and AIDS (1 Week) • Gender and Development (1 Week) • Environmental Impact Assessment of Rural Development Projects (2 Weeks) • Disaster and Environment Management (1 Week) • Entrepreneurship Development (1 Week)

Training institutes	Performance and Facilities	Conducted courses
		• Participatory Rural Development (1 Week) • Rural Finance and Credit Management (1 Week) • Development Project Planning and Management (2 Weeks) • Monitoring and Evaluation of Poverty Focused Rural Development Programme • Project Planning, Implementation, Monitoring and Evaluation (2 Weeks) • Planning with the People for Sustainable Poverty Alleviation (3 Weeks) • Food and Nutrition Programme Planning and Management (1 Week)
GTI	• More than 500 teachers working in BAU are the trainers of GTI • Dormitory-60-bed suitable for running two residential training courses at a time • Two modern PC labs for organizing IT-related training courses • Runs about 50-60 short training courses per year	• Certificate of Post-Graduate diploma in Information and Communication Technology (PGD-in-ICT) - (one-year course with a total 36 credits) • Foundation Training for University Teachers (Newly recruited Lecturers and Assistant Professors of public universities of Bangladesh) • Foundation Training for University Officers • Trainings for officers working in agriculture and rural development to make links between teaching, research and extension • Non-residential training to postgraduate students, officers, employees and teachers of BAU
SHNYC	• A sister organization of Department of Youth Development • Offers training mainly for rural youths, only a few for staffs	**For advisory service staffs of different organizations – functional** • Citizen rights and group development • Prevention from crime & drug and development of ethics and values • Life Skill and Family Life Education • Development of youth leadership and management of youth organizations • Code of conduct and Office management • Training of Trainers (TOT) - on new business creation N.B.: Training for non-officials are not mentioned

Training institutes	Performance and Facilities	Conducted courses
BPATC (Bangladesh Public Adminis-tration Training Center)	• Planned to train 1560 Officials in 21 batches during 2015-16 • Faculty Members -96 • Auditorium-01 (capacity-150) • Conference room 01 (for 50-60 people) • Class rooms-03 (with modern audio-visual facilities, capacity 40-50 each) • Syndicate rooms-02 (equipped with modern facilities, each of which having the capacity of 40-50 persons) • Seminar room-01 (with audio-visual facilities, capacity 60-70) • Fully equipped film-show room-01 • Residential facility – Double seated rooms full furnished and equipped with modern facilities) • Computer laboratory with inter-net connection • Library with 100,000 books, journals, periodicals, etc. • Recreational facilities with in-door and out games	**For Government Officials - functional** • Senior Staff Course (45 days): 5 training/year, 30 participants/course • Advanced Course on Administration • & Development (45 days): 6 training/year, 30 participants/course • Foundation Training Course (180 days): 3 training/year, 350 participants/course • Special Foundation Training Course for 40+ Officials (45 days): 1 training/year, 30 participants/course • Policy Planning and Management Course (12 days): 2 training/year, 20 participants/course
BPATC (Bangaband-hu Poverty Alleviation Training Complex)	• Offers training mainly for rural youths, only a few for staffs • Seven class rooms/training venues (including 1 A/C) with around 250 seat capacity • Integrated pond, nursery pond and mini carp hatchery, horticultural nursery • Accommodation for 142 person (General hostel-100, Officers-30, VIP Guest house-12 with 3 A/C) • Two separate cafeteria for • male and female with 100 seats	**For Officials – functional** • Human resources development • Income generation activities (IGA) management • Training of Trainers (TOT) • Group dynamics, saving and micro-credit management • Good Governance and Institutional-ization • Disaster management • Accounts keeping and financial management • Office management • Gender development • Research, Planning, Monitoring and Evaluation • Participatory Rural Appraisal (PRA) N.B.: Training for non-officials are not mentioned

Training institutes	Performance and Facilities	Conducted courses
BRDTI	• Offers training mainly for rural youths, only a few for staffs • Manpower: 41 including 11faculty members, one librarian, one artist, one administrative officer and 27 other employees • Four Class Rooms (two air conditioned) • Complete Multimedia Facilities • Four Syndicate Rooms • Conference Room (100 persons capacity) • Computer Lab • Library • Three Common Rooms • Faculty Meeting Room • Four hostels(accommodation capacity - 162) • Two storied Cafeteria Building (capacity - 350) • Modern Auditorium (Two storied gallery system with 600 seat capacity)	**For Officials – functional** • Rural Development • Poverty Reduction • Women in Development • Training of Trainers (TOT) • Human Resource Development • Financial Management • Credit Management • Office Management • Cooperative Education and Training • Integration of Environmental Concern in Agriculture and Rural Development • Seminars, Symposium and Workshops on national and international issue • Foundation, Refresher and Short Courses of different functionaries of the • government and non-government organizations N.B.: Training for non-officials are not Mentioned.
NRDTC	• Offers training mainly for rural youths, only a few for staffs • Class room- 02 • Hostel for 48 participants	Training courses as requirements of BRDB and other organizations
PKSF	• Provides training to its officials to enhance their strategic and operational skills with sound understanding of different economic and social issues • Developed 24 modules on various intervention of poverty reduction and employment creation • Offered 54 batches of training during 2013-14 • Training wing supported by a six-member team • Facilities to run 4 training batches (25 participants/ batch) simultaneously • In order to provide more training opportunities, PKSF has selected 30 training institutes throughout the country facilitated by its POs	• Training program for PKSF officials • Training program for Partner Organizations (PO) Officer and Staff • International training for overseas participants • Training program for Non-POs and others • Training Programs for PKSF's Projects people

Training institutes	Performance and Facilities	Conducted courses
	• Talented and efficient resource pool comprises of 40 members, each outsource training centre has a resource pool comprising of 5 to10 members	
HRDC Trust of Proshika	• Different organizations conduct training on payment • Seven conference halls • Large auditorium of 300 capacity separated into three training halls instantly, each of them could accommodate 50 participants in a seminar-type sitting arrangement. The other two conference halls can accommodate 70 participants in a theatre style and 35-40 in a training style. These halls are air-conditioned and well equipped with necessary electronic audio-visual ware. There are two more air-conditioned training halls with the capacity of 25 participants in each. • Accommodation: Double/single ac room with attached bath- 67, Couple bed rooms- 8, Cottages -3 (1 master bed, 2double rooms and 1 big discussion room), Dorms (3 seated) - 26 rooms (non ac) for female participants, Double bed non AC rooms- 6	**Practical Skills Training for Proshika Staff** • Ecological Agriculture and Project Management • Irrigation and Tilling Technology Service and Management • Technology on Livestock Husbandry and Treatment • Apiculture and Project Management • Sericulture and Project Management • Fish Culture and Project Management • Prawn Culture and Management • Aquaculture and Open Water Fisheries Management • Environmental Friendly Rural Housing Technology • Water Supply and Environmental Sanitation Technology • Arsenic Detection in Tubewell Water and Removal System • Social Forestry and Project Management • Homestead Gardening and Project Management • Advance Course on Seed Production Technology • Training on Primary Participatory Video Production • Basic Course on Computer Training **Human development training courses for Proshika staffs:** • Sustainable Development Strategies and Poverty Eradication • Training of Facilitators (TOF) • • Logical Framework Approach (LFA) • Right Based Development Approach (RBA) • Behaviour Change Communication (BCC) • Participatory Monitoring and Evaluation

Training institutes	Performance and Facilities	Conducted courses
		• Project Management Governance and Local Government • Leadership and Team Building • Project Monitoring and Evaluation • Women in Management • Policy Advocacy • Strategic Planning • Participatory Rural Appraisal (PRA) • Gender and Development • Organizational Development Management • People's Theatre • Health and Nutrition Education • Credit, Savings and Financial Management of Development Activities • Teachers' Training on Non-Formal Primary Education N.B.: Training for beneficiaries are not Mentioned.
BLD (BRAC Learning Division)	BLD executes training and learning programmes through 28 residential BLCs (BRAC Learning Centres) having the capacity of approximately 3,000 participants per day in different parts of the country with modern amenities. All the BLCs offer training courses in response to national and international standard. BLD offers the ideal learning centres with: - Trainees' hostel, cafeteria - Adequate number of Air Conditioned Class Room - Computer and Language Lab - Library Facility - Auditorium, Internet Facility - Multi Purpose Hall Room - Multi Media (Audio Visual, Computer, Microphone, Over head Projector) - Big play Ground, Beautiful Garden - Quality Cooking - Full time (24 hours) Security - All Time power Supply - Comfortable Bed Room with attached Bathrooms - Indoor and Outdoor Games	**Agriculture and Rural Livelihood** • Marketing and Sales Promotion-Seeds • Microfinance Management. • Delinquency Management • Effective Marketing for Market Officers • Powerful Tools for Managing Growth and Profitability **Microfinance and Accounts related** • Financial Analysis • Financial Management • Financial Management for Development Organizations • Microfinance Management • Small Enterprise Management Course • Group Dynamics Saving and Credit Management - for Partner NGOs • Small Business Analysis • Operations Management • Accounts Management • Basic Accounts Management • Product Comparison Analysis • Situation Analysis • Best Practice of Progoti Program management • Customer Service for Customer Satisfaction

Training institutes	Performance and Facilities	Conducted courses
		• Savings Product Promotion Mechanism • Training on Microfinance Communication **Business and Enterprises related** **Effective Selling Skills** • Supply Chain Management • Entrepreneur Development and Business Planning **Education related** • Foundation Course for POs • Education Management & Development • Management Workshop • Basic Training for Librarian/Asst. Librarian • ICT Basic Training • ICT Advanced Training • ICT Refreshers • School Action Plan • Pedagogy Management Course • Education Management and Development • Enhancing Managerial Competencies • ICT Teachers Training **Development and Management related** • Leadership Skills Development • Participatory Rural Appraisal • Social Awareness Raising Education • Confidence Building • Community Mobilization for STUP • Operations Management • Enhancing Social Capital • Monitoring and Evaluation • Logical Framework Approach • NGO Management & Leadership Development • Safe Migration and Social Participation • Policy Advocacy: The Rights Based Approach • Social Communication • Communicators –Advocacy • Advocacy, Communication and Social Change • Strategic Planning • Individual and Group Behavior

Training institutes	Performance and Facilities	Conducted courses
		• Development Management • BRAC Approach to Comprehensive Development • Development Approaches and Strategies • Leadership Education And Development • New Trainer Development Program • Advanced Management • Leadership and NGO Management **Professional skills Development** • BRAC Orientation prior to Joining
		• BRAC Orientation to Newly recruited field staff • Organizational Culture and Values to Newly recruited HO staff • Effective Meeting Conduction • Performance Assessment System • Human Communication Skills Development • Training of Trainers • Management Skills Development • Communication and Presentation Skills Development • Project Planning and Management • Basic Computer, Internet & E-mail Usage • Report Writing • Training Needs Assessment • Curriculum Designing • Case Writing • Managing High Performing Team • Project Proposal Writing • Creative Thinking • Essential Habits of Managers • Management Skills • Social and Emotional Learning
ATI	In an average 2200 students obtain Agricultural Diploma degree per year from 15 ATIs under the administration of DAE and the academic affiliation with National Technical Board. There are some Non-Government ATIs in Bangladesh.	Agricultural Diploma course - requirement for appointing root-level workers of agricultural extension (crop sector)

Training institutes	Performance and Facilities	Conducted courses
LTI	In an average 100 Trainees obtain Livestock diploma degree per year from one LTI under the administration of DLS and the academic affiliation with National Technical Board	Livestock Diploma course - requirement for appointing root-level workers of Animal Husbandry extension
VTI	In an average 275Trainees obtain Veterinary Diploma degree from two VTI under the administration of DLS and the academic affiliation with National Technical Board	Veterinary Diploma - requirement for appointing root-level workers for the treatment of livestock
FTI	In an average 125Trainees obtain Fisheries Diploma degree from FTI under the administration of DOF and the academic affiliation with National Technical Board	Fisheries Diploma course - requirement for appointing root-level workers of fisheries extension

Annexure 3. Extension and Advisory Services of different Divisions of Research Organizations

Divisions of Organizations	Extension activities
Technology Transfer & Monitoring Unit (TTMU) of BARC	In 2014-15, TTMU has organized one workshop, five trainings and two meetings. Four Training of Trainer (TOT) were conducted at out-side and only one was at BARC, Dhaka. Around 120 field level Officers and 120 Agricultural Officers (SAAO) were trained for mango and Potato crops. Around 250 participants including DAE officers (around 100), researchers, academia, private seed companies, NGO workers and farmers were participated in the 2-day long national workshop. Around 350 innovative technologies of crops, livestock, fisheries and forest was presented by the respective NARS institutes.
On-Farm Research Division (OFRD) of BARI	Train research and extension officers as well as farmers on improved technology of crop production from 9 Farming Systems Research and Development (FSRD) sites and s70 Multi location Testing (MLT) sites across the country
Adaptive Research Division (ARD) of BRRI	In 2014-15, a total of about 500 trainings were conducted by ARD, BRRI across the country. A total of 15000 farmers and 2500 field level extension workers (BS, SAAOs) participated in those trainings.
Jute Farming System Division (JFSD) of BJRI	Train research and extension officers as well as farmers on improved jute technology from 9 regional stations
Training & Technology Transfer Division (TTTD) and On-Farm Division (OFD) of BSRI	Train research and extension officers as well as farmers on improved sugar-crop technology
Adaptive Research and Extension Division (ARED) of BINA	Conducted training for 570 Agricultural Extension Officers and 330 mass media workers on high yielding varieties of crop and modern technologies generated by BINA and 295 BINA staffs on use of ICT
Training, Planning and Technology Testing Division (TPTTD) of BLRI	Organized training for the improvement of 136 staffs (99 male and 37 female) during 2014

Annexure 4: Training Needs Identification as suggested by Halim and Ali

Training need is a condition where there is a gap between “what is” and “what should be” in terms of incumbents’ knowledge, skills, attitudes, and behaviour for a particular situation at one point in time. This gap is called “a problem,” which usually occurs when a difference exists between “desired performance” and “actual performance.” The needs identification process help trainers in making sure that they have matched a training programme to a training problem. For example, agricultural extension officers (AEOs) are giving training to village extension workers (VEWs), but performance of the VEWs is not improving. The reasons may be as follows:

1. The AEOs lack subject-matter knowledge.
2. The AEOs do not conduct training well.
3. The training centre lacks training facilities.
4. The VEWs are organized not to work properly until their demands are satisfied by the government.

The first two problems are related to knowledge and skills and can be solved effectively by a training programme, but the third and fourth problems need government attention to solve. Training needs identification is possible through different analytical procedures. The major procedures used in determining training needs are the following:

Organizational analysis determines where training emphasis should be placed within the organization and is based on the objectives of an organization. Concerning what one should do in analysing an organization, McGhee and Thayer (1961) suggest four steps:

1. Stating the goals and objectives of an organization
2. Analysing the human resources
3. Analysing efficiency indices
4. Analysing the organizational climate

The results of these analyses are then compared with the objectives of the organization. These comparisons point to specific areas in which training is needed.

Individual analysis aims at identifying specific training needs for an individual or group of employees so that training can be tailored to their needs. This analysis centres on individuals and their specific needs concerning the skills, knowledge, or attitudes they must develop to perform their assigned tasks. The possible methods or techniques for individual analysis include performance appraisal, interviews, questionnaires, tests, analysis of behaviour, informal talks, checklist, counselling, critical incidents, recording, surveys, and observations.

Group analysis includes a number of techniques in which a group of well-informed employees discuss different aspects of the organization, the employees, and the tasks to identify the major discrepancies in achieving predetermined targets for each of them with a view to assessing training needs as distinguished from other necessary changes for removing these discrepancies. The major techniques which are used in this approach are brainstorming, buzzing, card sorts, advisory committee, conferences, problem clinic, role playing, simulation, task forces, workshops, and so forth.

Many problems exist in an organization, but some problems cannot be solved by training. After a preliminary needs analysis, which gives probable causes and solutions, the results should be verified with the concerned personnel of the organization to determine whether training is an appropriate action to solve that problem.

Curriculum Development. This is the most important part in a training programme after a need for training has been identified. The curriculum specifies what will be taught and how it will be taught. It provides the framework and foundation of training. The first phase of curriculum development determines what will be taught, that is, the training content.

Once training needs have been identified and training activities have been decided as part of the solution, a *needs analysis* should be done to determine knowledge, skills, and attitude requirements and performance deficiencies. The needs analysis procedure involves breaking down the “training problem” into its basic parts in different successive phases to identify and understand the important components in each phase. Ultimately it leads to identifying and understanding the training content.

A. Job analysis. Job analysis is a method of determining major areas of tasks where training may be needed (see JA Worksheet). It involves the dissecting of a job into its component events or parts. This analysis allows a trainer to better understand what an employee does in an organization. Job analysis involves the “task identification” of a particular job (Wentling, 1992). The techniques used in task identification include job questionnaire, interview, participant observation, work sampling, job audit, and small-group discussion. The following steps may provide a guide for completion of job analysis:

1. Identify the job that is to be the subject of the analysis. This involves defining the focal point for the job analysis. It may include the entire job of a group of employees or only a specific segment of their job.

2. Prepare a list of tasks which can be done following different approaches and methods. Four approaches can be used to identify job tasks: (a.) experts identify and list critical tasks, (b.) observations and interviews are conducted with employees, (c.) meetings are held with group representatives, and (d.) a tentative list of task is reviewed by employees and their supervisors.

3. Verify the tasks. The draft list of tasks should be verified by experts, workers, and supervisors in the analysis process. This can be done through expert review, small-group discussions, and inter views. When the tasks are verified, a final list of job tasks is prepared.

4. Determine the frequency. The workers and super visors can fill in a form indicating how frequently each task in a job is performed. Different scales such as “seldom,” “occasionally,” “weekly to monthly,” “daily to weekly,” and “daily” can be used to quantify the intensity of a task accomplished.

5. Determine the importance. Not all tasks are equally important to a job. An occasionally performed task may be very important. Therefore, a relative importance rating is useful along with frequency rating. A scale such as “marginally important,” “moderately important,” and “extremely important” may be used to determine the relative importance of the job tasks.

6. Estimate the learning difficulty. An estimate of learning difficulty is another dimension of the job-task analysis. It shows the trainer the employees' perception of difficulty, which may be different from the trainer's own perception. A scale such as "easy," "moderately difficult," "very difficult," and "extremely difficult" may be used to determine the difficulty indices of job tasks.

7. Calculate the total score. This can be done by simply adding the scores for frequency, importance, and learning difficulty for each task. The column for total score in a worksheet indicates the priority tasks for training if these are training problems.

8. Review the findings. The results of the job-task analysis should be discussed with significant people in the training system, including government leaders, programme directors, and others interested in related training.

B. Task analysis. The output of the job analysis is a list of broad job tasks, based on importance, learning difficulty, and frequency of doing the task. Each task is a complex set of procedures in itself, and therefore it needs further analysis to find out which specific segment of the of the task is critical in designing a training programme (see Task Analysis Worksheet). To do this, it is necessary to follow a method called task analysis, which is similar to job analysis.

Task analysis procedures include preparing a blank task analysis worksheet, writing down the name of the job at the top of each sheet, and then making copies. Each of these forms will be used for breaking down and analysing each of the most important job tasks. Therefore, it is necessary to write one important task identified for training on each of the task analysis worksheets and to list all component parts of each task on its respective task analysis worksheet. This is followed by the steps used for job analysis to find out the frequency, importance, and learning difficulty for each step of the tasks. Then the score for each component part is put in the "total score" column, and the results are discussed with concerned personnel in the organization. The job analysis and task analysis processes are similar to each other, so the model for both worksheets is the same.

The important difference between these two steps of analysis is that "the job analysis helps us identify major blocks of content to include in training; the task analysis helps us understand what comprises an individual block" (Wentling, 1992). Both are very important to the curriculum development process. What needs to be taught and what steps are involved in the process are completed by these analyses and comprise the major steps in curriculum development.

C. Knowledge and skill-gap analysis. The knowledge or skill-gap analysis is a process of determining the training needs of individual employees in relation to the important tasks-steps or components of tasks identified for training (see Skill-Gap Analysis Worksheet). The skill-gap analysis determines how skilled or proficient individual employees are on these tasks-steps or components, how much individuals differ from desired performance, and whether or not they need training. It would be a waste of resources and frustrating to the trainer and trainees to design and deliver training on topics and skills where the trainees are already able and proficient. A priority list of the tasks identified for training according to the total score in the job analysis is made. Then, the steps or components that were identified on each task analysis worksheet are listed on the skill-gap analysis worksheet. This is followed by rating each step-component in terms of the trainee's current proficiency on a scale of 1 to 5, as shown in the legend of the worksheet. Identifying the steps-components that appear to have low proficiency is required because there is a gap between what is desired and the current situation. After this, a review is done to ponder whether the gap can be decreased or removed through training or whether training is the most appropriate method. There may be some steps-components for which measures other than training are more appropriate. At this stage, key personnel such as subject-matter specialists, supervisors, and extension-training experts should discuss the findings before finalizing the curriculum. This helps to identify different perspectives and to avoid unnoticed mistakes or biases in curriculum development.

The training needs analyses provide many things to a trainer. The analyses determine the training contents and how deficient the trainees are in these contents, and the sequence of tasks provides the sequence of training activity.

Job Analysis Worksheet					
Job: Agriculture Extension Officer					
Tasks:	**Frequency performed**[a]	**Importance**[b]	**Learning difficulty**[c]	**Total score**	**Focus**
1. Supervision	4	3	1	8	...
2. Conducting training	4	3	3	10	yes
3. Planning programmes	2	3	2	7	...
4. Research trial	2	2	1	5	...
....	...	...	...	...	...
....	...	...	...	...	...
....	...	...	...	...	...

[a] 1 = Seldom
2 = Occasionally
3 = Weekly to monthly
4 = Daily to weekly
5 = Daily

[b] 1 = Marginally important
2 = Moderately important
3 = Extremely important
4 = Extremely difficult

[c] 1 = Easy
2 = Moderately difficult
3 = Very difficult

Job Analysis Worksheet					
Job: Agriculture Extension Officer					
Task: Conducting training					
Components/steps	**Frequency Performed**[a]	**Importance**[b] **Difficulty**[c]	**Learning score**	**Total**	**Focus**
Establishing rapport	5	3	1	9	-
Introducing the topic	-	-	-	-	-
Presenting the subject	5	3	1	9	-
Maintaining sequence	-	-	-	-	-
Maintaining eye contact	-	-	-	-	-
Using A/V aids in time	5	3	4	12	yes
		-	-	-	-
	-	-		-	-
Summarizing the lecture	5	3	3	11	yes

[a]1 = Seldom
2 = Moderately important
3 = Weekly to monthly
4 = Daily to weekly
5 = Daily

[b]1 = Marginally important
2 = Moderately important
3 = Extremely important
4 = Extremely difficult

[c]1 = Easy
2 = Moderately difficult
3 = Very difficult

Skill-Gap Analysis Worksheet			
Job: Agriculture Extension Officer			
Task: Delivering lecture in VEWs training			
Steps-components	**Level of proficiency**	**Is proficiency a problem?**	**Can problem be solved by training?**
Establishing rapport	1 2 3 **(4)** 5	[ ]	[ ]
Introducing the topic	1 2 **(3)** 4 5	[Y]	[Y]
Presenting the subject	1 2 3 **(4)** 5	[ ]	[ ]
Maintaining sequence	1 2 **(3)** 4 5	[ ]	[ ]
Maintaining eye contact	1 **(2)** 3 4 5	[Y]	[Y]
Using A/V aids in time	1 **(2)** 3 4 5	[ ]	[ ]
Supplying handouts	1 2 **(3)** 4 5	[Y]	[N]
....	1 2 3 4 5	[ ]	[ ]
Summarizing the lecture	**(1)** 2 3 4 5	[Y]	[Y]

1 = Cannot do at all
2 = Can do less than half of the task
3 = Can do more than half but less than total
4 = Can do total but cannot maintain time schedule
5 = Can do within time schedule

Annexure 5. Experience from CAPaBLE Program

The programme was implemented as a part of Asia Pacific Adaptation Network (APAN) activities that aimed at enhancing the capacity of national and regional institutions to support adaptation actions. Under this project, three workshops were conducted in January, March and August 2011 with the participation of all project collaborators representing different training institutes, universities, and ministries of agriculture in five project-targeted countries (Bangladesh, Cambodia, Lao PDR, Mongolia and Nepal). While the first and second workshops (meetings) focused on training needs assessment, the last workshop was focused on the drafting the training modules for their respective countries which were then finalized and submitted as the final country reports. The project received the technical expertise from Institute for Global Environmental Strategies (IGES), Asia Institute of Technology (AIT) and AIT-UNEP Regional Resource Center for Asia and the Pacific (RRC.AP). The objectives of the project were: (a.) to undertake appraisal of training needs in terms of knowledge and skill areas for effective adaptation; and (b.) to design training modules for imparting knowledge and skills for effective adaptation. The following activities were carried out in Bangladesh:

- **Desk review of training modules implemented by various government and non-government agencies in the field of climate change adaptation for agriculture sector:** Reviewing was done on the important information on the duration of existing training programs, subject matters covered, relative weight of knowledge and skill areas, nature of knowledge and skill areas, target audience, and organizations involved in conducting these training programs.
- **Held consultation meetings to identify priority subject areas for training:** Consultation meetings were conducted with the participation of subject matter specialists, departmental officials and trainers to identify priority subject areas for training, to identify institutional limitations and if there is a need to change the job profile of important functionaries in agriculture department to take forward the agenda of climate change adaptation.
- **Conduct surveys to identify existing skill and knowledge areas and possible changes in the job functions of staff for handling climate change adaptation related work:** The questionnaire was consisted of various functionaries working in agriculture at various levels and their current job responsibilities to identify institutional and infrastructure limitations for training and to assess their knowledge and skill areas in climate change adaptation in agriculture sector.

The information of the above activities was compared with the existing level of knowledge and skill areas and gaps were identified that formed the training content for intervention at induction and in-service training programs. Workshops on training design, methodologies and course module development were organized in Thailand in order to standardize the process in training design. During the workshop, discussions were made on the Training Need Assessment (TNA) outcomes and converted the gaps into learning and session objectives which further helped in identifying training content, duration, mode of delivery etc. The module development workshops were participatory in nature and using learning-by-doing approach. The workshops addressed key important elements in module design such as principle of adult learning, formulating learning objectives, selection and organization of training contents and identifying effective training methodologies. Standard format for module development was provided and used as a guideline for the personnel to prepare course curriculum framework. After the completion of the design phase, the course modules were presented and submitted to module development experts to review and give feedbacks. The ultimate outcome of this project was development of training modules. The capacity building programs were developed in a comprehensive manner to ensure urgent implementation of adaptation actions through identification of measures for prioritizing adaptation actions, capacity building & response strategies, integration of adaptation into sectoral & national planning, and identification of means to incentivize adaptation by various stakeholders. The project identified gaps in the existing capacity of various stakeholders and training programs.

The training modules developed from the above mentioned project were further pilot tested in Bangladesh and modified by Dr. Md. Sekender Ali and his team in 2012-13 with the financial help from Institute for Global Environmental Strategies (IGES), Japan. The pilot testing of training modules was carried out for two levels of agriculture extension officers i.e. district and upazila agriculture officers and Sub-Assistant Agriculture Officers (SAAO) operating at the village level. Pre-and post-training evaluations were carried out through structured questionnaires and the results were statistically tested using paired t-test. The pre-training evaluation of trainees revealed that half (50%) of the trainees had low knowledge and of the half (50%) had medium knowledge on climate change adaptation (CCA). None of the trainees had high knowledge on CCA. Therefore, it was concluded that there was a necessity to conduct training for the district and upazila Level Officers of Department of Agricultural Extension (DAE). The post-training evaluation revealed that most (70%) of the trainees achieved high knowledge and 30% of them achieved medium knowledge on CCA. None of the trainees had low knowledge after receiving training. Therefore, it was concluded that the training had led to improvement in their knowledge on CCA.