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# LESSONS LEARNED FROM CCBA IMPLEMENTATION

COLD CHAIN BANGLADESH ALLIANCE (CCBA) REPORT

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# **Lessons Learned from CCBA Implementation**

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## **DISCLAIMER**

*The author's views expressed in this publication do not necessarily reflect the views of the United States Agency for International Development or the United States Government.*

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## Introduction

The USAID-funded Cold Chain Bangladesh Alliance (CCBA) project has the goal to increase the availability, access, and use of domestically-produced and nutritious foods (Development Object 2 in USAID/Bangladesh's Feed the Future Multi-Year Strategy) in an effort to sustainably reduce poverty and hunger. CCBA is funded through the Global Development Alliance (GDA), USAID's model for public-private partnerships. USAID/Bangladesh and Winrock International partnered with Golden Harvest, a local food processing and transportation company, to implement this project.

CCBA aims to build Bangladeshi farmers' capacity to grow and provide high value vegetables for the Golden Harvest product lines and to reduce post-harvest losses and establish cold chain entry at the field level. Simultaneously the project provides technical assistance for Golden Harvest's cold chain investments and build capacity in cold chain management to support both farmer and Golden Harvest activities.

Since the early stages of the project, the project had several changes from its initial plans. The first adjustment was that Golden Harvest's interest shifted from the vegetable value chain to the dairy value chain for products such as ice cream. Golden Harvest had been exporting a limited selection of frozen vegetables to the Bangladeshi diaspora in Europe, but that market decreased during the global economic slowdown. Within a year of the start of the project, the Golden Harvest management identified a higher profit opportunity in the ice cream market and made an executive decision to divert the capital investment in cold storage facilities and management from frozen vegetables to the dairy sector and the ice cream product line. Frozen vegetables as a product line were discontinued.

The second adjustment was that USAID requested the project to expand work in the Feed the Future (FTF) Zones of Intervention (ZOI), which are separate from the areas where Golden Harvest is operating and buying products. The project is training horticulture farmers in the FTF ZOI and working to make select market links with supermarket buyers.

With the major shifts in the project, CCBA successfully piloted several activities (discussed below) in the horticultural practices in the country. As the project is reaching completion, the successes and recognized gaps in the planning and implementation of the project are documented for future utilization by USAID/Bangladesh and other implementing agencies. For this purpose, the Lessons Learned report has been prepared.

This report is based on a field trip to Bangladesh to review key project documents and hold discussions with the CCBA project leadership to develop an understanding of the projects' current activities, challenges, and lessons learned from implementation. The project team interviewed the CCBA staff, the GDA private sector partner (Golden Harvest), other private sector stakeholders along the horticulture value chain, including retailers, farmer groups, traders, transporters and women practicing homestead gardening. Additional meetings were held to understand the shift in the focus of the private sector partner from the horticulture to the dairy sector. The team visited Dhaka, Jessore, Khulna, Barisal and Sylhet in the trip. The lessons learned are categorized into:

- 1) Programmatic level lessons
- 2) Strategic level lessons

The CCBA project results illustrate that there are significant post-harvest loss reduction and nutrition benefits experienced due to the piloted and adapted best practice activities introduced in the horticulture value chain in Bangladesh. Since several of the activities were either piloted or there was insufficient time to fully learn the benefits of the introduced activities, they need to be continued and further learning documented while being scaled up and further adapted to the local needs.

It is to be noted that this report is not an evaluation of the project and is prepared with the objective documenting lessons which may be applied in future projects in Bangladesh.

## Programmatic Level Lessons

### *Production groups are beneficial to the value chain*

CCBA established production groups from the early stages of the project with the objective of increasing the focus of farmers on high-yield crops, disseminate improved production practices and link the farmers to input suppliers and local service providers.

CCBA identified willing farmers in rural areas (starting in Gazipur and Jessore) holding community meetings in villages to understand the needs of the farmers and identify farmers interested in the opportunities and willing to commit to group involvement. Typical farmers selected for the group were marginal farmers with 0.25 – 0.30 acres of land available for farming, showing high interest in year-round production of high value crops. The selected farmers required willingness to learn new technology, adopt good agricultural practices and improved post-harvest practices plus essential willingness to work in a group to get access to knowledge and skills from CCBA staff and private sector stakeholders.

The selected farmers were then formally organized into producer groups of up to 30 farmers per group. CCBA provides training to the producer groups on improved technologies and practices with emphasis on best post-harvest practices, and established and/or strengthened relationship with local service providers and input suppliers. All farmers in each producer group focused on the same crop in the season to allow joint activities and scale.

During discussions with smallholder farmers during the visits to the rural areas the farmers communicated significant benefits they experienced through producer groups. The farmers realized the benefits of previously unpracticed group activities including better crop selection and collectively learning improved farming practices strengthened with peer learning. Production groups allowed relationship building with other value chain participants (input markets) resulting in quicker demonstration and adoption of improved production practices including improved seed varieties, pheromone traps, and alternative methods of trellising.

During meetings with input suppliers (three seed companies and four pesticide and fertilizer traders), there was confirmation that the groups facilitated the suppliers and service providers in holding demonstrations of new products and in providing training of production practices to farmers.

**Conclusion:** Though the piloted production groups demonstrated significant benefit to the smallholder farmers, CCBA staff observed the benefits for slightly more than two years. Since the first year of the project, 312 groups have been operating and 499 groups were set up in the second year; 155 groups are even newer, with less than a year of operation. During this period, groups are at different levels of experience and maturity, showing varying levels of adaption of

demonstrated practices. In addition, even in geographic areas where production groups do exist, some farmers have not willingly joined, raising the need to further understand the unmet needs of farmers. Continuation of the group formation practice and adaption to local needs is required for realization and confirmation of sustainable benefits.

A deeper understanding is required for the business impact that has been experienced. For this, a study needs to be conducted to estimate the improved production efficiency; improved yield and factors leading to the adoption of good agricultural practices including successful use of pesticide alternative; and reduction in costs of production – which collectively results in higher profit per unit land owned per farmer. Such a business impact study will allow increased dissemination and adoption of the practices introduced by CCBA.

***Collection centers linked to production clusters are a promising intervention but are at an early stage and require continued support***

With the objective of creating linkages between farmers and input and output markets, CCBA set up *production clusters* linked to *collection centers*, which facilitated economies of scale in the benefits realized at production groups and more importantly, improved post-harvest practices and established links with the wholesale markets, traders and transporters.

Each production cluster consisted of up to 10 production groups which effectively represented 100-300 farmers (varying in location by level of maturity of the cluster). Each production cluster was then linked to a collection center, also known as an aggregation point.

The collection centers give the producers the opportunity to assemble and accumulate their produce for pre-cooling, washing, sorting, grading, weighing, packaging and storing, resulting in significant post-harvest loss reduction. Similarly, joint hiring of transport with other farmers to haul product to the market reduced transportation costs. Alternatively attracting traders and/or brokers to the field for the product was practiced for the first time. Finally selling to the buyers at the quality and at the price that allows both the buyer and the seller to get the most advantages was recognized.

The farmers received improved post-harvest practices and marketing training at the collection center from CCBA. In addition, the collection centers also served as a location for farmers to collect and share production experiences and market information, advise each other and collectively negotiate with other stakeholders (traders, transporters, and others).

In order to establish collection centers, CCBA worked with the farmers to find a suitable vacant land close to a rural road to setup a makeshift structure (in some cases, the group converted them to permanent structures). CCBA provided weighing scales, plastic crates, secateurs for proper harvesting, grading, sorting, cleaning, weighing, and packing for the farmers linked with the collection centers. Some collection centers also had water cooling facilities for the vegetables.

Each collection center is managed by a Marketing and Planning Committee (MPC) consisting of member farmers who collectively make decisions for all the members. The more developed collection centers were in the process of formalizing the MPC and transferring ownership of the land on which the center was established to the MPC. The members were required to pay a membership fee.

The collection centers were in use not only by farmers who were members of relevant clusters but also by non-member farmers. This further indicated that some collection centers and MPCs

even in formative stages provided broader services and utility of infrastructure to farmers wider than the membership base.

The level of formalization and maturity of the collection centers varied significantly. During the field visits, it was observed that the collection centers can be as formalized as a covered, but open air concrete slab providing space and shade for post-harvest aggregation and processing or it may be a designated shaded area where tarps and crates are used in post-harvest activities.

**Conclusion:** The collection centers are at varying levels of establishment and require continued support for maturity and self-sustainability. Though these collection centers demonstrated post-harvest loss reduction and leveraged bargaining capacity of the farmers, the variations in the physical structures, facilities available, as well as the MPC organizational capacity (including management skills to maintain the collection centers, continued fee collection and increasing membership of farmers using facilities, negotiating skills with traders, etc.) clearly indicate needs for varying levels of improvements. Additional technical assistance and organizational training is required for their sustainability. It is important to note that since the collection centers vary in levels of development, the continued support they need will require customization as per their maturity level. The piloting of this intervention demonstrates their benefits (as was confirmed by all farmer members interviewed), it is still too early for confirmation of the best practices in structure and functionality.

This intervention also encourages experimentation of introducing assets too expensive for individual farmers but that can be collectively owned. These could include transportation vehicles or in the case of horticulture, larger water based pre-cooling centers.

Production clusters show potential for leveraging relationship building with large intraregional buyers as well as top end retailers (supermarkets). This will potentially allow less middle players translating to greater revenue shares to smallholder buyers as well as better retail prices for consumers. However, since the clusters are at an early stage of existence, realizing such benefits needs further understanding of the clusters' leveraging capacity and the attraction of the high end retailers directly to farmers with the objective of eliminating middle players. Due to CCBA reaching the end of the project term, another project or institution will need to continue the understanding of the clusters' strengths and passing on the advantages to the farmers.

### ***Post-harvest handling and logistics are effective and replicable; need sustainability***

Systemic post-harvest handling and logistics upgrading across the horticulture trade from collection centers through local and regional markets has been highly effective in improved products, better prices and increased trade. Harvest and post-harvest handling practices including use of secateurs for harvest, pre-cooling and hydrating of produce, sorting and grading, appropriate packing and select utilization of crates have been adopted at the farmer and initial broker level. These practices have directly resulted in increasing the percentage of the farmer receiving the price for higher grade product and a reduction in the loss of value coming from handling damage and inconsistent product within marketed lots. Production practice training to small farmers who are members of producer groups has resulted in up to 100% production increase confirming the impact potential and reducing post-harvest loss from 6% to 3%.

The improved practices are well accepted by the value chain participants and are effectively replicable. However, there is lack of evidence of their sustainability and continued expansion after the CCBA project ends.

Parallel to the improvement in the produce quality, it needs to be noted that post-harvest loss at producer level was known to be only 6%. The post-harvest loss is experienced more at the transportation, trader, and retailer levels which can be controlled by better packing practices, which are possible, and improved transport practices, which is very challenging in Bangladesh.

**Conclusion:** Improved production practice training at producer group level is most impactful. Trader associations have also confirmed the value of the farmer training and have willingly paid higher prices for the improved quality vegetables. At the same time, since there is low post-harvest loss at producer level, there is less room for further improvement there. However, there is continued deterioration in vegetable quality once the vegetables leave the producers due to traditional packing practices and long durations of transportation in hot temperatures. This loss can be reduced by increased adoption of improved packing practices introduced by CCBA.

Discussions with traders at the Shonadanga Wholesale Market in Khulna confirmed their interest in direct involvement with the continued training to the farmers. Traders are willing to provide post-harvest loss reduction training to the producers to reduce sorting and transportation costs at the market levels. This interest needs to be materialized in future projects; the trader associations can be provided Training of Trainers so they can continue to disseminate the knowledge and replicate the benefits to an increasing base of smallholder farmers.

### ***Low cost vegetable cooling practices and logistics (compared to cold chain) are effective in Bangladesh; need wider adoption for industry level loss reduction***

Reducing the temperatures of harvested vegetables by 10°C doubles their shelf life. Immediate cooling after post-harvest is known to be the most effective intervention for horticultural products. The intervention reduces respiration (lessens perishability); reduces transpiration (less shriveling), and slows ripening (maintains texture, flavor, and nutrients) which collectively reduces physical loss of vegetables and increases their market price.

Due to a lack of required infrastructure of cold storage facilities and transportation system and high capital costs, an integrated cold chain for horticultural products using complex systems for forced air, hydro-cooling or vacuum cooling is not proven to be feasible for the Bangladesh market. CCBA piloted transporting vegetables using refrigerated trucks. Though the experiment showed there may be some profit in using the refrigerated trucks, it is too limited to offer incentives to farmers and transporters. The bulk of the horticulture marketed moves through open air markets and horticulture losses are increased by product entering and exiting controlled temperature environment through condensation and wilt resulting from dramatic changes in temperature. (The experiment of transporting vegetables through refrigerated truck resulted in additional profit of only USD 19.42 for 2742 kg of products). This discourages commercial adaption of refrigerated trucks for vegetable transportation and promotes using low technology methods.

Instead, the CCBA piloted low cost/low technology methods proved very effective. Of this, the most impactful and well accepted by farmers is water cooling of vegetables at collection centers immediately post-harvest, reducing their temperatures by up to 20°C in hot weather. This was previously not practiced in Bangladesh; the intervention has demonstrated the increased shelf life of vegetables. Other than the farmers showing immediate acceptance, vegetable traders are increasingly willing to pay higher prices and travel to collection centers to purchase the higher quality vegetables.

**Conclusion:** The successful pilot intervention of post-harvest water cooling needs to be more broadly adopted by farmers throughout the FTF region. This can be implemented in partnership



with Bangladesh Extension Education Services (BEES). During meetings several farmers mentioned receiving training from the extension services though there was no confirmation on the frequency and quality of support. Other potential partners can be trade associations, who have shown willingness to train farmers to ensure regular supply of better quality education. This partnership can result in greater sustainability due to benefit reaped by all stakeholders. As per situation in the relevant regions, educating BEES agents and traders will result in continuing of the practice and expanding it to areas still unaware of the practice.

Using of refrigerated trucks at this stage does not provide enough gain to horticulture farmers to make the practice worth commercializing at this stage. This is not helped by the fact that there is lack of sufficient transportation vehicles in the country for commercial adaption of the practice and the fact that the majority of horticulture products are wholesaled and retailed through completely open air environments lacking any temperature or humidity control.

### *Preferences for packing and transportation vary for crops*

Interventions don't have the same acceptance rates for all crops. This lesson was learned when CCBA introduced plastic crates to farmers for collection and transportation of vegetables. Previously, collection was mainly in soft bamboo baskets, and transportation was in soft bamboo baskets jute sacks.

CCBA demonstrated the benefit of low post-harvest damage when collecting vegetables in the field in plastic crates and expected the same to be used for transportation of all the vegetables to the markets.

The farmers willingly adapted usage of plastic crates for all vegetable collection. After usage of plastic crates for transportation, they soon reverted to the use of jute sacks for some vegetables. For example, tomato crops were collected in plastic crates, brought to collection centers, cleaned, sorted and repacked in the plastic crates to be transported to the market. The plastic crates minimized any damage throughout the process. However, eggplants were collected in the plastic crates due to convenience and brought to the collection centers but after cleaning, sorting, grading, were repacked in long jute bags.

The jute bags did not protect the eggplants but due to the size of the vegetable, the plastic crates would not hold enough vegetable per crate and would be inefficient in stacking on the transport vehicles – mainly open small trucks (*nosimon*) which have been traditionally used. The long bags allowed greater amounts of eggplants to be carried per trip on the truck and even with potential transport damage, were preferred over plastic crates.

**Conclusion:** Farmer experiences can be different from the intended interventions which need to have built in flexibility to allow reverting to traditional methods if preferred. In the example of the plastic crates, farmers expressed willingness to use plastic crates of varied dimensions for different vegetables.

### *Supermarket direct purchasing vegetables from farmers resulted in better prices for farmers and lower post-harvest losses*

CCBA introduced the practice of direct procurement of vegetables from farmer clusters to one supermarket, Agora. Agora staff informed that the company purchases 20% of its vegetables directly from farmer clusters. For this practice, it involves the sister firm Rahimafrooz Agro as an agent in conducting all the transactions and transportation of the vegetables. The Rahimafrooz

Agro representative interviewed confirmed that the farmers involved showed great willingness in the practice.

Rahimafrooz Agro introduced the farmer groups to preferred input suppliers to ensure better produce and provided 90-day credit to some farmers for input purchases. Upon harvest, Rahimafrooz Agro directly purchased the vegetables from the farmers and delivered them to the Agora outputs. This allowed the farmers to be paid a slightly higher price (varying by vegetable and season) and also reduced the post-harvest loss. During discussions, Rahimafrooz Agro management claimed that in selected cases, farmers experienced reduction in post-harvest losses from as high as 30% to 5%. CCBA could not verify this claim nor did its own experience show such drastic reductions.

**Conclusion:** This pilot practice of direct procurement from farmers demonstrates the potential for contract farming in Bangladesh. It needs to be noted that this practice was possible since Agora had a sister logistics company which has the resources and relations for the direct procurement process to be established. Though both Agora and Rahimafrooz Agro confirmed their satisfaction with the procurement process and indicated that the farmers also preferred it, there was no meeting with the farmer groups to confirm their satisfaction. It is also important to note that there are only a very few potential large scale buyers in Bangladesh, like Agora, and their volumes are extremely limited.

### ***Interventions needed throughout the vertical linkages of value chain but not all stakeholders have interest in change***

The entire horticulture value chain needs relevant interventions for sustainable impact. CCBA focused at production nodes and high end retailers with limited intervention in other vertical linkages for nodes including wholesale markets, traders, transporters and lower end retailers. There was increased productivity and reduced post-harvest loss at the smallholder producer level but there is no evidence of the improvements translating to better produce available in the retail market. The technical assistance provided to the high end retail super markets had no direct linkage to the vegetable producers in the FTF region.

**Conclusion:** During visits to wholesale markets, including Karwan Bazar in Dhaka and Shonadanga Market in Khulna, it was observed that the wholesalers have a particular institutional structure which will take a lot of effort to penetrate. The traders in these markets mainly act as agents working on commission of the sales of the vegetables with little at risk due to any transportation or storage loss. This results in minimal incentive for them to change their current trade methods or invest in additional assets.

The unlinked interventions of improved production practices and the technical assistance provided to the superstores may be made more impactful and sustainable by linking improved smallholder producers with premium value chains where the better produce is supplied to premium markets; except that the volume moved through these premium markets remain extremely limited. This will result in increased product quality being available to end users as well as maintaining benefit for the smallholder producers through repeat increased revenue per land unit allowing increased farmer household income.

### ***Gender mainstreaming is effective in selected activities but must be delivered to both men and women***

Gender influence in Bangladeshi agriculture varies by function. In the horticulture value chain, women are actively involved in the vegetable production at farm level throughout the soil preparation, sowing, maintenance, harvesting and post-harvesting activities. However, they have little influence on decision-making such as in input purchase, crop selection or product marketing. Especially in areas where there are community led efforts such as at collection centers, women have minimal voice in the decision making. Women have control in homestead gardening where they can decide which vegetables to grow and how to utilize the harvest.

These features require relevant interventions to be adapted to the situation. The CCBA project learnt that all the production and post-harvest training provided to men farmers was later taught by them to the women involved in the practice also. Women received separate training on homestead gardening, food processing and nutrition. None of the same training was offered to both genders.

The fact that the production and post-harvest training is provided to women by their partners is a clear proof of the need for women to also receive the same training. It is also known in Bangladeshi culture that men prefer to be well aware of the exposure women receive from outside players. Being the primary decision makers in the culture, they need to be directly educated on nutritional benefits of food selection and preparation to reduce risk of benefit loss to women education.

**Conclusion:** The benefits of production and post-harvest education provided to farmers will be multifold if provided to both genders in groups together in regions where men and women traditionally work collectively in the field. In selected regions with ultra-conservative culture, the same trainings will need to be gender segregated while keeping men in the loop to enhance their cooperation. Through training, women's functionality and role in the value chain can be improved in all areas where they are already active.

Similarly, men need nutritional improvement training to ensure they do not prevent women from newly learnt practices. To avoid cultural violation, the training need not be essential for men but they should be aware that their presence is welcome. The preferred impact can be achieved by choice of appropriate time and venue of training when both genders are likely to be together.

### ***Food processing at household level reduces post-harvest losses and improves nutrition; commercialization can benefit further***

Food processing to reduce post-harvest losses introduced to rural women by CCBA has shown popularity amongst the relevant women groups. Scaling up and linking the women to the local market for selling processed food can help develop a cottage industry. This can be another source of income for women, reducing their financial dependence on men. Currently, the processed food is consumed at home, improving nutrition. Commercialization can have further indirect benefits.

According to consultations with CARE, for improved nutrition in rural households (primarily child and maternal nutrition), the three essential accompanying factors with the messaging for improved nutrition include (i) women empowerment (for women's confidence and decision making capacity); (ii) backyard vegetable production and (iii) women income generation.

CCBA has already intervened in the first two factors by providing gender equity lessons and delivering training on homestead gardening. Commercialization of food processing can be a

source of income for the relevant women. This can provide the required combination for empowerment that has a nutritional impact on women and children.

**Conclusion:** Piloting food processing by women is well accepted in women groups with requests for additional training. Local organization(s) which support women owned enterprise development need to be informed of the benefits of the CCBA pilot and convinced of the potential for success; they can then take this effort forward independently. Separation from the value chain efforts will also allow focus on the primary goals of the project.

### ***Dairy farming has significant potential in Bangladesh; the private sector needs continued technical support***

The interest of the private sector partner, Golden Harvest, shifted from the horticulture to the dairy sector. This interest was triggered by the fact that only 20% of the dairy needs in the country are fulfilled by fresh milk and the remaining through imported powder milk. Continued involvement of the implementing partner allowed witnessing the potential in the dairy industry.

Golden Harvest invested in a commercial dairy farm in Sylhet. With technical support from CCBA, the project 500 smallholder farmers during the last twelve months in improved dairy practices resulting in tripling their milk production per cow. Golden Harvest has developed relations with the smallholder farmers to supply the milk to the chilling facility being set up at the commercial dairy farm. To facilitate this, Golden Harvest plans to offer its dairy farm as a resource center to the smallholder farmers. They intend to offer facilities for cattle rearing, production training, animal health and veterinary services in addition to being their customer.

This provides a supplier base to Golden Harvest and strong customer to the farmers. Golden Harvest expects that all the milk produced at its farm and collected from smallholder farmers will be supplied to the Sylhet liquid market consisting of commercial sweet and confectionary producers. All the milk produced will be consumed in the local market indicating the unmet demand.

This particular case is an evidence of the latent demand for liquid milk and the potential for the dairy industry. The significant interest from the private sector player in supporting smallholder farmers is further confirmation of the expected returns from their investments.

**Conclusion:** The private sector has shown a keen interest in the dairy sector but lacks the technical knowledge to continue scaling up the practice or import best practices from outside the country. For continued success, technical assistance and exposure to dairy farming practices outside Bangladesh need to be provided. Similarly, smallholder farmers need scaled up support which can be delivered in partnership with Bangladesh Extension Education Services (BEES). Financial sector support to leverage the industry's potential should also be encouraged to ensure replication of commercial dairy farming in other parts of the country.

## **Strategic Level Lessons**

### ***Misalignment of social/development objectives and business objectives resulted from lack of market understanding and long term planning by the private sector partner***

A key characteristic of USAID's GDA model is that the business objectives of the private sector partner and development objectives of the relevant USAID mission should be pursued

simultaneously and reinforce each other. In the CCBA project, the initial understanding was that the private sector partner, Golden Harvest, would provide leverage of 2:1 by investing USD 10.2 million in its frozen food product line (ready to eat foods, finger foods and frozen vegetables) to align with the USAID/Bangladesh food security objectives.

However, the interest of the private sector partner shifted soon after its realization of insufficient market size for its initially intended product line of frozen vegetables. When Golden Harvest diverted its funds to the dairy sector and ice cream product line, there was immediate misalignment with USAID's social and development objectives.

It is important to note that private sector partners in a GDA or public-private partnership (PPP) are not necessarily basing their decisions on detailed market studies and long term business plans. Private sector partners' decisions can be fairly opportunistic, which can impact the project implementation plan when focus shifts due to changes in market conditions or business interests of the private sector partner. The private sector partner cannot be convinced to continue interest based on corporate social responsibility (CSR). For sustainability, it is important for the solution to be 'business driven' and not a philanthropic move of the private sector partner.

**Conclusion:** GDA and/or PPPs need better communication and planning with reinforced confirmation of the objectives alignment to ensure common goals pursued by jointly designed solutions. There needs to be confirmation and evidence that the private sector partner has long term plans for continued business interest as initially expressed.

Parallel to this, there needs to be sufficient flexibility built into the project knowing the private sector's ultimate objective of maximizing profitability can shift focus due to external factors (such as market condition changes) or delay in implementation.

Had there been sufficient flexibility at the planning phase, the GDA implementer would have been able to realign the social objectives to meet the reprioritized business goals of Golden Harvest. In the current situation, the project has successfully met separate targets in horticulture while continuing to provide direct value to the primary private sector partner and develop linkages and capacity of smallholders to feed into the new market focus – dairy. However, objectives continue to remain misaligned.

### ***Gender balanced interventions in value chain are essential for maximum impact***

Though CCBA had several gender focused interventions, they were rarely along the horticulture value chain. The cross-cutting issue of gender focused training to women groups was limited to homestead gardening, nutrition training, and food processing. These activities are highly essential since previous research demonstrates that women in lower income rural households are most effectively involved in these activities<sup>1</sup>. In this aspect, CCBA delivered training was highly beneficial to the women groups, though none were in line with the commercial horticultural production of the small-scale farmers.

The project experienced what is previously known about Bangladeshi agriculture; women work closely along men in the production and post-harvest stages in Bangladesh, contributing up to 68% of the agriculture labor<sup>2</sup>. Yet the trainings provided to farmers were delivered to men only.

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<sup>1</sup> Naved, et al, A Rapid Assessment of Gender in Agriculture of Bangladesh (International Rice Research Institute), 2011

<sup>2</sup> N. H. Karim, Agriculture Management Systems in Bangladesh in Gender Dimensions in Biodiversity Management and Food Security: Policy and Programme Strategies for Asia (Rome: Food and Agricultural Organization), 1999

However, increased involvement of women in agriculture and field activities is coupled with greater flexibility of social norms (gender division) in lower income farmer families. This opens significant opportunities for women's involvement in interventions along several nodes in production and post-harvest related activities, though is still limited in trade and market involvement. The training interventions need to be more gender balanced as per involvement in the value chain.

**Conclusion:** Interventions designed for value chains in Bangladesh will be significantly more effective if the assistance and training is provided to women in parallel to men, especially in all areas of agricultural production and post-harvest activities. The impact can be further augmented by provision of gender friendly agricultural extension services. Similarly, there should be greater planning of closely linking of women to the value chain till the post-harvest stage and planning of their greater involvement in an incremental way in steps beyond their current involvement. This will be essential at the planning phase of projects and less effective if done as an add-on feature at later stages of the project.

### ***Food safety is not a priority in the market***

While the issue of food safety has received significant discussion among civil society, the public sector, and various food market stakeholders, it remains unclear whether the average Bangladeshi consumer is willing to pay any premium or demand any traceability required to ensure safe food. Food safety issues are likely an issue of production (pesticide residues), the water (contamination of water used for washing, hydrating, or in any way touching fresh food), or during handling (preservatives applied to extend the life.) But the concern and visibility of food safety as an issue may be more overblown than any actual consistent health issue. The market simply isn't there for a significant 'safe food' supply chain and brand.

The food safety efforts of CCBA were focused only on high end retail markets to obtain ISO 12000 certifications or in educating the smallholder farmers in food safety practices (controlled pesticides, usage of pheromone traps and post-harvest handling). All the other linkages in the value chain were unattended reducing the certainty of the food safety. The improved products or cleaner retail environments did not receive response of higher demand for safer food products.

**Conclusion:** The public sector framework for food safety involves numerous ministries and agencies with no consistency, some corruption, and little predictability. There appears to be no political will to change this in the near term.

Therefore, there is little to be done within the food safety regulatory framework which would develop and enforce a consistent and predictable food safety regime evenly across the food system in the near-term and there is no significant domestic market currently for a privately driven traceable, safe food brand to be developed.

The largest food retailers are interested in meeting international standards of best practice that are within their operational economic interests and the largest food processors are interested in meeting international food safety guidelines for potential access to export markets.

Since it is unlikely that the market is willing to pay any premium price, a confirmation of this understanding might help in paving a future path. A quick assessment of willingness to pay premium for higher prices needs to be conducted to identify if a market segment exists for the premium product.