IOSR Journal of Agriculture and Veterinary Science (IOSR-JAVS)
e-ISSN: 2319-2380, p-ISSN: 2319-2372. Volume 9, Issue 1 Ver. II (Jan. 2016), PP 07-16
www.iosrjournals.org

An Assessment of Public and Private Crop Extension Services in Bangladesh

Md. Mamun-ur-Rashid[1], Gao Qijie[2]
[1]*Department Of Agricultural Extension & Rural Development, Patuakhali Science And Technology University, Dumki, Patuakhali -8602, Bangladesh.*
[2]*College of Humanities And Development Studies, China Agricultural University, 2 Yuanmingyuan Xilu, Beijing, China.*

Abstract*: Agricultural Extension can offer a sustainable exit from overwhelming poverty in many developing countries. With the aim of assessment of public and private extension services in Bangladesh, this study purposefully considers nine organizations three from each public, private and non-government origin. This study used qualitative methods like focus group discussion, key informant interviews, informal interviews, relevant literature review, etc., for collecting data. Strength, weakness, opportunities, and threats (SWOT) analysis was also conducted to see the SWOTs of different extension services. The findings of this study mirrored that agricultural knowledge and information system (AKIS) in Bangladesh is composed of public sector, private sector, NGOs, community based organizations, and voluntary farmers. Although private and NGO sources progressively occupying space in farmer choice list, public extension service is still playing the pivotal role in offering agricultural extension service in Bangladesh. All kinds of extension services play a significant role in the extension system of Bangladesh, however they differ significantly based on client access, geographical coverage, institutional capacity, motive, efficiency, effectiveness, and sustainability of extension work. Finally, the findings of the study established the fact that the presence of variety of extension services puts Bangladesh in a favorable position to establish a pluralistic extension network.*
Key words*: Assessment; public extension service; private extension service; Bangladesh*

I. Introduction

The agricultural extension is one of the major gateways for diffusing agricultural technologies and therefore has a crucial role to play in ensuring sustainable agricultural development and farm household livelihood security (Okrely et al., 2010). This is also an essential pillar of research and development (Qamar, 2005). An extensive body of literatures disclosed high return of investment in agricultural extension, especially in developing economies (Birkhaeuser et al., 1991; Evenson, 2001). Based on 294 studies worldwide, International Food Policy Research Institute (IFPRI) appraised that the annual rates of return on extension investments were 79 percent (Alston et al., 1999 in Swanson, 2008). Using fixed effects and matching methods for evaluating the impact of the provision of agricultural extension services for grape producers in Mendoza, Argentina Cerdán-Infantes et al., (2008) showed that the producers at the bottom of productivity by participating in extension program had an increased yield close to 40%. Another study in resettlement areas in Zimbabwe found that access to agricultural extension (one or two visits per agricultural year) can increase productivity by 15% (Owens et al., 2001). Similarly, in Bangladesh, study revealed that extension contact has positive significant effects on improving farm income (Haq, 2013).

The mere availability of extension service is not enough to derive high benefit from extension service, as purposes of agricultural extension are changing very rapidly. Massive changes in global developments necessitate considering the function of agricultural extension in a broad category (Qamar, 2005). Christoplos (2010) described this situation precisely, with a wonderful example. According to him, "Extension is no longer just about men from public sector agricultural agencies riding around a motorcycle talking to farmers, even though this stereotype still describes a significant proportion of extension agents". Apart from the transfer of technology and increasing production, agricultural extension has a set of other functions, such as transformation and marketing; transferring management to mobilize and organize producers, rural groups and communities; transferring capacity to educate, build human resources, and enhance local capacity for e.g. integrated pest management, market awareness, farm management and in negotiating financial, input, and market services (Feder et al., 1999).

National extension and advisory systems in many developing nations are facing increasing challenge to meet new demands from farmers and other actors in the innovation system. Market liberalization and development, democratization, and communication revolution push farmers to obtain agricultural information from a variety of sources than before. For instance, public information sources often focus on purely production issues (Spielman et al., 2011). Farmers consider private sector for business-related services, and access

facilitation services (such as group process, interaction with input and market actors) through NGOs and farmer organizations (Heemskerk and Davis, 2012). So, offering good extension service is preconditioned with the capacity building of all the probable sources of information.

Bangladesh is a resource poor developing country, where budget allocation for agriculture sector is minimal. Nonetheless, due to trade liberalization, and weaknesses of governance, government does not have strong control over private organizations and NGOs. Actually, public and private organizations (both profit and non-profit) run under different goals and objectives and under different authority, so equal capacity building might be an arduous task. However, a useful alternative for offering good agricultural extension can be coordination and management of pluralistic extension service based on programs and actions jointly furnished and implemented by multiple stakeholders and service providers. For taking such initiative a scrupulous assessment of different extension service is very essential.

1.1 Historical Perspectives of Different Extension Services in Bangladesh

Introduction of agricultural extension in this region is not an age old perspective. The actual agricultural extension makes its debut after the independence from the British colonialism in 1947. In 1951, agricultural extension starts its voyage, when employees of the defunct Jute Regulation Department were merged to the agriculture Department. At that time, scale of agricultural extension activities were very limited, and confined to demonstrations in the district headquarters. During the period 1951-1980, several numbers of organizations were come into light. A list of other major organizations came into existence in the same period is presented chronologically in Table 1. It is important to note that most of these organizations were created to prevent further famine outburst in the beginning of 1970s. However, until 1980, one important attribute of agricultural extension was the co-existence of an array of mono-crop extension organizations operated under different Ministries.

Table 1. Major agricultural organizations in Bangladesh came forth in 1951-1980.

Name of the organization	Emergence
Village Agricultural and Industrial Development Program (V-AID)	1954
Directorate of Plant Protection	1956
East Pakistan Water and Power Development Authority (EPWAPDA)	1959
Agricultural Information Service (AIS)	1961
East Pakistan Agricultural Development Corporation (EPADC)	1962
Department of Agricultural Extension and Management	1968
Directorate of Agriculture (Jute Production)	1974
Horticulture Development Board	1974
Tobacco Development Board	1974
Sugar and Food Industries Corporation	1976

Source: Hossain et al., 2014

Unfortunately, creation of different organization under different ministries was facing a range of problems in offering quality extension service. The problems encompasses the lack of precise demarcation of function and specific area of operation, absence of coordination and wastage of valuable resources, and high overhead and supervision cost, etc. In the follow-through, blending different organization became inevitable. In this context, DAE (Department of Agricultural Extension) was established in 1982 merging six departments, namely the Directorate of Agriculture (Extension and Management); Directorate of Agriculture (Jute production), Directorate of plant protection, Horticulture Development Board, Tobacco Development Board and Central Extension Resources Development Institute. This DAE is still the centerpiece of public extension service provider, which at present has 12,832 grass root level extension workers called Sub Assistant Agriculture Officer (SAAO) and 2000 extension personnel distributed throughout the country (DAE, 2013). In fact, DAE is the largest public sector extension service provider in Bangladesh, having mission to provide all categories farmers with needs based extension services, and enabling them to optimize their use of resources.

Involvement of NGOs in the agriculture sector can be traced back to the middle of 1970s. Almost all the major NGOs in Bangladesh have agricultural programs as a separate program or as a part of other programs like income generation activities, natural resource management, environment protection and regeneration, disaster mitigation and livelihood improvement, etc. There are more than 100 local, national, and international NGOs those are involved in agricultural extension and advisory activities (Birner et al., 2010). According to Haque (2010), about 400 NGOs are directly involved in agricultural activities hence extension services. Some of the major NGOs providing extension support are Bangladesh Rural Advancement Committee (BRAC), CARE International, Chemonics International, Ranglpur Dinajpur Rural Service (RDRS), Thangamara Mohila Sabuj Sangha (TMSS), PROSHIKA Manobik Unnayan Kendra, Association for Social Advancement (ASA), Grameen Krishi Foundation (GKF), Winrock International (WI), and Christian Commission for Development Bangladesh (CCDB), Word Vision (WV), etc.

In the beginning of 1990s, as a result of a policy change, the situation of the agricultural extension system in Bangladesh starts changing notably. Private sector started to boom very rapidly, due to liberalization of domestic trading in mid 1990s (Cabral et al., 2006; ASIRP, 2003). This policy change allows private sector in agribusiness, and this sector represented a sustained growth well into the early 2000s (Agrico ANZDEC, 2004). For example, until the end of 1980s, few public companies were dominated in the seed and agrochemical market. Within the period of the next 15 years, the number of companies involved in seed business climbed up to 100 with an extensive network throughout the country (BSGDMA, 2007). Numerous agrochemical companies also appeared in the agribusiness sector at the same period of time. According to Dasgupta et al. (2005), there are approximately 66 registered agro-chemical companies in Bangladesh of which 6 are being multinational in nature.

1.2 Agricultural Knowledge and Information System in Bangladesh

The paradigm of agricultural knowledge and information system (AKIS), which flourish in the 1990s premised the importance of developing a system of institutions (e.g. Research, extension and education) that cooperate and communicate with each other for better output i.e. increasing agricultural productivity. AKIS in Bangladesh is a complicated web composed of different players originated from public, private and non-government sources. Farmers in Bangladesh use numerous sources of information for conducting agricultural activities (please see Figure 1). A brief discussion of different components of AKIS is presented in this section.

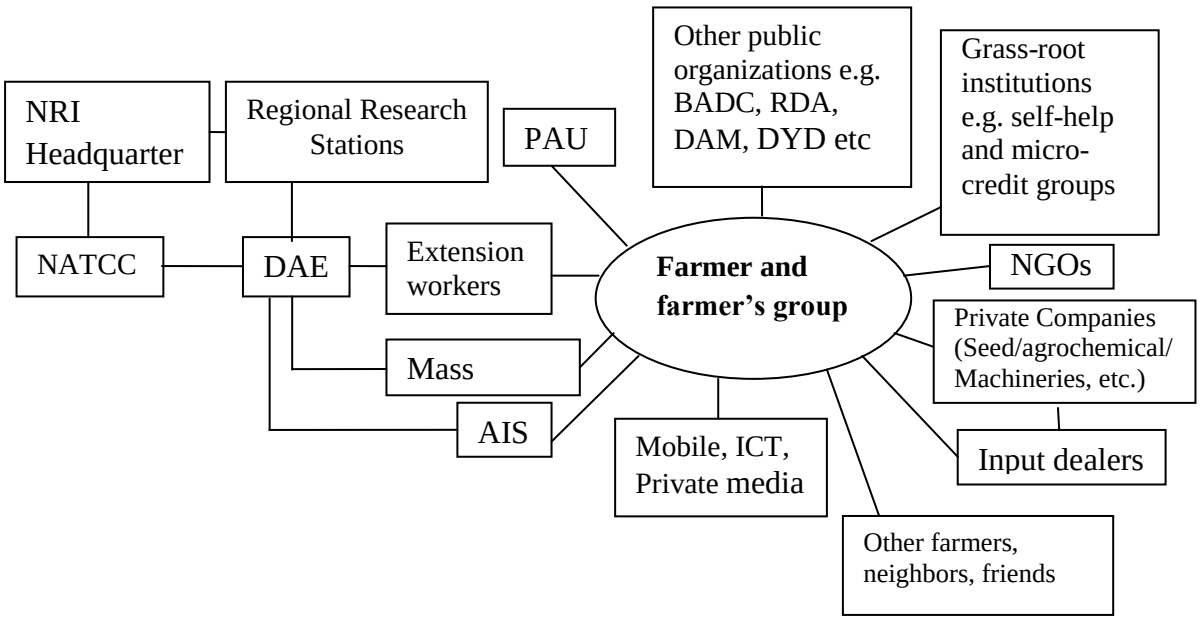

Figure 1. Information trade between extension and farmers in Bangladesh

Legend: Information flow is the line between boxes, RDA= Rural Development Academy, DAM= Department of Agricultural Marketing, DYD= Department of Youth Development, AIS= Agricultural Information Service, BADC= Bangladesh Agricultural Development Corporation, PAU= Public Agricultural Universities, NATCC= National Agricultural Technical Coordination Committee, NRI= National Research Institute
Source: *Adapted by the authors based on Glendenning et al. (2010)*

Public Sector

There are 12 government organizations related to different ministries are acting as agricultural extension service providers. However, except very few specialized organizations like DAE, DLS, DOF, BADC, RDA, etc., others performed agricultural extension activities as a part of other works. There are also a number of research institutes generating agricultural knowledge and information. National Agricultural Research System in Bangladesh is composed of 10 research institutes (each deal different types of crops/livestock/fisheries), worked under the umbrella of the Bangladesh Agricultural Research Council (BARC). It is noteworthy to mention that some of these research institutes have regional research stations to conduct area specific research. Another source of information linked to public sector are several public agricultural universities, of which very few offer extension support to a limited number of clients, predominantly from the university surrounding areas. However, public section is both centralized (i.e. decision-making largely based on headquarter) and fragmented (i.e. poor-coordination between ministries and departments). Lamentably, expect very few most of the public

service providers concentrate on educational and technical program. A glimpse of different extension services cater by public and private providers is presented in figure 2.

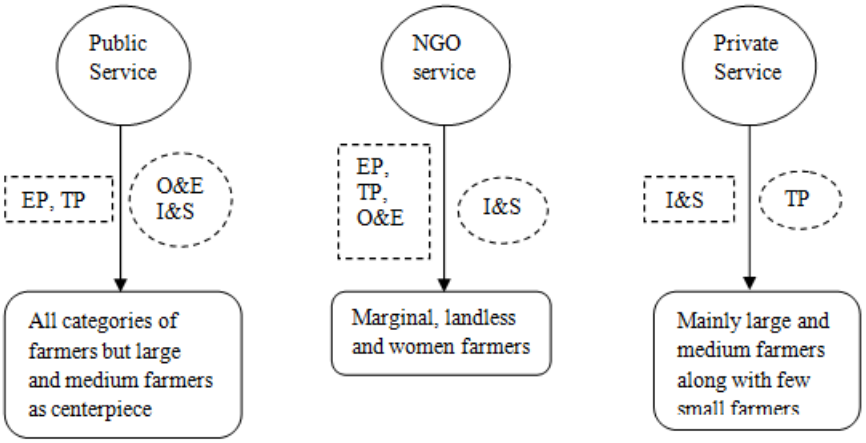

Figure 2. Flow of different types of extension services and their clients

Legend: Rectangular dashed boxes indicate **major service**, Round dashed circles indicate **minor services**, EP= Educational Programs (e.g. Farm management, natural source management, marketing training, etc.), TP= Technical Programs (e.g. crop management, farming systems, etc.), O&E= Organizing and empowering (e.g. Credit societies, self-help groups, farmer associations, etc.), I&S= Inputs and Services (e.g. Machinery and equipments, seeds, fertilizers, chemicals, etc.)
Source: *Adapted by the authors following Swanson and Sami (2002)*

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 centered to high-potential investment and cash crops/enterprises. Their extension services usually tied with product sale and hence called 'embedded' service.

NGOs

In Bangladesh, several thousands of NGOs are working in different sectors. According to the report, until January 2014, there are 2333[1] NGOs working in Bangladesh. 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[2] based. 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, agro forestry, 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.

Community Based Organizations

Numerous self-help groups are working around the country. In most cases, these self-help groups are formed for distributing micro-credit, and occasionally they act as a channel for agricultural information dissemination. BRAC, the largest and appeared to be the most effective NGO in Bangladesh, not only provides advisory services, but also micro-credit and help farmers build a value chain for specific crops, livestock and/or fisheries product. Despite, large NGOs many other local and national NGOs are also using self-help groups for channeling agricultural information, credit and inputs (Occasionally).

[1] Please see http://ngonewsbd.com/ngo-list-of-bangladesh/
[2] A sub-district and the lowest level of administrative government in Bangladesh. Please see http://www.mujibnagar.com/upazilas-of-bangladesh

Voluntary Farmers

Traditionally, in Bangladesh, farmers seek information from their successful peer or other advanced farmers. Recently, several donor agencies such as the World Bank, DANIDA, etc. are recruiting progressive farmers for information dissemination. These organizations also provide these recruited farmers with minimal resources and vehicles (e.g. bicycle). CARE-Bangladesh is using positive deviant farmers, as a substitute for an extension worker for spreading agricultural information among fellow farmers. However, using voluntary farmers for information dissemination is a recent concept, hence their efficiency is not clear yet.

II. Methodology

This research is based on qualitative approach. A variety of techniques, such as Key Informants (Stakeholder) Interviews, Focus Group Discussion, formal and informal discussion with selected staffs, etc., were adopted in situation analysis, identification of constraints, and suggesting ways of improvement. Strengths, weaknesses, threats and opportunities of each kind of service were identified using SWOT analysis. Moreover, information from desk studies was also ploughed. Crop Extension service in Bangladesh can be described as a complex web of numerous actors with diversified roles, functions, and objectives, so a combination of qualitative techniques seems to be more rational in the assessment of the service. Primarily, all the stakeholders evolved from public and private origin constitute the population of the study. However, participating respondents include farmers, field extension agents, extension officials from block to national level, extension experts in universities, NGO representatives, and the heads of both private and public extension service providers.

Numerous organizations from public, private, and NGO are offering extension services to the farmers of Bangladesh. Financial limitations and scarcity of time make it impossible to consider all the players of agricultural extension service. To overcome such limitation, this study purposefully selected nine organizations three from each cluster of public, private and NGO service. Organizations were selected based on their capacity and coverage. For instance, one international, one national and one local NGO was selected to form NGO cluster. Hence, the selected organizations for this study are Department of Agricultural Extension (DAE), Department of Youth Development (DYD), Bangladesh Agricultural Development Corporation (BADC), CARE-Bangladesh, Development Wheel (DEW), Sabalamby Unnayan Samiti (SUS), Metal Agro Limited, Lal Teer Seed Limited, and Supreme Seed Company limited.

Network of agricultural extension service is crisscrossed throughout the country. However, availability of different service varies largely with a spatial dimension. Considering such fact, this study considers several Upazilas under different districts. For instance, Dobaura and Netrokona Sadar Upazila under Netrokona district were selected for the close observation of a local NGO activity. Trisal, Gouripur, Phulbaria, Muktagacha and Mymensingh sadar Upazila under Mymensingh was selected to get a vivid picture of public and international NGO service. To assess the private company service, Mithapukur and Pirjong Upazila under Rangpur district was selected.

III. Findings And Discussion

3.1 Comparison of Different Types of Extension Services

A comparison of different agricultural extension services is provided in Table 2. Information provided in the table represented that public service covers all kinds of clients, while NGO service covers mainly special group like landless and women farmers. Private services, on the other hand, consider large farmers, medium farmers, small farmers, and seed dealers.

Table 2. Comparison of different types of extension service in Bangladesh.

Criteria	Type of service		
	Public	NGO	Private
Target farmers (in theory)	All categories of farmers	Marginal, landless and female farmers	Large, medium, small and tenant farmers, seed dealers
Target farmers (in practice)	Large and medium farmers remain in the center of service, Male biased	In general real target farmers are selected. However, in some cases farmers are selected based on their earlier involvement with other groups e.g. microfinance-group.	In some cases, target farmers are ignored at the end of the season and company purchase products from other farmers
Approaches used	Group approaches are emphasized. Extension methods encompasses: result demonstration, method demonstration, field days, fairs, farm walks, farmer	Participatory group approach. Extension method encompasses: group discussion, training, courtyard meeting, demonstration, motivational	Contract farming approach. Extension method encompasses: demonstration, group discussion, training, farm and home visit, office call, cell phone call, etc.,

	rallies, folk media, group meetings, motivational tours, participatory technology development, farm & home visit, office call, etc.	tour, farm and home visit, office call, cell phone call etc.,	
Motive of extension work	Service	Service. However, some NGOs are involved in agribusiness in recent years.	Profit
Effectiveness	Effective	Effective	Effective
Efficiency	Moderate; have skilled manpower but limited logistic support	Moderate; have good mobility capacity but lack skilled manpower	Low; shortage of manpower both in terms of skill and number
Sustainability	Sustainable; run by state revenue budget	Unsustainable; highly dependent on foreign donors	Sustainable; run by own budget
Impact	Significant	Significant	Significant

***Source**: Field study*

It is important to note that farmer access to different kinds of extension service vary significantly based on farm size and gender. For instance, farmers' access to government extension service is strongly correlated with land size. A comparison of farm size based farmer access to different extension service is presented in Figure 3.

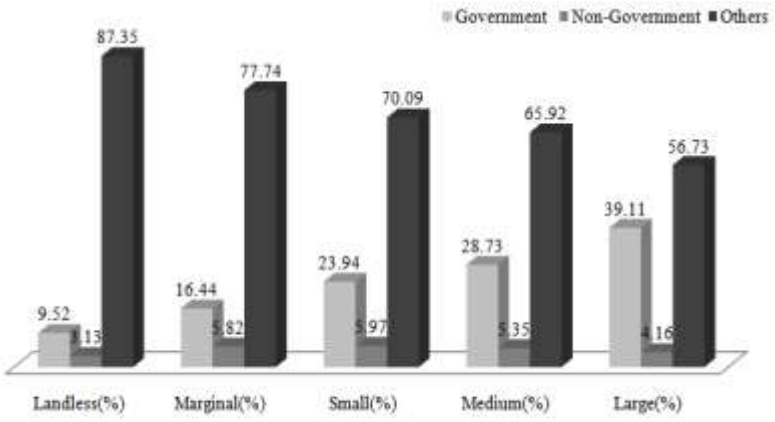

Figure 3. Farmer access to different types of extension service by land size

Note: Others include private organizations, other farmers, mass media, community based organizations, etc.)
Source: *Bangladesh IAPP (Integrated Agricultural Productivity Project) Survey (2013)*

Women farmers have comparatively a little more access to NGO extension services but have remarkably less access to public service. As presented in Figure 4, women farmers have five times less access to public service compared to their male counterpart, despite the female farmers engagement to agriculture has increased by 8% from the year 2000 to 2008 (Jiam & Hossain,2011). The public service uses a variety of extension methods to educate farmers compared to NGOs and private service. All the extension service is effective and has significant impact on its clients. However, NGO service is less sustainable as they have to depend mainly on foreign donors for their activities. On the other hand, high profit making intentions and shortage of skilled manpower decrease efficiency of the private extension to great extent.

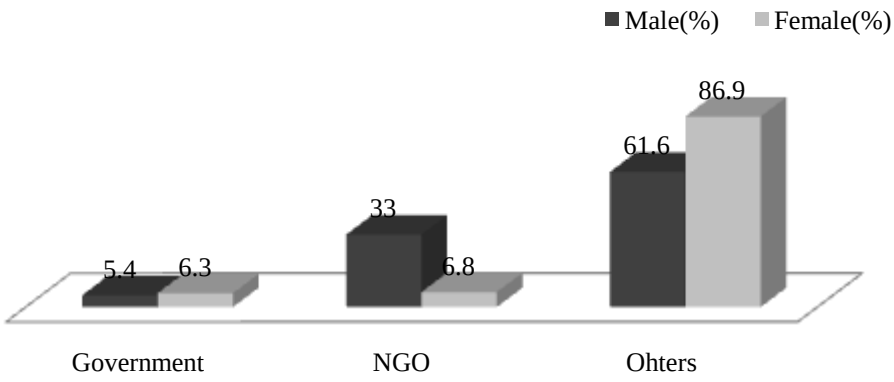

Figure 4. Gender based farmer assess to different agricultural extension service in Bangladesh

Note: Government service includes Department of Agricultural Extension (DAE), Department of Livestock (DLS), Directorate of Fisheries (DoF) and Department of Forest (FD); NGOs include Bangladesh Rural Advancement Committee (BRAC), Proshika, and Caritas; others include private organizations, other farmers, and mass media.
Source: *Bangladesh National Extension Coverage Survey, 2003*

3.2 SWOT Analysis of Different Types of Extension Services in Bangladesh

SWOT analysis helps to assess numerous strengths, weaknesses, opportunities and threats (SWOTs) within an organization or within extension system as a whole (Hanyani-Mlambo, 2002). This study carried out SWOT analysis to see the service status of three categories of organizations namely public organizations, NGOs and private profit organizations. This SWOT analysis was done based on farmer, extension worker, extension expert, and scholar's opinion including findings of other studies. Data presented in Box 1 represents that extension services irrespective of types are suffering from a number of weaknesses. Major weaknesses in public (PUB) services included inadequate monitoring and supervision of clients, limited capacity of providing rapid service, high client and extension worker ratio, less accountability to clients, etc. private non-profit (PNP) service; on the other hand, are suffering from handicapped expertise in handling agricultural extension issues, limited geographical coverage, funding inconsistency, etc. Weaknesses of private profit (PPR) service encompass high profit making orientation, scarcity of extension experts, less accountability to farmers, etc. It is further confirmed from the analysis that service providers also possess a variety of strengths, which are conspicuously different from each other. This might be a probable indication that they can supplement each other to overcome service weaknesses. SWOT analysis also convinces us that all these service providers have ample opportunities to amplify their services in different sector, as well as among different communities. However, all kinds of extension services have to face several potential threats at present or in future. Most importantly, one of the common threats of all kinds of service is high competition among themselves. This might be a probable indication that all kinds of extension service have to concentrate on service quality, to retain their clients, and maintaining their existence in agricultural extension canvas.

Box 1. SWOT of different types of extension service.

	Strengths	**Weaknesses**	**Opportunities**	**Threats**
PUB service	1. Completely service based 2. Qualified and experienced staff 3. Extensive use of mass media 4. Huge number of clients 5. Countrywide coverage 6. Trustworthy to farmers 7. Greater emphasis on field crops e.g. rice, wheat, etc.	1. Inadequate monitoring and supervision of clients 2. Limited training both in quality and quantity 3. No/few offices at block level 4. High ratio of clients and extension worker 5. Less capable of providing rapid service 6. Discontinuous support 7. Limited market information 8. Poor social capital development 9. Less accountable to clients	1.Livestock and fisheries information 2. Special emphasis on women and youth 3. Credit and input distribution 4. Disaster management and mitigation	1. Unstable market price 2. Labor migration from agriculture 3. Dwindling of crop land 4. Fund shortage 5. Increasing competition among extension service providers 6. Internal and external politics

PNP services	1.Up-to-date sustainable technology 2. Strong supervision 3. Holistic support covering nutrition, health, marketing, etc. 4. Service available to deprived clients 5. Highly qualified experts for policy and planning 6. Special emphasis on social capital development 7. High mobility capacity	1. Lack of expertise in agricultural extension 2. More priority on savings and loan (micro-credit) other than service 3. Limited geographical coverage 4. Funding unsustainability 5. Few technical experts 6. Less logistic support for lower level workers 7. Limited training for clients both in quality and quantity 8. Inadequate collaboration with other organizations 9. Transient project/program based service	1.Work in collaboration with government agency 2. Serving special clients ignored by other providers 3. Value chain development 4. Function in hard to reach areas	1. Donor fatigue and scaling down 2. Political instability 3. Technical graduates switch very often 4. Unstable price of agro products 5. High competition among NGOs
PPR services	1. Strong supervision and monitoring 2.Frequent field visit 3. Quick and timely flow of funds 4. High mobility capacity 5. Extension support encompasses inputs and credit 6. Extensive use of ICT e.g. cell-phones, internet, etc.	1. Highly profit oriented 2. Concentrated in potential agricultural areas 3. No/few extension expert 4. Scarce training 5. Discontinuous service 6. Officers haul excessive work load 7. No accountability to farmers 8. No service for resource conservation	1. Sufficient funds 2. Capable to deal with high value crops 3. Persistent farmer groups 4. Well developed marketing channel	1. High interest rate and complex investment procedure 2. Instability of product price 3. Natural hazards 5. Employees often switch for better options

3.3 Discussion

Since the independence in December, 1971 several initiatives and reforms have been exercised for the improvement of agricultural extension service in Bangladesh. However, efficiency and success of agricultural extension service are still under constant criticism. Shortage of manpower is one of the major problems hamper public extension service. According to DAE guidelines (2003), one SAAO has to cater extension service to 1,200 households, instead of a standard ratio 1:500. However, the situation might get worst nowadays as the recruitment procedure in DAE is very lengthy. This scarcity of field staffs has resulted in the decrease in the quality of services. NGOs and private organizations are also suffering from acute manpower shortage. For the purpose of saving money and maximizing profit, they don't want to recruit sufficient technical staff. Interestingly, many NGOs and private organizations are offering extension service using non-technical staffs, who don't have any formal know-how in the field of agricultural extension.

The structure of public extension service in Bangladesh is overwhelmingly top down and less decentralized. As a result, bottom level officials and farmer's participation in problem solutions and budget decisions are very limited. After the inception of the New Agricultural Extension Policy (NAEP) in 1996, the government is trying to decentralize and enhance bottom up planning and create space for farmers in extension planning. However, there is no mechanism in place to involve farmers and extension workers in budget decision-making. NGOs on the other hand, ensure participation only in the selection stage of the clients for an extension program. Unfortunately, planning of extension activities and solution of problems is very often furnished by top level management. Nonetheless, in most cases, their funding policy and strategies remain unclosed to the clients.

Actually, all kinds of farmers need extension support for better performance. However, all the services either public or private concentrate more on specific types of clients. Virtually, all the farmers are the clients of public extension service, but lamentably they concentrate more on large and medium farmers, who possess a major proportion of cultivable land. In Bangladesh, performance of extension service is very often recorded on the basis of increased production. Abrupt increase of production requires more cultivable land and high investment capacity, so extension workers concentrate on large and medium farmers and remain indifferent about marginal and small farmers, who constitute the major section of the peasants in Bangladesh. NGOs are very often appreciated to reaching special type of vital clients like landless and women farmers. However, access among the same group of clients is not equal. Many NGOs turn pre-organized microcredit groups as extension farmers' groups. The possible reason might be, as they are familiar with this group, so it might be easy for them to administer this group. Another probable reason is, as the members of extension groups in most cases get input support in free of charges, so they can lure others to join their microcredit group for receiving agricultural extension services.

Shortages of skilled extension workers hamper the efficiency of almost all kinds of extension services. In Bangladesh, field level extension workers get a Diploma from Agriculture Training Institutes (ATIs).

Unfortunately, these ATIs are suffering from extreme shortage of manpower. Their syllabus, in common, do not based on field oriented problems. Nonetheless, their learning is mostly based on theory rather than practical issues. So, these students are not capable of handling sophisticated agricultural information service, unless a further training is provided. Training provision for developing further skill is highly limited for field level extension workers in all kinds of service providers. Normally, irrespective of the type of services, higher level officials receive more favor in receiving training than field level extension workers.

Lack of funding for doing actual extension service is a major problem impedes performance of extension service in Bangladesh. For public extension service, major proportion fund goes for salary and other maintenance purpose. A meager amount left for doing demonstrations and other field extension programs. Lack of logistic supports like a motorized vehicle for field level extension workers also hampers rapid service provisions. For almost all kinds of services, field level extension workers use non-mechanized vehicles to do extension work. Interestingly, government extension field workers do not receive any amount as a cell phone bill, since the cell phone is widely proved to be an important medium for disseminating rapid information. In case of NGOs, although they have the high mobility capacity, but field level extension workers receive less logistic support. Furthermore, as all their projects normally depend on donor support, so lack of fund makes many successful projects to stop in the midway.

Duplication of scarce resources due to lack of coordination among different stakeholders, limit efficiency of extension service to a large extent. Notably, proper working relations among research and extension are absent, although the importance of linkages between extension and research has underpinned in NAEP, as well as in all reform strategies suggested by DAE. However, no significant improvement has been yet located in the linkage between extension and research. Highly top down structure of DAE hinder research-extension linkage in many cases. Nonetheless, relationship among the extension service provider is also handicapped. For instance, a very limited relationship exists among Department of Agricultural Extension (DAE-crops), the Department of Fisheries (DOF) and Department of Livestock (DLS), as well as with other NGOs and private company service providers. Although, the NAEP principles recognize well to the need of the changing environment for the extension, including: decentralization of public services to local level institutions; the entry of new service providers; advocating partnerships with NGOs and the private sector; liberalization of trade regime and privatization. Regrettably, its implementation is being hindered due to weak commitment to change, including lack of clarity in the public-private role in the extension policy.

The web of extension service in Bangladesh is constructed by number of extension service providers. However, their potential is not yet capable of fulfilling the entire demand of the clients. Various weaknesses and threats place these service providers in a vulnerable position, need special attention. As Bangladesh is a resource poor developing country, it is not logical to expect abrupt investment in agricultural extension. However, as a matter of fact, Bangladesh is in a great position to utilize the potentials of all the extension service providers through establishing a pluralistic extension service system. Where extension service providers share and coordinate their strengths in a rational way to overcome their weaknesses and threats and open up new windows of opportunities.

From the foregoing discussion, it is clear that different types of extension service viz. public, private and NGO service are providing information to farmers of Bangladesh. However, the majority of available literature concentrates only on public extension service and have little or discussion about other types of extension service. As a result, potentials and weaknesses of other service remain unaddressed. The findings of this study may be helpful to have an in depth assessment of the agricultural extension system in Bangladesh. Policy makers, researchers, and academician may get food for their future strategies and thinking. However, the findings of this study can be challenged for limited geographical coverage, and for considering the limited number of extension service providers. Nonetheless, the recommendations are broad, which require further follow-up studies to have a more clear picture of the status of different kinds of extension service in Bangladesh.

IV. Conclusion

Agricultural extension has remarkable importance in the poverty alleviation of developing countries. Formal inception of agricultural extension in Bangladesh is not an age old phenomenon, and the scenario of agricultural extension service started changing noticeably in the beginning of 1990s. At present farmers in Bangladesh use a diversity of information sources originated mainly from public, private and NGO sectors. Unfortunately, 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, but this service is effective and sustainable in terms of financial capacity. Extension service in Bangladesh is still in the backdrop in terms of client access, geographical coverage and efficiency. However, at the same time, this country is also in a propitious position to endow a pluralistic extension system, which probably can solve many shortcomings of present agricultural extension service. In the light of the findings of this study, the following recommendations can be put forward to improve the agricultural extension service in Bangladesh.

1. An up-to-date extension policy need to be in the place, where role of public, private and NGO service providers along with coordination strategies clearly defined.
2. Extension service providers should pilot innovative funding strategies where clients can share a proportion extension service cost.
3. During the planning of extension programs, gender and farm size biased limitation of access to extension should be considered. Special programs for women and landless farmers are needful as they constitute a major section of the peasants in Bangladesh.
4. Extension education institutions should keep continuous contract with field level extension service, so that can produce skilled workers for solving sophisticated extension problems.

References

[1]. Agrico ANZDEC. 2004. Agribusiness Development in Bangladesh. Final Report for the Agribusiness Development Project GOB/ADB TA 4139-BAN. Dhaka.

[2]. ASIRP. 2003. Agricultural extension in Bangladesh: an entitlement of all farmers? The results of national extension coverage survey. Available online at http://www.lcgbangladesh.org/Agriculture/reports/The%20Results...

[3]. Birkhaeuser, D., R. E. Evenson and G. Feder. 1991. The economic impact of agricultural extension: a review. Economic Development and Cultural Change. 39: 607-650.

[4]. Birner, R., A. R. Quisumbing and N. Ahmed. 2010. Cross-cutting issues: governance and gender. Bangladesh Food Security Investment Forum, 26–27 May, Dhaka, Bangladesh.

[5]. BSGDMA .2007. Bangladesh seed industry at a glance. Bangladesh Seed Growers, Dealer and Merchants Association, Asian Seed Congress, 6-10 November, Manila, Philippines.

[6]. Cabral, L., C. Poulton, S. Wiggins and L. Zhang. 2006. Reforming agriculture policy: lessons from four countries. Working paper, Future Agriculture. Available online at www.future-agricultures.org/publications/research-and.../file.

[7]. Cerdán-Infantes, P., A. Maffioli & D. Ubfal. 2008. The impact of agricultural extension services: the case of grape production in argentina. Inter-American Development Bank, Office of Evaluation and Oversight. Working Paper OVE/WP-05/08. Available with updates at http://www. iadb. org/intal/intalcdi/pe/2009/03159. pdf.

[8]. Christoplos, I. 2010. Mobilizing the potential of rural and agricultural extension. FAO, Rome.DAE. 2003. Annual report.Government of the People's Republic of Bangladesh, Kishorgonj.

[9]. Dasgupta, S., G. Meisner and N. Mamingi. 2005. Pesticide traders' perception of health risks: evidence from Bangladesh. Working Paper series 3777, The World Bank, Washington DC.

[10]. Evenson, R, E. 2001. Economic impact of agricultural research and extension. Elsevier, North-Holland.

[11]. Feder, G., A. Willett and W. Zijp. 1999. Agricultural extension-generic challenges and some ingredients for solutions. Working Paper, The World Bank, Washington D.C.

[12]. Glendenning, C. J., S. Babu and K. Asenso-Okyere. 2010. Review of agricultural extension in india: are farmers' information needs being met? IFPRI Discussion Paper 01048, Eastern and Southern Africa Regional Office, International Food Policy Research Institute, Washington, D.C.

[13]. Hanyani-Mlambo, B. T. Strengthening the pluralistic agricultural extension system: a Zimbabwean case study, Zimbabwe: Agricultural Research Council (ARC), 2002

[14]. Haq, A. Z. M. 2013. The impact of agricultural extension contact on crop income in Bangladesh. Bangladesh J. Agril. Res. 38(2): 321-334.

[15]. Haque, J. T. 2010. Agrarian Transition and Livelihoods of the Rural Poor (Draft version). Available online at: www.unnayan.org.

[16]. Heemskerk, W. and K. Davis. 2012. Pluralistic extension systems. In: The World Bank (ed.). Agricultural Innovation Systems: An Investment Source Book, The World Bank, Washington D.C.

[17]. Hossain, M. G., A. K. Azad and Akter, N. (Eds.). 2014. National agricultural extension systems in SAARC countries: an analysis of the system diversity. A Technical Synthesis Report, SAARC Agriculture Centre (SAC), Dhaka

[18]. IAPP. 2013. Baseline household survey report. Development Impact Evaluation (DIME) & Global Agriculture and Food Security Program (GAFSP). Available online at www.gafspfund.org/.../Bangladesh%20IAPP%20Baseline%20Report%20..

[19]. Jiam, W. M. H. and M. Hossain. 2011. Women's participation in agriculture in Bangladesh 1988-2008: changes and determinants. Paper presented in the pre conference event on "Dynamics of Rural Livelihoods and Poverty in South Asia" , Asian Society of Agricultural Economists (ASAE), October 12, Hanoi, Vietnam.

[20]. NAEP. 1996. New agricultural extension policy. Ministry of Agriculture, People's Republic of Bangladesh. Available online at: https://agricultureandfarming.wordpress.com/.../dae-department-of-agric..

[21]. Okorley, E. L., D. Gray and J. Reid. 2010. Towards a cross-Sector pluralistic agricultural extension system in decentralized policy context: a Ghanaian case study. Journal of Sustainable Development in Africa. 12(4): 1-10.

[22]. Owens, T., J. Hoddinott and B. Kinsey. 2003. The impact of agricultural extension on farm production in resettlement areas of Zimbabwe. Economic Development and Cultural Change. 51(2): 337-357.

[23]. Qamar, M. K. 2005. Modernizing national agricultural extension systems: a practical guide for policy-makers of developing countries. Sustainable Development Department, FAO, Rome.

[24]. Spielman, D., K. Davis, M. Negash and G. Ayele. 2011. Rural innovation systems and networks: findings from a study of Ethiopian smallholders. Agriculture and Human Values. 28(2):195–212. http://dx.doi.org/10.1007/s10460-010-9273-y

[25]. Swanson, B. E. 2008. Global review of good agricultural extension and advisory service practices. FAO, Rome.

[26]. Swanson, B. and M. Samy. 2002. Developing an extension partnership among public, private and non-governmental organizations. Journal of International Agricultural and Extension Education. 9(1).