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ANNUAL PROGRESS REPORT

COLD CHAIN BANGLADESH ALLIANCE (CCBA) PROJECT

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ACRONYMS

BARI	Bangladesh Agricultural Research Institute
BARC	Bangladesh Agricultural Research Council
BASA	Bangladesh Association for Social Advancement
BCSA	Bangladesh Cold Storage Association
BFFEA	Bangladesh Frozen Food Exporters Association
CCBA	Cold Chain Bangladesh Alliance
COP	Chief of Party
CSA	Commodity Systems Assessment
DAE	Department of Agriculture Extension
DCOP	Deputy Chief of Party
DOC	Day Old Chick
F2F	Farmer-to-Farmer
FCR	Feed Conversion Rate
FGD	Focus Group Discussion
FtF	Feed the Future
GDA	Global Development Alliance
GDP	Gross Domestic Product
GoB	Government of Bangladesh
HACCP	Hazard Analysis Critical Control Point
HVC	High-Value Crop
HYV	High-Yielding Variety
LSP	Local Service Provider
M&E	Monitoring and Evaluation
MOU	Memorandum of Understanding
MPC	Marketing and Planning Committee
NGO	Non-Governmental Organization
PHL	Postharvest Loss
PPR	Performance Plan and Reports
SMKK	Sheba Manab Kallyan Kendra
TNA	Training Needs Assessment
TOT	Training of Trainers
YLB	Yard Long Bean
WFLO	World Food Logistics Organization

EXECUTIVE SUMMARY

This annual report covers the Cold Chain Bangladesh Alliance (CCBA) Year 2 activities conducted between September 2014 and October 2015.

The Cold Chain Bangladesh Alliance (CCBA) project is part of the Global Development Alliance (GDA), USAID's model for public-private partnerships. USAID/Bangladesh and Winrock International are partnered with Golden Harvest, a local food processing and transportation company, to implement this project. CCBA's overall goal is to increase the availability, access, and use of domestically produced and nutritious foods in an effort to sustainably reduce poverty and hunger. The project is implemented in collaboration with the World Food Logistics Organization (WFLO), a core partner of the Global Cold Chain Alliance (GCCA).

CCBA is comprised of four components with specific objectives. The components are as follows:

Component 1: Increased capacity of small and marginal farmers to grow high-value agricultural products

Component 2: Improved agricultural market efficiency and planning

Component 3: Increased private sector investment and capacity in cold chain management

Component 4: Increased compliance with international food safety standards

During Year 2, CCBA consolidated its work in two of its project areas (Jessore and Gazipur) and started work in new areas under the Feed The Future (FtF) zone of influence (Barisal, Khulna, Faridpur, and Chuadanga), and in non FtF areas (Comilla, Sylhet, and Chittagong).

CCBA selected four production areas in Jessore, four in Comilla, Sylhet, two in Chittagong, two in Khulna, two in Barisal, two in Faridpur and one in Gazipur.

CCBA recruited new field staff for Comilla, Sylhet, Chittagong, Chuadanga, Khulna, Faridpur and Barisal; and established new field offices in Comilla, Sylhet, Chittagong, Khulna and Barisal. CCBA also recruited a Grants Manager, a Communication Officer, and an M&E Officer.

Project activities and staff movement became significantly restricted due to the deteriorating political situation in Bangladesh in January 2015. Countrywide blockade, strikes arsons and violent demonstrations compelled the staff to curtail their activities particularly field visits, data collection, extension service and organize trainings. Furthermore, farmers in the project areas could not access markets during peak harvest periods.

Field activities started again in mid-April 2015 when violence subsided, beginning with the selection of production areas and formation of high value producer groups within the Feed the Future (FtF) zones.

Under Component 1, CCBA organized 499 producer groups, each group consisting of 30 high-value crop producers, broiler chicken producers, dairy producers, or backyard vegetable producers to facilitate technology transfer, access to inputs and market linkage through collection centers and capacity building. The project established 23 demonstrations plots in the FtF area to showcase new crop varieties and different technologies. During Year 2, CCBA organized 515 training events involving 15,284 male and female producers. Trainings included instruction on HVC production, post-harvest technology, marketing and Backyard Vegetable Production and Nutrition.

Under Component 2, CCBA established four collection centers to facilitate aggregation and post-harvest handling of eggplant and other high-value crops produced by more than 870 cauliflower, eggplant, field pea, yard long bean, chili and bitter gourd farmers. Four Marketing and Planning Committees (MPC) were formed to manage the collection centers and link farmers with wholesale markets. CCBA provided tools and equipment for the farmers linked with the collection centers.

In November 2014, in coordination with WFLO, CCBA fielded an international consultant to assess post-harvest loss of selected crops, conduct a workshop with key stakeholders to take stock of the post-harvest situation in Bangladesh, followed by a seminar.

Under Component 3, CCBA has provided an array of support to Golden Harvest including training on Food Safety for its factory and marketing staff, cold chain management, and technical assistance in establishing supply chains. CCBA developed local farmers' capabilities in the Golden Harvest zones, training farmers to meet Golden Harvest's product supply demands and specifications, and positioning farmers to tap into the markets and improved food safety standards that Golden Harvest is developing and growing through its cold chain investments. CCBA trained poultry producers and established a direct market relationship to supply Golden Harvest with broiler birds, and trained dairy farmers in anticipation of Golden Harvest's dairy farm operation. According to Golden Harvest's recruitment records, 482 full time jobs have been created through the cold chain initiative, particularly permanent jobs created at the newly built cold storages and cold chain logistics

In September 2015, CCBA fielded two consultants to assess the cold chain system and energy efficiency in cold storage operation.

Under Component 4, CCBA organized two training events on HACCP and GMP cold chain supply for the factory staff of Golden Harvest Agro Industries Ltd.

CCBA also facilitated one training on Food Safety Management (ISO 22000:2005) for Rahim Afroz Limited and organized Cold Chain Management and Food safety training for Super Shops and Fresh Produce suppliers.

To develop a critical mass of resource persons with technical knowledge on Good Agricultural Practices (GAP), CCBA organized a Training of Trainers (TOT) conducted by an international consultant in January 2015 for representatives from Department of Agriculture Extension (DAE), Bangladesh Agricultural Research Institute (BARI), Bangladesh Agriculture Development Corporations, BADC, NGOs, and CCBA staff.

I. PROJECT PROGRESS TOWARDS RESULTS

COMPONENT 1: INCREASED CAPACITY OF SMALL AND MARGINAL FARMERS TO GROW HIGH VALUE AGRICULTURAL PRODUCTS

Component 1 addresses food insecurity and constraints on availability and access to nutritious foods by increasing small and marginal farmers' productivity of high-value agricultural products. To address farmers' lack of quality inputs and knowledge of best agriculture and postharvest practices and market information, CCBA establishes and strengthens producer groups, provides training for farmers on improved technologies and practices with emphasis on best postharvest practices, and strengthens local service providers.

A. SELECTION AND EXPANSION OF PRODUCTION AREAS

In addition to CCBA's ongoing activities in Jessore and Gazipur, CCBA has expanded its project interventions into seven new regions that include Comilla, Sylhet, Chittagong, Khulna, Faridpur, Barisal and Chuadanga bringing the total number of project areas to nine.

Before selecting the production area, CCBA field staff reviewed secondary data, conducted interviews with key informants, and undertook preliminary field visits. This was followed by focus group discussions (FGD) involving producers, input sellers, and market players; and physical mapping of the areas. CCBA also conducted evaluations of agro-ecological conditions favorable for HVC production, farmers' willingness to adopt new technologies, number of farmers willing to produce a marketable surplus, existing infrastructure (roads and markets), proximity to existing or planned collection centers and markets, and Government of Bangladesh (GoB) priorities.

Considering the agro ecological conditions favorable for high value commodity production, infrastructure, proximity to existing or planned collection centers, and other criteria of CCBA, 19 new production areas were selected in the reporting year. Among the 19 new production areas, there are four in Jessore, one in Gazipur, four in Comilla four in Sylhet, two each in Chittagong, Khulna and one in Faridpur, and Barisal. Focus group discussions for constraints analysis and needs assessments were conducted in the selected production areas. In addition to selection of new production areas, the existing 12 production areas in Jessore and Gazipur have been expanded as well by incorporating new villages, unions, and upazilas.

In Jessore, upon inclusion of four new production areas, along with necessary expansions and rearrangements of existing production areas, there are in total 11 production areas.

Table 1: New and Existing Production Areas of CCBA in Y2 in Jessore Region

District	Production Areas	Upazila	Union	Villages
Jessore	Production Area 01	Jessore Sadar	Churamonkati	Abdulpur, Churamonkati, Poltadanga, Bagdanga, Shatiantola, Sajiali, Belermath, Kamlapur, Nurpur, Shantola, Vogolpur, Shialdari
			Kashimpur	Bijoynogor
	Production Area 02	Jessore Sadar	Kashimpur	Nouda, Doherpara, Shamnagor, Kifaitnagor, Khozarhat, Gobila, Dakatia, Ghona, Doulatdihi, Khitibdia, Mirapur
			Ichhali	Kismot Razapur, Nongorpur, Rajapur, Kodalia

District	Production Areas	Upazila	Union	Villages
	Production Area 03	Jessore Sadar	Lebutala	Lebutala, Birnarayanpur, Tezrol, Britikapara, Khajura, Goherpur
	Production Area 04	Jessore Sadar	Hoibatpur	Boro Haibotpur, Choto Haibatpur, Shahabazpur, Anayetpur, Nichintopur, Manikdihi, Tirerhat, Mothurapur, Baliaghat, Dakkhin Lolitadhoh, Rohomotpur, Loukhali
	Production Area 05	Monirampur	Bhojgati	Hurgati, Chalkidanga, Deluabari, Joypur
	Production Area 06	Monirampur	Hariharnagar	Modonpur, Khatura, Kaimkhola, Modhupur
			Rohita	Salamotpur, Soroskati, Muragacha
	Production Area 07	Monirampur	Chaluahati	Horispur, Shoila, Singer khazura, Mobarokpur, Chaluahati, Sahapur, Hayatpur, Tripurapur
			Maswimnagar	Hakimpur, Rampur
	Production Area 08	Monirampur	Shyamkur	Lauri, Shymkur, Panichottor, Gopikantopur
			Chaluahati	Ghiba
	Production Area 09	Chowgacha	Swarupdaha	Kodomtola, Tarranebas, Swarupdaha, Belermath, Bagardari, Tengorpur, Zielgari, Anderkuta, Kongsharipur, Khorincha, Bohilapota
			Narayanpur	Koibilla, Hogoldanga, Petvora, Narayanpur, Hazrakhana
	Production Area 10	Chowgacha	Phulsara	Tetulbaria, Durgapur, Kotalipur, Sayedpur
			Jagadishpur	Mirpara, Arpara, Jhinaikundho, Dakkhinsagor, Arkandi, Kandi, Marua
	Production Area 11	Chowgacha	Patibila	Shadipur, Patibila, Muktada, Boro Niayamotppur, Hayatpur, Ichapur
			Hakimpur	Nimtala, Arraji Sultanpur, Kamorpur, Sarufpur, Chakla

In Gazipur, upon inclusion of one new production area, along with necessary expansions and rearrangements of existing production areas, there are in total six production areas.

Table 2: Production Areas of CCBA in Y2 in Gazipur Region

District	Production Areas	Upazilla	Union	Villages
Gazipur	Production Area 01	Gazipur Sadar	Pubail	Mathulia, Shikulia, Satianipara, Khiligao, Udor, Somorsingh, Bindan, Satanipara, Choto koiar, takbari, Dopapara, Patartak, Choto Joynagar
		Kaliganj	Nagori	Birtul, Parwan, Dhanun, Royan, Vasania, Bagdi, Mathoil, Soto Dhindi, Kulun, Luduria, Tohordia, Rayerdia, Talia, Vatuer tak, Ketun
	Production Area 02	Sreepur	Maona	Chakpara
			Telihati	Uttar Pelayet, Taltoli, Dombari
	Production Area 03	Kaliganj	Baktarpur	Brammangaon, Khoikora, Brammangaon, Satanipara
			Jangalia	Punshohi, Azmotpur, Morash, Sathiani
			Jamalpur	Baluavita, Borovola, Kapais, Choladi, Gararchar, Uttar Jamalpur
			Tumulia	Joyrampur, Chuaria khula, Rajnagar
			Kaliganj Sadar	Moulgaon, Deopara
			Moktarpur	Shibpur, Borogaon, Puten
	Production Area 04	Gazipur Sadar	Pubail	Megdubi , Harbaeed, Haidorabad, Rahapara, Nilerpara, Kolerbazar, Dokhinkhan, Amrabad
		Sreepur	Rajabari	Faogan, Dumni, Ujalia

District	Production Areas	Upazilla	Union	Villages
			Prahlladpur	Domdoma, Vitipara
	Production Area 05	Kapasia	Singhasree	Singasree, Boribari
			Rayed	Vikartek, Pechudia, Lohadi, Moishan, Amraid, Dighirkanda, Belashi, Dikdia, Borohor, Hayeljor, Noshingpur, Hayeljor, Rayed Vigartek, Koshdi
			Chandpur	Chandpur
			Durgapur	Durgahpur, Masok
			Ghagutia	Khirati, Shaldoi, Chala
			Barishab	Barishabo
			Toke	Tok, Ghoserkandi
			Karihata	Trimohini
			Targaon	Targaon
	Production Area 06	Gazipur Sadar	Baria	Kasorita, Amona
			Sadar Union	Pajolia
		Sreepur	Prahlladpur	Marta, Mendipur, Vitipara

In Comilla, four new production areas have been selected. The selected new production areas include 57 villages in nine unions under Adarsha Sadar, Burichong and Debidwar upazilas. In Sylhet, the selected four new production areas include 97 villages in 11 unions under South Surma, Sylhet Sadar and Gowainghat upazilas. In Chittagong, the selected two new production areas include 21 villages in six unions under Patiya and Chandanish upazilas. In Khulna, the selected two new production areas include 19 villages in six unions under Dighalia, Dumuria upazilas, and Metropolitan Thana. In Faridpur, the selected one new production areas include 11 villages in four unions in Sadarpur and Madhukhali upazilas. In Barishal, the selected new production areas include four villages in two unions under Babuganj upazila. In Chuadanga, FGDs are ongoing for the selection of new production areas.

Table 3: Selected New Production Areas of CCBA in Y2 in New Regions

District	New Production Areas	Upazila	Union	Villages
Comilla	Production Area 01	Adarsha Sadar	Pachthubi	Ranguri, Borjola, Basontapur, Kalikapur, Pachthubi, Italla, Sawalpur, Subornapur, Pandanagor
			Amratali	Shimpur, Ujirpur, Ratnaboti, Banashua, Joshpur, Khalkerper, Moulobinagor, Banashua
	Production Area 02	Adarsha Sador	Kalirbazar	Sayedpur, Doyara, Kamlapur, Kamarbug, Bejbari, Azimpur
	Production Area 03	Burichong	Bharella	Bharella, Gobindopur, Poshchim Singh, Shundrom, Ramchandrapur, Paruyara
			Moinamoti	Baghilara, Bazehora, Bazebaher Chor, Chandshar, Kathalia, Namtola, Shomeshpur, Vaduhapara
			Mokam	Abidpur, Mitholma, Varail, Varikuta, Dubayerchor
	Production Area 04	Debidwar	Boro Kamta	Boro Kamta, Brammon Khara, Bugmara, Nobiabad, Phagunda, Premu
			Elahabad	Elahabad, Fultoli, Mohammadpur, Poyabari, Shelkanta
			Mohonpur	Mohonpur, Sotna, Taltola, Kuroin
Sylhet	Production Area 01	South Surma	Kamalbazar	Guptergaon, Munshirgaon, Sufur, Mutraspur , Saidpur, Puran Gow, Krori Gram, Betur Mukh Talibpur, Krishnapur, Botergaon, Mutrashpur, Naibug

District	New Production Areas	Upazila	Union	Villages
			Mollargaon	Mollargaon, Sonopara, Sadarkhola, Tajpur, Suklampur, Tazpur, Khanoya, Hazrai, Khalpar, Telirai, Gopshohor, Lama Hazrai
			Lal Bazar	Nazirgaon, West Bage Lamapara
			Daudpur	Nai Khai Jhapagram, Terashigram, Surigaon, Turukhkhola, Rakhalgonj, Sherajpur, Kandirgram, Modon Gouri, Zapagram
			Mogal Bazar	Hazigonj
	Production Area 02	Sylhet Sadar	Kandigaon	Dighirpar, Purbodosha Anantapur, Paikergaown, Badialigaon, Bosontara, Miergao, Poshshim Dosa, Fulkhuchi, Tilokpur, Mollargaon, Bagarpar, Kandigaon, Basirpur, Bashitpur
			Hatkhola	Pagoil, Satarogram, Umayergaon, Rajargaon, Jangalia, Megargaon, Hatkhola, Nowagaon, Nandirgaon, Fakirargaon
			Tuker Bazar	Daldali, Kumargaon, Baluchar, Shahapur, Noagaon
	Production Area 03	Gowainghat	Fatehpur	Fatehpurbazar, Boyra, Tatarkool, Moddopara, Ramnagar, Gulni, Banglabazar, Deoyanergaon, Ojan Fatehpur, Choumohoni, Nowagram, Lakibari, Upo-Lombo, Benna Kandi
	Production Area 04	Gowainghat	East Jaflong	Muslimnagar, Kalinagar, Naya basti, Lakherpar, Vitrakhal
			West Jaflong	Protappur, Hajipur, Kalijuri, Hatirkhal, Rajnagar, Lathi, Dhalerpar, Joynagar, Tarukhal, Loni, Longlakhal, Islamabad
Chittagong	Production Area 01	Patiya	Kachuai	Shrimai, Parigram, Kochuai, Bahuli
			Haidgaon	Haydgaon
			Kelishahar	Sottarpetua, Uttor Burshi, Kelishahor, Khillapara
			Kharana	Kharona, Lalarkhil
	Production Area 02	Chandanish	Dohazari	Caga Char, Dohazari, Eid Pukuria, Jamir Juri, Khillapara, Raypara, Rayjoara
			Satbaria	Hasondondi, Mohammodkhali, Satbaria
Khulna	Production Area 01	Dighalia	Jogipol	Teligati
			Arongghata	Arongghata, Gaikul, Sarderdanga
		Metropolitan Thana		Kattikkul
		Dumuria	Gutudia	Lata, Khamarbati, Bill Pabla
	Production Area 02	Dumuria	Atalia	Motbaria, Gobindhokati, Chakondia, Boratia, Kulbaria, Maltia
			Shobhona	Patabunia, Kadamtala, Sibpur
			Maguraghona	Bata, Dholkhola
Faridpur	Production Area 01	Sadarpur	Krishnapur	Shoildubi, Purbakandi, Nizgram
			Bhashanchar	Choijuddin Mollar Dangi, Katakhali
Barisal	Production Area 01	Babuganj	Chandpasha	Argikalikapur, Gazipur, Vobanipur
			Kedarpur	Vuterdia

B. DEVELOPMENT OF TRAINING MODULES AND MANUALS

CCBA updated existing Training Modules and Manuals on vegetable production, which are used by project staff in training producer groups and beneficiaries. The training manuals for postharvest management for bitter gourd, eggplant, and tomato, pest management through IPM approach and home level processing have been completed. Total number of manuals produced by project is four and are being in used in giving training to the beneficiaries.

C. LOCAL SERVICE PROVIDERS (LSP)

CCBA engages with local service providers who provide support and services to the producers and work as a network in the rural value chain and marketing system. During the reporting year, CCBA identified 71 local service providers (LSP) from Jessore, Gazipur, Comilla, Sylhet, Chittagong, Khulna, and Barisal region who have been directly involved in field activities serving the CCBA producers in backward and forward market linkages. The LSPs were selected from advance and lead farmers; suppliers of inputs such as seed, seedling, fertilizer, vermi-compost, pesticide; medicine traders; and sellers. Many of them are working as vegetable traders as well. The LSPs who are working in the field of poultry are mostly feed, medicine and broiler traders.

In Y2, CCBA facilitated three trainings for 71 LSPs from Jessore, Comilla and Sylhet. The training in Jessore took place on September 1, 2015 with 24 participants. The training in Comilla took place on September 10, 2015 with 25 participants among which two were female. The training in Sylhet took place on September 15, 2015 with 22 participants among which one was female. The training topics covered the role and responsibilities of LSPs, sectors in which LSPs provide services, marketing approach and strategy, and business plans for LSPs. The training also included practical exercises for developing the presentation skills of the LSPs.

Table 4: Trainings for Local Service Provider (LSP) in Y2 by Region

Region	Number of Trainings	Male	Female	Total
Jessore	1	24	-	24
Comilla	1	23	2	25
Sylhet	1	21	1	22
Total	**3**	**68**	**3**	**71**

One major challenge of engaging LSPs as extension and other knowledge based service providers is lack of incentives for their services if producers are not in a position to pay for them. Historically, extension and technical service provided to the crop producers by Government, NGO's and Companies has been free. Small holders also get free services from local input sellers, neighbors and advance farmers whenever they face problems. Moreover, small farmers do not generate enough cash regularly to pay to the service providers. In the given situation, LSP's are now working free but would eventually create a demand for embedded services with inputs, like seeds, pheromone traps, vermi-composts, small equipment etc.

In the reporting year, some of the mentionable activities of LSPs include assisting producers in selling high value crops in the local and regional markets at relatively higher prices, and ensuring timely supply of quality seeds, seedlings, fertilizers, vermi-compost, pesticide, fungicides, and pheromone traps to the producers at reasonable prices. The LSPs working in the poultry and dairy sector are also serving the producers with quality day old chicks, feed, medicine, vaccines and other necessary inputs. LSPs have also been providing up-to-date market information to the producers. They provide technical assistance to the producers directly in the field as well advocating good agricultural practices.

D. ORGANIZE AND STRENGTHEN PRODUCER GROUPS

ORGANIZING PRODUCER GROUPS

In the reporting year, 499 new producer groups have been formed comprising 14,891 members. Among which, 381 groups are high value crop producer groups with 11,347 members, 88 are backyard vegetable producer groups with 2,614 woman producers as members, 18 are poultry producer groups with 570 broiler producers as members, and 12 are dairy producer groups with 360 members.

Table 5: Category Wise Number of Producer Groups Formed in Y2

Group Category	Number of Groups Formed	Number of Members		
		Male	Female	Total
High Value Crop	381	11195	152	11347
Backyard Vegetable	88	0	2614	2614
Poultry	18	539	31	570
Dairy	12	360	0	360
Total	**499**	**12094**	**2797**	**14891**

In Jessore, 81 new groups have been formed comprising 2,430 members. Among which, 60 groups are high value crop producer groups with 1,800 members, and 21 are backyard vegetable producer group with 630 members. In Gazipur, 89 new groups have been formed comprising 2,600 members. Among which, 53 groups are high value crop producer groups with 1,516 members, 18 is backyard vegetable producer group with 514 members and 18 are poultry producer groups with 570 members.

In Comilla, 103 new groups have been formed comprising 3,090 members. Among which, 83 groups are high value crop producer groups with 2,490 members, and 20 are backyard vegetable producer group with 600 members. In Sylhet, 127 new groups have been formed comprising 3,810 members. Among which, 95 groups are high value crop producer groups with 2,850 members, 20 are backyard vegetable producer group with 600 members and 12 are dairy producer groups with 360 members.

In Chittagong, 40 new groups have been formed comprising 1,195 members. Among which, 37 groups are high value crop producer groups with 1,105 members, and three are backyard vegetable producer group with 90 members.

In Khulna, 48 new groups have been formed comprising 1,440 members. Among which, 44 groups are high value crop producer groups with 1,320 members, and four are backyard vegetable producer group with 120 members.

In Faridpur, two new high value crop producer groups have been formed comprising 56 tomato producers. In Barisal, nine new groups have been formed comprising 270 members. Of these nine groups, seven groups are high value crop producer groups, and two are backyard vegetable producer groups with 60 members.

Table 6: Number of Groups Formed in Y2 by Region

Region	Group Category	Number of Groups Formed	Number of Members		
			Male	Female	Total
Jessore	High Value Crop	60	1800	0	1800
	Backyard Vegetable	21	0	630	630
Gazipur	High Value Crop	53	1485	31	1516
	Backyard Vegetable	18	0	514	514
	Poultry	18	539	31	570
Comilla	High Value Crop	83	2490	0	2490
	Backyard Vegetable	20	0	600	600
Sylhet	High Value Crop	95	2850	0	2850
	Backyard Vegetable	20	0	600	600
	Dairy	12	360	0	360
Chittagong	High Value Crop	37	1098	7	1105
	Backyard Vegetable	3	0	90	90
Khulna	High Value Crop	44	1206	114	1320
	Backyard Vegetable	4	0	120	120
Faridpur	High Value Crop	2	56	0	56
Barisal	High Value Crop	7	210	0	210
	Backyard Vegetable	2	0	60	60
Total		**499**	**12094**	**2797**	**14891**

STRENGTHENING PRODUCER GROUPS

CCBA continued to form producer group management committees among the groups, organize regular meetings, facilitate field visits to ensure on-time technical support, link the committees with LSPs and input-output markets, as well as assist in reducing postharvest losses. During Y2, 674 producer group committees have been formed having selected representatives from the groups and subsequently 1,075 meetings have been conducted to operationalize and strengthen the groups.

See Table 7 for producer group committees formed, and total meetings held.

Table-7: Producer Group Committee

Sl No	Region	Producer Group Committees formed	HVC	Women	Poultry/Dairy	Group Meetings held
1	Jessore	302	217	85	-	226
2	Gazipur	89	53	18	18	184
3	Comilla	103	83	20	-	363
4	Sylhet	127	95	20	12	249
5	Chittagong	40	37	3	-	40
6	Khulna	13	11	2	-	13
Total		674	496	148	30	1075

CCBA field staff facilitated the producer group meetings which focused on forming committees and distribution of responsibilities among the members, as well as identifying problems and discussing solutions; and production topics included crop-specific production related issues and solutions, formation of single crop based clusters, land suitability, requirement of seed and other quality inputs, sourcing, intercultural operations such as irrigation, drainage, fertilization; and plant protection measures.

Producers also discussed preparing better marketing plans for selling at local or distant wholesale/retail markets at higher prices; how to access market price updates, as well as input and output market linkages. The meetings facilitated establishing linkages between producers and input suppliers, as well as linkages with technical personnel from government and research institutes who regularly visited the producers' plots. Such follow up services facilitated better implementation of the new technologies that the producers learned in the CCBA trainings resulting in increased production and decreased postharvest loss. The women producers' meetings focused on income generation through backyard vegetable production and some of the groups initiated monthly savings from their small earnings. Women usually have a less secure place in rural Bangladesh. They need money to buy seeds and other inputs to establish backyard vegetable garden or starting a pickling venture. Credit is one way to get money but it is not easy and interest rate is higher even if they are a member of a NGO group. More often, it is easier if they have some startup money. Regular and small savings gives better opportunity to take risk and it is useful during rainy days or someone in the family is sick. Considering the above few women groups started savings individually. Besides, savings, groups also discussed on seedbed and pit preparation, staking procedures and pest management.

E. TRAINING FOR PRODUCER GROUPS AND OTHER STAKEHOLDERS

In Y2, CCBA facilitated 515 training events for 15,284 female and male producers covering High Value Crop Production and Postharvest Management for high value crop producers; Backyard Vegetable Production, Post-Production & Nutrition; and two days long training on "Modern Technology of Broiler Production and Farm Management & Marketing.".

In addition to these commodity-based trainings, CCBA also conducted Training on Marketing and Market Linkage, and Hands-on Training on Integrated Pest Management (IPM) as well in the reporting year.

Table 8: Category Wise Number of Trainings and Participants in Y2

Training Category	Number of Training	Number of Participants						
		Jessore	Gazipur	Comilla	Sylhet	Chittagong	Khulna	Total
High Value Crop	369	3119	1549	2390	2848	504	521	10931
Backyard Vegetable	120	1672	564	598	600	90	60	3584
Poultry	14	-	409	-	-	-	-	409
Dairy	12	-	-	-	360	-	-	360
Total	515	4791	2522	2988	3808	594	581	15284

Among the total 515 training events, 369 trainings were on High Value Crop Production & Postharvest Management imparted to 10,931 high value crop producers, 120 trainings on Backyard Vegetable

Production, Post-Production & Nutrition were conducted for 3,584 woman producers engaged in homestead gardening. CCBA organized 14 training events on Modern Technology of Broiler Production, Farm Management & Marketing for 409 broiler producers, and 12 training events on Modern Production Technology of Dairy and Farm Management imparted to 360 dairy producers.

TRAINING ON HIGH VALUE CROP PRODUCTION & POSTHARVEST MANAGEMENT

In the reporting year, 369 trainings on High Value Crop Production & Postharvest Management have taken place in six regions involving 10,931 participants.

The training on High Value Crop Production & Postharvest Management included tomato, cucumber, cauliflower, French bean, eggplant, yard-long bean, bitter gourd, carrot, chili, green pea and onion.

See Table 9 for the number of trainings on high value crops and number of participants during Year 2 by region.

Table 9: Number of Trainings on High Value Crops in Y2 by Region

Region	Number of Trainings	Male	Female	Total
Jessore	105	3033	86	3119
Gazipur	54	1514	35	1549
Comilla	80	2390	-	2390
Sylhet	95	2848	-	2848
Chittagong	17	500	4	504
Khulna	18	415	106	521
Total	**369**	**10,700**	**231**	**10,931**

TRAINING ON BACKYARD VEGETABLE PRODUCTION, POST-PRODUCTION & NUTRITION FOR WOMAN PRODUCERS

In the reporting year, CCBA organized 120 Backyard Vegetable Production, Post-Production & Nutrition Training in six regions attended by 3,584 woman producers. The training focused on production technology and models of homestead vegetable gardening to meet partial nutritional requirements of the family.

Figure 1: Training on Backyard Vegetable Production, Post-Production & Nutrition for Woman Producers

CCBA conducted 56 trainings in Jessore, 19 in Gazipur, 20 in Comilla, 20 in Sylhet, 3 in Chittagong and 2 in Khulna. See Table 10 below for the numbers of women participants by region.

Table 10: Number of Trainings for Woman Producer Groups in Y2 by Region

Region	Number of Trainings	Number of Participants
Jessore	56	1672
Gazipur	19	564
Comilla	20	598
Sylhet	20	600
Chittagong	3	90
Khulna	2	60
Total	120	3584

The training topics included the production of year-round backyard vegetables, harvesting techniques, postharvest handling, cleaning, sorting by size and packing, and hygiene before, during, and after the food preparation. The training also included practical sessions on how to cook nutritious foods, particularly combining seasonal vegetables with regular foods such as rice and pulses to serve a healthy diet for the family and provide the daily nutritional requirements.

TRAINING ON MODERN TECHNOLOGY OF BROILER PRODUCTION, FARM MANAGEMENT & MARKETING

In the reporting year, CCBA conducted 14 trainings on Modern Technology of Broiler Production, Farm Management & Marketing in Gazipur serving 409 poultry producers of 14 villages under 9 of unions of Kapasia and Sreepur upazilas.

Table 11: Number of Trainings on Poultry in Y2 by Region

Region	Number of Trainings	Male	Female	Total
Gazipur	14	381	28	409
Total	14	381	28	409

The two-day long training covers extensive details of broiler rearing that include selection of farm location; procedures to measure the requirements of daily ration and identify the necessary machinery; specifications for temperature, air circulation, space, overall environment; and cleaning and proper maintenance of the sheds. Training also includes lessons on identifying quality day-old-chicks and transportation; feed and feeding standards; bio-safety measures; various diseases and their symptoms, preventions and treatments including vaccination; as well as market linkages for broilers.

TRAINING ON MODERN PRODUCTION TECHNOLOGY OF DAIRY & FARM MANAGEMENT

In the reporting year, 12 trainings on Modern Production Technology of Dairy and Farm Management took place in Sylhet with the participation of 360 dairy producers of Fotehpur union under Goainghat upazila.

Table 12: Number of Trainings on Dairy in Y2 by Region

Region	Number of Trainings	Male	Female	Total
Sylhet	12	360	0	360
Total	12	360	0	360

A training needs assessment (TNA) was conducted before finalizing the training topic and lessons sheets. The day long training covers dairy management and husbandry that includes cattle shed construction, selection of location of cattle shed in the homestead, internal temperature during rainy season and winter air circulation, space, overall environment; cleaning and proper maintenance of the sheds. Training also includes lessons on identifying quality feed and feeding standards; preparation feed mixture with concentrates, bio-safety measures; various diseases and their symptoms, preventions and treatments including vaccination; de-worming, milking techniques and maintenance of hygiene as well as market linkages for milk.

COMMODITY-SPECIFIC TRAININGS AND PARTICIPANTS

Among the 515 commodity-specific trainings, CCBA organized 369 trainings on High Value Crop Production & Postharvest Management. The other 146 trainings included 120 trainings on Backyard Vegetable Production, Post-Production & Nutrition for Woman Producers, 14 on Modern Technology of Broiler Production, Farm Management & Marketing, and 12 on Modern Technology of Dairy Production, Farm Management & Marketing. See Table 13 for the number of trainings and participants for commodity specific trainings during Year 2.

Table 13: Commodity-Specific Trainings and Participants in Y2

Training Topic	Number of Trainings	Number of Participants		
		Male	Female	Total
High Value Crop Production & Postharvest Management Training on Bitter Gourd	61	1755	49	1804
High Value Crop Production & Postharvest Management Training on Carrot	06	180	0	180
High Value Crop Production & Postharvest Management Training on Cauliflower	39	1177	07	1184
High Value Crop Production & Postharvest Management Training on Chili	19	541	13	554
High Value Crop Production & Postharvest Management Training on Cucumber	52	1522	25	1547
High Value Crop Production & Postharvest Management Training on Eggplant	82	2433	13	2446
High Value Crop Production & Postharvest Management Training on Green Pea	04	115	05	120
High Value Crop Production & Postharvest Management Training on Onion	20	559	17	576
High Value Crop Production & Postharvest Management Training on Tomato	48	1286	103	1389
High Value Crop Production & Postharvest Management Training on YLB	34	1011	-	1011
High Value Crop Production & Postharvest Management Training on French-bean	04	120	-	120
Backyard Vegetable Production, Post-Production & Nutrition Training for Woman Producers	120	-	3584	3584
Modern Technology of Broiler Production, Farm Management & Marketing Training	14	381	28	409
Modern Production Technology of Dairy and Farm Management Training	12	360	-	360
Total	**515**	**11440**	**3844**	**15284**

Among the total 15,284 producers who participated in CCBA trainings in Y2, 3,844 were women, equivalent to 25% of the total trainees as shown in Figure 2.

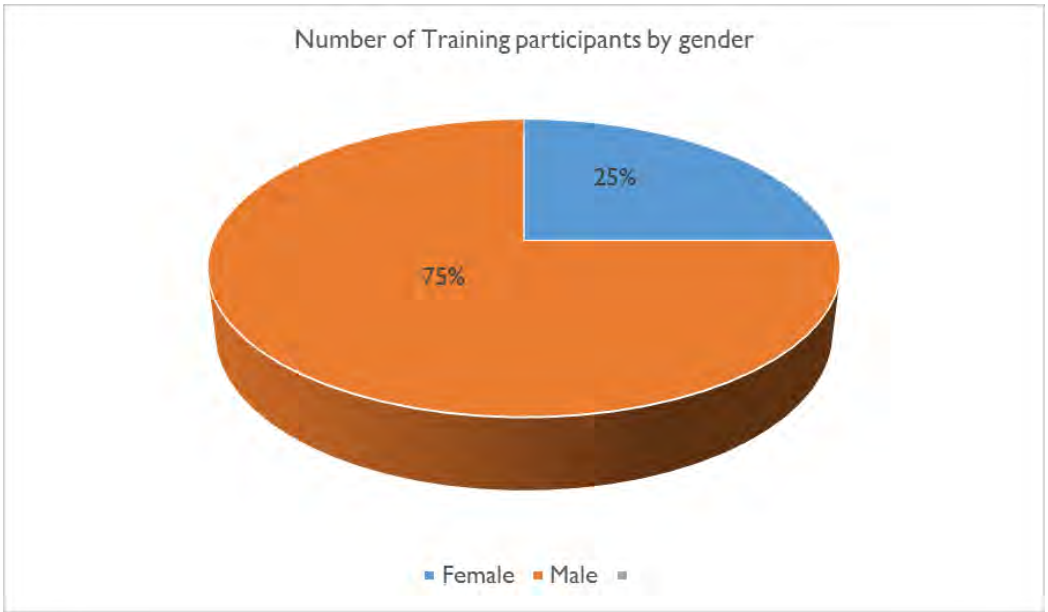

Figure 2: Number of Training Participants by Gender

The impact of each training was assessed through pre and post-test evaluations of the participants using a set of questionnaires. During this reporting year, the average change in learning new technologies and increased knowledge is 35% to 73% in High Value Crop training, 40% to 80% in Broiler training, 20% to 55% in Dairy training and 37% to 77% in Backyard Vegetable Production, Post Production and Nutrition training. Figure 3 shows the improvements in participant learning based on the pre and post-test evaluations of the HVC trainings, by region.

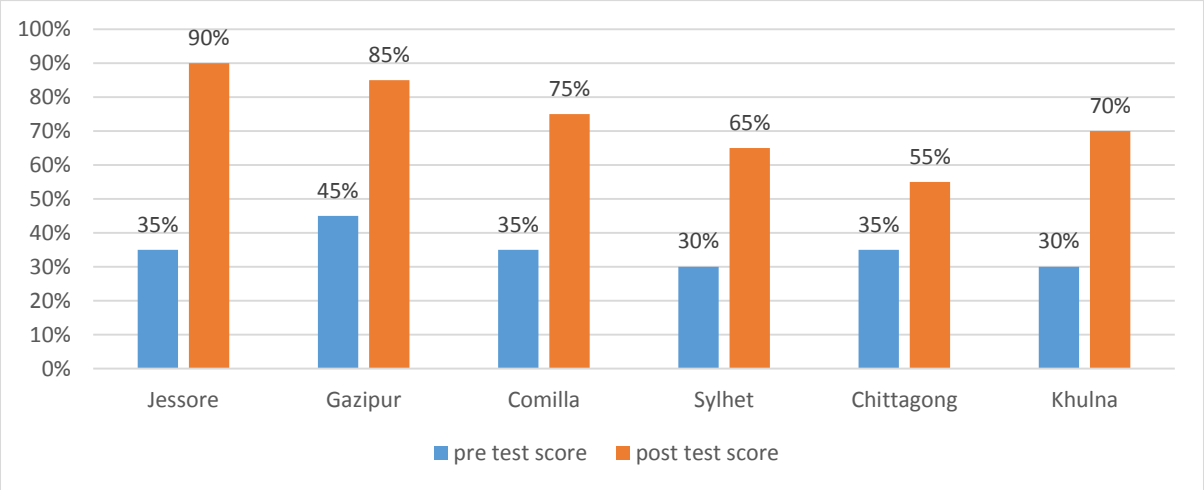

Figure 3: Progress Assessment of Training Evaluation

TRAINING ON BIOSECURITY MANAGEMENT IN BROILER PRODUCTION

In the reporting year, CCBA conducted four trainings on "Biosecurity Management in Broiler Production" in Gazipur with participation of 111 broiler producers among which 92 are male and 19 are female. The training for the Ghagutia Broiler Producer Group took place on September 19, 2015

at Ghagutia village, Kapasia upazila with 30 participants. The training for two broiler producer groups from Shaldoi took place on September 20 and 21, 2015 at Shaldoi village, Kapasia upazila with 28 and 25 participants respectively. The training for the Durgahpur Broiler Producer Group took place on September 30, 2015 at Durgahpur village, Kapasia upazila with 28 participants. The training topics covered biosafety and biosafety elements, farm preparation and management, importance of quality chicks, Day old chick (DOC) management at the brooding house, disease and pest management, feeding system, and importance of quality feed. The training has made the producers aware of modern biosecurity management technology including disease and pest management technology that will help the producers improve broiler production through healthier management with reduced production costs.

TRAINING ON MARKETING AND MARKET LINKAGE

In the reporting year, CCBA conducted 13 trainings on marketing and market linkages with 773 participants, among which 50 were women. The trainings took place in Jessore and Gazipur. The three trainings at Gazipur took place in Kaliganj and Sadar upazilas with participation of 180 producers, traders and wholesalers among which 21 are women.

Table 14: Marketing and Market Linkage Trainings

Sl No	Region	Number of Training	Period	No. of Participants		
				Male	Female	Total
1	Gazipur	3	Quarter 1	159	21	180
2	Jessore	10	Quarter 3	564	29	593
Total		**13**		**723**	**50**	**773**

The 10 trainings at Jessore took place in Monirampur and Sadar upazilas with 593 participants, among which 29 are women.

Figure 4: Training on Marketing High Value Crop and Market Linkage.

The training focused on marketing, addressing the poor postharvest handling that leads to quality deterioration and lowered prices, the importance of strong linkages for better prices, and getting a

premium price through proper sorting, grading and packaging. The participants were trained on proper harvesting and postharvest practices such as the field heat removal immediately after harvesting, and pre-cooling before transporting to the market. Reducing the number of times the producers load and unload their commodity can also minimize postharvest quality loss. Trainings also explained how selling in bulk will help producers get better prices.

HANDS-ON TRAINING ON INTEGRATED PEST MANAGEMENT (IPM)

CCBA has launched an integrated pest management (IPM) training with four hands-on trainings of 65 producers in Hurgati, Birnarayanpur, Nongorpur of Jessore and Shikulia of Gazipur. s. The two-day training covered the definition and necessity of IPM and took participants through field sampling procedures including a field walk, data collection, visual identification of samples, and sample collection through a water pan and poly bag. The training also covered drawing and presentation of an Agro Ecological System Analysis (AESA) and decision making based on the AESA; major insects and diseases of specific crops; usage of pheromone traps, balanced fertilizer, and biological and botanical elements for pest control.

Figure 5: Hands-on Training on Integrated Pest Management (IPM) at Birnarayanpur, Jessore during Sampling of Bitter Gourd.

F. DEMONSTRATIONS AND TECHNOLOGY TRANSFER

ESTABLISHMENT OF DEMONSTRATIONS

Inaccessibility to new and improved varieties, lack of knowledge and insufficient skill of applying new technology in the field are some of the biggest challenges for the producers of Bangladesh.

Hence, CCBA is increasing the capacity of the producers through demonstrations introducing them to new varieties and facilitating the adoption of new technologies. In the reporting year, CCBA has facilitated the establishment of 67 demonstrations in five regions that include Jessore, Gazipur, Comilla, Sylhet and Chittagong. Among the 67 demonstrations, 23 are in Jessore, 18 are in Gazipur, six are in Comilla, 19 are in Sylhet, and one is in Chittagong.

Figure 6: Chief of Party, A.B. Siddiqui, PhD, Visiting the Tomato Demonstration Plot at Birnarayanpur, Lebutala, Sadar, Jessore.

CCBA has been working to introduce new varieties that have good attributes, are particularly suitable for processing purposes, and have good market demand. During the reporting year, several the new varieties were successfully introduced to the producers. The project introduced and demonstrated the following new varieties across the project areas.

Table-15: New Variety Seed and Seed Company

Sl No	Crop Name	New Variety	Company
1	Tomato	Novelty F1 and Sigma -16	Metal Seed
2	Cauliflower	Mid Best, C-33321, and Sevan	Metal Seed
3	Chili	Picnic	Metal Seed
4	Cucumber	Chokori	Metal Seed
5	Cabbage	Tropical Quick	Metal Seed
6	Eggplant	Soldier	Metal Seed
7	Bitter gourd	Green Arrow	Metal Seed
8	Yard long bean	Kegornatoki	Metal Seed
9	Bitter gourd	Lima	Metal Seed
10	Eggplant	Green Ball	Metal Seed
11	Cucumber	Bonolata	Metal Seed
12	Tomato	Tidy	Metal Seed
13	Bitter gourd	Taj 88	Lal Teer
14	Cauliflower	Marbel	Lal Teer
15	Bitter gourd	Tia F1	Lal Teer
16	Eggplant	Banani F1	Lal Teer
17	Eggplant	Retina	GETCO Agro Vision Ltd. (GAV)
18	Cauliflower	Snow Baby 60	GETCO Agro Vision Ltd. (GAV)
19	Cabbage	GT Cross	GETCO Agro Vision Ltd. (GAV)
20	Cauliflower	Snow Baby 60	GETCO Agro Vision Ltd. (GAV)
21	Cucumber	Lucky - 7	GETCO Agro Vision Ltd. (GAV)

Figure 7: Cauliflower Demonstration plot at Jessore.

The new and improved varieties offer a variety of improvements including brighter colors, better in texture and uniform in shapes. Green ball, the new eggplant has been highly rated by the farmers due its fleshy meat with round shape, bright green color, and hardiness; and market demand is high. The cucumber variety Bonolota was highly accepted due to early harvest. It takes almost half the time than the local variety to get the first harvest.

Along with introducing new and improved varieties, the demonstrations are useful to show environmentally friendly practices to the producers. In many plots, the producers are using vermi-compost for the first time to increase soil fertility, and their pest control cost has been reduced by using pheromone traps. The demonstration farmers maintained schedules for seed sowing, transplanting, fruiting, and harvesting, which many producers had not been practicing.

The women producer groups of CCBA were also provided with technical support through group meetings and seeds suitable for backyard vegetable production. They received training on the importance of nutrition, safe production, postproduction, and integrated pest management (IPM). The women producers learned about seed preservation, seedbed and pit preparation and seed sowing. The project conducted demonstrations on food processing technology such as preparing pickles and sauces.

As an example, two CCBA farmers, Shukumar Ghosh and Mohammad Nizam, both from Birnarayanpur village, Lebutala union under Sadar, Jessore, cultivated Sigma-16 and Novelty (Metal Seed) varieties of tomato, replacing the old variety, on 0.24 acres (0.1 hectare) of land. The production of these new varieties is 20 ton per acre, which is about three times the production rate of the local variety, and the postharvest storage duration is 20 to 25 days making the price to be 10 to 15 taka more than the local variety price. The demonstration plots displayed the production of the improved tomato variety as well as new and improved technologies and innovations including standard pre and postharvest practices for handling, storage, and packing.

INTRODUCING INTEGRATED PEST MANAGEMENT (IPM) TO PRODUCERS

Integrated Pest Management (IPM) has been implemented in six large contiguous farmer fields in Jessore and Gazipur. CCBA coordinated with farmers to establish connected zones under IPM to enhance the success of the IPM approach. Two of the three blocks in Jessore were for bitter gourd production in Birnarayanpur, Lebutola and Nongorpur, Ichali under Sadar upazila involving 50 producers covering eight hectares of land cultivating local variety. The third cluster was for eggplant production in Hurgati, Bhojgati under Monirampur upazila, where 34 producers cultivated an improved variety called "eyeret" on two hectares of land. The producers are now using pheromone traps for pest control and started using vermi-compost to improve productivity. In Gazipur, the IPM blocks were conducted at Shikulia, Khilgaon and Udor. In Shikulia, the IPM plot is of bitter gourd covering 4 contiguous acres of land, cultivated by 19 producers. In Khilgaon, the area covers 6 acres, cultivated by 22 bitter gourd producers. In Udor, the area includes bitter gourd, teasel gourd, sponge gourd covering 7.5 acres of land, cultivated by 17 producers. Another 45 producers in Jessore and 20 producers in Gazipur also received training on Integrated Pest Management.

Figure 8: IPM Block at Hurgati, Vozgati, Monirampur, Jessore

FIELD DAY AT JESSORE

CCBA facilitated a farmer field day on the tomato demonstration plot at Birnarayanpur village, Lebutala union under Sadar, Jessore on February 14, 2015. The comparative demonstration included Sigma 16 and Novelty, two new and improved varieties of tomato cultivated by CCBA farmers Shukumar Ghosh and Mohammad Nizam Ali. During the field day and demonstration plot visit, over 100 tomato producers in Birnarayanpur committed themselves to implement their newly acquired knowledge on cultivating new varieties, raise healthy seedlings, transplant the seedlings at the appropriate time, and take proper care of the young plant in the main field to boost the plant at an early age. A.B. Siddiqui, PhD, Chief of Party, CCBA; CCBA field staff; Dr. Md. Sirajul Islam, Chief Scientific Officer, RARS, BARI; and Nitya Ranjan Biswas, Deputy Director, DAE were present at this field day.

Figure 9: Field Day at Birnarayanpur, Lebutala, Sadar, Jessore on February 14, 2015.

FIELD DAY AT SYLHET

CCBA facilitated a farmer field day at the bitter gourd demonstration plot at Laxmibasa (Sonopara) village, Mollargaon union under South Surma upazila, Sylhet on August 2, 2015 with 80 participants from the government, research, and extension offices including DAE, BARI, SRDI, AIS, and CCBA trained producers and LSPs. The demonstration plot displayed the performance, possible applications, feasibility, best practices, and methods of the improved variety of bitter gourd seed, Green Arrow (Metal Seed), to farmers and resource personnel. Ansar Ahmed, the producer trained by CCBA in February 2015, shared his experience of conducting the demo with the audience. He thanked CCBA for introducing and providing him with the new variety as well as the knowledge on preparing high seedbeds, soil and seed treatment, application of dolomite, line sowing, use of pheromone trap, and clean cultivation.

Figure 10: Field Day at Laxmibasa (Sonopara), Mollargaon, South Surma, Sylhet on August 2, 2015

At the field day, the Chief Guest, Md. Shafiquzzaman, SSO, SRDI, Sylhet mentioned that the goals of CCBA are very essential for the betterment of the present horticulture production scenario of Sylhet. Other key participants were Dr. Anisur Rahman, Deputy Chief of Party, CCBA; Dr. Md. Mahmudul Islam Nazrul, Senior Scientific Officer (SSO), OFRD, BARI; Hazi Mokon Miya, Chairman, Mollargaon Union, South Surma; Md Mohaiminur Rashid, Regional Farm Broadcasting Officer (RFBO), AIS; and Md. Forhad Hossain, Agriculture Extension Officer, South Surma, Sylhet.

COMPONENT 2: IMPROVED AGRICULTURAL MARKET EFFICIENCY AND PLANNING

Component 2 addresses low volume production and low prices and incomes for farmers by expanding and unifying small and scattered production plots to a larger and contiguous production area of one or two crops aggregating into a larger volume. CCBA facilitates the establishment of a large production area based rural collection centers and Marketing Planning Committees, and introduces opportunities for value-added income generation.

G. ESTABLISHMENT OF RURAL COLLECTION CENTERS

The rural Collection Centers are primarily convenient meeting places where the producers of the nearby production field respective meet and share knowledge and experiences and develop their skills in good agricultural practices. CCBA organizes 150-200 small horticulture producers, growing one single crop in fragmented small land pieces owned by each of them side by side making a larger contiguous area, named as a cluster of a particular crop, leading to a nearby collection center for economy of scale and connecting to output markets. The project works with the producers to find a suitable vacant land, near the clusters for product aggregation, preferably near a rural road having suitable inward and outward access to larger markets and helps farmers to form a market planning committee who erects some makeshift structures on the land. CCBA provides crates, weighing scales, registers books, training on sorting grading and packing and helps in organizing buyer seller meeting.

The Collection Centers give the producers the opportunity to assemble and accumulate their produce for sorting, grading, weighing, packaging, storing, and 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. CCBA has introduced the use of digital temperature probes, pre-cooling tables, and field transportation trolleys on a trial basis at the Collection Centers. The Collection Centers are creating market opportunities for the producers through market linkages and bulk sales, and the Centers can introduce and apply advanced technologies to minimize postharvest losses and systemize the supply chain for implementation of cold chain management.

In this reporting year, four new Collection Centers have been established, bringing the total number of Collection Centers to seven. The Birnarayanpur Collection Center located at Birnarayanpur, Lebutola, Sadar of Jessore that was established on May 18, 2015, has brought together 240 bitter gourd and 60 tomato producers and has had breakthrough sales to the Meena Bazar outlet and to the Sonadanga wholesale market of Khulna and the Shibchar market of Madaripur using refrigerated trucks. Previously the producers were unable to reach bigger markets and get higher prices due to inefficiency in the market linkages and poor condition of the connecting roads. All aggregated commodities at the Collection Center are now undergoing an improved postharvest handling process before being marketed. The produce is sorted, cleaned, graded based on size, quality, and maturity, weighed, pre-cooled, and properly stacked in crates for being transported to the markets.

The collection centers established during the reporting period have successfully aggregated and marketed eggplants, bitter gourd, yard long bean, chili and some other minor crops and generated substantial revenues, as mentioned below in the table 14.

Figure 11: Commodities being aggregated at Birnarayanpur Collection Centers at Lebutola, Sadar, Jessore.

Table 16: Collection Center Sales in Y2

Name of Collection Center	Total Volume of Produce Aggregated and Marketed (KGs)	Total Revenue Generated (USD)
1. Hurgati Collection Center	236,610	68,918
2. Nongorpur Collection Center	183,760	36,165
3. Baghbari Collection Center	73,020	22,616
4. Shikulia Collection Center	44,881	12,575
5. Swarupdaha Collection Center	376,010	144,845
6. Birnarayanpur Collection Center	128,146	27,414
7. Madanpur Collection Center	88,000	27,553

H. STRENGTHEN MARKETING PLANNING COMMITTEES AND MARKET LINKAGE

CCBA has been working towards establishing effective and efficient market linkages so that producers have access to wholesale and end markets and consumers have access to safe and nutritious food. In the reporting year, some existing linkages between the collection center and wholesalers have been strengthened and few new linkages have been established. Marketing of agricultural produce in the feed the future zone of influence has not been systematically organized. High value crop producers are generally poor and persons of small means. They usually harvest twice in a week during harvesting period having small marketable quantity putting them in a weak bargaining position and uneconomical to carry the small quantity to carry to distant assembly markets. Collection center based marketing committee works as bargaining agents for number of farmers linked with the collection center. These committee members need adequate information and capacity to deal with the marketing agents. CCBA organized and trained the marketing committee members on market information, bargaining techniques, organizing buyer seller meetings and visiting to wholesale markets to establish direct linkage with wholesalers.

BREAKTHROUGHS ACHIEVED AT LEADING RETAIL SUPER SHOPS

CCBA facilitates new market linkages for CCBA producers. These links led to a deal between the producers and two leading organized retail super shops in Bangladesh, Agora and Meena Bazaar. Three commodities (eggplant, bitter gourd, and pointed gourd) were aggregated at the Birnarayanpur and Hurgati Collection Centers of Jessore and sold to the Khulna outlet of Meena Bazaar and to the central warehouse of Agora in Dhaka on May 18 and 21, 2015, respectively. As CCBA has a goal to improve consumer access to safe and nutritious food, the commodities underwent postharvest procedures including pre-cooling at the Collection Centers. The commodities were marketed through refrigerated truck hired from the Bangladesh Agricultural Development Corporation (BADC) to deliver high value nutritious and safe food to the end consumers. CCBA producers now have a better understanding of the product quality required by the super shops, and a relationship has been established between the producers' groups and super shops.

Figure 12: Safe and fresh commodity produced by CCBA producers being sold at Meena Bazaar, Khulna.

POULTRY SUPPLY TO GOLDEN HARVEST

CCBA has been closely working with the broiler producers of Gazipur to create market linkages that promote sustainable, high-quality production and income for both the producers and the buyers. Previously, Golden Harvest used to buy broilers from the open market but now CCBA supported producers are supplying directly to the factory, which is beneficial for both the parties. In the reporting year, 91,205 KGs of broiler have been supplied to Golden Harvest generating revenue of 137,642 USD at an average rate of 1.5 USD/KG of broiler.

BUYER-SELLER MEETINGS AND INPUT-OUTPUT MARKET LINKAGES

In the rural context, it is often difficult for poultry producers to find suitable buyers for their products; and it is also challenging for some buyers to find reliable sources of high quality products. At the same time, producers find it hard to source quality inputs so that their product is of good quality. The input and output market actors along the value chain play a vital role in linking the producers to the end consumers, and must be able to manage supply and demand, provide fair prices, and ensure quality.

Keeping that in mind, CCBA has organized over 35 meetings in the reporting year to improve linkages with both input and output market actors.

In Gazipur, there have been six buyer-seller meetings among producers, LSPs, and vegetable traders. On May 5, 2015, CCBA facilitated a meeting at Konabari between three buyers, the president and secretary of Konabari Arot, and the president of CCBA's high value crop producers' committee from Pajulia, Sadar, Gazipur. On May 15, 2015 a meeting between three buyers, two LSPs, and eight lead producers took place at Shikulia. The buyers were representatives from Cherag Ali, Kawran Bazar, Mirer Bazar and Ulukhola Bazar. On June 11, 2015 a meeting between three LSPs, four buyers and 10 lead producers took place at Birtul. The buyers were representatives from Cherag Ali, Tongi Bazar, Kawran Bazar and Ulukhola Bazar. On June 9 and 16, 2015 CCBA facilitated two meetings with retailers and LSPs to find an efficient way for the producers of Udor to sell their produce in a greater quantity. As a result, the producers of Udor are now selling vegetables to a representative retailer twice a week to supply Cherag Ali, Mirer Bazar, Tongi Bazar and Ulukhola Bazar.

On October 21, 2015, a meeting between six poultry producers and the Operation Manager from Golden Harvest took place at Golden Harvest's processing center, Hotapara, Gazipur. The meeting allowed the poultry producers to know more about the procedure to supply poultry to Golden Harvest and facilitated building better relations between the producers and Golden Harvest.

In Comilla, there have been 11 buyer-seller meetings with 16 output market actors and representatives of 11 HVC producer groups comprising bitter gourd and eggplant producers from Mokam, Varella and Moinamoti union under Burichong; Panchthubi union under Adarsha Sador; and Borkamta union under Debidwar. The meetings focused on ways to establish efficient market linkages, to conduct group marketing of commodities to reduce transportation costs, and to get better market prices by maintaining quality and reducing postharvest loss. The meetings resulted in sales of 2,600 KGs of bitter gourd and 6,500 KGs of eggplants collectively from the HVC producer groups. The average selling price was USD 0.02 more than the local market price. These transactions saved time for both the producers and the buyers, as the producers collected the produce in one place, and the buyers could buy the produce from a single location. It reduced the number of times the produce was loaded and unloaded. Some of these buyers are linked with Dhaka and Chittagong wholesale markets, therefore the produce reached a wider market, fetching higher price which would not have been the case if the producers had sold individually at the local markets.

In Sylhet, CCBA conducted 24 meetings with output market actors and HVC producers at West Jaflong union of Gowainghat upazila, at Kandigaon union of Sadar, Kamalbazar, and at Mollargaon union of South Surma upazila. As a result, HVC farmers are able to sell their products such as bitter gourd, cucumber, and yard long bean at fair prices through the identified vegetable aggregators, offering the best competitive price.

Several private linkages with input suppliers have been established in Y2 along with continued development of the previously established linkages. The objective of these linkages is to establish a self-sustaining network in the rural marketing system so that producers can select the best quality input materials and receive the supporting services to enhance their knowledge and skills. In Jessore, Ispahani Agro Limited, ACI, Russell IPM America, Metal Seed Company, and Kasem Seed Company are working with CCBA producers. In Gazipur, Metal Seed Company has provided new varieties of

bitter gourd (Green Arrow), YLB (Kegornatoki), and cucumber (Bonolota) to 400, 100, and 30 CCBA producers respectively. ACI Seed Limited has provided a new variety of cucumber (Elin) to 25 CCBA producers. Based on the FGDs conducted during the training needs analyses (TNA), two of the major constraints for the producers were the limited knowledge of new and improved varieties of seed and the high price of quality seeds. ACI and Metal both provided the best seeds at a reduced cost i.e. at bulk price that is little less than retail price to these 555 producers from Gazipur's Sadar and Kaliganj upazilas, among which 345 producers were from Sadar upazila and 210 producers were from Kaliganj upazila. CCBA organized meetings between the producers and input supplying companies during the reporting year. The representatives of input suppliers such as Lal Teer, Metal Seed, ACI Seed, and Ispahani Biotech discussed about their product quality, use and effectiveness elaborately with CCBA staff, selected LSPs, and HVC producers. With these linkages, LSPs have been providing farmers with high quality seeds and seedlings. As a result, 2,370 producers are now cultivating new and improved varieties of bitter gourd (Green Arrow and Lima of Metal Seed, and Tia F1 of Lal Teer), cucumber (Bonolata of Metal Seed and Alavy F1 of Lal Teer), eggplant (Challeger of Metal Seed and Purple King of Lal Teer), tomato (Sigma-16 of Metal Seed), and yard long bean (1070 of Lal Teer). Through the linkage established with Ispahani Biotech, a total of 167 HVC producers used around 1,500 pheromone traps. About 1,670 HVC producers procured dolomite lime through the linkages established with dolomite dealers. The farmers had been trained by CCBA in the proper use of these inputs.

COMPONENT 3: INCREASED PRIVATE SECTOR INVESTMENT AND CAPACITY IN COLD CHAIN MANAGEMENT

Component 3 addresses postharvest losses as well as production, availability, and access to nutritious foods by better integrating businesses operating along the value chain so that a larger volume of quality products will reach the market. To reduce postharvest losses and improve market efficiency, CCBA provided technical support around Golden Harvest's and other agro-processors' new investments in cold chain infrastructure and increased the capacity of the private sector to maintain and trace product quality; support cold chain business association development; facilitate cold chain exposure visits; and conduct trainings on cold chain management. However, cold chain is a completely new concept in the country and most of the companies do not see value or are not willing to invest in this new unchartered area where they were never been exposed to.

I. POSTHARVEST MANAGEMENT

POSTHARVEST LOSS ASSESSMENT

In conformity with CCBA's objective of increasing compliance with international food safety standards and reducing postharvest losses, CCBA conducted an assessment of the current postharvest scenario in the CCBA project areas; meet and guide the producers and trainers for better postharvest handling; as well as coordinated with the public and private sector stakeholders to share expertise and information in Y2. As a part of its activity, CCBA fielded Dr. Kerstin Hell, a consultant in collaboration with WFLO, to conduct a study on postharvest losses followed by a workshop on Postharvest Management Practices of High-Value Vegetables, a training on Postharvest Technology of High-Value Horticulture Crops, and a seminar on Postharvest Loss Assessment of Selected Winter Vegetables - Way Forward.

During the field visit, Dr. Hell assessed the postharvest losses of four major winter crops (cabbage, cauliflower, chili, and eggplant), gathered the baseline data, carried out focus group discussions, met with the regional agents, surveyed the market places, etc. The findings corroborated the previous data of Bangladesh on high postharvest losses. Cumulative postharvest losses along the vegetable market chains range from 5% to 39%. The study shows that the maximum losses incurred at the harvesting stage, reaching up to 15%. The postharvest losses at different points along the market chain are shown in Table 15.

Table 17: Postharvest Losses of the Selected Winter Vegetables

Crops	Postharvest Losses in Percentage (%)				
	Harvest	Local Market	Wholesaler	Retail	Total
Cabbage	7-15	2-3	2-7	3-7	14-32
Chili	0.5-1	0.5-1	1-2	2-3	5-7
Eggplant	8-12.5	8-10	4-8	3-8	23-38.5
Cauliflower	10-12	2-3	5-7	5-6	22-28

Despite several efforts and interventions through various organizations and approaches, no significant improvement has been observed in the rate of postharvest loss in Bangladesh. Minimizing post-harvest losses is a very challenging task since the whole supply chain involves a number of actors insensitive to product quality and losses. CBA is working to address the challenge of reducing postharvest losses. As a part of the post-harvest handling loss assessment process a workshop was organized on "Postharvest Management Practices of High-Value Vegetables - Role of Producers, Traders, Wholesalers and Retailers" on November 23, 2014 at Joyati Society, Jessore attended by 30 participants including farmers, buyers, local service providers, transporters, and other stakeholders and CCBA beneficiaries. CCBA observed that, at present post-harvest losses at the collection point level is around 6% which could be minimized by adopting better postharvest handling approaches at the field level.

Training of Trainers on Postharvest Technology of High-Value Horticulture Crops

CCBA arranged a training on postharvest technology for high-value horticulture crops on November 24, 2014, at the Regional Agricultural Research Station (RARS) in Jessore with 30 participants. The participants included representatives from the USAID Agricultural Extension Project, Bangladesh Agricultural Research Institute (BARI), International Rice Research Institute (IRRI), Department of Agriculture Extension (DAE), Bangladesh Agricultural Development Corporation (BADC), Regional Agricultural Research Station (RARS), and other government organizations working in the same sector. CCBA staff Dr. AHM Monirul Haque facilitated the training and the CCBA-fielded WFLO consultant Dr. Kerstin Hell participated as a resource person. The training covered the types of postharvest losses, losses due to insect infestations, and stages of losses, and raised awareness on measures to minimize postharvest losses, technologies developed by BARI, and waste management and use of different ripening agents. The training has created synergies between different research and development organizations following interactive discussions that highlighted farmers' need for more attention and training on pre-harvesting stages and for adoption of known simple and appropriate technologies at primary aggregation points.

SEMINAR ON POSTHARVEST LOSS ASSESSMENT OF SELECTED WINTER VEGETABLES - WAY FORWARD

Figure 13: Seminar on Postharvest Loss Assessment on December 7, 2014

To disseminate the lessons learned and observations from the assessment, and to generate dialogue to help improve the existing postharvest handling situation in Bangladesh, CCBA organized a seminar on "Postharvest Loss Assessment of Selected Winter Vegetables - Way Forward at the RIGS INN Hotel, Dhaka, Bangladesh on December 7, 2014.

Ms. Ramona M EL Hamzaoui, Director, Economic Growth, USAID Bangladesh, attended the seminar as Chief Guest, while the CCBA Chief of Party, Dr. A.B. Siddiqui, presided. Attendees included Mr. Mark Tegenfeldt, Deputy Director, Economic Growth, USAID Bangladesh; Mr. Mohammad Shibly, AOR, Economic Growth, USAID Bangladesh; and scientists and experts from Bangladesh Agriculture Research Institute, Bangladesh Agricultural Research Council, the Department of Agricultural Marketing at the Bangladesh Agricultural University, Sher-e Bangla Agricultural University, Hortex foundation, development partners, and NGO representatives. The CCBA COP welcomed the participants, gave a brief account of achievements of the CCBA project, particularly regarding the establishment of the 5 collection centers for product aggregation, which has substantially reduced postharvest losses of CCBA farmers.

Ms. Ramona M El Hamzaoui, Deputy Director, USAID, emphasized the importance of coordinating efforts among USAID supported projects working in the field of postharvest handling. Ms. Hamzoui also reminded the audience that in Bangladesh adequate data and information has already been generated on post-harvest losses, and now we should start working to minimize the losses by using new and innovative technologies so that nutritional value of the produce is not lost and the products are safe when they reach consumers.

In her presentation, Dr. Kerstin Hell remarked that her study corresponds with previous studies conducted in Bangladesh, which shows that the postharvest situation hasn't improved over the years. She also reported that the highest losses occur at the harvesting stage (0.5%- 15%), followed by the primary market (0.5%-10%), and the retailers (2%-8.5%). The economic impact of the postharvest losses in cabbage, eggplant, and cauliflower is over 7 million USD, while overall postharvest loss of vegetables is over 400 million in the country.

The seminar included a lively and interactive question and answer session, and featured a three member panel discussion attended by Prof. Kamrul Hasan, of Bangladesh Agricultural University, Dr. Nazrul Islam of BARI and Dr. Saleh Ahmed of Hortex Foundation.

Discussions during the seminar suggest that strong coordination is required amongst the research and development organizations working in this sector as well as an immediate dialogue with all related stakeholders in the postharvest sector to review guidelines on how to reduce postharvest loss.

CONSULTATION MEETING ON RESEARCHABLE TOPICS ON POSTHARVEST HANDLING AND COLD CHAIN MANAGEMENT

CCBA organized experts for a consultation meeting on Researchable Topics on Postharvest Handling and Cold Chain Management for Selected Vegetables on July 12, 2015 at the SAIC Conference Room, BARC, Farmgate, Dhaka. A total of 20 participants attended the meeting and included representatives from Bangladesh Agricultural Research Institute (BARI), Bangladesh Agricultural University (BAU), Sher-e-Bangla Agricultural University (SAU), Horticulture Research Centre (HRC), Hortex Foundation, Fresh Potato and Vegetable Exporters' Association, Agriconcern, Agora and Swapno. A.B. Siddiqui, PhD, Chief of Party, CCBA chaired the meeting and delivered the welcome speech, objectives, and outline of the consultation meeting. Dr. Abdur Rahim, Professor, BAU; Dr. Nazrul Islam, PSO, HRC, BARI; Dr. Md. Sekender Ali, Professor, SAU; Dr. Md. Ayub Hossain, PSO, FMPE, BARI and Dr. Md. Miaruddin, CSO, PHTD, BARI presented on different researchable issues on postharvest handling and cold chain management for selected vegetables. The experts interacted and shared findings of their papers with the participants of the meeting to get their suggestions and comments. The participants enumerated different researchable issues on postharvest handling and cold chain management for selected vegetables. Through discussion, the participants identified several research topics including the following based on which CCBA issued an RFA for project-supported research.

- Identification of a commercial harvesting index for CCBA commodities to improve shelf life and quality;
- Quantitative and qualitative analysis on post-harvest losses at different segments of the supply chain particularly on CCBA commodities;
- Standardization of grading systems for vegetables;
- Feasibility study on cool house infrastructure development for primary marketplaces;
- Standardization of temperature and humidity and crop compatibility on cold chain transportation;
- Comparative study on traditional packaging, plastic crate packaging and plastic crate packaging with lining materials;
- The effect of pre-cooling and sanitizing agent for long shelf life;
- Identification of harvesting tools and transport equipment for selected CCBA commodities;
- Development of devices for the transportation to keep produce cool; Effect of MAP on shelf life for the selected CCBA commodities.

TRAINING OF TRAINERS ON PRODUCTION & POSTHARVEST MANAGEMENT OF HIGH VALUE CROPS

CCBA arranged a two-day long Training of Trainers on Production & Postharvest Management of High Value Crops on April 22 to 23, 2015 at Sylhet with 22 participants from the government, research, education, and extension offices including DAE, BARI, BADC, Soil Resource Development Institute (SRDI), Agriculture Information Service (AIS), Sylhet Agricultural University (SAU). CCBA collaborated with the Department of Horticulture, SAU to build capacity of the resource personnel. The training gave the resource personnel exposure to specific practices for selected high value crops

and increased knowledge and skills on safe production practices and postharvest management. Key resource persons were Dr. Md. Shahidul Islam, Chairman, Department of Horticulture, SAU and Dr. AHM Monirul Haque, CCBA project Manager, Production and Postharvest. Dr. Md. Shahidul Islam provided TOT on the production technology for HVC production in the Sylhet region including seed selection, seed treatment, soil condition, land preparation, seedling preparation, fertilizer management, pruning, staking, weeding, disease and pest control. Dr. AHM Monirul Haque provided TOT on the present scenario of postharvest losses in Bangladesh and steps to reduce these losses, including different technical aspects of postharvest losses, stepwise breakdown of Postharvest losses, packaging and storage requirements of selected high value vegetables, product compatibility, controlled atmosphere/modified atmosphere for prolonged shelf life and other recommendations for reducing postharvest losses. Similar trainings were organized in Jessore previously.

Figure 14: Participants at Training of Trainers on Production and Postharvest Management of High Value Crops on April 22 to 23, 2015 at Rose View Hotel, Sylhet

HANDS-ON TRAINING ON PICKLE PRODUCTION FOR WOMEN PRODUCERS

As an initiative to minimize postharvest loss, CCBA provided training for women producers on how to preserve products that are discarded after grading. Women producers participated in hands-on trainings for processing produce into pickles in Jessore. A total of three trainings have taken place in this year at Hurgati, Monirampur and Lebutala, Sadar. The training dates were May 19, May 28, and September 2 and 3.

Figure 15: Training on Pickle Production for Woman Producers at Lebutala, Sadar, Jessore on May 28, 2015

A total of 25 trained woman producers from Hurgati and Biranarayanpur, Jessore successfully processed eggplants, bitter gourd and garlic into pickles maintaining proper hygiene, taking all precautions to ensure food safety following the hands on training and method demonstration. They now know that utilizing leftover vegetables through agro-processing into shelf-stable products can generate income and are looking forward to creating a small-scale agro-processing industry soon.

Figure 16: One of the woman producer preparing eggplant pickles at Hurgati, Monirampur, Jessore.

HANDS-ON TRAINING ON POSTHARVEST MANAGEMENT OF SPECIFIC CROPS

In addition to the ongoing trainings on high value crop production and postharvest management, CCBA arranged seven crop specific postharvest management trainings for approximately 170 participants that include 159 producers and 11 traders from Jessore, Sylhet and Comilla. The hands-on trainings covered postharvest management techniques for eggplant, bitter gourd, cucumber, and tomato.

Table 18: Hands-on Training on Postharvest Management

Sl No	Date	Location	Region	Training Topic	No. of Participants		
					Producers	Traders	Total
1	19/5/2015	Hurgati, Monirampur	Jessore	Eggplant	17	3	20
2	27/5/2015	Birnarayanpur, Sadar		Bitter Gourd	25	5	30
3	8/6/2015	Kamal Bazar, Dakkhin Surma	Sylhet	Bitter Gourd and Cucumber	30	0	30
4	8/6/2015	Anantapur, Sadar		Bitter Gourd and Cucumber	27	3	30
5	15/6/2015	Shimpur, Adarsha Sadar	Comilla	Cucumber	30	0	30
6	16/6/2015	Nabiabad, Debidwar		Tomato	30	0	30
Total				**0**	**159**	**11**	**170**

In Jessore, CCBA organized crop based post-harvest training in Jessore, Comilla and Sylhet and trained 170 trader and producers, mainly engaged in product aggregation. The training topics covered harvesting maturity and technique, sorting, washing, field heat removal/pre-cooling, removal of water through air drying, grading, packaging, and transporting through both normal trucks and refrigerated trucks, and storage. The trainees learned the importance of proper and improved postharvest practices and that these improved techniques would help minimize postharvest loss.

Figure 17: Hands-on session on postharvest management of bitter gourd and snake gourd at Naogaon, Hatkhola, Sadar, Sylhet on June 9, 2015.

J. COLD CHAIN MANAGEMENT

COLD CHAIN ENERGY NEEDS ASSESSMENT

CCBA conducted an energy needs assessment of existing cold store facilities in August carried out by Matt Chang, a WFLO energy expert. The assessment included observations from existing cold storage facilities to determine current energy consumption, inefficiencies, constraints, operating costs, and opportunity for energy savings.

During the assessment, the consultant visited Agora, Shikaju Engineering Works, Meghna Cold Storage, and Golden Harvest to assess the facilities and practices in regards to energy efficiency, energy usage, and rates. Based on the assessment, the suggested energy efficiency general guidelines included refrigeration, lighting, HVAC (heating, ventilation, and air conditioning), and insulation.

Cold Chain facilities, particularly, cold storages in Bangladesh use grid power as source of energy and mainly have backup generators to face intermittent blackouts and outages, but they occur much less frequently than a few years ago. However, with more supply of power from conventional sources, the cost of energy has become expensive. Government is giving subsidy to cold storage operators but other end users, particularly; super shops and other cold chain user do not get that advantage. In this context, use of alternate source of energy and efficient use of electricity is paramount for the industry to move forward.

Every cold storage facility change its thermodynamic balance every moment of operation depending on demand, mass, atmospheric variances and process criteria. Nevertheless, the general operation and procedures currently being used in Bangladesh do not consider this. Instead, the operations are viewed and treated as very static and stable. In addition to this, there is great lack of expertise in cold storage operation and energy need as a whole.

It was recommended to undertake multiple facility inspections by an energy-efficient, refrigeration operator/trainer while providing hands-on training and best practices for cold chain industry members. It was further suggested that, each company implements an "Energy Manager" who is responsible for monitoring the facility energy use, pursue and remedy increases in energy consumption, research, recommend and disseminate energy best practices, and track changes in facility energy rates. The Bangladesh cold chain industry would benefit by establishing a local cold chain exposition to bring in high quality suppliers and equipment manufacturers to choose from while also encouraging the Bangladesh Cold Storage Association to leverage vendors for better pricing options. It was also recommended that a renewable and alternative energy specialist assess and recommend specific solutions for application and implementation in Bangladesh, with solar being the primary option since it is an already widely excepted form of alternative energy in Bangladesh's cold chain population and is a good fit for its weather and climate. The recommendations have been shared with the industry.

COLD CHAIN ASSESSMENT

One of the project objective is to facilitate establishment cold chain in Bangladesh through its GDA partner in which post-harvest losses are reduced, and high-value agricultural products are delivered to the market. Cold Chain is fairly a new concept in Bangladesh. CCBA in collaboration with WFLO undertook a bench marking activity to asses (1) current cold chain systems and infrastructure (2)

domestic commercial environment for perishable products and (3) potential for human capital development and training. CCBA conducted a cold chain assessment in August by fielding WFLO consultant, James Rusty Eason. During the assessment Golden Harvest's warehouse, distribution points, factories, and retail locations were visited. Karwan Bazar, two collection centers at Jessore, and an Agora retail chain super shop was also visited. The assessment included findings and recommendations for cold chain management in regards to postharvest, processing, transportation, storage, warehousing, and retail. The consultants concluded that actors within the cold chain in Bangladesh do not understand the importance of maintaining temperature control throughout the supply chain. As with many developing countries, transport appears to be the weakest link in the cold chain in Bangladesh, as refrigerated transport is almost nonexistent. He further noted that, regardless of what currently exists, it is critical for farmers, logistics providers, exporters, and logistics operators (e.g. warehouses and transportation fleet owners) to understand how product quality can and should be maintained from farm to fork. This knowledge will facilitate the demand and incentive to invest in cold chain. It will be necessary to curb the disdain for cold chain that was met in country. While not within the realm of this project, public education campaigns aimed at consumers on food safety and nutrition could facilitate demand for cold chain. Retail should be brought into a cold chain association supporting Bangladesh. Currently, the Bangladesh Cold Storage Association exists, and offers one alterative. However, this association should include the entire cold chain if improvements are really going to be seen across the board as retailers tend to the drivers for these improvements. A representative association could provide a platform to implement training and to forge policy initiatives. Larger retailers, such as Agora or Meena Bazar, should support this as it would help to promote their agendas across the country and help change or created needed policies. Also, an association inclusive of retailers could form an alliance and implement a business model that includes a buyers' program for association members that would also help to control costs. This would be followed by the implementation of a cold supply chain and distributor service, which would include warehouses/distribution centers and transport with logistical management services. This would take time and growth but these are the types of business systems that need be implemented to benefit the consumer both domestically and internationally.

TRAINING ON COLD CHAIN MANAGEMENT AND FOOD SAFETY

CCBA held a Cold Chain Management and Food Safety training on August 26, 2015 at Rigs Inn Hotel, Dhaka, Bangladesh for 22 participants from the leading supershops of Bangladesh, including Agora, Meenabazar, and Pick n Pay, and well-reputed suppliers such as Shandar Bakers, Tabassum Enterprise. CCBA fielded WFLO consultant, Mr. James "Rusty" Eason was the key resource person of the training which covered standard operating procedures of cold store warehouses, GFSI - Food Safety Awareness, WMS - Inventory Management, supply chain management (SCM), business process management (BPMS), customer relationship management (CRM), cold chain for processors, and logistical carrier management covering mobile temperature sensors.

PROVIDE TECHNICAL ASSISTANCE TO GOLDEN HARVEST

CCBA provides technical assistance to Golden Harvest related to their investments in cold storage facilities, particularly establishment of cold storages at four different locations, purchasing of reefer vans and refrigerators for outlets in support of the GDA objective to increase availability and use of

domestically produced nutritious foods. Golden Harvest using their cold storage facilities to build operations and market share in two value chains that offer them the most profitable returns on their cold storage investments. GH has developed forward looking business plans to scale up their operations in poultry and diary, and is currently pursuing plans to establish their own dairy farm and milk collection center. CCBA assisted Golden Harvest in the process of establishing their dairy farm by providing technical support in farm design and planning at Goyanghat, Sylhet. As a part of the assistance, CCBA's Chief of Party undertook field visits to the proposed farm site along with Golden Harvest's Managing Director, CEO, and other Directors to assess existing infrastructures, evaluate the business plan, develop further plans, and provide guidance on the current and future expansion of the operation for more efficient and effective functionality. Golden Harvest approached CCBA to facilitate exposure visits for their staff to see the leading dairy farms in Bangladesh as well as India. CCBA also provided technical assistance to develop dairy farm infrastructure at Sylhet. The draft plan of dairy farm infrastructure has already been prepared.

Golden Harvest, in their pursuit of creating an industry standard in cold chain, is expecting to be able to take full advantage of their investment in cold chain through the opportunities and linkages that CCBA is developing with improved rural production systems in poultry and dairy in the GH operational zones.

DAIRY FARM EXPOSURE VISITS FOR GOLDEN HARVEST

CCBA facilitated visits for Golden Harvest staff to two local dairy farms, the American Dairy Farm at Shreepur, Gazipur and the Nahar Dairy Farm at Mirsorai, Chittagong on April 25 and May 06, 2015 respectively. Through these visits, Golden Harvest personnel increased their understanding of operational procedures of a dairy farm including technical aspects such as breed selection and feed. During the visits, Golden Harvest staff saw presentations on the activities of the dairy farms. Take away from the visits were inventory management, machinery and infrastructure list, requirement of work force particularly need of an expert manager, etc.

Figure 18: CCBA and Golden Harvest personnel at Nahar Dairy Farm on May 06, 2015.

TRAINING ON HACCP AND GMP FOR FACTORY STAFF OF GOLDEN HARVEST

Cold Chain Bangladesh Alliance is also building Golden Harvest's capacity to achieve and maintain compliance with international food safety standards that will ensure the quality and safety of the products going through their cold chain facilities. Through building GH's operational capacity in implementing standard and safe practices, CCBA can reach its aim of ensuring food safety across the value chain. CCBA arranged two day-long trainings on May 13 and 14, 2015 at Golden Harvest Factory, Hotapara, Gazipur for Golden Harvest factory staff on HACCP and GMP. The training was provided in collaboration with SGS Bangladesh. SGS is a worldwide renowned certification company and has previously certified Golden Harvest on HACCP. The company works in Bangladesh and has a state of the art laboratory facility with expert senior lead auditors.

Figure 19: Participants during the training on HACCP and GMP.

The 24 participants included operators, quality officers, production officers, quality control supervisors, production supervisor, packaging supervisors, cleaning supervisor from frozen food, meat processing and ice cream divisions. This training was intended to support adoption of new technology, good and safe practices in food production, handling, processing, and manufacturing which helps to reach the goals of establishing an efficient cold chain management system. The training topics covered Food Safety and Hazards; PRP (Prerequisite Program); Operational PRP (Operational Prerequisite Program); Verification and Validation; Flow Diagram and Process Flow Diagram. Training also highlighted on Monitoring; Corrective Action; Critical Control Point; Employee's Personal; Hygiene Policies; Hand Washing; Cross-contamination; Frequency of Sanitizing Food Contact Surfaces: Bussing and Cleaning Tables and Non-food Contact Surfaces; Pest Control Plan and Report, Inspection of Incoming Products; Inspection of Incoming Products; Prevent Physical, Chemical, Biological Food Contamination; and HACCP Principals. The training included experience sharing, group work followed by open discussions, and interactive question and answer sessions. There was also a simulation on a food safety hazard with participation of all trainees.

COLD CHAIN EXPOSURE VISITS IN INDIA FOR GOLDEN HARVEST

CCBA facilitated a cold chain exposure visit to India for Golden Harvest staff from August 3 to 8, 2015 to increase their knowledge and understanding of cold chain operations including technical aspects such as tools and equipment, food processing, dairy farm and processing plant. The team met with the

Global Cold Chain Alliance (GCCA) India staff and National Center for Cold Chain Development (NCCD) staff in New Delhi, and took tours of the National Dairy Research Institute (NDRI), the National Institute of Food Technology Entrepreneurship and Management (NIFTEM) and the Suri Agro Fresh Cold Storage at Haryana. Discussion, meetings with experts and visits to the institutes gave the visitors a better understanding of Indian cold chain industry, its history, operational system and difficulties faced.

The participants also visited an Agricultural Produce Marketing Committee (APMC), the Market of National Importance (MNI) at Azadpur, Delhi and the manufacturing plant of Frick India Limited at Faridabad. The tour met with several companies working with cold chain and food processing facilities including Carrier Transicold, Gurgaon, Haryana, Yakult Danone India Private Limited at Sonepat, Haryana, Danfoss Industries Private Limited, and Everest Industries Limited. Visiting and meeting cold chain professionals and experts gave the visitors a clear understanding of the complexity of operation of cold chain for fresh and processed products and business model of the companies. Participants also visited Mother Dairy Plant at New Delhi. The dairy plant is one of the best-operated and profitably run dairy plant of India. Since, Golden Harvest is planning to establish its own dairy plant; the visitors got an overall understanding and standard operational procedure followed including need of HAACP of a modern dairy plant. The participants believe that this will help them to decide their future course of action in establishing their own dairy plant.

PILOTING COLD SUPPLY CHAIN DEMONSTRATIONS OF VEGETABLES

CCBA conducted a small pilot on cold supply chain of fresh vegetables from the farmer to a retail market. This pilot was conducted to determine the actual costs and benefits to farmers for using cold transport for vegetables compared with open-air transport. On May 16, 2015 CCBA followed a shipment of vegetables undergoing cold chain management during postharvest handling starting from collection of produce from the field, sorting, grading, pre-cooling, packing in crates, loading in the reefer van, and delivery to the retail customer at the Khulna outlets of Shonadanga wholesale market and Meena Bazzar Outlet. Producers and traders representatives were present throughout the process and learned the cool chain operation. The demonstration shows that when produces were sold at nearby regional wholesale markets and retails markets the price is considerably good and quality of the produce remained excellent while transporting through refrigerated trucks in plastic crates. Cost per kilogram of produce is twice of the cost of local transportation, but that did not affect the profit margin of the producers, as there were no postharvest losses quantitatively or qualitatively. The producers made some small profit while using refrigerated van. Transport cost in refrigerated truck was USD 92 (BDT 7168).In local conventional system; the cost of one-way shipment of commodity was USD 36 (BDT 1400X2 = 2800). Net revenue earned in the refrigerated system was USD 716 (BDT 55842) and in conventional system was USD 599 (BDT 46741). The net revenue earned by carrying fresh produces in refrigerated trucks was USD 117 (BDT 9101) more than that of conventional system.

COMPONENT 4: INCREASED COMPLIANCE WITH INTERNATIONAL FOOD SAFETY STANDARDS

Component 4, addresses food safety issues by advocating and assisting local firms in adhering to international food safety standards in domestic food production. CCBA is facilitating HACCP and GAP

training for Golden Harvest and other firms that work in the CCBA project zones, while also building the capacity of local research and training institutions to provide training and certification on food safety standards.

K. GOOD AGRICULTURAL PRACTICES

Good Agricultural Practices, widely known as GAP, is recognized in the international regulatory framework for reducing risks associated with the use of pesticides, taking into account public and occupational health, environmental, and safety considerations. GAP addresses environmental, economic and social sustainability for on-farm production and post-production processes resulting in safe and healthy food and non-food agricultural products. The use of GAP is being promoted increasingly by the private sector through informal codes of practice and indicators developed by food processors and retailers in response to emerging consumer demand for sustainably produced and wholesome food. Adoption of GAP by farmers may create opportunities of access to new market that will ensure higher prices, provided they have the capacity to respond. GAP represents a multitude of approaches and applications addressing a range of needs in many parts of the world. Many countries have their own GAP based on the principles laid down in the Global GAP protocol. In Bangladesh use of pesticides during production and application of toxic chemicals after production is a matter of concern to all most all level of consumers. Therefore, establishing and implementing a recognized GAP protocol is essential to make safe and nutritious food available for the end consumers, however no guidelines or standards currently exist to ensure GAP or provide a certification in GAP in Bangladesh. The Cold Chain Bangladesh Alliance (CCBA) is initiating the first steps toward developing and implementing GAP protocols for Bangladesh. CCBA undertook activities in Y2 in regards to GAP to increase the capacity of small and marginal farmers to produce high value agricultural product and to increase compliance with international food safety standards and reduce postharvest losses, two of the core components of CCBA project. In support of this CCBA is also working towards creating a critical mass of certified GAP resource personnel who will train producers and others in the food supply chain in adopting and applying GAP.

TRAINING OF TRAINERS ON GOOD AGRICULTURAL PRACTICES

The project conducted two three-day long Training of Trainers on Good Agricultural Practices for over 40 participants from BARI, DAE, DAM, BADC, Solidaridad, and USAID Projects including USAID Agricultural Extension Project, USAID Agricultural Value Chains Project, USAID Agro-Inputs Project, SPRING and USAID Horticulture Project. The trainings were held at the CCBA project headquarters in Dhaka from January 20 to 22, and at the Banchte Shekha Training Center in Jessore from January 24 to 26, 2015. The objective of the trainings was to expose the staff and resource personnel to GAP and to increase their knowledge and skill in GAP. Dr. Y. Martin Lo, GAP Expert and Food Safety Specialist, was the key resource person for the trainings. The ToT covered several crucial topics including the importance of training for the safety of fresh fruits and vegetables, as well as the biological, chemical, and physical hazards existing in fresh produce and its impact on human health and economy. The training included four group activities followed by presentations on development of Sanitation Standard Operating Procedures (SSOP); concerns about pesticides in Bangladesh; a practical guide for field site visits for GAP compliance; and the development and implementation of GAP through self-assessment by the farm to comply with GAP requirements.

GAP CERTIFICATE AWARD CEREMONY

Following the training, the certificate award ceremony for the trainees was held on February 14, 2015 at Regional Agricultural Research Station (RARS) in Jessore, giving the trainees an opportunity to share their feedback on the ToT. Some of the trainees presented on their learning from the training. CCBA also shed light on the plans to extensively implement GAP in Bangladesh in order to elevate the quality and standard of produce and to better comply with the HACCP principles and FDA requirements for food safety. It is expected that implementation of GAP and compliance with HACCP principles in Bangladesh will increase the income of the farmers and other stakeholders in the cold value chain and increase the availability of nutritious and safe food.

Dr. Md. Sirajul Islam, Chief Scientific Officer of Regional Agricultural Research Station, Jessore (RARS), said during the ceremony that the goal of CCBA is surely distinctive and the initiative taken by CCBA to train the trainers on GAP is praiseworthy. Although this is just the beginning, if all the extension offices and research institutes work closely together with the farmers in the field then surely the messages of the advanced technologies and safe practices will reach the farmers and will be adopted by them eventually.

CCBA Chief of Party, A.B. Siddiqui, PhD, addressed the concerns in regards to food safety and nutrition. He reported that CCBA is gathering the existing knowledge and proven findings on good agricultural practices. He also stressed the necessity of maintaining accurate records on the historical background of the farm plot to ensure traceability, and on conducting demonstrations to show the relevance of GAP to the farmers.

CCBA planned to support these preliminary activities by organizing a GAP workshop to develop a basic training curriculum for producers; and by arranging field demonstrations for producers to acquire a practical understanding of the good practices. CCBA requested a close collaboration with RARS and DAE to create a standard GAP protocol for Bangladesh within the next year.

SEMINAR ON GOOD AGRICULTURAL PRACTICES IN THE CONTEXT OF BANGLADESH

To keep up the momentum, a seminar on Good Agricultural Practices (GAP) in the Context of Bangladesh was held on June 17, 2015 where Dr. Y. Martin Lo shared his experience of working with scientists and development practitioners in developing GAP curriculum for the producers of Bangladesh. The participants included representatives from the Department of Agricultural Extension (DAE) projects - Soil Resource Development Institute (SRDI) and Second Crop Diversification Project (SCDP); Pilot Program for Climate Resilience (PPCR); Bangladesh Safe Agro Food Efforts Foundation (B-Safe Foundation); Hunger Free World; and Meena Bazar.

TRAINING ON GOOD AGRICULTURAL PRACTICES FOR PRODUCERS

CCBA organized a GAP training for 30 bitter gourd and tomato producers of Kodalia, Lebutala, Sadar, Jessore on September 17, 2015. The training was delivered by the extension and research personnel, trained by the project in the local language based on the GAP training curriculum developed by the project. The training covered an introduction to and benefits of GAP for land selection, testing land

residues, and use of composts and fertilizers. It also included training on GAP principles for water management, pest management, harvesting techniques, postharvest activities such as grading, sorting, packaging, cleaning, washing, and transportation.

SEMINAR ON BANGLADESH GAP -WAY FORWARD

CCBA organized a seminar on Bangladesh GAP - Way Forward at the Rigs Inn Hotel in Dhaka on September 29, 2015. Dr. Abul Kalam Azad, Executive Chairman, BARC was the chief guest at the seminar, while A.B. Siddiqui, PhD, Chief of Party, CCBA chaired the event. A total of 18 participants (Annex 1) attended the seminar and actively took part in the open discussion. The represented entities include the Department of Agricultural Extension (DAE), Bangladesh Agricultural Research Institute (BARI), Bangladesh Agricultural Research Council (BARC), Horticulture Research Center (HRC), Bangladesh Accreditation Board (BAB), FAO Food Safety Programme, SAARC GAP Scheme, Bangladesh Fruits, Vegetables and Allied Products Exporters Association (BFVAPEA), Capacity Development for Agricultural Innovation Systems (CDAIS) and Hortex Foundation. The presentation was followed by interactive Q & A and open discussion sessions. The topics included aflatoxin control; third party certification; framework of certification body, and food safety issues along with GAP. The seminar bought together the government and private entities working for the successful establishment of Good Agricultural Practices (GAP) in Bangladesh. The event gave all an opportunity to share and explain their approaches and activities in regards to GAP. In his closing speech, the CCBA COP requested all of the seminar participants to continue to communicate, coordinate, and cooperate with each other with the knowledge of each of their responsibilities.

L. FOOD SAFETY

MEMORANDUM OF UNDERSTANDING BETWEEN CCBA AND AGORA

CCBA approached Rahimafrooz Superstores Ltd. (RSL) to explore the potential for market linkages with CCBA farmers working in RSL's zones of operation. RSL operates the supermarket "Agora", which is Bangladesh's first organized retail super shop chain launched in 2001 and ISO 1900 certified in 2011. Agora mainly focuses on food items ranging from a wide variety of fish, meat, vegetables, fruits, bakery, dairy, and grocery with various other consumer goods and household utensils. Currently it has 14 outlets and 1 (one) central warehouse in major locations at Dhaka and Chittagong. Agora aims to offer their customers a convenient shopping experience with good quality and fresh products at good prices to improve the quality of life for customers, team members, and suppliers/partners.

Based on discussions, CCBA and RSL agreed to develop an MOU to collaborate on high value vegetable marketing. The MOU Signing Ceremony between Cold Chain Bangladesh Alliance (CCBA) and Rahimafrooz super store limited (RSL) took place at CCBA project headquarters in Dhaka on August 2, 2015. Under the MOU, CCBA will conduct a series of trainings for Agora on Food Safety Fundamentals leading to Certified HACCP Food Safety Plans and finally to the development of a comprehensive food safety and quality management system. CCBA and RSL will work jointly to improve safe and nutritious food, encourage growers to produce high value crops and facilitate access to markets, particularly through Agora chain stores. The project will also work jointly with RSL to reduce postharvest loss and address environmental issues, and deliver international standard safe and

nutritious foods to Bangladesh consumers. This will eventually increase farmers' income and food security, minimize postharvest losses, and enhance access to market.

TRAINING ON FOOD SAFETY MANAGEMENT (ISO 22000: 2005)

A Training on Food Safety Management (ISO 22000 2005) was held on August 24, 2015 at Rigs Inn Hotel in Dhaka. A total of 20 personnel from the leading superstore Agora, Rahimafrooz Superstores Limited (RSL) participated in the daylong training. The trainees were introduced to ISO 22000 Food Safety Management Systems (FSMS) and an overview of the clauses of FSMS was provided. Participants engaged in group work on clauses 5, 6, 7, and 8 covering management responsibility, resource management, planning, and realization of safe products, validation, verification, and improvement of FSMS.

II. MANAGEMENT AND ADMINISTRATION

A. ESTABLISH NEW FIELD OFFICES

As CCBA project areas are rapidly expanding in the second year of the project, three new field offices at Comilla, Sylhet and Chittagong were established and all supporting logistics were procured in the second quarter. CCBA project area has been expanded to Khulna region and field office has been established in the third quarter. CCBA project area was expanded to Barisal region and field office has been established in this quarter. The project activities in Faridpur and Chuadanga area are administered from the regional office at Jessore.

B. HIRE AND TRAIN PROJECT STAFF

RECRUITMENT OF PROJECT STAFF

In Y2, to strengthen the CCBA team, a total of 12 recruitments took place and all of the recruited personnel started working for the project immediately. Five new team members were recruited in the Headquarter and seven new team members for regional field offices. Communication Officer, Monitoring Officer, and Field Coordinators for Comilla and Sylhet joined the CCBA team in the first quarter. Monitoring & Evaluation Specialist, Grants Manager and Field Coordinators for Chittagong and Khulna joined the CCBA team in the second quarter. Head of Marketing and Field Coordinators for Faridpur, Barisal, and Chuadanga joined the CCBA team in the third quarter.

TRAININGS FOR PROJECT STAFF

The newly recruited HQ personnel and Field Coordinators received their induction training at CCBA Headquarter, Dhaka on the project activities and their responsibilities including brief session on each of the departments' existing at CCBA.

Field Coordinators received raining on Good Agricultural Practices (GAP) at CCBA Headquarter, Dhaka from January 20 to 22, 2015. The FCs participated in group activities followed by group presentations. Field Coordinator, Sylhet, CCBA participated at Trainer's Training on High Value Vegetable Crops Production in Sylhet Region, organized by Krishi Gobeshona Foundation under Department of Horticulture, Sylhet Agricultural University (SAU) on August 22, 2015 at Conference Room, Faculty of Agriculture, SAU.

CBA HQ staff participated in Training on Grants, conducted by Ms. Julieta Varron, Associate Director, Awards Management, on November 12, 2014. The Training on Code of Professional Conduct, Ethics, and Performance Management, conducted by Curtis B. Shearin, Senior Manager, International HR Operations took place on April 27, 2015 at Grand Oriental Hotel, Gulshan, Dhaka. CCBA team also attended Training on Ethics Reporting conducted by Henry Barrett, Director, Global Risk and Internal Audit on September 14, 2015 at CCBA Headquarter, Dhaka.

Admin Assistant received training on Security Focal Point on April 8, 2015 at Conference Room, CREL, Winrock International, Gulshan, Dhaka.

Monitoring Officer, as the gender focal point of CCBA, attended the consultation Meeting on Country Development Cooperation Strategy (CDCS) - Gender Analysis on August 23, 2015 at American Club, Gulshan, Dhaka. The impact of gender on development in Bangladesh was discussed in the meeting.

Monitoring and Evaluation personnel attended the first meeting of working group for USAID's Feed the Future Projects on April 27, 2015 at Hotel de Crystal Crown, Gulshan, Dhaka and attended the second meeting of working group for USAID's Feed the Future Projects on September 21, 2015 at Six Season Hotel, Gulshan, Dhaka. Monitoring and Evaluation personnel attended the workshop for USAID's Feed the Future Projects taking place on February 24, 2015 at Summer Palace, Baridhara, Dhaka. They attended the workshop for USAID's Feed the Future Projects on Monitoring, Evaluation, and Learning taking place on May 27, 2015 at Lakeshore Hotel, Gulshan, Dhaka. They also attended two-day training on DQA for USAID's Feed the Future and Global Climate Change Partners on August 30-31, 2015 at Six Season Hotel, Gulshan, Dhaka.

C. ANNUAL AND MONTHLY TEAM MEETINGS AND WORKSHOPS

The discussion on the annual work plan for Y2 took place on December 8, 2014 at the CCBA Headquarter and the workshop on Regional Detailed Task Implementation Plan of Y2 was conducted on December 22, 2014 at Parjatan Hotel, Sylhet with participation of the whole team of CCBA project.

Each month monthly meeting has been conducted at the conference room of CCBA HQ where the regional field coordinators share their progress in relation to the targets. The plans for the next month is also discussed along with challenges, opportunities and solutions.

D. SELECT NGO SUBRECIPIENTS TO IMPLEMENT ACTIVITIES

CCBA project searched potential national applicants/organization to utilize their experience to provide different type of services to organize producer groups and other value chain actors, build capacity, facilitate organizational development, support improve market efficiency and improved food safety regulations in five geographical regions; Chittagong, Khulna, Barisal, Fardipur and Chuadanga. In this regard, CCBA published an RFA in the three most widely circulated national newspapers; The Daily Star, Prothom Alo and Daily Ittefaque under capacity building grants on April 13, 2015.

A Grants Review Committee (GRC) of four members was formed to conduct selection process of capacity building grants of CCBA projects. A TOR was prepared for the GRC members and the committee members completed their tasks based on the TOR. A total of 19 applicants submitted their proposals for CCBA project in response to the RFA. Out of the 19 applicants, 15 applicants' 18 proposals were evaluated through marking process. GRC members prepared marking guideline and each member independently marked the 18 proposals that were screened at the first phase. Through

the marking process, GRC members short-listed nine potential applicants out of the 15 applicants, to further evaluate independently. The applicants were invited to present their understanding of the project and how they plant to implement the activities in accordance to the core components of the project. Eight of the applicants presented and based on their presentations, discussions at the meetings, the GRC members scored the organizations to prepare the final list of potential awardees. Finally, GRC members recommended four applicants for receiving the grant for capacity building through implementing CCBA project. The award of four applicants is at the final stage of approval of USAID.

ORIENTATION AND INTRODUCTORY MEETINGS WITH NGO SUBRECIPIENTS

The orientation meeting with BASA Jessore regional staff including the Program Coordinator took place on February 14, 2015 at Regional Agricultural Research Station (RARS), Jessore. CCBA goal and objectives along with brief on the approach, regional target, and indicator were covered in this meeting followed by an elaborated discussion on the project management that included details on clusters, demonstrations, LSP etc. COP, DCOP, Manager - Production and Postharvest, Monitoring Officer were the key speakers at the orientation.

The introductory meeting with SMKK Sylhet regional staff took place on March 7, 2015 at CCBA Sylhet office at Uposhohor. The highlight of the meeting includes SMKK staff status on the field, activities, as well as the obstacles they are facing. CCBA's approach on safe food production, new varieties, and new technologies, reduction of postharvest loss and access to market was explained to them. A brief on the weekly reporting format was also given. Chief of Party, A.B. Siddiqui, PhD, was the key person to give SMKK staff the introductory induction.

HANDS-ON TRAINING ON M&E TOOLS, REPORTING AND DATA COLLECTION

BASA staff of Gazipur and SMKK staff of Comilla received hands-on training on process monitoring reporting during May 13-14 and May 18-19, 2015 respectively. BASA staff of Jessore received training on June 24, 2015. The training topics included M&E tools and data collection procedure, postharvest loss calculation, process monitoring, cluster mapping, preparation procedure of "at a glance project achievement at union, upazila and district level", field facilitators' weekly/monthly activity planning, reporting and supervision modality, different databases that included training database, performance database and technology use database. Monitoring and Evaluation Specialist, CCBA conducted these trainings.

WORKSHOP ON PROJECT PLANNING AND PROGRAM IMPLEMENTATION

Workshop on Project Planning and Program Implementation was arranged on March 31, 2015 at the Bangladesh Agricultural Research Council (BARC), Dhaka with 70 participants directly involved with the project implementation. BASA and SMKK joined the workshop with 29 and 28 participants respectively. CCBA team joined the workshop with 13 members of the team. The BASA participants represented Jessore and Gazipur with 13 field staff from each region. And SMKK represented Comilla and Sylhet with also 13 field staff from each region. The objective of the workshop was to discuss on the implementation strategy of respective regions with focus on Annual Implementation Plan of Year 2; Strategy and approach to tackle overarching challenges, Increase efficiency in implementations and efficacy of communication as well as Reporting and result based program monitoring and transparency

of outcomes. The workshop stimulated discussions on many crucial topics and instigated issues that needed addressing for better operation of the project implementation. The group activities were designed for the participants to work with their fellow on topics that are vital in the project implementations such as local service providers (LSP), minimization of postharvest loss, increasing market efficiencies, supply chain functionality etc.

III. PROGRAM PROGRESS

HIGH VALUE CROP CULTIVATION ACRES COVERAGE

During Y2, the total area covered by CCBA producers was 823 hectares. Cultivation of eggplant accounted for the highest area of production at 219.69 hectares, followed by bitter gourd with 195.85 hectares and cucumber with 141.22 hectares. The following table shows area under each of the high value vegetables cultivated during the year by the CCBA trained producers, who adopted new technologies.

Table 20: Area Coverage by High Value Crop

Name of HVC	Area Coverage (Hectare)
Egg plant	219.69
Bitter gourd	195.85
Cucumber	141.22
Yard Long bean	108.66
Chili	89.92
Tomato	35.00
Onion	19.00
Cauliflower	10.00
Carrot	3.72
Total	**823.00**

IV. PERFORMANCE MONITORING

CCBA YEAR 2 (OCTOBER, 2014 – SEPTEMBER, 2015) PERFORMANCE

FTF Ref.	Indicator & Disaggregation	Unit	Achievement Y-2 (Oct, 14 - Sep,15)	Cumulative Achievement
4.5.2-7	Number of individuals who have received USG supported short-term agricultural sector productivity or food security training	Number	15433	21892
	Male		11577	16080
	Female		3856	5812
4.5.2-5	Number of farmers and others who have applied improved technologies or management practices as a result of USG assistance	Number	10204	10204
	Male		10204	10204
	Female		0	0
	New		1815	10204
	Continuing			
4.5.2-42	Number of private enterprises, Service Provider, Farmer Groups, producers organizations, water users associations, women's groups, trade and business associations and community-based organizations (CBOs) that applied improved technologies or management practices as a result of USG assistance	Number	55	83
	New		1	1
	Continuing		49	49
4.5.2-2	Number of hectares under improved technologies or management practices as a result of USG assistance	Hectares	754	754
	New		754	754
	Continuing			
	Male		754	754
	Female			
4.5.2-13	Number of rural households benefiting directly from USG interventions	Number	15284	20028
	New		15284	15284
	Continuing		4744	4744
	Male		11441	16185
	Female		3843	3843
4.5.-2	Number of jobs attributed to FTF implementation	Number	482.4	1055.4
	Male		280.8	608.8
	Female		201.6	446.6
	New		482.4	482.4
	Continuing		573	573
4.5.2-23	Value of incremental sales (collected at farm-level and outlets) attributed to FTF implementation	USD	11495703	11495703
4.5-10	Total increase in installed storage capacity (m3) (GH)	M^3	2	2573
	Dry		0	
	Cold		2	2573
4.5.2-38	Value of new private sector investment in the agricultural sector or food chain leveraged by FTF implementation	USD	203133	9233800

FTF Ref.	Indicator & Disaggregation	Unit	Achievement Y-2 (Oct, 14 - Sep,15)	Cumulative Achievement
Cus-1	% of Post-Harvest Losses	%	15%	3%

V. PROGRESS ON LINKS TO OTHER PROGRAMS

CCBA has involved other associations, organizations, and companies with project activities through events such as trainings, workshops, seminars, collaborative meetings, as well as market linkages. The associated entities include Department of Agricultural Extension, International Rice Research Institute, Bangladesh Agricultural Research Institute, Regional Agriculture and Research Station, Bangladesh Agricultural Development Corporation, Soil Resource Development Institute, Second Crop Diversification Project, Asian Vegetable Research and Development Center, Asia F2F Program, Pilot Program for Climate Resilience; Bangladesh Safe Agro Food Efforts Foundation, Hunger Free World, Meena Bazar, Agora.

A. COORDINATION WITH GOVERNMENT OF BANGLADESH

CCBA is continuing to liaise with government entities working in research, development, education, and extension offices to work hand in hand for extending the interventions of the project. Linkages established thus between the agencies and producers groups and other supply chain actors is expected to continue for the benefits of the stakeholders. BARI, Department of Agricultural Extension and DAE projects such as Soil Resource Development Institute and Second Crop Diversification Project, Department of Agricultural Marketing, Bangladesh Agricultural Development Corporation, Bangladesh Agricultural Research Council, Agriculture Information Service, Sylhet Agricultural University (SAU) have been involved with CCBA through collaborative meetings, trainings, seminars and workshops for better alliances and synergies.

In Jessore, scientists of Regional Agriculture and Research Station (RARS) are collaborating with CCBA to facilitate training sessions for producer groups to disseminate different modern production technologies and good agricultural practices. Total 36 trainers and co-trainers from RARS, DAE, BARC contributed in 57 batches of CCBA training for high value crop producers and woman producers during the reporting quarter.

In Sylhet, Md. Jamal Uddin Ahmed, Divisional Commissioner; Md. Shahidul Islam, Deputy Commissioner; Md. Sadir Uddin, Additional Director, DAE were invited to the Field Launching Ceremony on April 22, 2015 at Rose View Hotel, Sylhet prior to the Production & Postharvest Management of High Value Crops. The ceremony was conducted with over 45 participants from the government, private business, research, education, and extension offices including DAE, BARI, BADC. The Divisional Commissioner mentioned that the approach of CCBA is surely unique and the significance of the successful implementation of this project is paramount. Hence, they are more than willing to support CCBA in every way.

In coordination with Sylhet Agricultural University (SAU) and DLS of Gowainghat Upazila, CCBA organized a mass vaccination program in Sylhet against Anthrax disease at Fotehpur union surrounding the Golden Harvest dairy farm under Gowainghat Upazilla dated on 21 September 2015. A total of 290 cattle of CCBA dairy producers were vaccinated against Anthrax.

B. COORDINATION WITH USAID/BANGLADESH PROJECTS

CCBA coordinates with other USAID funded projects in the feed the future area to share experiences, development approach, lessons learned, and exchange technical expertise. COP, CCBA attended a meeting on June 18, 2015 at Cultivating New Frontiers in Agriculture (CNFA) office, where COP's of Agricultural Value Chain Project, World Fish, Agriculture Input Project (AIP), representatives from Ag. Extension Project and Blue Gold Project attended and shared their respective experiences of working in the feed the future zone of influence. Each project lead gave a brief highlight of their project activities, particularly monitoring and evaluation approach. AIP is working on improving the knowledge, availability, and use of safe, high-quality agricultural inputs by agro-retailers and farmers in southern Bangladesh. Since CCBA is working at the farm level to address the issues of producers lacking improved inputs that are essential to product quality, the collaboration of CCBA with AIP is going to benefit the producers greatly. During the meeting A.B. Siddiqui, PhD, Chief of Party, CCBA briefed about the project activities. The meeting was focused on linking the agro-input sellers associated with AIP with the CCBA beneficiaries to ensure supply of quality inputs that will aid to production of safe high value crops.

C. USAID/BANGLADESH VISITS CCBA ACTIVITIES UNDER FTF ZONE

USAID/Bangladesh mission members visited the CCBA project site at Jessore on May 21, 2015 to have firsthand knowledge about the ongoing project activities in the Feed the Future zone. The team members included USAID/Bangladesh's Director, Ms. Ramona M EL Hamzaoui; Deputy Director, Mr. Mark Tegenfeldt; Project Management Specialist, Mr. Mohammad Shibly; Economic Growth. They visited several areas in Jessore region observing activities that particularly included capacity building of the woman producers, minimization of postharvest loss through cold chain management and implementation of GAP. They participated in producers' meetings, observed the IPM blocks, Collection Centers and processing facilities. USAID team was highly appreciative of the ongoing activities of CCBA in Jessore.

D. COORDINATION WITH OTHER PRIVATE ENTITIES

CCBA has been assisting Golden Harvest to establish their Dairy plant in Sylhet. As a part of its assistance, the project and Golden Harvest, jointly meet Sylhet Chamber of Commerce and Industry officials on March 8, 2015 at their office at Jail Road, Sylhet to explore possibilities of collaboration between the business entities of Sylhet and CCBA project in the field of cold chain, food safety and HVC crop production and marketing. An open discussion took place regarding the current scenario of Sylhet in terms of high value crop production, market price etc. CCBA mentioned the project goal and objectives and proposed a partnership to them and suggested contract farming with the CCBA producers. CCBA is more than willing to help Sylhet Chamber of Commerce and Industry in sourcing good quality raw materials through working with CCBA stakeholders. The food safety campaign that

CCBA is planning was also shared with them as well as the interventions planned for Sylhet such as the launch of various programs and commodities, establishment of Collection Center, increasing market linkage etc. The representatives of the Sylhet Chamber of Commerce and Industry included the Acting Secretary, Md. Golam Akhtar Faruk; Vice President, Alimus Sadat Choudhury and President, Salahudding Ali Ahamed while Chief of Party, A.B. Siddiqui, PhD, himself represented CCBA in this introductory meeting. Golden Harvest personnel were also present during this meeting.

Restaurant Owners' Association in Sylhet and CCBA had a meeting on March 8, 2015 at the Hotel Fortune, Niarpol, Sylhet. CCBA took the initiative to learn whence they are sourcing the food, how they are preparing it, and what they are delivering to their customers. CCBA's activities to better comply with the International Food Safety Standard was mentioned and since food safety and nutrition is one of the major components of this project, CCBA also proposed to conduct a training on "Food Safety and Nutrition" for the Restaurant Owners' Association personnel in Sylhet and explained how they can be linked with cold chain management.

VI. CHALLENGES

Throughout the reporting year, there were a variety of challenges that had an impact on project activities. Environmental hazards, particularly heavy rain, affected all regions of CCBA project areas. Owing to the heavy rainfall, most of muddy road became unusable for small trucks and pick vans or tricycles. The distribution channels of the rural market system collapsed, that resulted in higher transportation costs and lower market price.

Project implementation was just getting started in September 2014 after the joining of chief of party, however implementation time over the reporting year was affected by the strikes and blockades due to political disorder during the first and second quarter of the reporting year. These strikes and blockades prevented transportation and agricultural marketing activities in the project areas. Frequent strikes/hartal disrupted transportation, and the cost of transportation doubled during these times, which had negative impact on farmers' income and livelihood. The project also faced delays due to a total of 142 days of strikes during 2014 and 2015.

The distribution channels of the rural market system became dysfunctional due to road blockage imposed by the political parties that also resulted in higher transportation cost and lower market price during winter season. The possibilities for the producers to sell their quality produce at a premium price were minimized. The staff movement in the field was hampered heavily. Procurement has also been slow due to the unrest hence documentation has also taken longer than usual. These challenges were faced by all regions in the reporting year.

Despite the sincere interest and assistance of the farmers in many areas, one continuing challenge is the scarcity of suitable land to establish collection centers. High flood free land, access to road, closer proximity to the production areas and owner's willingness to give the land for public use are required to establish a collection center. Once such a suitable land is found the next difficult tasks are, erection of a permanent shade (roof), construction of floors, access to potable water to clean the produce and lack of fund to manage day to day expenses to run the centers etc., hinder the success of existing collection centers, it fails to inspire the producers and influence other producers to come together to establish collection centers.

In case of poultry, during summer the temperature is too high for the broiler chicks, and as a result the feed conversion ratio (FCR) gets lower and the body weight of the birds slowly decreases. This eventually leads to higher prices of day old chicks (DOC) but lower broiler meat price. This has affected the broiler producers in the third quarter. Another issue is that although the broiler poultry producers had a good start as Golden Harvest has been buying their broilers directly, Golden Harvest's demand has declined as their broiler processing plant is still under construction.

As the CCBA production areas are expanding and more areas are included, more challenges will arise and so will the opportunities. To overcome these challenges CCBA is focusing strongly on input and output market linkages so that even at times of unexpected environmental and economic challenges, the producers still have access to quality inputs as well as fair market price with ease of access. If producers have a range of market linkages, they will not be dependent on only one client and can find alternative buyers during unexpected changes. CCBA is also focusing on developing networks among the LSPs, input-output actors, and government officials so that the producers have access to better inputs, advance technology, efficient supply system, which eventually will lead to better quality of production, higher yield, minimized cost and increased revenue as a sustainable solution to these challenges.

Working with the private sector requires a project to be flexible and responsive to changing markets and changing private sector partner priorities. When the CCBA project concept was developed and discussed with proposed GDA partner Golden Harvest (GH), GH was designing a business idea for working with the vegetable value chain, and USAID and Winrock built the CCBA project concept on that business plan. But eventually GH found that vegetables would not work for them, and they shifted their focus to respond to the market with ice cream as its high value priority value chain. When the CCBA project began implementation, GH had become completely dedicated to ice cream and they were no longer interested in working with vegetables. As a result, GH is no longer interested in being linked with high-value vegetable producers. To address this significant shift, WI adjusted its support to GH to align with their chosen business priorities, namely dairy and poultry. CCBA continued the project activities in building farmer capacity in high value vegetable production and created market links with other private sector partners who are working with the vegetable value chain in the project zones.

The GDA partner's geographic area did not include USAID's FTF zones. CCBA began working in the zones where the GDA partner is operating, and then the geographic scope of the project increased to include USAID FTF zones as well. Since the GDA partner did not have a presence in the FTF zones, the project approached additional private sector partners who work in the vegetable value chain in the FTF zones to help create market linkages for project beneficiary farmers to sell their high value produce.

Safe food has become a major matter of public health issue in Bangladesh. Use of toxic and poisonous food adulterators is rampant. Food adulteration with toxic chemicals has reached an astounding level in Bangladesh. A major adulterant is pesticide that is used for crop protection. But farmers use pesticides with high frequency and beyond recommended doses, making it as one of the major threat for public health. Formalin and many of its variants in name or substance are used for preservation of fish, vegetables, fruits, even milk and reportedly meat. Calcium carbide, a banned ripening agent, is applied on fruits to ripen, formalin on fish, fruits, milk and vegetables as preservatives, brick dust and

poisonous yellow colorants in spices (chili powder and turmeric powder), urea to whiten rice and puffed rice, sawdust in loose tea, soap in ghee, and artificial sweetener, coal tar, and textile dyes in sweetmeats. Various coloring agents are used in sauces, juices, lentils, and oils. An official statistics published by the Ministry of Health and Family Welfare (MOHFW) of government of Bangladesh reveals that nearly half of the food samples have been found adulterated tested by Institute of Public Health (PH) from 2001 to 2009. Another major food safety concern of Bangladesh is unhygienic practice in food handling. Majority of the activities done from production to consumption stage are done in extremely unhealthy environments. The unhygienic food is one of the main reasons of diarrheal diseases as well as malnutrition. Lack of awareness, negligence and indifference among consumers are also obstacles to ensuring food safety. However, food behavioral change among people and awareness among of food sellers about maintaining safe food supply are imperative to reduce the risk to vulnerability to unsafe food.

LESSONS LEARNED

- CCBA has been able to create partnerships linking farmers to super shops that sell a variety of groceries including fresh vegetables. The super shops offer a convenient single location to buy a variety of goods. It has been noticed that these super shops are more popular with consumers during the rainy season, however during good weather consumers will return to the open-air markets to do their shopping. Culturally there is a time of year to use super shops, and a time of year when open-air markets are used. However, over time the convenience of super shops is attracting busy professionals and will be more widely used. With this growing trend, the super shop staff need to be trained to handle and store fresh produce.
- The CCBA project has piloted a number of activities to explore the status and potential for cold chain development. The project has learned that in the project zones, the post-harvest loss for vegetables at the farmer's field level is estimated at 6% of produce. With this low percentage of post-harvest loss, there is little incentive to take additional and expensive measures for produce handling.
- Cost benefit analysis shows that there is not much profit in having a cold chain for vegetable produce currently in Bangladesh. For example, difference in net profit generated by carrying vegetables through reefer van is only USD 19.42 for 2742 kg of products. The farmers themselves bear the cost of renting a truck to transport their produce, and the current cost of hiring a refrigerated truck to transport their produce is much higher than renting a regular truck, and the refrigerated produce does not increase farmer gains enough to make it worth the cost. In addition, losses are higher if the cold chain is not maintained following delivery to market.
- The relevant expertise for advising local businesses on cold chain technologies and opportunities may come from regional partnerships, for example the Y2 visit to India offered learning opportunities and connections in a similar context.