技術・職業教育学研究室　研究報告 —技術教育学の探求—
Bulletin of Institute of Vocational and Technical Education
No. 5　October 2008

Agricultural Extension Services In Bangladesh: A Review Study

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Agricultural Extension Service aims to educate the people of farming community in order to improve their quality of life through dissemination of knowledge, technologies, techniques, methods, ideas and useful information through extension system. It assists farm people, through educational process, in improving farm production methods and techniques, increasing production efficiency and income, improving their levels of living and lifting the social and educational standard of rural life. Agricultural extension services, which encompass public and private sectors, NGOs, research and academic institutions and also the farmers, are the main forces in the processes of technology transfer. The information usually flows from researchers to extension agents and from extension agents to farmers in one direction, and from farmers to extension agents and then to the researchers, in the other direction. As such, agricultural extension services, which are almost now more than one hundred years old, have become the most real life information system for technology transfer (Qamar, 1999). Technology transfer system has two streams. One flow from farms or farmers (production sites) to the research stations through extension activity and the other from research stations to the farmers through the extension activity (Haga, 1999).

The above concept of extension is most commonly in vogue throughout the developing and developed countries. Especially in the countries where information technology is not yet well developed, the role of extension workers is very vital to implement the programs of extension. Agricultural extension activities in less developed countries mostly centered on the performance of the field extension workers. As a result the governments of these countries emphasize more on human resource development and improvement of the organizational management through policy guidelines and law. The appendix tables 8 to 12 vide appendices 6 to 10 provide some global information about the number of extension organizations, methods of extension works being followed and the number of extension workers serving in the public sectors.

The services of an extension worker are very vital and significant. He needs to have basic education in agriculture, needs field experiences in conducting extension activities, needs to acquire latest technical information from the research stations, must have extension program in his front and also must be supported by the government policy and laws. Without these elements an extension worker cannot become successful in performing his job effectively and efficiently.

Although overall agricultural extension encompasses the development of crops, livestock, fishery, environment and forestry, separate policies on fisheries, livestock, as well as environment and forestry have already been formulated by the respective ministries. In this perspective, Ministry of Agriculture

has formulated this policy document in order to provide proper guidelines for various development activities relating to crops, which is the largest sector of agriculture. As expected, policies related to crop production and marketing together with minor irrigation, seeds, fertilizers and agricultural credit got prominence in the document. Since crop sector plays the major role in Bangladesh agriculture and gets the top most importance in various agriculture related programmes of the government, this policy document for the development of crop sector is, therefore, titled as the National Agriculture Policy.

In Bangladesh, it is possible to reduce rural poverty and raise the living standard of

common people by establishing agriculture as a profitable sector. It is, therefore, necessary to reorganize and develop the agricultural production system into a more dynamic and commercially profitable sector. In this context, the primary goal of the National Agriculture Policy is to modernize and diversify the crop sector, in other words the entire agricultural system, through initiation and implementation of a well-organized and well- coordinated development plan.

Objectives of the study

i. to state the origin of agricultural extension
ii. to describe the four generations of agricultural extension in Asia
iii. to describe the four paradigms of agricultural extension in Bangladesh
iv. to describe the agricultural extension system in Bangladesh
v. to describe the agricultural research system in extension service in Bangladesh
vi. to describe the agricultural education in extension service in Bangladesh
vii. to find out the problems of agricultural extension services in Bangladesh

Methodology

According to the objectives of the study, the authors consulted the different books, journals, newspapers *etc.* related to the present topic and searching the internet also to collect the information. The authors also discussed with the personnel who are working in agricultural extension organizations in Bangladesh.

Description of the Study

Origins of agricultural extension

Men and women have been growing crops and raising livestock for approximately 10,000 years. Throughout this period, farmers have continually adapted their technology, assessed the results, and shared what they have learned with other members of the community. Most of this communication has taken the form of verbal explanations and practical demonstrations, but some information took a more durable form as soon as systems of writing were developed. Details of agricultural practices have been found in records from ancient Egypt, Mesopotamia and China going back more than 3,000 years.

It is not known where or when the first extension activities took place. It is known, however, that Chinese officials were creating agricultural policies, documenting practical knowledge, and disseminating advice to farmers at least 2,000 years ago. For example, in approximately 800 BC, the minister responsible for agriculture under one of the Zhou dynasty emperors organized the teaching of crop rotation and drainage to farmers. The minister also leased equipment to farmers, built grain stores and supplied free food during times of famine.

The birth of the modern extension service has been attributed to events that took place in Ireland in the middle of the 19th century. Between 1845-51 the Irish potato crop was destroyed by fungal diseases and a severe famine occurred. The British Government arranged for 'practical instructors' to travel to rural areas and teach small farmer how to cultivate alternative crops. This scheme attracted the attention of government officials in Germany, who organized their own system of traveling instructors. By the end of the 19th century, the idea had spread to Denmark, Netherlands, Italy, and France.

The term 'university extension' was first used by the Universities of Cambridge and Oxford in 1867 to describe teaching activities that extended the work of the institution beyond the campus. Most of these early activities were not, however, related to agriculture. It was not until the beginning of the 20th century, when colleges in the United States started conducting demonstrations at agricultural shows and giving lectures to farmer's clubs, that the term 'extension service' was applied to the type of work that we now recognize by that name.

In the United States, the Hatch Act of 1887 established a system of agricultural experiment stations in conjunction with each state's land-grant university, and the Smith-Lever Act of 1914 created a system of cooperative extension to be operated by those universities in order to inform people about current developments in agriculture, home economics, and related subjects.

Four generations of extension in Asia

The development of extension services in modern Asia has differed from country to country. Despite the variations, it is possible to identify a general sequence of four periods or 'generations':

- Colonial agriculture: Experimental stations were established in many Asian countries by the colonial powers. The focus of attention was usually on export crops such as rubber, tea, cotton and sugar. Technical advice was provided to plantation managers and large landowners. Assistance to small farmers who grew subsistence crops was rare, except in times of crisis.

- Diverse top-down extension: After independence, commodity-based extension services emerged from the remnants of the colonial system, with production targets established as part of five-year development plans. In addition, various schemes were initiated to meet the needs of small farmers, with support from foreign donors.

- Unified top-down extension: During the 1970's and '80's, the Training and Visit system (T&V) was introduced by the World Bank. Existing organizations were merged into a single national service. Regular messages were delivered to groups of farmers, promoting the adoption of 'green revolution' technologies.

- Diverse bottom-up extension: When World Bank funding came to an end, the T&V system collapsed in many countries, leaving behind a patchwork of programmes and projects funded from various other sources. The decline of central planning, combined with a growing concern for sustainability and equity, has resulted in participatory methods gradually replacing top-down approaches.

The fourth generation is well established in some countries, while it has only just begun in other places. While it seems likely that participatory approaches will continue to spread in the next few years, it is impossible to predict the long-term future of extension. Compared to 20 years ago, agricultural extension now receives considerably less support from donor agencies. Among academics working in this field, some have recently argued that agricultural extension *needs to be reinvented as a professional practice.*[14] Other authors have abandoned the idea of extension as a distinct concept, and prefer to think in terms of 'knowledge systems' in which farmers are seen as experts rather than adopters.

Four paradigms of agricultural extension

Any particular extension system can be described both in terms of both *how* communication takes place and *why* it takes place. It is not the case that paternalistic systems are always persuasive, nor is it the case that participatory projects are necessarily educational. Instead there are four possible combinations, each of which represents a different extension paradigm, as follows:

Technology Transfer (persuasive+paternalistic). This paradigm was prevalent in colonial times, and reappeared in the 1970's and 1980's when the Training and Visit system was established across Asia. Technology transfer involves a top-down approach that delivers specific recommendations to farmers about the practices they should adopt.

Advisory work (persuasive+participatory). This paradigm can be seen today where government organisations or private consulting companies respond to farmers enquiries with technical prescriptions. It also takes the form of projects managed by donor agencies and NGOs that use participatory approaches to promote pre-determined packages of technology.

Human Resource Development (educational+paternalistic). This paradigm dominated the earliest days of extension in Europe and North America, when universities gave training to rural people who were too poor to attend full-time courses. It continues today in the outreach activities of colleges around the world. Top-down teaching methods are employed, but students are expected to make their own decisions about how to use the knowledge they acquire.

Facilitation for empowerment (educational+participatory). This paradigm involves methods such as experiential learning and farmer-to-farmer exchanges. Knowledge is gained through interactive processes and the participants are encouraged to make their own decisions. The best know examples in Asia are projects that use Farmer Field Schools (FFS) or participatory technology development (PTD).

Agricultural Extension System in Bangladesh

The Department of Agriculture Extension(DAE) is responsible for carrying out extension activities at the grassroots level under the supervision of MOA. The DAE carries its activities in the field level with the help of its different wings. DAE is mainly responsible for:

To motivate and help farmers adopt improved production practices to increase their productivity, meet national consumption requirements, maximize export and minimize import.

To provide farmers with the latest results of research and farm techniques for their socioeconomic betterment.

To help develop self reliance and cooperation by training local leadership for organized group action.

To 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.

To 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.

To 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.

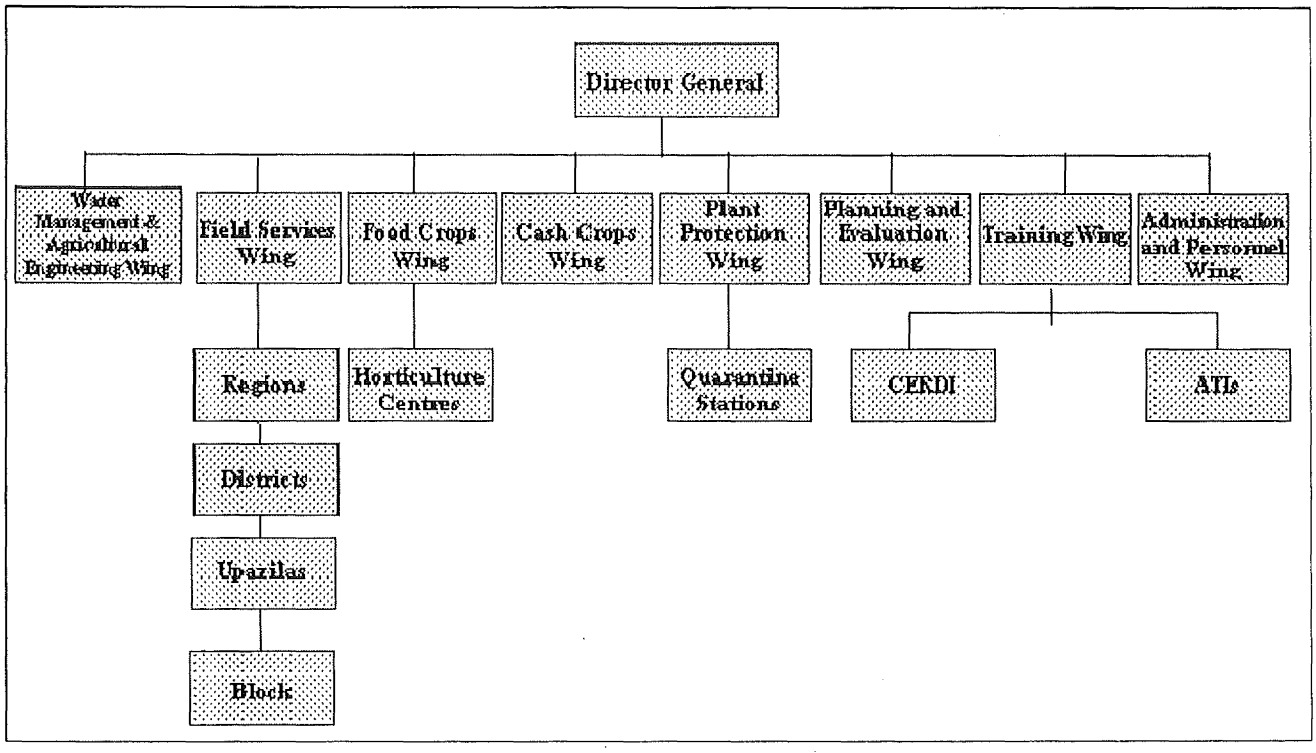

Fig.: Organizational Structure of DAE

The contribution of extension services under the supervision of MOA are reflected in the increased use of chemical fertilizer, increased recommended soil tillage, plant protection measures, use of improved/HYV seeds, irrigation practices, seed preservation practices, post harvest handling process and compost making/green maturing, among the farmers.

New Agricultural Extension Policy (NAEP)

Goal of NAEP:

To encourage the various partners and agencies within the national agricultural extension system to provide efficient and effective services which complement and reinforce each other, in an effort to increase the efficiency and productivity of agriculture in Bangladesh.

NAEP Principles:

1. Extension Support to all Categories of Farmer

All members, male and female, of all types of rural households are entitled to extension services.

2. Efficient Extension Services

Cost- effective services, provided by well-trained, highly skilled extension agents, must be provided to solve farmers, problems. Cost effectiveness will be enhanced by co-operation between extension providers.

3. Decentralization

As agricultural conditions and farmers information needs vary from place to place, extension programmes must be decided locally.

4. Demand-led Extension

Farmers problems, needs and demands will set the extension agenda. Issues requiring attention will be identified jointly by farmers and extension staff using participatory techniques.

5. Working with Groups of all Kinds

Working with groups offers the opportunity for more cost-effective use of limited extension resources, improved sharing of information, and the opportunity for grassroots decision making and participation.

6. Strengthened Extension-Research Linkage

Extension and research agencies con not function separately. There must be free flow of information between extension and research to deliver on effective service to farmers.

7. Training of Extension Personnel

All extension agents need to be confident of their ability to solve farmers problems, work together with all types of clients and collaborate with other agencies or individuals. Training is essential for this purpose.

8. Appropriate Extension Methodology

No single extension method is suitable for all extension activities. Extension agents can use farm visits, mass media, training, demonstrations, group meetings, farmer field schools and many other methods.

9. Integrated Extension Support to Farmers

Advice and information provided to farmers must take integrated farming systems perspective. Extension agencies with differing expertise must collaborate if they are to provide whole farm advice.

10. Co-ordinated Extension Activities

Co-ordination underlines all components of the NAEP. Extension services provided by different agencies must be coordinated at all levels in order to optimise the use of resources. This can be achieved by sharing information and expertise between the agencies involved.

11. Integrated Environmental Support

The NAEP supports extension programmes seeking to encourage farmers to apply sustainable and environmentally friendly agricultural practices. Efforts should be made to support and learn from farmers as well as from the formal research system.

Research-Extension Linkage

A close working relationship between research and extension is vital in providing high quality agricultural services to farmers. To support the Revised Extension Approach (REA), DAE maintain close links with research organisations. The key components of the system for research-extension linkage in Bangladesh are:

a) The National Agricultural Technical Co-ordination Committee (NATCC);

b) The Research Institute Co-ordination Committee (RICC);

c) Research Institute Planning Meetings:

d) The Agricultural Technical Committee (ATC);

e) Research-Extension Workshops; and

f) On-Farm Research.

National Agricultural Technical Co-ordination Committee (NATCC)

The NATCC is headed by the Chairman, Bangladesh Agricultural Research Council (BARC) and comprises representatives of all research and extension agencies at national level. The member secretary is the Additional Director (Monitoring), Field Services Wing, DAE. The NATCC meets as and when required, but at least once each season. The role of the NATCC is to :

a) ensure close working relations between research and extension;

b) review and recommend for implementation technologies evolved by research institutes;

c) support, monitor and evaluate the impact of extension services and on-farm research results;

d) direct research institutes towards conducting research on issues related to FINA results;

e) review, co-ordinate and guide ATCs.

Research Institute Co-ordination Committee (RICC)

The Research Institute Co-ordination Committee is responsible for maintaining national links between research and extension. It is flexible, meeting as required by the emergence of particular needs or problems that require a collaborative research/extension effort. Membership is equally flexible. The Director General, Department of Agricultural Extension, convenes RICC. DAE and BARC are the core institutions represented on RICC but each meeting will have a specific subject focus and that extension or research institutes with a particular interest are invited to attend.

Research Planning Meetings

Each member institute of the National Agricultural Research System (NARS) conducts planning meetings and workshops each year. DAE staff attends each of these planning workshops and meetings to promote farmer responsive research, share results of Farmers' Information Needs Assessment (FINA), and gain a clear understanding of the main research activities to be implemented in the next season programmes.

Agricultural Technical Committee (ATC)

This is the first formal forum between extension and research staff. The ATC meets four times each year, once before each cropping season, and once to review annual extension plans. The Additional Director of the region, is responsible for:

a) reviewing the technical content of extension plans to ensure the diffusion of the most appropriate technologies;

b) reviewing the content of extension plans to ensure that technologies listed are environmentally friendly;

c) reviewing farm level problems which could not be solved at district level, and recommending research programmes where necessary;

d) making arrangements for research-extension workshops between District Specialists and Senior Scientific Officers (SSOs).

Research programmes which are proposed by the ATC are submitted to research Institutes Headquarters for approval, often through the NATCC. Districts have been grouped together to form ATCs according to Agro-Ecological Zones (AEZ) and their proximity to research stations.

Research-Extension Workshops

Research-extension workshops at regional level provide an opportunity for research staff to become familiar with extension programmes and farm level constraints, and an opportunity for extension staff to become familiar with current research. These workshops last for one day, and are held at research stations. The main participants are District Specialists from DAE and Senior Scientific Officers (SSO) from research institutes.

Part of the workshop comprises a tour of the research institute, the enable extension staff to see in practice the type of research being conducted. Practical hands on sessions are arranged by SSOs so that District Specialists become familiar with emerging technologies. The other part of the workshop consists of DAE explaining their local extension programmes, how the respond to farmers needs, and which farm level problems they are unable to resolve. The output of these workshops includes ideas that might be included in extension plans, and research topics that might be included in research programmes.

On-Farm Research

On-farm research is conducted primarily be the on-Farm Research Division (OFRD) of the Bangladesh Agricultural Research Institute (BARI). On Farm Research sites are mainly concerned with: generating technologies which are locally relevant and viable; developing and testing technologies on farms; and testing technologies which have been developed by research or other organizations on farms. On farm research programs are drawn up in consultation between research and extension staff, with the participation of farmers. In addition to OFRD sites there are also 72 Multi Location Test (MLT) sites. Research conducted at these sites is primarily concerned with verifying new or adapted technologies, which have already been tested.

Agricultural Extension Officers and District Specialists participate in the planning, monitoring and evaluation of on-farm research, and work closely with BARI Field Assistants and selected farmers. Results of on-farm research are discussed at ATC meetings with a view to developing future programs or including results in extension plans.

Finally, DAE is committed to work with other stakeholders (like NGOs, GOs and Private sectors) for effective and efficient extension services. So that, farming problems and prospect can holistically handled.

Agriculture Research System in Bangladesh

The National Agricultural Research System (NARS) of Bangladesh consists of ten research institutes under the umbrella of Bangladesh Agricultural Research Council (BARC). Out of ten research institutes six belongs to Ministry of Agriculture (MOA), two to Ministry of Fisheries and Livestock (MOFL) one to Ministry of Commerce, and one to the Forest and Environment Ministry. In addition the NARS also comprises universities that have casual working relationship with BARC and other related organizations. The ten research Institutes under the NARS are:

(a) Bangladesh Rice Research Institute (BRRI)

(b) Bangladesh Agricultural Research Institute (BARI)

(c) Bangladesh Jute Research Institute (BJRI)

(d) Bangladesh Institute of Nuclear Agriculture (BINA)

(e) Bangladesh Livestock Research Institute (BLRI)

(f) Bangladesh Fisheries Research Institute (BFRI)

(g) Bangladesh Sugarcane Research Institute (BSRI)

(h) Bangladesh Tea Research Institute (BTRI)

(i) Bangladesh Forest Research Institute (BFRI)

(j) Soil Resources Development Institute (SRDI)

The Bangladesh Agricultural Research Council (BARC) is the apex body of the NARS. The Council serves as the national coordinating organization for planning, integration, and implementation of research on crops, livestock, soil, water, crop protection, agricultural engineering, forestry, fisheries, economics and social science. BARC also identifies problem areas in agriculture and prepares national plans for agricultural research within the framework of national policies and development goals. The Council collaborates with international and national research center to ensure a rapid introduction, evaluation and use of improved agricultural technologies. BARC is responsible for planning, developing and upgrading of manpower base of the NARS.

The component research institutes have their own ordinances and separate mandates. They are governed by their separate management boards. The role of the institutes is defined by their respective ordinances. They are responsible for the task of generating research programs in their respective fields of activity. All the research institutes have their own network of regional stations, centers and sub-stations throughout the country. These stations undertake research on regional and local basis to cover the 30 agro-ecological zones of the country.

Agricultural Education in Extension Services

Bangladesh University Grants Commission (BUGC) supervising the all universities (Public and Private) in Bangladesh. Basically these are controlled under the ministry of education. Among those universities there are some universities who are providing higher agricultural education for extension services enlisted in below:

a) Bangladesh Agricultural University
b) Sher-E- Bangla Agricultural University
c) Bnagabundhu Sheik Muzibur Rahman Agriculture University
d) Hazi Md. Danesh University of Science and Technology
e) Patuakhali Science and Technology University
f) University of Rajshahi
g) Sylhet Agricultural University
h) Chittagong Veterinary and Animal Science University

Besides, there are some Agriculture Training Institutes (ATIs) who are also providing agriculture education for extension services in Bangladesh. These are controlled under the Department of Agricultural Extension (DAE).

Problems of Agricultural Extension services in Bangladesh

Green revolution in 1970s made tremendous contribution in the dissemination of HYVs of rice, wheat and maize along with other input packages around the world, particularly in Asia. During this era Bangladesh also adopted several HYV rice and wheat cultivars with other essentials technology packages as irrigation, mineral fertilizers and chemical pesticides. With the introduction of modern varieties of rice the productivity has increased manifold. During the past three decades the agricultural production has increased from 10 million tons to 20 million~ or more. But this production level is half of the potential harvest. The present increase in production is due to the adoption of HYV rice (55% of the harvested rice area) along with-age technology. But further intensification is likely to add pressure on land, soil, water, environment: and other essential resources. At this point the extension agencies, both GOs and NGOs have a great role to play, which is not so easy. By now many new problems have already came up. These are loss of soil fertility, low organic matter content (more than 60% possess below 1.5%) in the soil, low level of nitrogen in almost all soil types, deficiencies in P,Z. S, B and other micro nutrients, lowering of under ground water level (might has caused arsenic problem), nutrient• imbalance, environmental hazards, eradication of indigenous technologies and cultivars. The erosion of genetic resources is an important problem in the country. In early 1960s there were. More than 8500 cultivars of rice, which has now been reduced to only a few dozens. In addition, flood and drought are common in the country. To combat all these problems DAE, although claims to have a lot of field level , rivers, but in reality it is much below the requirement, unless the modern information technologies are applied by all the GOs and NGOs at the field level for the development of agriculture. Present extension services seem to be poorly organized in meeting the needs of the challenges ahead, keeping in view the constraints and resource scarcity. Moreover, the interface between and among extension, research and education remains a critical area of concern to increase the efficiency of extension services. The DAE and other extension agencies including NGOs also lack linkages with the educational institutions, specifically with Agricultural Universities and Colleges. Monitoring and evaluation system has not been effectively developed in the extension system over the past decades. The similar problems of extension in case of livestock and fisheries are also visible in Bangladesh.

One of the serious problems to conduct agricultural extension work in Bangladesh is the presence of several Ministries, who are directly 'Involved to assist the farmers without much cooperation with the Ministry of Agriculture. This creates management problem and confuse the

farmers, NGOs, donor agencies and even the front line extension workers belonging to different Ministries. The absence of functional and active participation of local government is also a big problem in the extension system of the country. The role of local government could facilitate to a great extent in the management process of agricultural extension and development activities, if it could be-involved by enacting laws.

However, there are some specific problems of extension work in Bangladesh which are mentioned in below:

a) Lack of definite criteria for group formation of farmers
b) Unavailability of the Sub Assistant Agricultural Officers (SAAOs)
c) Inefficiency of the Sub Assistant Agricultural Officers (SAAOs)
d) Inadequate Provision for giving Reward to Devote Worker and Given Punishment to Negligent Worker
e) Administrative Weakness
f) Insufficient cooperation and coordination among different agencies
g) Technological shortcomings
h) Inability to provide advice to farmers on the marketing of produces
i) Socio-political barriers
j) Lack of active village-based cooperatives and farmers' organizations
k) Lack of public commitment

Conclusions

Agricultural extension services dealings with extension work, education and research. Therefore, there is triangular form among them where, education creates the skilled manpower and these skilled man power employed in research institutes. Therefore, research institutes generated the technologies and these technologies adopted by the farmers at their field through extension work. In Bangladesh, to adopt innovation (technology perceived by the farmers as new), there are some government and non-government organizations are working through their own mechanisms. Among those organizations, Department of Agricultural Extension (DAE) is pioneer and largest organization to do the extension work. To provide the skilled man power for extension services, there are some higher educational institutes in Bangladesh. Among those, Bangladesh Agricultural University (BAU) is the largest educational institutes for generating the skilled man power in extension services. To generate the valuable research out puts, there are some research institutes in Bangladesh. Among those, Bangladesh Agricultural Research Institute (BARI) is the largest one. So, education, research and extension are combinedly provide extension service in developing the agriculture in Bangladesh. To provide extension services the authority faced some constraints however, to overcome these constraints; we can improve our extension services in Bangladesh.

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