Transforming Roles of Public Extension to Strengthen Innovation: Lessons from Bangladesh

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Abstract

The rapidly evolving nature of agricultural innovation processes in developing countries requires agricultural extension to make necessary transformations of classical roles that previously supported linear knowledge circulation and adoption. New ways of conducting extension activities are emerging that involve facilitation of interactive communication among multiple stakeholders and a wide range of intermediation tasks within (and between) stakeholders operating in different social spheres. Drawing on lessons from an agricultural extension for development project in Bangladesh we examine whether and how the public-sector agricultural extension agency has transformed its roles in order to strengthen agricultural innovaion as an outcome of effective functioning of innovation systems and collective actions. The findings suggest that agricultural extension projects miss the opportunity to deliver extension services as collective and systemic functions. We argue that this is due to institutions that curb the agricultural innovation system function within the linear paradigm of technology transfer, under-estimation and depreciation of intermediary roles of extension personnel (e.g. brokering, negotiating, convening), and inability to foresee 'extension methods (e.g. training, demonstration)' as facilitation of learning and knowledge embedding processes.

1. Introduction

Agricultural extension services are often credited with enhancing food security, alleviating poverty and improving livelihoods in Asia and Africa (Van den Ban & Samanta, 2006). Currently, the rapidly changing agricultural development milieu is confronting numerous challenges of social, economic and environmental performance, and growing concerns about the collaborative learning and knowledge management process.

New insights from agricultural innovation studies have urged policy makers and rural development professionals to adopt different ways of performing agricultural extension services (World Bank, 2012). In effect, Agricultural Innovation System (AIS), is promulgated to undertake reforms in the knowledge and innovation support structures. Many countries have taken initiatives to transform roles of the agricultural extension to support innovation as a collective process of putting knowledge into practice, and achieving multi-stakeholder social, economic and environmental goals. However, public-sector extension agencies and extension workers are finding it ambiguous while translating their roles from the system perspective (Rivera & Sulaiman, 2009).

The extant knowledge of how the public-sector extension in Bangladesh is re-defining its roles for strengthening agricultural innovation, is scant and anecdotal. This implies that more empirical research is needed to understand the capacity challenges of public-sector extension as an instrument for innovation. Using a case study from Bangladesh, this paper examines how changes to extension services have been difficult, especially for public sector organizations, which are often struggling to retain any existing competencies while navigating the bigger structural shifts occurring within the innovation system that are bringing new players and rules to the field of extension (Sulaiman & Hall, 2005).

2. Literature review

The existing currency of the innovation systems framework has been developed through decades of intellectual debates, and featured relatively recently within agricultural sciences and rural development studies (Pant & Hambly Odame, 2009). In this development context, agricultural innovation does not turn out in a one-dimensional, linear knowledge circulation and adoption process of research-extension-farmer configurations, but rather, it depends on learning and meaning creation among multiple stakeholders (farmers, inputs and processing industry actors, agricultural traders, retailers,

policymakers, consumers and NGOs), networks and reconfiguration of socio-cognitive elements such as perception, rules, agreements, identities and relationships (Leeuwis & Van den Ban, 2004).

Unlike agricultural extension for development of 1990s, the AIS framework regards 'institutional innovations' as a cornerstone of development in low-income countries (World Bank, 2006; Hounkonnou *et al.*, 2012). Formal institutions (legislation, procedure, and policy) and informal institutions (norms, values and practices) not only enable or constrain interaction and learning of innovation actors but also are influenced by the prevailing social systems (Klerkx *et al.*, 2011). Culturally defined norms, historically determined institutional development, national and international priorities and policies mould abilities of the stakeholders to share knowledge, the validity of specific knowledge, accountability and performance of research and extension services. Then, if we want to ensure AIS work, we have to search for ways to make necessary adaptations to accommodate the existing shortcomings of the prevailing institutional environment. This implies challenging top-down and hierarchical approaches as well as changing routines and practices to ensure learning between one-to-one, one-to-many, and many-to-many innovation actors (Hall *et al.*, 2004), and developing facilitation and brokering roles (Rivera & Sulaiman, 2009).

We know from the history and evidence of agricultural extension in low-income countries that organizational routines and institutional practices are not easily changed (Rivera & Sulaiman, 2009; Hounkonnou *et al.*, 2012). Institutional change needs to be on-going adaptations taking into account of social and experiential learning by individuals, organizations and networks as a core development strategy. This is quite distinct from being achieved through one-off events, for instance, conventional training and workshops (Kibwika *et al.*, 2009). However, the public-sector extension agencies confront challenges of fostering innovation capacity - the ability to make use of suitable advisory approaches and methods (e.g. extension training, group-based learning, demonstration etc.) while building and sustaining relationship among producers: between producers, and users of knowledge; between scientist and policy makers in the specific socio-political context (Hall, 2005; Birner *et al.*, 2006).

3. Case and research methods

We followed a case study which is a flexible approach for empirical inquiry that helps to conduct in-depth investigation of a contemporary phenomenon within its real-life context; when the boundaries between phenomenon and context are not clearly evident, and in which multiple sources of evidence or techniques of data generation can be adopted (Yin, 1984, p, 23). In this study, the case is the multi-stakeholder institutional arrangements (group mobilization & extension training) of **North-west Crop Diversification Project (NCDP):** for strengthening market-oriented agricultural and rural development innovation in Bangladesh between 2001 and 2006.

Bangladesh has a strong public service extension system that is built on its legacy of T&V (Hassanullah, 2002). The decentralization of extension system was introduced as wider initiatives of decentralized public administration and effective governance recommended by international donor agencies in 1990s. The Department of Agricultural Extension (DAE), the largest public-service extension agency, with the financial assistance of the Asian Development Bank (ADB) implemented a multi-actor partnership project (i.e. NCDP) between 2001 and 2008. The goal of the project is to enhance capacity of smallholders for production of high value crops (HVCs) in 16 north-west districts, where majority of farmers are smallholders living on the edge of poverty.

Organizing smallholder groups is the entry point of the institutional arrangement of NCDP. After being organized in groups, smallholders' capacity for innovation has to be enhanced through various social mobilization activities (e.g. developing plans, networking, and entrepreneurship), and social and technical trainings (e.g. farmers training, extension events, discussion in group meetings). In regular group meetings (weekly/fortnightly), NGO partners were responsible for facilitation of discussion about group values, norms, project supports, credit facilities, technological options etc. Four Non-Governmental Organizations (NGOs) including Bangladesh Rural Advancement committee (BRAC), PROSHIKA Manobik Unnayan Kendro, were partnered in this project to organize and coach group members for social mobilization and micro-credit support. DAE was responsible for implementing farmers' training and extension events. Several public-sector organizations such as, Department of Agricultural Marketing (DAM) and Local Government Engineering Development (LGED), Bangladesh Agricultural Research Institute (BARI), and Rajshahi Krishi Unnayan Bank (RAKUB) were supposed to implement market development, adaptive research, and agribusiness credit line components of the project respectively.

In Bangladesh, field research was conducted between August and December, 2006 in Bogra – a north-western district located about 220 km away from the capital Dhaka. Data collection processes started with a review of secondary sources (reports, manuals, brochures and magazines) in order to get initial insights about the project and its background of development. In the exploratory and qualitative phase, the study involved key informant interview with 36 respondents and informal interview with 30 participants who were project partners, farmer group members, and relevant institutional actors (e.g. nursery owners, input dealers, commission agents). General and participant observations of several events, such as two monitoring and evaluation workshops at national and sub-district level, three farmers' training, four farmers' group meetings were conducted. A focus group discussion was conducted where group members, DAE and NGO field officer participated. At the final stage, a farmers' survey was conducted with 30 randomly selected farmer group members in Sherpur, Bogra.

Data was collected by the first author with the help of two trained data enumerators. Except survey, all interviews and discussions were recorded on a digital voice recorder, which were transcribed into English. The transcribed data was analyzed manually by the first author from the perspectives of qualitative research techniques (Miles & Huberman, 1994). A combination of inductive and deductive coding approaches were followed. A preliminary coding scheme was developed that contained a list of concepts and themes related to institutional and organizational challenges to strengthen innovation in the context of the case of this study. As the coding progressed, additions were made into lists and similar codes were grouped under pre-defined themes and concepts followed by searching connections between the codes. Survey data was analyzed using descriptive statistics. This served as a cross-check of some of the findings of the exploratory and qualitative phase.

4. Findings

Facilitation of market-oriented agricultural and rural development innovation process is a new task for public-sector extension services in Bangladesh.. This process can be tremendously challenging and we will discuss several dimensions of this situation encountered in Bangladesh.

4.1 Challenges for setting-up innovation contour and forging agreement

Preparation of agricultural and rural development innovation involves activities such as, preliminary stakeholder analysis, solicitation of stakeholders' ideas, exploring capacity for innovation, forging agreements and identifying broad areas and boundaries of interaction and intervention. In the Bangladeshi case, the preparation process leaped over ground situations, farmers' expectations, and concerns of relevant institutional actors. We identified five indications of this. First, there was early delay in preparatory stage of the project. The donor agency, (i.e. ADB) set the requirement of a strong monitoring and supervision of the development programs in Bangladesh (ADB, 2001). In getting financial assistance for agricultural development projects, a pre-condition was to form a technical assistance team in consultation with the ADB. The donor did not disburse funds until 2002 due to failure in fulfillment of the requirement of forming a Technical Advisory (TA) team for NCDP. Nine international and 16 domestic consultants comprised the TA team. Second, the crops and technologies were selected based mainly on expert consultation rather than on rigorous need assessment steps. Several ex-ante factors such as profitability, market demand, agro-ecological suitability, were considered in selecting crops. The project was started without a comprehensive need analysis study. Third, the geographical coverage of the project had been determined based on ease of physical access, administrative monitoring and organizational brokering rather than potentials of HVCs cultivation. Fourth, partner organizations were selected considering their mandate in public services and relevance to different components of this project. For instance, DAM, BARI, LGED are relatively large public institutions who had been criticized for their bureaucratic attitudes and performance in interactive agricultural development policy implementation and service delivery (Majumder & Shivakoti, 2001). On the other hand, NGO partners were selected mainly on the basis of their experience with micro-credit sector, scale of operations and budgetary capabilities. In our understanding, project partners should be selected considering their innovative spirits, commitments, and ability to deal uncertainties, emergent ideas in agricultural innovation process. A small number of big NGOs may be a good choice, to ensure ease of central monitoring and feedback system. However, it is a closed process of stakeholder selection. Fifth, and finally, there was lack of comprehensive process of consultation and agreement with stakeholders about institutional arrangements, project rules and norms at the preparatory stage of the project. Belated appointment of TA team created time-bound pressure to speed up the project. As there was no benchmark study for this project, the TA team

designed the project based on available literature/documents and resources of HVCs production, marketing, processing, credit and agri-business, and then solicited feedback through several regional meetings and the inception workshop. Field officers of DAE, and partner NGOs missed a clear understanding about synergistic functions of the project components and importance of systemic performance. Most, if not all field level staffs, were not aware about functions of different components and institutional arrangement of NCDP as a system.

4.2 Challenges for the management of planning for innovation support

Two seasonal (winter and summer) and an annual planning and review workshops were organized by DAE in every sub-district to operationalize the principles of bottom-up planning processes and provide opportunities to interact relevant stakeholders to ponder the progress and develop proposal for next year. The workshop is supposed to serve as a social space for field officers of DAE, NGO partners, farmers and other partners to engage in a dialogue for learning from the field experience. The workshops focused mainly on training, extension and group development activities. The field extension agent of DAE, is responsible for contacting farmers, conducting need assessment and feed their concern back to the workshops. Two-third of the farmers mentioned that they knew neither about the planning and review workshops nor the needs assessment study. While asked about farmers' participation, extension agents mentioned several reasons related to lack of logistic supports, human resources, institutional motivations and spaces which hindered performing the tasks properly.

There was infrequent participation of DAM, LGED and BARI in planning workshops. Some organizations such as DAM and BARI do not have organizational structure beyond the district level. Respondents from these organizations mentioned physical distance as a barrier for them to participate regularly in this event. Representation of public and private seed sectors was insufficient. Although the project questioned the credibility of the private sectors for providing quality seeds (NCDP, 2003), they are the main sources of seed and planting materials for vegetables, fruits, and spices. Public and private seed sectors (private traders and NGOs) were usually involved by the central project administration for importing seeds and planting materials to be sued in conducting demonstration plots of the project.

Besides missing functional links and commitments of relevant innovation actors, the process was dominated by the staff of DAE, and constrained by conflicts of norms and conservative maintenance of status-quo roles. NGO partners expressed their dissatisfaction since their ideas, and suggestions were often not considered and appreciated by the staff of DAE. While mobilizing smallholder groups, the stakeholders were engaged in disputes over several issues of group selection and credit norms. We will discuss these in the next section. Farmers expressed their dissatisfaction for not getting their views in place and getting an effective feedback from the facilitators of DAE. The outcomes of the annual plan were the number of crop-wise demonstrations, budget spent for demonstration, number of other extension events, training, number of groups formed and future targets. These were not consistent with innovation products or processes, and certainly not indicative of institutional innovation. Management was more in-line with updating previous plans with some modifications made on the basis of their perception of agronomic factors of the target crops. Reporting omitted evidence of learning such as integration of other components (e.g. market chain, seed sectors, post-harvest processing). In fact, there were strict references to DAE's own boundaries, institutional mandate and culture, and the dominating attitude of facilitators did not provide spaces for partners and relevant institutional actors to assess their roles and contributions in planning and subsequent implementation of the project activities.

4.3 Challenges for the facilitation of group-based extension beyond knowledge transfer

As group mobilization, micro-credit support, farmer training and extension events are intertwined, DAE and NGO partners are supposed to work in close collaboration. But at the early stage of group formation, DAE and NGO partners did not reach an agreement for a set of joint work principles, strategy or schedule. Working in a public organization, field workers of DAE were reluctant to change their own work styles and agenda. NGO partners started forming the groups without consulting DAE. When they submitted the group lists, DAE did not approve these for mainly two reasons - (i) delay in getting donor funds, and (ii) non-compliance of group criteria. NGO partners perceived credit management as an entry point for group mobilization, and therefore, they also included members of their own micro-credit groups who were mainly landless. According to the project, eligible group members should have land to cultivate crops. In some instances, DAE also formed groups as they had

to start training, demonstration and other extension events. However, prior consultation and consensus building among members of both DAE and NGO formed groups, was missing in most cases.

In what followed, group mobilization activities were trapped in a series of early nascent mistrusts, conflicting interests, and perceptions. NGO partners preferred farmers who would be able to start paying loans quickly. According to their experience, marginal and landless farmers performed better in credit recovery compared to small farmers. Since these farmers are usually involved in multiple livelihood activities (both on-farm and off-farm) they can start returning loan installments promptly. On other hand, DAE preferred resource-enabled farmers, and emphasized project rules that selected farmers based on ownership of a certain amount of cultivable land. In effect, DAE and NGO partners were involved in contradictory positions such as, non-approval of group, delay in organizing farmers training, denial of DAE staff to include some group members for training, blaming each other for not complying to project rules etc.

Several extension methods such as farmers' training and demonstration, Farmers' Field School (FFS) were identified as ways to enhance smallholder knowledge and skills of different HVCs. Farmers training was named as *'village based training*', after the idea that the events should be conducted at a local club, school or household premises of a group member. This would ease farmers' mobility difficulties, especially for women, and create an informal learning environment. However, DAE decided to conduct the training events in their sub-district training facilities, where some farmers had to travel a long way to attend. The decision was for feasibility of organizing effective training events. However, the study revealed different realities. An one-day training program was structured in four training sessions, of which three sessions were allocated for production and processing of three different crops and one session for marketing and credit management. Training observations indicated that topics were selected randomly based on experience of the extension personnel and agro-ecological factors (e.g. most common crops cultivated in a region, crops grown in a particular season). A comprehensive training need assessment was rarely evident, if not absent. There was also insufficient preparation for organizing training logistics and communicating between trainers and participants. Sub-district officers were very careful to allocate one or two sessions for trainers of district office in the training schedule, even though they had not confirmed the availability of these resource persons. Sometime, when they were informed about unavailability of a trainer for specific training sessions they had to allocate another trainer spontaneously. In the same way, the district officers took the liberty of choosing topics for their training session without following the training plan. This is indicative of strong bureaucratic and hierarchical relationships between district and sub-district extension officers.

Observations indicate that training sessions followed relatively '*instructional*' and '*instrumental*' approaches of passing technical information to the participants. Trainers used training aids such as, folder, booklet, leaflet, and posters. They were less interested to use available visual aids supplied by the project (e.g. printed transparent sheets), collect and use real-life examples (e.g. samples of diseases, fruits, and experiments) and prepare own hand-outs. Although some limitation for logistic supports (e.g. power supply) existed, trainers also did not have necessary motivation for use the materials when availability of logistics was not a limitation. This issue had also been discussed in a national meeting, where the project administrators and stakeholders reported their concerns about necessity of field trainers' motivation and quality of instructions.

By the end of 2005, the project implemented 6,000 demonstrations on varieties and management practices of different crops. The technical packages of the demonstration were developed centrally by the project consultant. Since there was no well-defined guideline for implementation extension agent of DAE used to select farmers for conducting demonstration based on their personal or past work relations and classical perception of innovativeness. These farmers are resources-enabled farmers who are likely to embrace technological packages earlier than others. What might be done in this case of a collective process of innovation, was to select farmers through group consensus, willingness to learn and share, credibility in the local networks, and feedback from partners NGOs who were supposed to closely facilitate the group activities. Extension field officer did not show motivation and interest in managing processes of conflict management and consensus development.

Extension agents emphasized adoption of a technological package. They did not perceive the real meaning of participation and the importance of adaptation and co-production of knowledge and technology in innovation processes. Strong biases of the external professionals (e.g. project planners, and scientist), and change agents towards (product) adoption as well as their lack of understanding of

the principles of participation hindered local creativity and innovation. Moreover, there was lack of necessary follow-up visits and encouragement of fellow farmers to visit the demonstration site. According to farmers surveyed, 17 percent of farmers (n=30) visited demonstrations whereas the project monitoring study reported 15 percent of farmers visited demonstration sites in their area. NGO partners were usually invited to attend the field day, but were not informed and invited to join in organizing demonstrations. The success of demonstrations was assessed on the basis of technological potentials.

Facilitators had less attention on the horizontal exchange of knowledge and learning. For instance, a project study (NCDP, 2006) indicates that out of 1426 beneficiaries only 43 percent reported application of knowledge and skills learnt from the demonstration. This implies that demonstration did not create opportunities for learning. The facilitator assumed an autonomous one-to-one knowledge flows from demonstration farmers instead of enabling learning in farmers' networks.

6. Discussion

6.1 Institutional constraints for articulating demands for innovation and systemic change

The findings show that public-extension agency did not cater for the integration of relevant components and actors by creating mutual understanding and functional interdependence that was necessary for improvement of the project's innovation performance. By referring to self-boundaries, institutional mandate and culture the partners made it difficult to create conceivable and/or practicable roles and contributions in planning innovation supports. The management of the innovation support plan was isolated from the local knowledge networks (e.g. farmers, traders, and input dealers etc.), which have important roles in bringing their synergies to the process. The findings support that 'system' thinking often reinforces in-built connotations of a clear boundary and a common goal, which is difficult to achieve in complex multi-actor processes (Leeuwis & Van den Ban, 2004). A complementary thinking for the facilitator and manager (i.e. DAE in this case) will be to conceive the process as managing and/or forging networks of relationships and capacity that cuts across the individual, organizational and system levels.

The findings provide two key theoretical insights for transforming roles of public-sector agricultural extension into a framework of a well-functioning AIS. First, agricultural innovation projects should be understood in terms of practical stakes and working approaches of organizations and individuals. Changes in individual socio-cognitive domains (e.g. in our case the attitudes of DAE and NGO staffs) are intrinsically linked to the project settings and can be facilitated better by installing necessary feedback mechanisms between what staff actually do in the field and in the organization but not by what they should do (De leener, 2003). Technically sound 'protocols' and 'procedures' (administrative rules and regulations) that stakeholders need to follow enhances job legitimacy but hinder creativity and spontaneity in human relationships. In contrast, a process approach (spaces for flexibility and iteration for learning from mistakes and successes) improves the professional legitimacy (Albaladejo *et al.*, 2007). Second, as change is connected with individual, and/or collective socio-cognitive change of various kinds social learning positively influences necessary changes for agricultural extension institutions (norms and new ways of doing tasks). This implies that social learning is the route to (or subject for) institutional learning (Woodhill, 2002).

6.2 Organizational and competence constraints for facilitation of pluralistic extension and taking up new roles of extension

In order to strengthen innovation extension organizations require to anticipate new and emergent partners and their complimentary contributions. GO-NGO partnership mechanisms have long been legitimized on the grounds that NGOs have more flexible work styles, and agenda for the empowerment and social mobilization. The findings highlight partner NGOs strategies that are less than altruistic - including members of their micro-credit groups, less interest in enhancing group-based capacities through engaged learning sessions, and supporting intermediary functions. Several studies have substantiated similar results that NGOs (especially large NGOs) have moved away from their original goal of social empowerment and governance (accountability) approach towards service-delivery (e.g. micro-credits, seeds etc.) approaches (Moniruzzaman, 2011). The group-based institutions were built on developing complementary perceptions about both tangible and intangible benefits and services. The findings raised questions about facilitation efforts of the extension agency and organizational interests of partner NGOs that were supposed to be complimentary for the group-

based innovation support services. The challenge is for the public-sector extension agency to be clear about the differences between extension as public and private goods, and importance of embracing sustainable partnerships with other stakeholders (e.g. NGOs) in order to empower farmers' group in Bangladesh (Islam *et al.*, 2011).

Overall the key challenge is the availability of necessary and competent human capital for performing innovations tasks that play very important roles in engaging clients and stakeholders for learning about socio-technical configurations of innovations. Traditional methods and ways of conducting extension (instrumental approach) influence directed changes and do not suffice to stimulate changes at different domains and scales. In this case study, extension agents identified their roles more as transferring information, and less as facilitating horizontal and vertical knowledge exchanges among farmers and other innovation actors. This is indicative of the classical role of extension and communication in transferring top-down knowledge and resources for fostering development. The extension staffs require new skills that go beyond their existing technical skills, and include 'soft skills', such as ability to make use of contextual, emotional, relationship, and affective domains. This also implies that extension agents need to use broader media and extension methods and, redefine the role of specific media for purposes of spreading stories, and/or fostering greater resonance of new discourses and conversations (Leeuwis & Aarts, 2011). According to our experience, this will also mean reforming curricula of agricultural education, and training institutes, by including new thinking about innovation and the reform of extension.

7. Concluding Remarks

The findings of this study affirm that the capacity of public-sector extension agency to transform its roles to strengthen market-oriented agricultural and rural development innovation in Bangladesh, is a dismal one. It should be recognized that public extension systems in countries such as Bangladesh will not change overnight into functionally sophisticated innovation systems for agriculture and rural development. In this paper, we identified several challenges of transforming extension roles, which are - i) a tendency to retain existing institution and reluctance to make necessary adaptations; ii) depreciation and omission of facilitating complimentary organizational manadates and incompetence of extension in catering broader intermediary functions (e.g. setting innovation agenda, forging agreements, & bridging relationships); and iii) inability to anticipate 'extension methods' as faciliation of learning and knowledge embedding processes. These areas should be explored further including comparative case analysis as well as possibly revisiting these challenges within a few years as Bangladesh further evolves its agricultural innovation system.

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