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Farming Systems for Improved Nutrition: a Formative Study

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About this paper

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About LANSA

Leveraging Agriculture for Nutrition in South Asia (LANSA) is an international research partnership. LANSA is finding out how agriculture and agri-food systems can be better designed to advance nutrition. LANSA is focused on policies, interventions and strategies that can improve the nutritional status of women and children in South Asia. LANSA is funded by UKaid from the UK government. The views expressed do not necessarily reflect the UK Government's official policies. For more information see www.lansasouthasia.org

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Acronyms

AFSP	The Agriculture and Food Security Programme
BCC	Behaviour Change Communication
BCUP	Borga Chashi Unnayan Prakalpa
BDT	Bangladeshi Taka
ENHA	Essential Nutrition and Hygiene Actions
FAO	Food and Agriculture Organization
FFS	Farmer Field School
HKI	Helen Keller International
HNPP	Health, Nutrition and Population Programme
IPHN	Institute of Public Health Nutrition
IYCF	Infant and Young Child Feeding
MDG	Millennium Development Goal
NGO	Non-Government Organization
PK	Pushti Kormi
SK	Shasthaya Kormi
SS	Shasthya Sebika
UNICEF	The United Nations International Children's Fund
USAID	The United States Agency for International Development
VMF	Village Model Farm
VO	Village Organization
WASH	Water, Sanitation and Hygiene
WB	World Bank
WHO	World Health Organization

Abstract

Introduction

International literature accords immense importance to agriculture interventions in order to achieve better health and nutrition. It stresses the importance of women's engagement, diversified production and consumption, and incorporation of other health and nutrition services into the agriculture extension services. Little is understood how communities perceive these dimensions in building their farming systems for better nutrition, particularly in the context of Bangladesh.

Objective

To understand the perceptions and needs of local farming communities in promoting agriculture for nutrition and how to address their needs, given the existing programmatic framework of a NGO, BRAC in Bangladesh.

Methods

First, a literature review on the existing agriculture-for-nutrition models in Bangladesh was done to understand the principles of promoting agriculture for better nutrition and how the existing agriculture interventions are integrated with nutrition in Bangladesh. Then, an explorative study was conducted over a four-week period in seven upazilas from six districts in Bangladesh. The study areas were selected, purposely considering geographical diversity and the presence of BRAC interventions on agriculture credit and nutrition. Focus group discussions, in-depth interviews with programme personnel and programme beneficiaries were done to collect necessary information. Analysis of the interview notes were facilitated manually by organising the data into a matrix with different themes in alignment with the research objectives.

Results

The principles of designing agriculture-for-nutrition interventions mainly highlight the importance of contextual assessment, coordination of the relevant departments to implement integrated interventions, appropriate targeting and the presence of an enabling policy environment. In addition to the homestead food production model by HKI and the farmer field school model by SPRING, the Bangladesh government provided the example of targeting women and incorporating nutrition education, sanitation and hygiene messages into its agriculture intervention model. Though the agricultural context in the rural areas is quite diverse with huge potential for improving nutrition, the participants in this study do not assess it through a nutrition lens. They engage in farming considering food safety rather than nutrition, but it has intuitively led them to source nutritious foods. The farmers conceptualised nutrition more from the health perspective. They were interested in improving their knowledge on diverse options of delivering interventions in making their farm production more nutrition sensitive as well as in the delivery strategy to make the services effective.

Conclusion

Pilot testing of interventions based on the feedback received from the communities who have been exposed to the principles and experiences of nutrition-sensitive agriculture models is worth considering in defining a feasible model to promote agriculture for better nutrition.

Key Words

Agriculture, nutrition, perceptions, needs and community

1 Introduction

Bangladesh has made substantial progress in achieving MDG targets for reduction in poverty, participation in primary schools, reduction of mortality and improvement in child nutrition. The recent landscape analysis done by WHO placed Bangladesh among the countries with strong nutrition governance in achieving MDG targets (UNSCN 2009). The country has unacceptable levels of maternal and child undernutrition, with 36 per cent of under-five children stunted, 33 per cent underweight, and widespread prevalence of micronutrient deficiencies (icddr,b et al. 2013; NIPORT et al. 2016). The progress was rapid in the 1990s but slowed down during the last decade (NIPORT et al. 2013: NIPORT et al. 2001 and 2005; WB 2005).

Empirical evidence suggests that nutritional improvement needs a cohesive approach, combining both direct and indirect interventions on the same platform, with particular focus on nutrition-sensitive agricultural interventions (Ruel et al. 2013). In Bangladesh, agricultural development strategies in successive Five-Year Plan documents focused on increasing productivity of cereal crops rather than on diversification of crops to make agricultural development nutrition sensitive.

International literature accords immense importance to experimental research on agriculture interventions and innovative farming systems to realise agriculture's potential in improving nutrition (Masset et al. 2011; Ruel et al. 2013). However, the development of intervention strategies, materials and instruments essentially requires examining the perspectives of the communities, their needs and preferences, to ensure their effectiveness. It requires the interventions to be relevant and appropriately designed in the context of specific countries. In the proposition for nutrition-sensitive agriculture, emphasis has to be given to empowerment of women farmers by allowing them to have more control over the household's financial resources, on decision making regarding activity choices including food items to be cooked, and child care (USAID 2011; Herforth 2013). World Bank highlighted three conditions for agriculture to be more pro-nutrition: a) investment on women to provide greater access to year-round availability of high-nutrient content food; b) improvement of nutrition knowledge; and c) incorporation of nutrition objectives and indicators in agriculture investments, strategies and plans (WB 2013). A recent synthesis by Herforth in consultation with professional networks and premising the relevant reports or documents points to 20 principles on how to improve the design for community-based agriculture-for-nutrition services (Herforth 2013).

BRAC has been implementing different forms of interventions to improve food security as well as nutrition in Bangladesh (BRAC-AFSP 2013; Hossain et al. 2014). The projects are large in scale and cover almost all divisions in the country. The Agriculture and Food Security Programme (AFSP) provides partial grants along with credit and extension services to encourage adoption of improved varieties of crops and farm management practices, pond aquaculture and adoption of animal farming by women. BRAC Tenant Farmer Development Project or Borga Chashi Unnayan Prakalpa (BCUP) operates to reach credit and extension services to 3,00,000 small and marginalised farmers who either fully or partially cultivate land owned by others. BRAC Health, Nutrition and Population Programme (HNPP) delivers nutrition messages to vulnerable communities from a health perspective. The health volunteers called Shasthya Sebikas (SSs) deliver the services under

supervision from Shasthaya Kormis (SK) and Pushti Kormis (PK) with frequent household visits and occasional training of wives, husbands and mothers-in-law. It is obvious that there is scope for promoting agricultural interventions for nutrition within the existing framework of BRAC. But these inventions are not integrated.

The primary objective of the study is to understand the perceptions and needs of local farming communities to promote agriculture for nutrition and the way of addressing their needs, given the existing programmatic framework of BRAC. The study specifically intends to:

- Understand the perceptions and practices of the people and communities on agriculture and nutrition
- Identify community and households' needs and demand for services on agriculture interventions for nutrition
- Understand the process of employing front-line service providers (such as SSs and SKs in HNPP) to promote agriculture for nutrition and their integration into the existing BRAC programmes
- Synthesise the findings to define agriculture-for-nutrition intervention strategies to promote diversified farming and improved nutrition

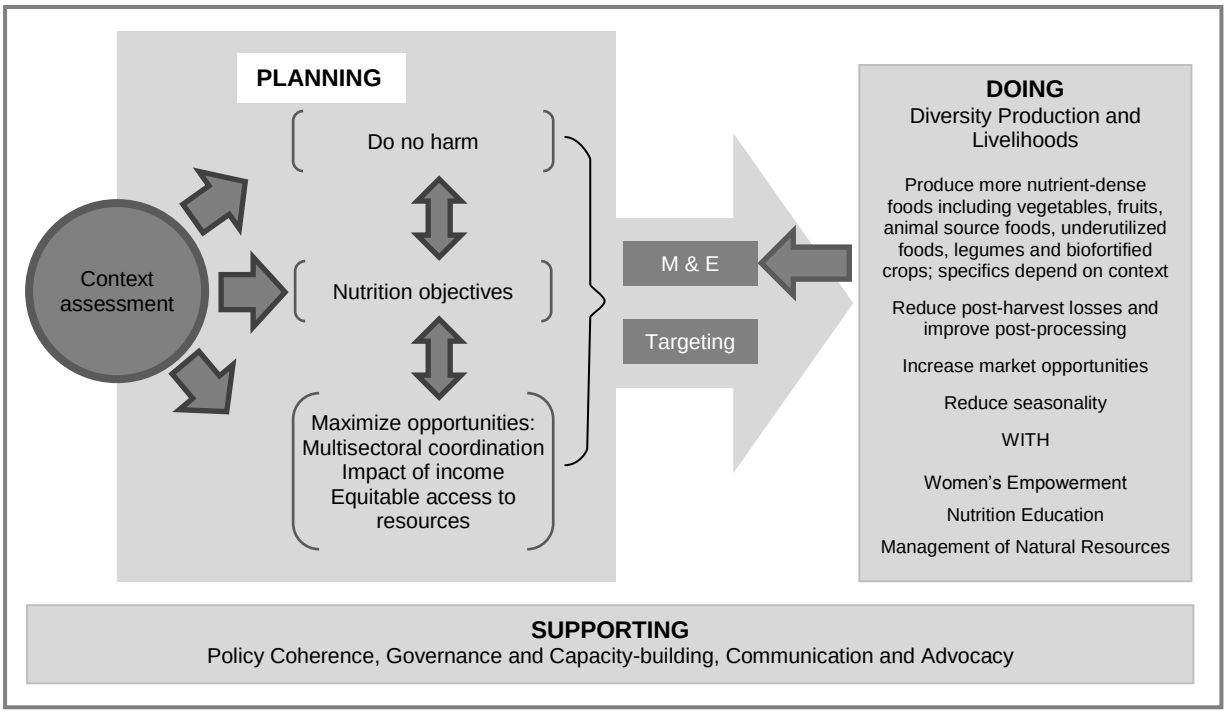
2 Review of Development Interventions on Agriculture for Nutrition

Before proceeding with the study at the community level, a literature review on the existing agriculture-for-nutrition models in Bangladesh was done to understand the principles of promoting agriculture for better nutrition and the way existing agriculture interventions are integrated with nutrition beyond BRAC in Bangladesh. The essence of the findings from the review has been summarized below.

2.1 Principles to design agriculture-for-nutrition interventions

Herforth highlighted 20 principles in consultation with professional networks and 20 guidance documents for community-based agriculture for nutrition services and broadly classified these into three categories: a) planning, b) intervention, and c) capacity enhancement, governance and supportive policies (see Figure 1) (Herforth 2013).

Figure 1 Principles to promote agriculture for nutrition interventions



Source: Herforth 2013

The planning phase emphasises the importance of incorporating explicit nutrition objectives and indicators beyond the traditional production-based models, as well as the need for context assessment. Such an assessment includes nutrition problems, local potentials and barriers in terms of food resources, agro-ecology, seasonality of production and incomes, access to productive resources, gender dynamics and roles, opportunities for collaboration with other sectors or programmes, existing efforts and services, and women's workloads. Appropriate targeting for securing maximum benefits for groups such as women, poor farmers or smallholders, as also coordinated services beyond agriculture such as health, sanitation, and child care and feeding practices are highlighted as fundamentals to be considered at the planning phase.

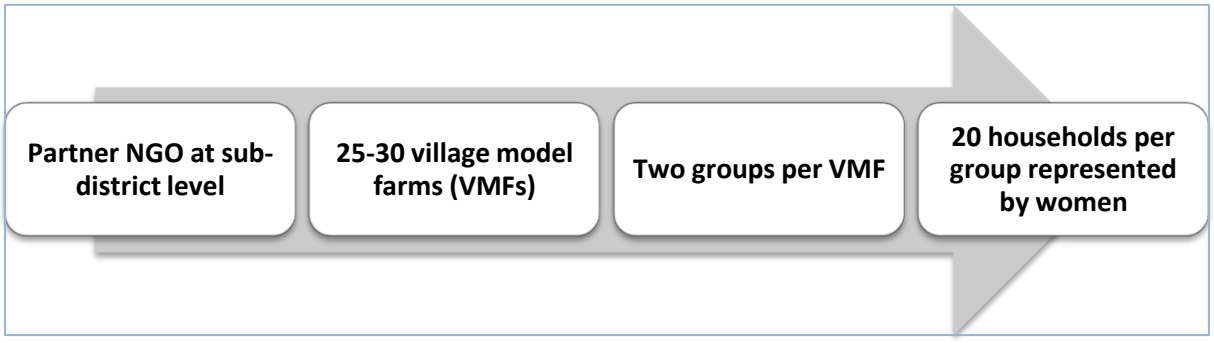
The three principles underscored in the "doing" category are women's empowerment, nutrition education and natural resources management. The importance of incorporation of nutrition education into the agricultural services through developing a set of concise, clear, and actionable messages and strategies based on an understanding of the local context has been stressed. The guidance emphasises facilitating small-scale production, particularly of nutrient-dense crops (such as legumes and leafy vegetables) and livestock and aquaculture. Market opportunities are viewed as a way for producers to increase income, as an incentive to grow nutritious and underutilised foods, and as a way to increase consumers' access to nutritious foods. Importance to improve processing, storage and preservation to retain nutritional value and food safety, to reduce seasonality of food insecurity and post-harvest losses, and to make healthy foods convenient to prepare are also highlighted.

The "supporting" strategies stress the importance of policy coherence, leadership, capacity strengthening at different levels, and translating the results into policy-relevant messages for effective programme and policy changes. Thus, the framework by Herforth 2013 shows that agriculture for nutrition intervention can be made effective if more principles are applied depending on the context (Herforth 2013).

2.2 Homestead food production model of Helen Keller International

The main pro-nutrition agricultural intervention piloted in Bangladesh is the homestead food production (HFP) model of Helen Keller International (HKI) through the intensification of homestead food gardens involving women (Iannotti et al. 2009). The intervention primarily aimed at combating vitamin A deficiency, through increasing consumption of vitamin A-rich vegetables and fruits. Later interventions addressed multiple micronutrient deficiencies through promotion of small animal husbandry. The model covered around 4 per cent of the population across diverse agro-ecological zones (Iannotti et al. 2009). The dimensions in the intervention strategy included: a) nutrition education and behaviour change communication (BCC); b) building on local practices and using existing structures and organisations; c) empowering women; d) fostering income generation; e) strong technical assistance and capacity-building components; and f) supportive monitoring and evaluation activities. In this model, HKI provided services through local NGO partners at the sub-district level where each NGO in turn covered approximately 25 to 30 village model farms (VMFs). Each VMF comprised two mothers' groups, each of 20 households (Figure 2). HKI provided the local NGOs inputs (for example, seeds, seedlings, chicks, etc.) and technical assistance (for example, training on key nutrition messages), which are then conveyed to the communities more directly. Key nutrition messages are usually communicated through education sessions, recipe trials, and social marketing campaigns at group meetings or individual counselling sessions by VMF owners and trained NGO staff.

Figure 2 Organisational structure of HFP



BCC approaches have been included to understand, negotiate and communicate improvements in child-feeding practices among vulnerable groups. The HFP programme was for three years with HKI involvement, followed by another two years with ongoing community support from partner NGOs. In this model, local practices also considered cultivation techniques and varieties; understanding and working with traditional customs; and navigating the cultural barriers and facilitators related to adopting optimal infant and young child feeding and household dietary practices. VMFs also supported access to inputs, technical information and better marketing opportunities.

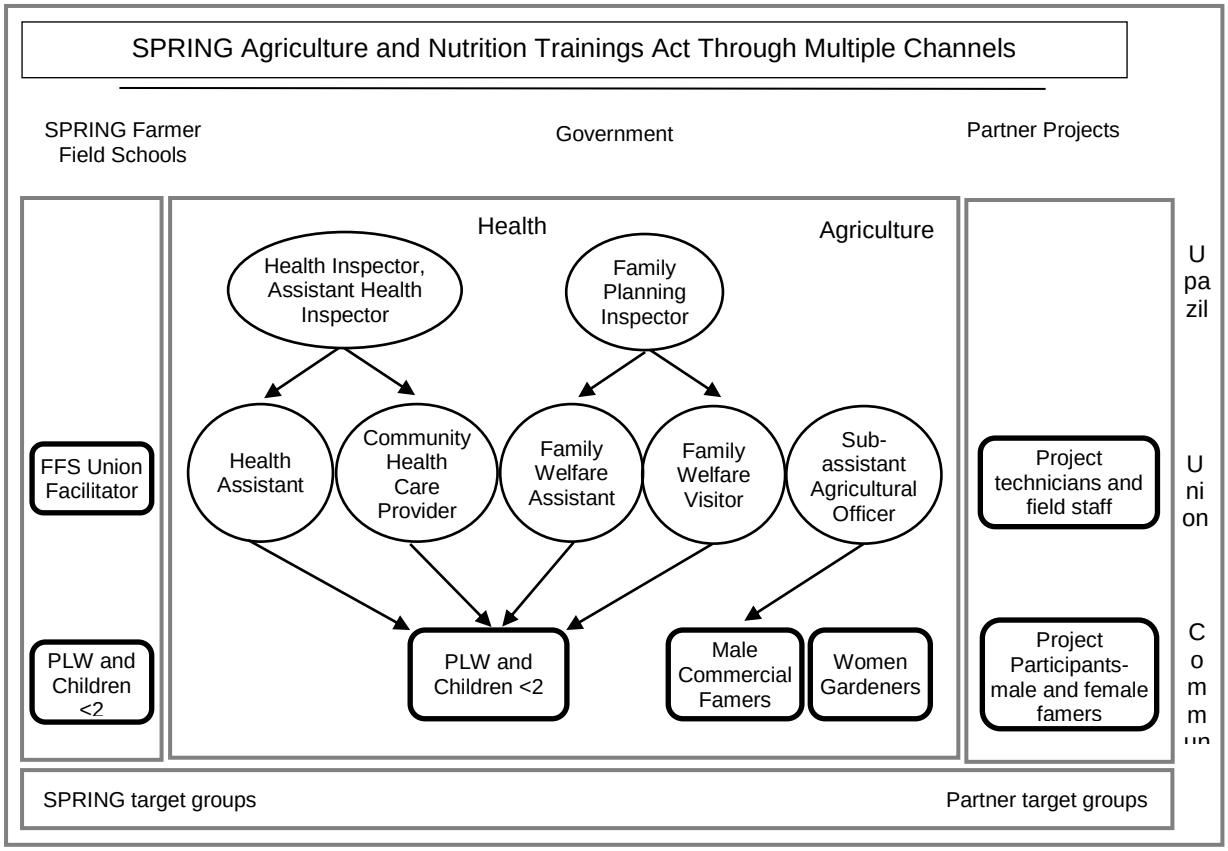
2.3 The integrated horticulture and nutrition development model

The Integrated Horticulture and Nutrition Development Project implemented by the Ministry of Agriculture (MoA) with the Department of Agricultural Extension (DAE) demonstrated and validated the use of food-based strategies to promote food and nutritional security (Bhattacharjee et al. 2007). The main focus was on "training and demonstration" at the horticulture development level to improve production as well as consumption. The project supported the formation of small, relatively homogeneous farmers' groups in the project villages in order to improve the efficiency of the horticultural production system through application of modern technologies and diversified cropping patterns. Nutrition education strategy included promotion of behavioural change related to food intake and feeding of young children. Mass media was involved to convey educational messages on the advantages of incorporating vegetables and fruits in the diet as well as nutritional awareness among various groups such as women (farmers) and schoolchildren. Training tools and materials were developed and tested through participatory education methods with community collaboration to ensure their applicability and effectiveness. The project promoted production of a variety of micronutrient-rich vegetables and fruits such as Indian spinach and stem amaranth, carrot, country beans, red pumpkin, tomato, broccoli, garden peas, okra, onion and green chillies.

2.4 Agriculture-for-nutrition intervention model of SPRING

The USAID-funded project SPRING-Bangladesh (2011-2016) adopted the Farmer Field School (FFS) model in collaboration with the government in Khulna and Barisal districts (Figure 3). Covering poor households with pregnant and lactating women (PLW) and children less than 2 years of age, the project integrated homestead food production with essential nutrition and hygiene actions (ENHA) (SPRING 2014). The FFS model involved three major areas of intervention: homestead gardening, poultry raising and pond aquaculture. Participant farmers living within one km of the learning plot site as also functionally landless households (<50 decimal land) with an income under $U.S. 50.00 per month were selected to receive interventions. They were provided seeds and financial assistance to construct poultry sheds in addition to receiving training. The training materials emphasised homestead food production covering an array of data on agricultural technology. The focus on nutrition and hygiene included a) women's nutrition and dietary diversity, b) exclusive breast feeding, 0-6 months old children, c) hand-washing before handling food and after defecation, d) complementary feeding of children under two, and e) dietary diversity.

Figure 3 SPRING-Bangladesh (2011-2016) project



In addition, the programme delivered nutritional cross-training to government extension agents and facilitators of implementing partners — such as Farmer Nutrition School facilitators, sub-assistant agricultural officers, project partners and community health agents — to promote food utilisation behaviour. The connection between agriculture and nutrition adopted by the SPRING intervention model has been defined as 'Own Production → Food Consumption Pathway'.

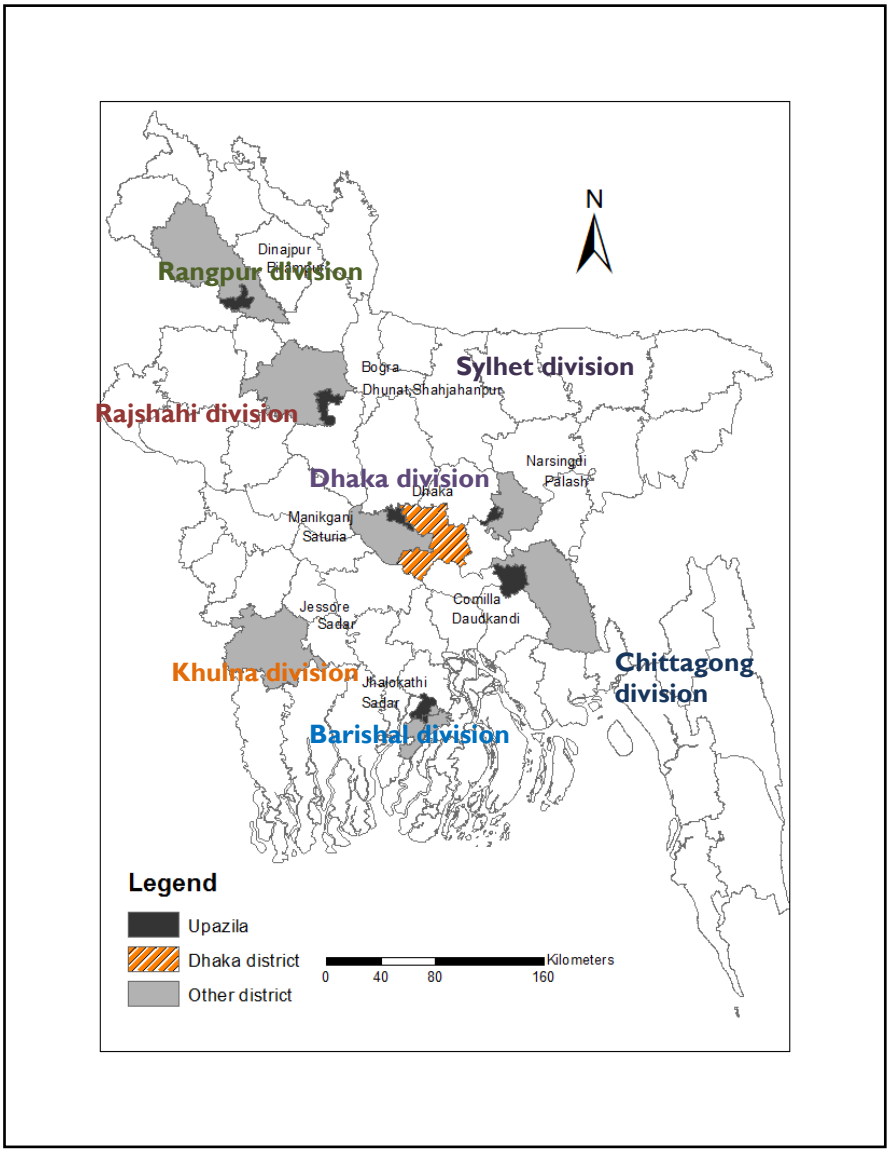
3 Methodology

3.1 Study design and selection of areas

An explorative study was conducted to understand the nutrition-sensitive farming context of the BRAC beneficiaries in Bangladesh, services they receive in relation to farming and nutrition, and their perceptions and unmet needs to promote agriculture for nutrition. To gather the information, 6 districts — Manikganj, Comilla, Dinajpur, Bogra, Jessore and Jhalokati — were selected on purpose, considering their geographical diversity, from 6 divisions of the country (Figure 4). From each district a representative upazila (sub-district) was selected where both BCUP and the BRAC nutrition project have been under operation. A pilot testing was done in Narsingdi, and the data included in the analyses. The main reasons for choosing the households from BCUP and the nutrition programme areas are a) both these programmes are being operated at a larger scale with more

stable platforms in comparison to other agriculture extension programmes, and b) BCUP provides financial support to farm households in the form of agricultural credit that addresses the financial constraint for adoption of input-intensive farming systems.

Figure 4 Location of Study areas



3.2 Study population and sample size

The participants who were enrolled and have been receiving programme services from either BCUP or the BRAC nutrition project, or both, were convened. Over a four-week period (July-Aug, 2014), a total of 12 focus group discussions (FGDs) (9 with female and 3 with male beneficiaries) were conducted in six villages of the six districts to get information from the communities regarding their perceptions, practices and needs on nutrition-sensitive agriculture. A total of 21 in-depth interviews (IDIs) were conducted with the programme personnel at different levels — programme heads/manager of BCUP and the nutrition project, branch/upazila managers of field offices, and front-

line service providers of both programmes — across all the locations including the pilot area (Narsigndi).. The key reason for interviewing the programme personnel was to understand the process of employing front-line service providers (such as SSs and SKs in HNPP) to promote agriculture for nutrition and their integration into the existing BRAC programmes. Further, 3 IDIs with women beneficiaries were done in three distinct areas (Manikganj, Dinajpur and Jessore) to triangulate the information gap if noticed at individual level conversations. Most of the focus group discussions and in-depth interviews at the beneficiary level were conducted with women because they were the main beneficiaries of BCUP and nutrition interventions of BRAC. Further, the researchers observed the study areas to familiarise themselves with crop management practices, production, programme services, delivery mechanisms, etc. The total number of FGDs, IDIs and observations can be seen in Table 1.

Table 1 Study sample sizes

	Head Office	Manikganj	Narsingdi	Comilla	Dinajpur	Bogra	Jessore	Jhalokati	Total
IN-DEPTH INTERVIEW									
Beneficiary									
Women	0	1 (BCUP & Nutrition)	0	0	1 (BCUP)	0	1 (BCUP & Nutrition)	0	**3**
Programme personnel									
PO/SK (Nutrition)	0	0	1 (SK)	1 (PO)	0	1 (PO)	0	1 (PO)	**4**
FO (BCUP)	0	1 (FO)	0	0	1(FO)	0	1(FO)	0	**3**
UM/RM/PH (Nutrition)	1 (PH)	1 (UM)	0	0	1(UM)	0	1 (UM)	0	**4**
BM /SBM /UM/ PH (BCUP)	1 (PH)	0	2 (BM)	1 (SBM)	1 (SBM)	2 (BM)	0	1 (SBM)	**8**
BM/UM/PH (BCUP-ext.)	1 (PH)	0	0	0	0	0	1 (RM)	0	**2**
FOCUS GROUP DISCUSSION (BCUP and NUTRITION)									
Beneficiaries									
Women	0	1	1	1	1	2	1	2	**9**
Men	0	1	0	0	0	0	1	1	**3**
OBSERVATION									
Nutrition and BCUP areas	0	1	1	1	1	1	1	1	**7**
Total	3	6	6	4	6	6	6	5	**43**

***PH represents Programme Head, RM: Regional Manager, UM: Upazila Manager, SBM: Senior Branch Manager, BM: Branch Manager, PO: Programme Organizer, FO: Field Organizer, SK Shyastha Kormi.**

3.3 Data collection procedures

Three pre-tested semi-structured checklists were used in collecting the relevant information: one for FGD with beneficiaries, one for IDI with programme staff and one for observation. Follow-up questions were asked as needed to facilitate the conversations. The checklist contained a range of issues regarding the context, practice, perceptions and demand in relation to nutrition-sensitive agriculture services, in order to understand how effectively agriculture can be promoted for better nutrition. Prompting questions were designed to be conversational, to allow sufficient time for complete responses (Fern 2001). Focus group discussions were conducted by the researchers and facilitated by a moderator.

Prior to the beginning of the interviews and the focus group discussions, a standardised, pre-approved consent paragraph was read to the participants individually and consent was taken verbally as well as written to proceed with the conversation and its audio recording for transcription purposes. Each group contained 10-12 participants. Focus group discussions lasted for about 60 to 90 minutes, depending on the responsiveness of the participants. In-depth interviews with beneficiary and programme people took about 40 to 90 minutes on average.

3.4 Data processing and analysis

Audiotapes were transcribed verbatim by research assistants. The research team coded the transcripts following the predetermined topics (given in Tables 3A and 4A). All coded transcripts were cross checked by the researchers. Analysis of the notes of the interviews and focus group discussions were facilitated manually by organising the data into a matrix according to the topics. The topics (Table 3A) were listed in column headings, and the responses of each interviewee were filled in under the appropriate box. This system facilitated reviewing and examination of the full range of responses with regard to the participants' context, practices, opinions and perceptions on nutrition-sensitive farming. The aim was to make farming practices more nutrition sensitive.

4 Findings

4.1 Background of the participants

A total of 96 women and 39 men receiving services either from BCUP or the nutrition programme or both, participated in FGDs and in-depth conversation sessions. Over half of the participants had children aged either under 5 or under 2. Some reported having grandchildren in these age groups. About 25 per cent (n=34) of the participants were found to be below age 25, 41 per cent (n=56) were in the 26-35 years age group and the remaining participants were over 35 years of age. About one-fourth of the participants (n=34) had no formal schooling, 19 per cent (n=26) had primary schooling up to Grade 4, 8 per cent (n=11) had graduated from primary schools, 38 per cent (n=52) were high school dropouts and 9 per cent (n=12) had completed secondary education.
According to the responses of participants, women were either engaged in homestead farming/kitchen gardening and domestic duties, including cooking food, or both. The husbands' occupation was predominantly traditional agriculture (94 out of 96 participants). The programme

personnel interviewed reported having had 2 to 5 years of involvement with BCUP/ BRAC nutrition project.

4.2 Farming contexts

Almost all the farmers said that they practised farming in their homestead (land around the house) to raise poultry and livestock, cultivation of fruits and vegetables, and aquaculture. However, the type and scope of farming largely depended on the availability of space in the homestead. For instance, households with ponds raised fish. If they had kitchen yards, they went in for kitchen gardening, and with additional space, vegetable and fruit farming was undertaken.

Where space was inadequate in small homestead areas to grow vegetables or other crops, cultivation was in larger meadows. In Dinajpur, farmers mainly talked about rice cultivation due to favourable agro-ecological and climatic conditions. In Comilla, farm households mostly cultivated potato and maize and pulses, besides rice. In Jhalokati, rice and fish farming were found most prominent. As a whole, cultivation of different varieties of rice, vegetables and fruits were common in all areas at the field level (Table 2). Cultivation of different leafy vegetables (pumpkin, bottle gourd, spinach, beans), seasonal fruits like jackfruit, guava, etc., is common practice in the homestead areas. The farmers stated that men usually provided inputs when it is outside the homestead area. They also highlighted that mutual understanding and cohesion between male and female members helped them in doing their work at different stages of farming like seed selection, land preparation, planting, weeding, intercultural operations, harvesting, threshing and marketing. They mentioned that men supported women in homestead /kitchen gardening in different ways such as selection of seeds, cultivation process, etc., while women helped men particularly after harvesting with manual processing, preservation, etc.

Table 2 Agricultural products frequently grown

Food Group	Name
Cereals	Rice, maize, wheat
Roots/tubers	Potato, sweet potato, arum
Pulses and seeds	Pulses, mustard, mustard seeds, sesame, sunflower
Vegetables	Eggplant, tomato, cauliflower, cabbage, okra, pui shak, palong shak (spinach), data, gourd, bitter gourd, beans, cucumber, pumpkin, snake gourd, and green banana
Fruits	Jackfruit, papaya, mango, hog plum, litchi, coconut, jambura (pomelo), jamrul, lemon and guava
Poultry/livestock	Cows, goats, ducks, hens, pigeons, koels
Fish	Tilapia, carp, barbell, climbing perch (koi), eel, magur, etc.
Others	Sugarcane, betel leaf and betel nut, turmeric, pepper, onion

Almost all participants (both men and women) reported that farming took place all year round, depending on seasonality, soil fertility, soil salinity, and harvest prices in the previous year. Most of them preferred consuming home-grown food than that purchased from the market as the former was safer than purchased foods that are grown, ripened or preserved using harmful chemicals, formalin, etc. A relevant local quote of a mother from Manikgong is cited below: "You know, the foods available from the market are injected with poisons; consuming these foods people get

attacked with diseases. Given this situation, own produced foods are safe to be eaten. We, therefore, harvest ourselves the food we consume to survive and stay with good health."

Thus, most of the farmers utilise part of their production for home consumption and sell the surplus for cash to meet other basic needs. Many of them also store part of the produce for a number of months, if feasible, for use during off-season when prices are high. Some mentioned selling chicken and keeping the eggs for the children. A small minority send some products to their relatives, friends, or in-laws as part of their social obligations.

4.3 Farming constraints

Almost in all the locations, people expressed constraints that negatively affect their farming production such as pests (insects, diseases, weeds), insufficient capital for farming inputs (such as fertilisers, quality seeds, irrigation expenses, rental charges for machinery services), inadequate knowledge of tackling fish or poultry diseases, difficulties in mitigating the adverse effects of natural shocks (flood, heavy rains and drought) and so on. In Dinajpur, people reported that goats enter their fields frequently and easily and consume whatever they cultivate. The participants from different areas complained about infrequent visits by local level government extension agents and limited effectiveness of their advice. A number of them turn to experienced neighbours/model farmers for advice on the choice of crop varieties, application of farming inputs and finer crop management practices. Model farmers are considered to be trustworthy and knowledgeable persons due to their extensive involvement and experience in farming and contact with extension services. A man from Comilla commented: "We understand on our own. When we don't understand ourselves, we ask the farmers who are involved with extensive farming to know how much fertilisers would be good for any particular crop, in what amount to be harvested and so on. We usually consult with the experienced and senior ones."

4.4 BRAC interventions on agriculture and nutrition

Participants opined that they received loans from BRAC at affordable rates of interest (10 per cent per year) to finance their agricultural activities. The amount of loans initially provided to them ranged from BDT 15,000 to BDT 20,000. With repeat loans, the upper ceiling was raised to BDT 100,000. The participants mentioned that they formed an informal association (around 20-30 people) and got together once a month at a specific village as per a pre-set schedule. BRAC representatives attended the meeting to conduct credit business and to provide advice on farming issues like insecticide use and seed selection. Many participants including the BRAC representatives and communities, mentioned that the BRAC focus was more on credit services rather than on providing extension services and that the BRAC representatives connect them with government extension agents if they face problems with their farming.

The programme head of BCUP pointed out that while "the rate of interest for providing loans is 10 per cent, but in declining balance method it comes to 18 per cent per year." The programme personnel selected households based on specific criteria, such as: a) households cultivating land owned by others but with a size of farm holding varying between 0.33 to 2.00 acres, b) households that do not have current loans from other NGOs, and c) households willing to utilise the credit for

farming. The lending bank catered to a VO (village organisation of 20 to 40 tenant farmers) within a radius of 8 sq. km. The programme covers 212 sub-districts (about 42 per cent of the total sub-districts in the country) from 46 districts (out of 64).

It has been confirmed that the main recipients of the credit services are women. The women participated in the FGD said that they were predominantly motivated by their husbands to get enrolled into the programme and the loans were mainly utilised by their husbands.

All recipients opined that decisions on how to use the loan amounts were not taken only on their own but jointly in discussion with their husbands or mothers/fathers-in-law and sons. Almost all of them usually bought cattle, agriculture inputs such as seeds, water pumps for irrigation, and fish fingerlings. A few mentioned using the credit for non-agricultural purposes such as purchasing household commodities like food, clothing, house repairs, etc. The borrowers perceived that they needed to ensure optimum use of the loans so that the principal and the interest can be repaid in monthly instalments. A man from Jessore who participated in FGD commented: "We repay the loan from earnings from many activities we are simultaneously engaged in. Because this year the entire paddy went under water, we have limited capacity to repay."

Such experiences lead people to use credit for non-agricultural purposes like, for instance, for conducting small informal businesses, purchase and repair of agricultural machinery, improving houses, and so on.

The beneficiaries observed that they benefit from credit in different ways. They mentioned multiple pathways through which they were able to secure better livelihoods. For instance, some mentioned purchasing agricultural machinery for renting out services to other farmers. Some mentioned leasing of small parcels of land for self-production of food to ensure food safety and availability of food during times of distress or high prices in the market. A mother from an extremely poor household from Narsingdi commented (FGD): "In the past we didn't have adequate food to eat and no shelter to dwell. We solved it after having cash in hand from the BRAC agricultural credit programme."

No barriers were reported in selling the farm production and none of the production surplus remained unsold. Wholesalers came to the farmers' houses to buy their produce with instant cash payment. In some instances, the male members of the household (husband or children) went to the local markets for selling the products. However, some of them highlighted the risk of substantial financial loss when market prices fell, particularly for perishable crops such as potato and green vegetables.

The participants who enrolled in the nutrition programme reported that they received nutrition counselling from BRAC on proper feeding practices for their children less than two years of age, particularly advice on colostrum feeding within one hour of birth, exclusive breastfeeding up to 6 months of age, providing complementary foods to children 6- to 23-months-old, with at least from 4 diversified groups. They also mentioned participating in training demonstrations on how to prepare specific food for their children and how to feed them. They highlighted that earlier they used to receive soap, bucket and mug for hand-washing which later has been limited only to counselling and demonstration on hand-washing. Some reported receiving pushtikona (micronutrient powder)

sachets for their children on payment. Many beneficiaries said that the pushti apa (nutrition sister) visited them every 7-15 days in a month and provided advice in choosing local recipes for their children, mainly khichuri (rice cooked with pulses), eggs, milk, and vegetables, and also guided them on the required quantity to feed. Some also said that they were advised to wash vegetables before cutting or chopping. A mother from Manikganj (FGD) said, "When I was pregnant, apa (nutrition sister) used to come to my house, weigh me and also used to counsel me to eat egg, milk, fish, meat, and vegetables all the time in large amount."
It was confirmed from the meeting with the programme personnel of HNPP that nutrition services mainly cover the component of IYCF (infant and young child feeding) for all the children below 2 years of age, and also pregnant/lactating mothers. The coverage of the services during the period of data collection was 140 upazilas (about 30 per cent of the country).

The recipients of BRAC nutrition interventions voiced their concern regarding the effectiveness of the interventions, as they could not always follow the messages that they received. They needed to consider multiple factors that affect decision making, an important one being the views of the older generation. The senior members' norms, perceptions and social power did not always allow them to follow the instructions and advice that they received from BRAC. Many of them mentioned that it was quite useless to receive any service or intervention unless their seniors were convinced adequately about them. For example, their in-laws perceived that diversified foods that include fish, meat, etc., might cause digestion problems for the children. Another example was the advice to wash hands before cutting vegetables which was not usually practised as it was not a traditional habit. The issue of financial constraints also came into the discussions.

The discussions also brought out the point that in some areas the BRAC Water, Sanitation and Hygiene (WASH) programme, an independent programme of BRAC, provided advice on good hygienic practices, use of safe water, and use of sanitary latrines. While all the households of a village were targeted, the poor got subsidised latrines. A woman from Narsingdi commented: "We were shown cartoon movies by WASH where it was shown how to wash hands before taking food and feed the children and warned that if it is not practised they might be sick with pneumonia."

The services from BCUP and the BRAC nutrition programme were not integrated. During the period of conducting the study in 2014, it was found that only BCUP worked in 28 districts and 21 upazilas, the nutrition interventions alone catered to 5 districts and 34 upazilas, and both BCUP and the nutrition programme worked in 18 districts and 70 upazilas. In some areas the services were concurrently delivered to the same households and communities, but in most cases they ran independently without any coordination. It was a similar situation with WASH services. Each programme selected the beneficiaries individually based on their own criteria for delivery of services. Thus, each programme had its own list of the enrolled participants with their background information, but was not aware of the reach of the other programmes and their delivery mechanisms. However, realising the importance of providing joint services, they started to discuss issues, particularly in terms of area selection. A senior programme personnel commented: "We started working for social mobilisation (including parents, teachers, village doctors, and religious leaders) and providing a packet of vegetable seeds as a gift (since 1st August 2014) to them. The price of vegetable seed packet is BDT 45. There are 5 types of seeds of leafy vegetables in the pack-lal shak (red amaranth), kolmi shak (water spinach), pui shak (Indian spinach), data shak (spleen

amaranth) and palong shak (spinach). For extension messages we used to tag fathers with local extension agents for counselling on agricultural practices."

The coincidental integration of the programme services found at the village or the household level:

- BCUP + Nutrition
- BCUP + WASH
- BCUP + WASH + Nutrition

4.5 Nutrition-sensitive agriculture: perceptions and practices

Nutrition-sensitive agriculture has been considered here as a farming system approach that deals with the availability, affordability and consumption of diverse, safe, nutritious food and diets, along with other non-food factors such as health, sanitation and hygiene (Herforth 2013, FAO 2013). The investigators intended to understand the way people see and define nutrition and how they link their farming outputs with nutrition in practice.

The people were found to be less confident/familiar with the formal term 'nutrition'. In fact, they conceptualised nutrition more from the health perspective. To capture their perceptions, some prompting questions were used such as:

- Have you ever heard about nutrition?
- What knowledge have you on nutrition?
- Would you name food items that you consider nutritious?
- Which food items do you consider good for health, blood formation, or for improving eyesight?

The participants mostly perceived nutrition as vitamins that are good for health and generate energy for work. Almost all of them said that vegetables, leafy vegetables, milk, eggs, fish, meat, are all nutritious. They said that these food items are good for health, reduce illness, increase energy, help brain development and foster growth of children, etc. Many perceived that small fish, colocasia, pumpkin, okra, etc., are good for eyesight whereas red spinach (lal shak or red amaranth) is good for blood formation. The expression of a mother from Dinajpur (FGD) was: "If these foods are consumed our health will become better and child will grow faster."

It was frequently observed that households who were enrolled in the nutrition programme were more responsive while conversing on nutrition than the households who were not the recipients of nutrition messages. Some perceived that providing commercially-manufactured nutritious foods such as Horlicks, Complan and others to their children do not really solve the problem of undernutrition. Most of the participants considered home-grown food more nutritious and safe as they were cultivated without the use of pesticides and chemical fertilisers. They were found to be aware about the necessity of giving additional dietary inputs such as all kinds of vegetables as well as fish, milk and eggs to pregnant or lactating mothers. Some of them could also perceive that if a mother's nutrition is satisfactory, it would be good for her child's nutrition status.

Women were more conscious of, and responsive to, health hazards whereas men were more comfortable and receptive when conversation was particularly focused on farming. Both men and women participated in the study were found to be aware of the additional needs of pregnant and

lactating women. Most of the time men referred to their wives when discussing the issues related to nutrition because they perceived that their wives were more knowledgeable and could respond better to such questions. The women pointed out that even when they were aware that whatever they produced was not always adequate to meet the nutritional needs of the family, sometimes they could not purchase more nutritious foods due to financial constraints.

Awareness of nutrition-sensitive farming, however, did not help the people in food production. Almost all of them produced whatever was appropriate with the soil, season, market demand, etc. The existing farming practice intuitively helped them to source nutritious foods from their production for their children and other family members. The participants mentioned that they were well aware that rearing cows would help in getting milk, chicken would give them eggs, and growing pulses would help in their nutrition. They engaged in home production for food items that were feasible given the resources and skills available. They frequently highlighted the bad effects of the food purchased from the market, such as food adulteration, unsafe foods, food with harmful preservatives, and therefore aimed to produce as many food items as they needed for home consumption. They mostly purchased fish and meat from the local market, as only a few of them were engaged in their production.

Almost all the participants of both sexes were found to have sound knowledge on the importance of practising proper sanitation and hygiene. Mothers from Manikganj, Bogra and Jessore mentioned that the lack of proper sanitation and hygiene practices may lead their children to be affected by worms and frequent illnesses that can further affect other family members. They reported that they mainly learnt it from the BRAC nutrition programme, WASH, television and other campaigns frequently held by different organisations in their areas.

They all use tubewell water for drinking and pond water for rest of the household work like washing clothes and utensils; cooking, cleaning vegetables and other food;, cleaning the house as also for baths and defecation, etc. Households who have their own tubewell use the water for all purposes. Almost all the villagers were conscious about the use of safe drinking water and do not compromise on it even if the source is far away from the house. Some of the women mentioned washing their hands with soap or detergent powder after defecation, before feeding the children, and before cooking. However, most of the men did not mention using soap after defecation. Almost all the people have access to sanitary latrines which they use. In Jhalokati, the latrines are mainly built near water sources which may become contaminated. Women did not report any obstacles for child caring due to their engagement with farming as their husbands mainly take that responsibility. Many of them opined that their husbands or other family members co-operated with them so that they could feed and take care of their children when required. However, some of them said that they could not take adequate food in a timely manner due to other workloads, and this might affect their nutrition status.

4.6 Community needs for services on nutrition and farming

The people were not very aware of the link between nutrition and farming nor were they able to adequately express their needs for services in that area. Though they conceded their lack of education, they liked to decide on their own what would be good for their overall wellbeing. They

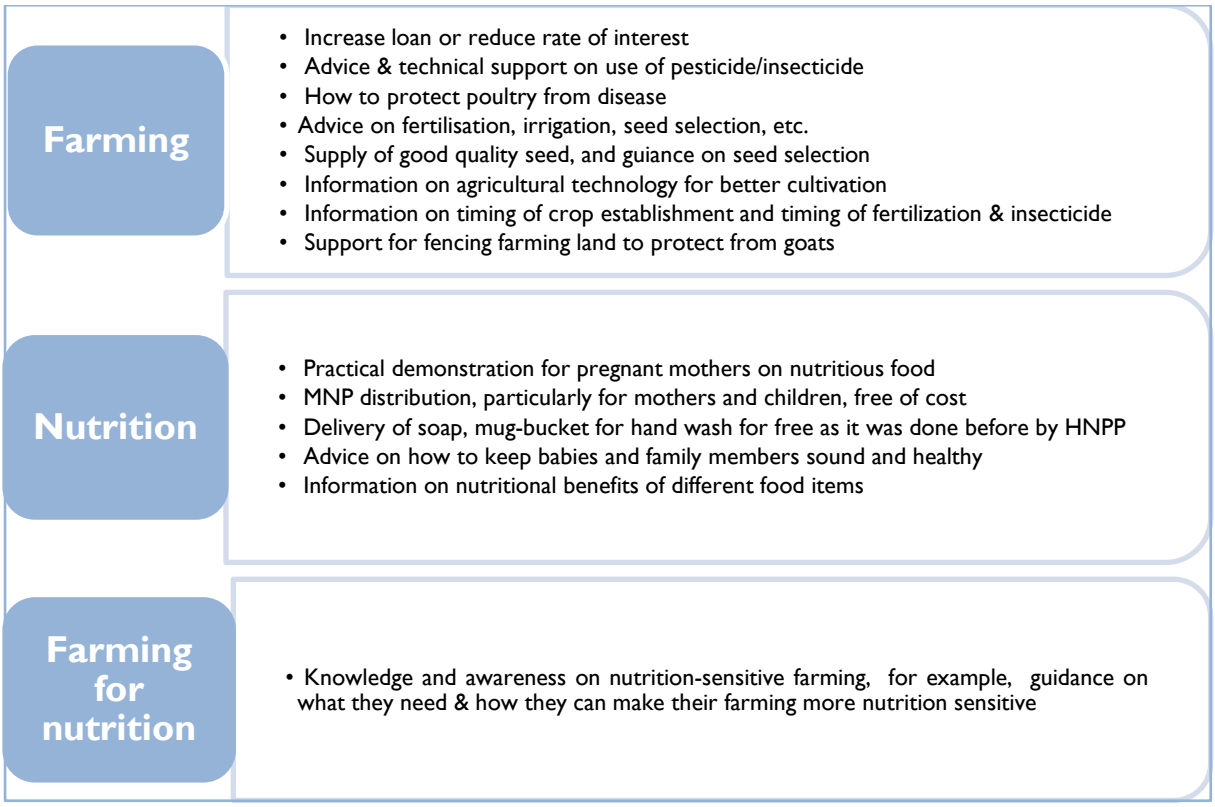
said that it would be useful if they were taught and understood methods of farming that would improve their nutrition needs. Most of the beneficiaries, both men and women, were found to be more open to the BRAC programmes or similar community interventions to achieve better nutrition through farming. A woman from Dinajpur during the conduction of FGD said: "We are the people from rural areas. Do we have that ability to realise what is good for us? You the people please provide us information that you consider beneficial for us." (FGD with women, Dinajpur)

When further interrogated, the participants highlighted a range of needs within the boundary of their real experiences, knowledge and understanding. Initially they randomly talked about increasing the size of loans or reducing interest rates or establishing schools, latrines and roads in their villages. The researchers invited answers to questions at different stages such as:

- What do you need/want to improve your farming?
- What do you need to improve your nutrition?
- What do you need to improve your farming for nutrition?

The range of responses that came out frequently in most areas is highlighted below (Figure 5).

Figure 5 Common range of responses



Most of them considered poor nutrition as an outcome of poverty, and suggested that the community services on farming and nutrition be combined with verbal counselling and provision of credit support. They also said that whatever counselling is done, it must include the senior and influential household members alongside the mothers.

The farmers were questioned specifically if they would be interested in getting suggestions and counselling on methods to make their farming output more nutritious through a single channel combining all the BRAC services. The answer was always affirmative as 'yes' or 'good' or 'would be good'. None of the villagers were found to be uninterested in receiving services on nutrition-sensitive farming systems. They thought it would be a good initiative and useful.

4.7 Feasible delivery mechanisms for nutrition-sensitive farming interventions

Having ascertained their thoughts and interest in nutrition-sensitive farming, discussions were held with the community members and local representatives of the BRAC programmes on the best ways of providing the services. The discussion was particularly focused on different options and means of delivering the services and messages that the communities can receive and use in their learning. Most of the participants among the villagers and programme officials suggested structuring sessions for knowledge building and improved practice through group meetings as done for BCUP via VO. A relevant quote of a woman from Jessore who participated in the FGD is reproduced below: "Door to door counselling may be time consuming. Rather gather 10 people at one point and arrange discussion. It can be done twice a month. Say we are advised cultivating nutritious food, apa comes to see our cultivation, weighs it, and later may follow up how it has been done and cultivated. Counselling madam may come twice whereas loan madam may come once in a month. Two visits will create more awareness on the importance of good nutrition practices. Initially it can be done twice a month, then after we understand well, it can be done once a month."

Both beneficiaries and programme managers advised using practical demonstrations for conveying the messages effectively. They mentioned periodical arrangements for showing documentary videos, short dramas, popular theatre and folk songs using multimedia for effective reach. It was suggested that such interventions should be schedule in the evenings, as farmers are usually busy during the day.

Programme personnel from HNPP opined that the message content should be designed to specify:

1. Why communities should produce specific agricultural products and how they can benefit from producing these. The message could be: 'This vegetable contains iron or calcium and will help to improve calcium or iron deficiency'.
2. The amount of food needed from the particular group of products
3. The number of food groups to be included in the daily diets
4. What would be the source for those specific food groups

The field level programme people were of the opinion that local farmers will be more convinced to grow nutritious crops when they find possibilities of making profit as well. Most of them thought counselling only from the nutrition perspective will not convince all the people equally. It is important to show them the dual benefits of nutrition and market opportunities through farming. They also emphasised that the messages should be specific and few in number with clear and practical instructions, otherwise people may feel swamped with lots of information that they cannot digest.

It was also additionally suggested by most of them that the availability of credit may be made conditional on adopting nutrition-sensitive farming systems, such as conditional cash transfers practised in safety net programmes. Then a follow-up mechanism can be adapted as done in BCUP to ensure their use of loans for the given conditions.

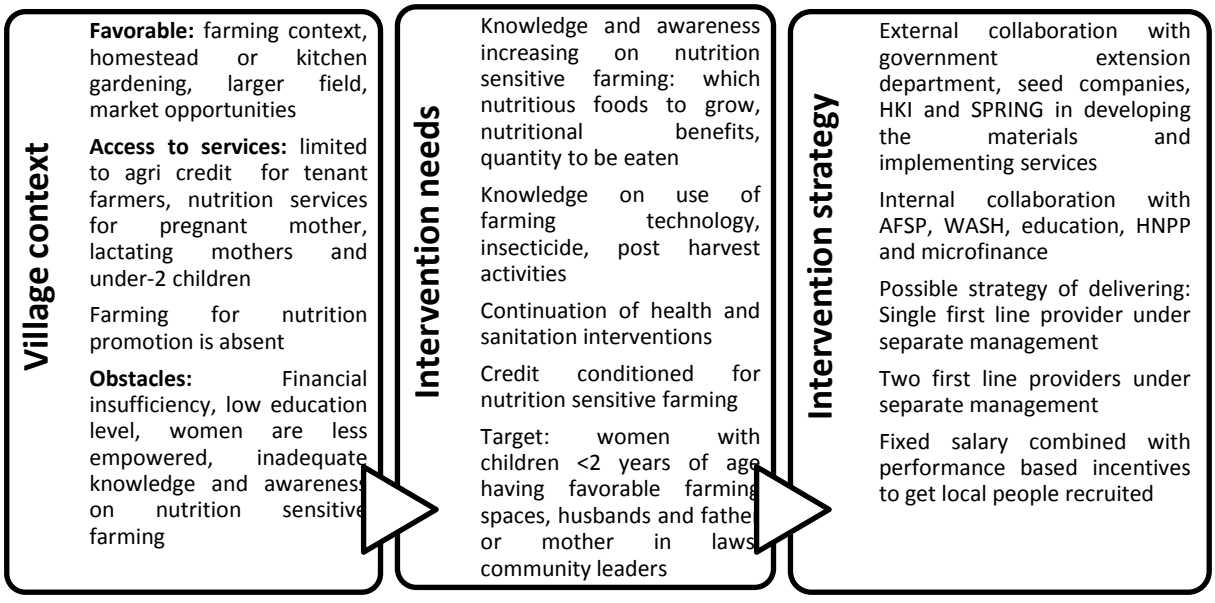
The next discussion was on employing a service provider to disseminate information on nutrition-sensitive farming to the communities. Such a person had to be accepted by the people and be able to inform and convince communities about the nutritional benefits of specific agricultural products and the amount they might need from that particular food group. Almost all the programme personnel and community members agreed that educated women from each village (with at least a high school certificate) might be able to accomplish the tasks effectively. Some participants thought educated youth with at least an agricultural diploma should be hired. They stressed on the importance of considering gender balance in employing local people for such services. They perceived that men don't listen to women; rather, women listen to women and men listen to men.

Programme staff from local field offices talked about the importance of separate management systems such as assigning a service provider exclusively for each intervention, without involving him/her in other programmatic works. The two options commonly mentioned were:

Option 1: A single frontline provider under a separate management level and monitoring system will be required who will deliver messages on both nutrition and agriculture. The frontline provider should be trained on the pre-selected topics that they are supposed to deliver on farming for nutrition. This can be done either recruiting new persons or rearranging the assignments of the available staff at different levels (SS or SK or PK or PO).

Option 2: Nutrition advice should be recommended by SS or PK and farming messages should be delivered by an agriculture extension worker under a separate management level. In this system, the programme organiser (PO) should be newly recruited but the others can be tagged from the existing human resources.

Figure 6 Key findings



Finally, there was discussion on the resources that might be required to get people recruited and in ensuring that the services are delivered effectively. Generally, people perceived that a fixed salary combined with performance-based incentives might work better than single incentives or profit made from selling seeds. They greatly discouraged the option of seed business as it had been quite ineffective earlier. Some participants thought that the seed-selling option would be good but not that exciting. People get seeds for free or at cheaper rates from local markets or agencies. Local programme personnel thought that seeds for free may not work; seeds at reduced rate in comparison to the market price may work better. Senior programme personnel from BRAC commented that: "There was a big issue behind this, that is, if for any reason crop is destroyed or production is not good after using BRAC seeds then they blame BRAC for it and don't intend to pay back the loan."

The suggestions indicated two alternatives for determining the remuneration of front-line service providers:

- Firstly, if the person is newly appointed, then range of salary may be at least BDT 5,000 to BDT 10,000 plus incentives on performance or profit from seed selling. Incentive was to be determined based on the successful growth of each vegetable item for a fixed size plot.
- Secondly, if the person is already getting some salary (like BDT 4,000 to BDT 5,000), then additional BDT 2,000 to BDT 5,000 plus incentive on performance or profit from seed selling can be considered.

5 Discussion

Agriculture in Bangladesh is definitely considered important as a major source of employment and livelihood, ensuring food security and its contribution to national GDP. There are about 15 million farm households; about 90 per cent with a farm size of less than one hectare and two-thirds with size of less than one acre who are mostly landless or marginal farm operators (BBS 2011a). Consequently they fall below the national poverty line with inadequate solvency, low education attainment, etc. that are also reflected in the study findings (BBS 2011b; FAO 2014). The findings also suggested that women mostly work in homestead areas and in post-harvest activities to support their husbands or augment meagre household incomes.

The context of farming in the study areas was found to be quite diverse with huge potential for improving nutrition. Rice cultivation was found to be common, along with maize, potato, pulses or oil seeds. The homestead production included vegetables, fruits, poultry and fish. Following the traditional norms and practices, the farm households shaped and used their subsistence farming both for ensuring food security and earning income through production of high value crops such as potato and vegetables. The literature review suggests diverse complementary actions with backing up women's empowerment for smallholder agriculture to improve nutrition (Wiggins and Keats 2013; Hunger Alliance 2007). Yet, the people receive credit-based support without the integration of other nutrition or health services. It seems that women receive the services as proxy for their husbands due to programme priority. The loans are mainly utilised by their husbands and other male relatives who are engaged in agriculture as their principle occupation.

The review of literature suggests multiple pathways through which the agriculture system connects food production, consumption, financial returns, women's socioeconomic status, and time allocation for childbearing, nutrition and other welfare outcomes (Gillespie et al. 2012). In the study areas, people mostly related their farming to food security, food safety and income. Nutrition was an intrinsic outcome through traditional farming methods that gave priority to production of cereals to address hunger. They were found to be less aware or sensitised to understand and practice a farming system that delivered good nutrition. The households practised farming considering agro-ecological factors such as soil fertility, seasonality, market demand and so on. They did not calculate the nutritional benefits from home production because they do not assess agriculture through the nutrition lens. They had access to nutrition counselling to some extent but that was more about children's feeding practices or dietary requirements during pregnancy or the lactating period. However, they were found to be interested in improving their well-being, particularly nutrition, through agriculture. They were interested in getting support from knowledgeable persons or stakeholders for improving their knowledge on nutrition-sensitive agriculture and were willing to experiment according to the advice.

Previous examples suggest that in Bangladesh possibly two or three decades ago people were not adequately aware about the health consequences of sanitation, hygiene, oral rehydration solutions, immunisation, etc. However, these became successfully known through rigorous behaviour change interventions with widespread messaging and sensitisation activities by government, mass media and NGOs (GED: Bangladesh Planning Commission 2014). This formative study found farm households to be well aware about the negative health consequences of unsafe food due to considerable mass media messaging and multiple government actions for enforcing food safety laws and acts.

Despite substantial potentials of agriculture for nutrition security in the study areas, the meaning and significance of nutrition-sensitive farming has not yet been adequately conveyed to the farming communities. It is in fact only recently been recognised by development agencies and stakeholders in the country and is in the process of being communicated to the farming communities. The participants agreed that there could be potential to make their farming more nutrition sensitive but they were not adequately aware of what to do and how to achieve that. They were open to learning about it from educated people and institutions. Further, they mentioned lack of knowledge and skills on using insecticides, agricultural technologies, ways of keeping their children disease free and healthy, as well as sanctions of more loans, etc.

Group counselling with practical demonstrations carried out by local knowledgeable persons was considered as an appropriate method in effectively reaching the services to the communities.. A similar approach has been applied by other agencies like HKI, SPRING, etc. (through farmer school approach, village model farms and so on) and also been recommended in international literature (Herforth 2013; USAID and IYCN 2011; SPRING 2014; Iannotti et al 2009). Additionally, video clips, local dramas, folk songs, etc., were found to be good avenues to tap the people's interest in nutrition-sensitive agriculture. The message content should be precise, pictorial and instructive so that people can better understand and capture the ideas (USAID and IYCN 2011). Depth and intensity of the contents of the messages are also vitally important. According to the needs of the communities the message contents should be focused to improve their knowledge on nutrition-

sensitive farming with a combination of health, sanitation, and nutrition education that can be translated into improved practices.

A review of literature on the subject (Herforth 2013; USAID and IYCN 2011) brought out the suggestion that women farmers should be predominantly targeted in delivering messages and interventions, along with other influential community members and family decision-makers. The participants also agreed that they are more likely to accept and use new messages if they are supported at the community and household levels. An incentive-based salary structure was identified as the best way in motivating the service providers and ensuring delivery of quality services.

The participants were interested in receiving credit, but the programme managers suggested that it can be made conditional, so that the credit is used for nutrition-sensitive farming instead of traditional agriculture.

The literature review and the view of the participants in the discussions threw up two options of delivering nutrition sensitive farming messages: either through a single channel or two channels within a single platform (Herforth 2013; Heise 2013; SPRING 2014; Iannotti et al 2009). However, little is known which one will really work well in reaching out to the communities effectively, particularly within the context of Bangladesh as well as the BRAC programmatic framework.

6 Conclusion and Recommendations

It is clearly apparent that the agriculture situation in rural Bangladesh is fertile and diverse. However, the communities are yet to realise the meaning and significance of nutritious agriculture. . Farming is carried out based on factors such as soil fertility, seasonality, market demand, and so on. Agriculture is not assessed through the nutrition lens. However, the farming communities are interested to learn more on how to make their agriculture more nutrition sensitive.

The findings of the study brought out the following recommendations:

1. The design of the intervention materials and strategies should primarily be in alignment with the identified needs of the communities, to increase their knowledge and awareness on nutrition-sensitive farming within the framework of BRAC. The focus should be on nutrition-sensitive farming production as well as on consumption and market opportunities. Designing of materials should be done taking into consideration the diverse segments of the communities —mothers having children less than 5 years old, their husbands, mothers-in-law and other relevant people who may have significant influence on the family. To ensure the utmost effectiveness of credit for nutrition-sensitive farming, credit conditions should not be kept limited only to agriculture, rather it should be expanded to nutrition sensitive farming.
2. Intervention materials/tools should be developed in consultation with the relevant programme personnel of BRAC (AFSP, HNPP, WASH), the Department of Extension (DAE) of the government and other agencies like HKI, SPRING, FAO, etc., based on their experience of developing earlier materials.

3. The drafted strategies should be tested at pilot scale with the communities, to receive their feedback and assess their acceptability in finalising them.
4. As different options for implementing the services were discussed, a pilot testing can be undertaken with the final messages to identify the most feasible one to ensure utmost effectiveness of the services. Approaches can be tested:
    - Employing a single line service provider as 'agriculture for nutrition promoter' under a specific management level and monitoring cell. This can be done by recruiting a salary- and incentive-based service provider from the local areas with SSC or HSC grade education.
    - Recruiting two service providers — one for nutrition-sensitive farming and the other for nutrition-specific messages — under a specific management level and monitoring cell. This can be done by recruiting an extension agent and a nutrition promoter similar to SS or SK level cadre of HNPP.
    - Assigning existing SS/PK under the agriculture-for-nutrition promotion programme by reducing their coverage area from HNPP.
    - Integrating the refined strategies under the existing service delivery systems where the extension worker will provide services only on agriculture and the SS/PK will provide services for nutrition to the same households.
5. Once a feasible model of delivering the interventions is identified, a larger scale intervention trial can be undertaken to assess the impact; this can be incorporated into the policy framework of the government and other relevant institutions.

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Appendix

Table 3A Predetermined topics reviewed according to the villagers' responses

Background **Information of the beneficiaries**	**Farming** **Context/practice/services**	**Nutrition** **Perception/practices/services**	**Health/Sanitation/Hygiene** **Perception/practices**	**Nutrition-sensitive farming** **Perception/practices/needs/suggestions**
Identification Number Age Marital Status Occupation of participants and their spouse Education of participants and their spouse Number of under 2/5 children Involvement with BCUP/HNPP programme Farming activities of women Farming activities of men/husbands	Context: Local yields (usually and extensively cultivated) Own production (both homestead and field) Reasons for producing Obstacles Solving Strategy	Perception Nutrition/nutrient rich food Importance of consuming nutritious foods Perception on IYCF Dietary perception during pregnant, lactating and adolescent	Perception Sanitation and hygiene (hand washing, sanitation) Benefits of good practice	Perception on nutrition sensitive agriculture
	Agricultural Practice Agri product type for homestead land Agri product type for cultivation land Why produce these When to produce these Utilisation of agricultural product	Practice Practice of IYCF Practice of diversified consumption for children, mothers and other members of the family Sources of food Sources of nutrient rich food Do they feel that the food met the nutrition demand	Practice Practices for hand washing Practices of sanitation during food processing, defecation etc. Toilet facility Uses of water Sources of drinking water Sources of water for other work	Practice Own production (both homestead and field) Reasons for producing or choosing Consideration of nutritional value while producing/selecting Name of foods produced considering nutritional value Opportunities of producing nutritious/regular foods in your own yard and how Impact on child care due to agriculture involvement of women Obstacles
	Services received Types of services From whom Agri loan related Amount of the loan Utilisation of the loan Benefit got from loan Decision regarding loan utilisation Opportunities/barriers	Services received From whom Types of services got from the programme Involvement of family members for nutrition support Opportunities and barriers	Services received From whom Types of services got from the programme	Received any services in relation to nutrition sensitive farming
	Market opportunity		Morbidity history Family member who is ill Reason for illness Health service sought	Needs/suggestions On what How/way of receiving By whom and how

Table 4A List of topics discussed with programme staff

Sl. No.	Topics
1	Involvement with programme and responsibilities
2	Programme services
3	Monitoring systems
4	Effectiveness/acceptability of programme interventions
5	Barriers/opportunities
6	Integration with other services, particularly agriculture and nutrition
7	Collaboration with government, seed companies or others
8	Opinion on combined approach to nutrition-sensitive farming
9	Suggestions how to design the nutrition-sensitive farming intervention programme (on what and how, by whom and how)