

Meeting the Food Security Challenge through GO-NGO Partnership: Is it Realistic?

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Abstract

Bangladesh, being a disaster-prone economy facing food availability problem frequently. There exists a wide gap in between the production potential and farmers' productivity level in almost all the production environments. Due to unfavourable land-man ratio, the possibility of horizontal expansion has already been exhausted. Therefore, enhancement in productivity should come through vertical augmentation of the productivity through minimizing yield gap. Reaching proven technologies to the end-users are often delayed causing delay in harnessing the potentials of the technologies developed by the research institutions. This can be accelerated through GO-NGO partnership in an effective manner. Such partnership could ensure food security even under climate changed phenomenon. The research institutions may provide the NGO's with the latest technologies for enhancing food production along with proper training to disseminate those to the end-users. Recent experience of BRAC in rehabilitation of the cyclone Sidr victims suggest that NGO's can demonstrate those technologies in the farmers' field along with proper credit support for technology adoption and for enhancing productivity. The technology users would be able to use appropriate input in time through the much needed financial support, which is lacking in the present technology dissemination and delivery system. The GO-NGO partnership approach is expected to augment productivity per unit of time, per unit of land and water resources that will eventually lead to ensure food security for the expanding population of the country.

Key Words: Food security, partnership, GO-NGO

Introduction

The greatest challenge that Bangladesh had to face after independence was the supply of food for its growing population. Ensuring food security for all is one of the major challenges in Bangladesh today. At the same breath, production and availability of crops/foods through proper utilization of the limited land resource base in order to meeting the demand is also a great challenge for Bangladesh. Despite the impressive achievements in food grains production during the last decades, food security at farm households and individual levels remains a major concern for the government. (Shakila *et al.* (2008).

However, frequent occurrence of devastating floods, droughts, cyclones have caused slower agricultural growth which in turn forced the resource poor farmers to become out migrants to the urban areas. Enhancement in productivity requires technology development and proper dissemination to the end users for rapid adoption. Although public sector-research institutes are responsible for developing the much needed production technologies, exploitation of its potentiality highly depends on timely dissemination and proper adoption. Transfer of technologies and diversification and intensification of crop

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production programs through appropriate extension services are of crucial importance to Bangladesh agriculture. (Khan *et. al.* 1999).

Since research extension linkages of the public sector are governed by some strict and formal regulations, very logically technology dissemination process is delayed in the public sector. It is always argued that much longer time is needed to reach new technologies to the end users (from research stations) and therefore, such dissemination system is regarded as a slow technology delivery system. It is not desirable for achieving food security in a land scarce economy like Bangladesh. However, in

most cases the regulations of the NGOs are flexible and can be adopted quickly if it is advantageous for the organization and for their beneficiaries. The extension providers of the NGO sector can directly contact with the researchers and take out the mature technologies for demonstration/validation, which is not possible for an extension provider of the government sector. Therefore, strengthening of public-private interface for quick and effective dissemination of developed technologies at the door step of the end users is utmost necessary, which would eventually help rapid adoption of modern technologies and enhance productivity level.

Agricultural Technology Generation

The public sector i.e., the government organizations (GO) are mostly responsible for the development/generation of agricultural technologies. Among them, the Bangladesh Agricultural Research Institute (BARI) is mandated to develop all agricultural crop related technologies except rice, jute and sugarcane. While the Bangladesh Rice Research Institute (BRRI) is mandated to develop high yielding varieties (HYV) of rice and its production technologies. The Bangladesh Jute Research Institute (BJRI) and the Sugarcane Research and Training Institute (SRTI) are responsible for the development of improved varieties and production technologies of jute and sugarcane. The Bangladesh Fisheries Research Institute (BFRI) is mandated to develop improved fish species and their production technologies. Bangladesh Institute of Nuclear Agriculture (BINA) is another public research organization also responsible for the development of improved rice and non-rice crop varieties

and their production technologies. The Bangladesh Livestock Research Institute (BLRI) is responsible for the development of improve breeds of livestock. These institutions have both national and international linkages to carry out research activities and operated under the leadership of Bangladesh Agricultural Research Council (BARC), the apex body of the public research organizations in Bangladesh. Besides, there are some agricultural universities do research and develop improved crop and their production technologies. These organizations are not mandated to disseminate agricultural technologies; they do it in a limited scale as part of adaptive research and/or technology validation processes.

In Bangladesh, the non-government organizations (NGO) and the private sectors are generally the users/disseminators, not the generators of agricultural technologies. Yet, a few NGOs like BRAC do research for development of improved crop varieties and associated technologies.

Agricultural Technology Dissemination

Like the technology generation, its dissemination is mostly handled by the public sector. The main agencies responsible for dissemination of improved agricultural technologies are (a) the Department of Agriculture Extension (DAE), (b) the Department of Fisheries (DOF) and (c) the Directorate of Livestock Services (DLS). Some NGOs, as part of different project activities, do participate in dissemination of agricultural technologies. BRAC being the largest NGO in the world do regularly participate in dissemination of agricultural technologies through its Agriculture and Food Security Programme in order to complement the efforts of the government's food security campaign.

Mechanism of technology dissemination

The mechanism of technology dissemination is very simple and straight forward. The research agencies provide training to the extension personnel on the technologies and production packages of the newly developed technologies. The extension personnel also participate in the adaptive research in the final stage of technology validation in the farmers' field. Thus, they learn about the new and improved technologies. The extension personnel usually take newly developed technologies from the research agencies and set-out demonstration in the farmers' field, organize field days for the neighbouring farmers and for other clients for familiarization of the technologies. The extension providers also organize training for the farmers on the production packages of the newly developed and improved technologies. Thus agricultural technologies spread out and adopted by the farmers. The above process works for the government organizations.

The NGOs working in the agriculture sector harness improved technologies from the research agencies, sometimes from the government extension providers and organize training for their employees for dissemination among the beneficiaries for improving their livelihoods and income. The research agencies also provide training of the NGO extension providers as part of their GO-NGO collaboration in a limited scale for dissemination of agricultural technologies.

Advantages and disadvantages of technology dissemination by GO and NGO

Research-extension linkages of the public sector are governed by some strict rules and regulations. The linkages are established between two agencies, not among the personnel. Thus technology dissemination is delayed in the public sector. It was observed that 2-5 years time is needed to reach new technologies to the farmers' field (from research stations). Such dissemination system is regarded as a slow technology delivery system. It is not desirable for achieving food security in a country like Bangladesh where land-man ratio is very low and the land resources are diminishing at the rate of 1% per year and population is increasing at the rate of 1.4% per year.

While the rules and regulations of the NGOs are flexible and can be changed/adopted quickly if it is advantageous for the organization and for their beneficiaries. The extension providers in the NGO sectors can directly talk to the researchers and take out the mature technologies for demonstration, which is not possible for an extension provider in the government sector.

BRAC Approach and Experience in Technology Dissemination

BRAC is the largest NGO in the world working in almost all the development sectors including agriculture. It has responded to almost all the crises occurred in Bangladesh. Very recently, BRAC has worked and has been working in livelihoods restoration/improvement of the victims of cyclone SIDR and AILA along with eradicating the adverse effects of monga. Besides, it has taken-up a gigantic task of improving the livelihoods of the share croppers of Bangladesh. In all cases, BRAC has been providing both technical and financial supports to the beneficiaries either in the form of grants or through its normal credit mechanism.

Rehabilitation of the cyclone SIDR victims through agricultural intervention

On 15 November 2007, cyclone SIDR hit Bangladesh that caused extensive damage to properties including standing crops. More than 647,775 ha of cropland were reportedly damaged. The main crop damaged was rice. Unlike other regions of Bangladesh, the affected area has a single harvest during November/December. Thus the timing of the cyclone was particularly harmful, in that many of the crops were ready for harvest. Against this backdrop, a post-SIDR livelihoods rehabilitation programme was undertaken by BRAC with the financial support from the European Union (EU). The overall objective of the action was to contribute to the socio-economic stability in the cyclone SIDR affected areas of Southern Bangladesh, thus effectively linking relief, rehabilitation and development. The specific objective was rehabilitation of livelihoods of the SIDR victims of Southern Bangladesh. The livelihoods rehabilitation programme was divided into (a) agriculture-based

livelihoods rehabilitation, and (b) non-agriculture-based rehabilitation programme. Agriculture-based livelihoods included provision of rice, maize, vegetable and betel leaf inputs; replacement of lost cow, goat, fishing boat and net, lost nursery, homestead plantation and provision of fodder seed for fodder cultivation (BRAC 2010). BRAC has provided cash grants to buy different inputs and has also provided training for its judicious utilization for higher productivity and income.

The traditional practice of the farmers of SIDR affected coastal regions of the country was to grow traditional rice in the Aman season. Some farmers used to cultivate pulses in Rabi and rice in Aus season. They used to practice traditional agriculture. Cyclone SIDR destroyed their assets along with agricultural seeds, mostly rice seed. Crisis not only destroyed property, it also creates opportunities for technological intervention. Under this situation, BRAC came forward with packages of financial and technological interventions to restore the livelihoods of the SIDR victims of southern Bangladesh. They have introduced, for the first time, hybrid rice in both Boro and Aus season; hybrid maize and sunflower in Rabi season and different types of hybrid and open pollinated vegetables those were grown by mostly the women farmers throughout the year. The farmers have lost their livestock during cyclone SIDR. As a result shortage of draft power for land tillage emerged as one of the main constraints to crop production. BRAC has developed local entrepreneurs for providing land preparation and irrigation services of the farmers through its normal micro-credit program.

Table 1 Target and achievement of different livelihoods rehabilitation components for the Sidr victims of southern Bangladesh, June 2008-November 2009.

Rehabilitation components	Units of measurement	Target	Achievement	Beneficiaries reached (no)
Rice	Acre	70,000	70,098	119,340
Maize	Acre	17,500	17,529	31,973
Vegetable	Acre	32,000	32,294	196,220
Betel leaf	Bigha	3,000	3,000	5,197
Goat	No	4,000	4,000	2,000
Cow	No	16,000	16,000	16,000
Livestock fodder seed	Kg	37,320	47,982	34,844
Fishing boat and net	No	2,550	2,550	2,550
Tree nursery	No	2,000	2,000	2,000
Homestead plantation	Family	200,000	200,023	200,023

As a result of the interventions, a total of 70,098 acres of land came under both hybrid and high yielding varieties (HYV) of rice production (Table 1). Hybrid rice was grown in Aus, Aman and Boro seasons at different locations of the coastal regions of Bangladesh, yield of which varied from 6.0 to 8.0 t/ha (Mondal *et al.* 2010a). The hybrid rice introduced in Aus season, for the first time, performed well (yielded 6.0 t/ha) in the coastal region that generated enormous impact on the farming communities and among the extension providers as well. Since most of the coastal rice lands remain fallow in Aus season, introduction of hybrid rice may render significant impact in achieving food security from inside the country. Socioconsult (2010) estimated that about 0.2 million tons of paddy was produced in the SIDR affected areas of the country. At the price of Tk. 10,888/ton, the value of the output so produced stands at Tk. 2,137 million. The total assistance to rice crop was Tk. 323 million. This gives a benefit-cost ratio of 6.6:1 (Table 2). On the other hand, a total of 17,529 acres of land has been brought under maize cultivation

through the intervention. As a result about 38,564 tons of maize was produced. At the prevailing price of Tk. 14,154/ton, the value of this output comes to Tk. 546 million. When pitted against the amount spent on maize, the benefit-cost ratio is estimated at 6.3:1. Besides, 32,294 acres of land came under vegetables production and the benefit cost-ratio as calculated by Socioconsult (2010) was 73.5:1. (Socioconsult 2010) concluded that, by and large, BRAC's interventions paved ways for food security through augmentation of supply of food grains in the SIDR affected areas of the country.

Technology adoption and changes in economic conditions: For cereal crops, BRAC has adopted block demonstration approach emphasizing farmers own crop management practices for sustainability of the intervention (BRAC 2010). They have invited neighbouring farmers (both male and female), local leader, public representatives, local elites and government officials during crop cutting sessions. Vegetables were cultivated in blocks in the field and in homestead areas of the SIDR

victims, who have no land other than homestead. Field days were also organized in similar manner followed in cereal crops for technology dissemination and wider adoption of high-valued and nutrition-rich vegetable crops. The intervention not only

increased food availability and farm income, it also created impact on technology adoption among the farming communities, both the participatory and non-participatory farmers.

Table 2 Benefit-cost ratio for crops grown in Barisal region.

Crop	Area covered (ac)	Yield (md/ac)	Total production (ton)	Price (Tk/ton)	Total value (mill Tk)	Total grant (mill Tk)	Benefit-cost ratio
Rice	70,098	70	196,274	10,888	2,137	323	6.6:1
Maize	17,529	55	38,564	14,154	546	87	6.3:1
Vegetables	32,294	367	474,076	20,000	9,482	129	73.5:1

Socioconsult (2010) conducted a sample survey to document the improvement of the economic status of the beneficiaries of the BRAC-EU project. Survey results showed that most of the respondents reported an improvement in their socio-economic conditions during the post-grant period (Table 3). For example, while 69% of the responding households reported improvement in their economic condition following the BRAC-EU intervention, 28% revealed that it improved highly. Again among the responding households, 25% cited an improvement in accessing food, while 31% realized improvements in terms of accumulation of assets.

Socioconsult (2010) reported that about 36% of the responding households found their knowledge increased following the link with the livelihood rehabilitation project (Table 3). This could be due to constant contacts with BRAC field level workers who spread new ideas to them such as adoption of hybrid rice, use of optimal and balance doses of fertilizer, integrated pest management, artificial insemination of cow etc. Again, about 32% of households witnessed an improvement in terms of

education of children. Thus, by and large, it showed that as a result of the access to grant, a larger proportion of the recipients perceived improvements in socio-economic conditions. Most importantly, the acquisition of knowledge and new ideas and accumulation of assets would serve as the motor for their sustainable improvements in socio-economic conditions.

Household food availability: A field survey was conducted by a Socioconsult (2010) to assess the food availability at the household level of the SIDR victims. They have asked the respondents about the number of months when they can eat well or take three satisfactory meals a day. This is an important question as far as interventions are concerned. They have observed that there has been a significant improvement on this count between the pre- and the post-SIDR periods (Table 4). For example, about 55% of the households reported to have had three satisfactory meals throughout the year in the pre-SIDR period. The proportion has risen to 70% in the post-SIDR period when interventions were injected. Specifically, only 10% of the

households in Charfession used to have three meals a day before intervention while about one-third can now eat well throughout the year. Again, 6% of households in Charfession used to meet three satisfactory meals a day for five months in the pre-SIDR

period. The share has come down to almost half with the access to the interventions. By and large, reportedly, households performed well in terms of satisfactory meals in the post-SIDR period.

Table 3 Degree of improvements in socio-economic condition of the SIDR victims.

Components	Highly improved	Improved	Same	Deteriorated	No answer
Economic condition	28.2	40.9	8.4	0.5	22.5
Social status	2.9	20.7	43.5	0.3	32.6
Knowledge	9.3	27.1	31.2	0.0	32.3
Education	3.7	28.3	35.1	0.2	32.8
Health and nutrition	2.3	14.2	51.1	0.2	32.2
Housing	5.1	20.1	43.0	0.6	31.2
Dresses	2.3	17.8	45.5	0.2	33.5
Assets	9.3	21.7	35.2	0.2	33.5
Food	3.5	21.6	34.9	0.2	39.8

Table 4 Months of good meals

Location	12 months		5 months		7 months	
	Post-Sidr	Pre-Sidr	Post-Sidr	Pre-Sidr	Post-Sidr	Pre-Sidr
Charfession (Bhola)	32.6	10.1	3.1	6.2	4.5	6.9
Morelgonj (Bagerhat)	45.5	21.9	2.4	5.7	3.3	8.9
Pirojpur Sadar (Pirojpur)	90.8	78.5	0.0	0.0	0.0	0.0
Amtoli (Barguna)	84.9	77.4	0.0	0.0	0.0	0.0
Kalapara (Patuakhali)	93.5	80.4	2.9	0.7	0.0	0.0
Average	70.0	54.5	1.7	2.6	3.1	1.5

BRAC's agriculture credit and technology dissemination

BRAC has been implementing two mega-projects for improving food availability, livelihoods and farm income of the sharecroppers all over the country, and the farmers affected cyclone SIDR and AILA. Both the projects are operated under credit program of the organization. The sharecroppers' project is financed by the Bangladesh Bank (BB) and the cyclone victim's project is financed by the Islamic

Development Bank (IDB). BRAC charges soft interest in sharecroppers' project jointly agreed by the BB and BRAC and cyclone victims' project in interest-free as agreed by IDB and BRAC. In both the projects, credit is given to the beneficiaries following normal micro-credit procedures, except the collection of loan money. The loan money, in this case, is collected monthly (not weekly) installment synchronizing with the crop harvest, when ability of the farmers or beneficiaries to pay back money is high.

BRAC has reached more than 135,000 sharecroppers and 40,000 cyclone victims through these projects. In both the projects, agricultural development officers are deployed to identify the needs of the beneficiaries, develop training materials and provide training for judicious utilization of their resources (land, water and money) for higher productivity and farm income. Through the projects BRAC has been disseminating improved high yielding and hybrid crops and their production technologies such as balanced and timely application of fertilizer, adoption of water saving technologies for boro rice cultivation and pest control using IPM techniques in order to improve food production and increased farm income. The sharecroppers and cyclone affected farmers are provided with the recently developed submergence tolerance rice in flood-prone areas, salt tolerant rice in coastal areas and short duration HYV rice (e.g. BRRI dhan33) in munga-prone areas of the country to accommodate a potato crop in between two rice crops. Rice-potato-rice is not only a profitable cropping pattern, it generates employment during the munga period (Mondal *et al.* 2010b).

BRAC formed village organizations (VO) to provide any kind of financial support including micro-credit. The beneficiary farmers were given loan to buy necessary inputs and provided with hands-on training to effectively utilize those inputs. It was observed that the farmers were able to harvest more than their neighbours who were not included in BRAC programme. They are happily repaying their loan installment seeing the harvest that they have never achieved. The agricultural development officers regularly visit the VOs and help the members (either sharecroppers or cyclone victims) to develop year-round cropping pattern for his/her land and suggests use of improved production technologies for improving their livelihoods.

Limited credit support for agricultural technology dissemination is an unique approach adopted by BRAC seems appropriate and sustainable for achieving household's food security, especially organizing the sharecroppers (constitute more than 45% of the farmers) who are neglected and are not included in any form of credit programme operated by both in the GO and NGO sectors.

BRRI Experience in Technology Dissemination

BRRI has a strong linkage with the DAE for dissemination of rice related technologies. BRRI and DAE organized research-extension workshop once in every two years, where the promising technologies are discussed by the scientists. The DAE personnel thus get the latest rice technologies and later on develop their dissemination strategies among the farming communities. The DAE set-out demonstration in the farmers' field for wider dissemination of the technologies developed by BRRI. They also provide

feedback about the performance of the technologies in the farmers' field as well as farmers' reaction in adopting those technologies. This process takes 2-5 years to reach the technologies to the farmers' field after its generation.

For dissemination of improved rice seeds, BRRI provides breeder seeds to the Bangladesh Agricultural Development Corporation (BADC). They usually multiply those seeds and use to sell those among the farmers. Since BADC has limited seed production and marketing

facilities, its dissemination goes in a slow pace. In the recent years, BRRI has developed relations with the NGOs and private sectors to disseminate some of the specific technologies like dissemination of the improved varieties of rice seed. The NGO and private sectors have also limited

capacities, but their production capacity and marketing channels are more efficient than the public sectors. As a result, seed technology dissemination went much faster in the private than the public sector, especially dissemination of newly developed rice varieties developed by BRRI.

Advantages of Public-Private Partnership

It is recognized that public-private partnership is useful in technology dissemination and productivity improvement in agriculture. Some of the important features of PPP are highlighted below:

- a. Policy liberalization for NGOs and private sectors to have access to formal input delivery system,
- b. Production area and outlets of NGOs and private sectors at grass root level and doorsteps to farmers,

- c. Scope to work with marginal and resource poor farmers at local level through local NGOs,
- d. Locally demand driven technology/variety may be chosen for demonstration and/or multiplications,
- e. Popularizing the location specific and newly developed technologies among the end users.

Concluding Remarks

Bangladesh agriculture has recovered from the shock of the 2007/08 food crisis but the high rate of inflation remains a key issue. Global increases in wheat prices have several implications for Bangladesh. The long-term view is that the price of staples will not return to a lower level. Stocks of staples are likely to remain low, agricultural land decreasing by 1% per year in the country, and the population increasing at 1.4% per annum. As a consequence, Bangladesh imports a significant portion of its rice needs. Some rice exporting countries have shown reluctance to allow rice exports under the present conditions. Given BRAC's ease of access to farmers through its many branches, they can extend improved crop varieties and management practices to farmers nationwide to complement the efforts of government in attaining national food security. It was

observed that BRAC has made and has been making significant contribution in achieving household's food security through financial support from the Bangladesh Bank, European Union and Islamic Development Bank and technical supports from BRRI, BARI, the International Rice Research Institute (IRRI), CIMMYT (International Wheat and Maize Research Centre), CIP (International Potato Centre) and different seed companies both at home and in abroad. Therefore, GO-NGO partnership seems realistic in achieving food security from inside the country. What we need to do further? The government sectors should provide more and continuous technological support to the NGOs that they rendered for the public extension agencies in order to achieve food security under the threat of climate change and expanded population growth of Bangladesh.

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