

Final Endline Evaluation of the Philippines Cold Chain Project (PCCP)

USDA Food for Progress (FFPr) Program

Implemented by Winrock International
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ACRONYMS

ABCAO	Association of Butuan City Aqua-culture Operators
AFPC	Agusan Del Sur Farmers Producers Cooperative
AGRUFAPCO	Ambukal Group of Upland Farmers Producers Association
AKKA	Angat Kabuhayan para sa Kalusugan Association
ALVEFA	Alegra Vegetable Farmers Association
AMFD/MFCOA	Association of Masao Fisherfolks Development
AMPA	Aclan Mango Producers Association
ARCs	Agrarian Reform Communities
AROMA	Animal Raisers Organization of Marihatag
ASPSI	Asian Social Project Services, Inc.
ASRA	Angas Swine Raisers Association
BAHIVEGA	Bayugan High Value Grower Association
BALLPA	Barangay Lisondra Lobster Producers Association
BASPFA	Barangay San Pedro Fisherfolks Association
BBLCA	Barangay BayBay Lobster Culturist Association
BBS	Beneficiary-Based Sampling
BFAD	Bureau of Food and Drugs
BFAR	Bureau of Fisheries and Aquatic Resources
BFFA	Benglen Farmers and Fishermen Association
BOFIA	Baleguian Organic Farmers Irrigators Association
BTHRA	Barangay Trinidad Hog Raisers Association
BVGA	Burbuanan Vegetable Growers Association
CAMFFIA	Cambas-ac Farmers and Fisherfolks Association
CARAGA	Caraga Administrative Region
CBOs	Community-Based Organizations
CCAP	Cold Chain Alliance of the Philippines
CFMPC	Camagong Farmers Multi-Purpose Cooperative
CLGRO	Cabuang-an Lobster and Grouper Raiser Association
CLWA	Crossing Luna Womens Association
CMPC	Culit Multi-Purpose Cooperative
CMPMC	Carmen Mango Processing and Marketing Center
CONFARCA	Consuelo Farmers Credit Association
CPAPFAI	Centro, Punta, Asinan, Piling Fisherfolks Association, Inc.
CRIMC	Caraga Regional Integrated Marketing Center
CROBEVP-MPC	Crossing Luna Beawan Vegetable Producers Multi-Purpose Cooperative
CVGA	Cuarinta Vegetable Grower Association
DA	Department of Agriculture
DAR	Department of Agrarian Reform
DAREBCO	Duque Agrarian Reform Beneficiary Cooperative
DGCFFA	Dona Glenda Chapter Fisherfolks and Farmers Association
DonPauFIA	Don Paulino Fisherfolks Association
DOST	Department of Science and Technology
DRCHVPA	Dona Rosario CLOA Holders and Vegetable Producers Association
DTI	Department of Trade and Industry
FFPr	Food for Progress
FFS	Farmer Field School
FFT	Farmers Field Training
FGD	Focus Group Discussion
FICCO	First Community Cooperative
FFPr	Food for Progress Program
FTF	Feed the Future
GCA	Global Chain Alliance

GDP	Gross Domestic Product
GAP	Global Agricultural Practice
GMP	Good Manufacturing Practices
GMPC	Genetic Material Processing Center
GMPM	Good Manufacturing Processes Manual
HAACP	Hard Analysis and Critical Control Points
HERI	Happy Enterprises and Resources, Inc.
HONFACRECO	Honrado Farmers Credit Cooperative
HUKSAK	Humilog Kilusan ng Samahan ng mga Kababaihan
HWT	Hot Water Treatment
IKG	In-Kind Grant
JAGFACO	Jaguimitan Farmers Cooperative
JFAI	Jagupit Farmers Association
KAMAMANA	Kaanib ng mga magsasaka at Mangingisda ng Numa
KAMASI	Kapunungan sa Mag-uuma sa Simbalan
KASAMA	Kahayag Sabang Mangingisda Asosasyon
KCBMPO	Kinayan Community Based Resource Management People's Organization
KFA	Kapatungan Farmers Association
KFMPC	Kipundao Farmers Multi-Purpose Cooperative
KII	Key Informant Interview
KJA-COOP	Kitcharao Jabonga Agriculture Cooperative
KTFOA	Kinabigtasan Tilapia Fishcage Operators Association
LASRA	Los Arcos Swine Raisers Association
LFMPC	Libas Farmers Multi-Purpose Cooperative
LGU	Local Government Unit
LO	Left Overs
LOP	Life of Project
LPFAI	Lower Panaytayon Farmers Association
MAFFA	Magsaysay Farmers and Fisherfolks Association
MAMVEGRO	Magkiang Mid-Land Vegetable Growers Organization
MBA	Mutuan Benefit Association
MFAMat-I	Farmers Association
MFIs	Microfinance Institutions
MLGA	Ma-atas Lobster Growers Association
MSFA	Mary Sampaguita Farmers Association
NEFFA	Nueva Estrella Farmer Fisherfolk Association
NeMSPO	New Maug Swine Producers Organization
NESRA	New Esperanza Swine Raisers Association
NMIC	National Meat Inspection Commission
NMIS	National Meat Inspection Service
OD	Organizational Development
PCCP	Philippines Cold Chain Project
PCIC	Philippine Crop Insurance Corporation
PFA	Patin-Ay Farmers Association
PFOA	Pamanlinan Farmers and Fishpond Operator
PGs	Producer Groups
PIDA-IA	Pinamanculan Dalindigan - Irrigators Association
Pilmico	Philippine Animal Nutrition Corp.
PISAMSRA	People's Initiative for Sustainable Agriculture of Marihatag Swine Raiser's Association
POBTAHOPCO	Poblacion Tagbina Hog Producers Cooperative
POTA	Processing Organizations and Trade Associations
PPP	Public-Private Partnership
PSA	Philippine Statistics Authority
RDP	Rural Development Plan
REMCO	Ruben Ecleo Multi-Purpose Cooperative

RePop	Swine Repopulation Program
RMB	Rizal Micro Bank
SALVEGA	Salvacion Vegetable Growers Association
SANJOBSFARM	San Juan Lobster Farming Organization
SAPL	Special Agricultural Project Loan
SCFOA	Surigao City Fishponds Operator Association
SDSVEGA	Surigao Del Sur Vegetable Growers Association
SEAFDEC	South East Asian Fisheries Development Center
SEDFI	Surigao Economic Development and Microfinance Foundation, Inc.
SISPA	Sta. Isabel Swine Producers Association
SMHOFA	Sta. Maria Rural Improvement Association
SMM	Samahan ng Maliliit na Mangingisda
SMRIC	Sta. Maria Rural Improvement Club
SMS	Short Message Service
SOEMCO	Socorro Empowered People's Cooperative
SOP	Standard Operating Procedure
SSF	Share Service Facility
SSOP	Sanitation Standard Operating Procedures
TAMCA	Tago Aquamarine Culture Association
TANSRA	Tandag Swine Raisers Association
TARBECO	Tagcatong Agrarian Reform Beneficiaries Multi-Purpose Cooperative
TASFO	Talisay Small Fisherfolks Association
TASRA	Tago Swine Raisers Association
TFP	Total Factor Productivity
THRA	Trento Hog Raisers Association
TIFAFO	Tigbao Farmers and Fisherfolks Association
USDA	United States Department of Agriculture
USG	United States Government
VCA	Value Chain Analysis
VCMR	Value Chain Mapping Report
VPFA	Villa Pantinople Farmers Association
WACBRMPO	Wakat Community Based Resource Management People's Organization
WSGA	Womens Support Group of Awa

I. EXECUTIVE SUMMARY

Asian Social Project Services, Inc (ASPSI) evaluated the effectiveness, relevance, efficiency, impact, sustainability and learnings of the five-year Philippines Cold Chain Project (PCCP) implemented by Winrock International with funding from the U.S. Department of Agriculture. PCCP was implemented in Caraga Region, starting in September 2013 and ending in April 2019. It covered all five provinces of Caraga, namely: Agusan del Sur, Agusan del Norte, Surigao del Sur, Surigao del Norte, and Dinagat Island. Sectors covered are horticulture (mango, banana and pinakbet vegetables), livestock (swine), and fisheries (mariculture and aquaculture involving fin fish and crustaceans). ASPSI evaluated Winrock's performance in achieving foundational and mid-level results in support of the two strategic objectives of the USDA Food for Progress (FFPr) program: FFPr SO1, increased agricultural productivity, and FFPr SO2, expanded trade of agricultural products.

PCCP was effective in establishing partnerships with private and public sector given the broad scope and geographic coverage. PCCP met (or significantly exceeded) nearly all targeted results contributing to FFPr **Strategic Objective One, increased agricultural productivity**. During the project, 22,426 producers—more than double the target of 10,400—applied new technologies and techniques, putting 8,700 hectares of agricultural land (also double the target) under improved technologies or techniques across the region². ASPSI's analysis suggests that applying improved technologies and techniques introduced by PCCP increased agricultural productivity for participants:

- PCCP participation increased livestock production by 321 kg per production cycle.
- For each year that a vegetable farmer participates in the program, the beneficiary produces 244 kg more per production cycle.
- For each year that a crustacean producer participates in the program, the beneficiary produces 26 kg more per production cycle.

Activities under FFPr **Strategic Objective Two, expanded trade of agricultural products**, were less effective at having impact even though the project exceeded its volume and value of sales targets, it did not achieve some target outputs in market linkages for beneficiaries. Based on ASPSI producer survey data analysis using an aggregated weighted average ASPSI estimates PCCP beneficiaries sold 9,734 MT of agricultural products during the last production cycle; 2,651 MT more than they sold in the production cycle before they joined the project. ASPSI analysis extrapolates the total value of sales is \$22.2 million, an increase of \$8.3 million above what producers earned before the project³.

PCCP fell short of some output targets in increased value added to post-production agricultural products, established market linkages, and some buyer-seller arrangements. Feedback from key informant interviews indicates that PCCP focused on SO1 (increased productivity) during the early years of the program until the midterm evaluation (May 2016) and shifted in later years of the program to SO2 (expanded trade) when production volumes increased in the final two years.

Expanding trade beyond local markets requires cold chain, dry storage, and post-harvest facilities to create added value, maintain food safety, and prepare products for shipping. PCCP's in-kind grants program aimed to increase cold storage and other post-harvest facilities through public-private partnerships, however these facilities started in May 2016 and faced delays.

This report summarizes ASPSI's findings for each of the eight key evaluation questions in the scope of work by eight topics:

1. Application of new technologies and techniques
2. Collective actions by producer organizations
3. Financing as a tool for investment
4. In-kind grants (IKGs) for cold-chain and storage facilities
5. Business and supply-chain management of IKG-supported facilities
6. Public-private partnerships for cold-chain and investment

² Winrock International. 11th Bi-Annual Report to USDA. Philippine Cold Chain Project (PCCP). (Draft, March 2019)

³ ASPSI's total volume and value of trade calculations do not include tests for statistical significance or margins of error.

7. Market relationships and trade
8. Pathways to sustainability

1. Application of improved techniques and technologies (Section IV, C1)

Winrock's farmer training activities were one of the most successful aspects of the project. ASPSI's field surveys found that horticulture, livestock, and fisheries producers applied many of the project's new production technologies and techniques at high rates, a likely contributor to increased production. For example, ASPSI survey data found that livestock producers who adopted artificial insemination increased production by 316 kg per production cycle, and those who used feeders and drinkers increased production by 230 kg. Application rates were low for post-harvest technologies and techniques that required dedicated facilities, however, due to delays in the in-kind grant program.

2. Collective actions by producer organizations (Section IV, C2)

Winrock met most of the targets for producer group trainings, however results were modest. Fewer than half of the 79 PGs ASPSI surveyed adopted collective input procurement or collective marketing. On the other hand, 78% reported sharing of best practices among members.

3. Financing as a tool for producer investment (Section IV, C3)

After an early learning, PCCP's activities to increase the use of financial services (FFPr 1.2.3 and 2.2.3.1) have increased financing for agriculture sustainably beyond the life of the project. From 2015 through 2016 PCCP initially provided loans to beneficiaries through a loan guarantee fund model with First Community Cooperative (FICCO)), but the model removed too much of the risk from the financial cooperative. In early 2017, when the repayment rate from the initial loans had plummeted to 20%, Winrock closed the loan guarantee fund and transitioned to a new role as loan facilitator. Winrock helped its initial partner (First Community Cooperative (FICCO)) and added three new financial institutions (Cantilan Bank, Rizal MicroBank, and Surigao Economic Development and Microfinance Foundation, Inc. (SEDFI)) learn to assess agricultural borrowers as part of existing, commercial loan portfolios. Representatives of the microfinance institutions told ASPSI that they intend to continue awarding micro-loans to agriculture (See Section C3).

4. Business and supply chain management of IKG-supported facilities (Section IV, C4)

In 2014 Caraga Region had only 3 type AA slaughterhouses that met the NMIS standards (Bislig City, Cadadbaran City, and Prosperidad) and 34 accredited Local Registered Meat Assistance Services (LRMEAS). Some IKG-supported facilities lack sound business plans and local support, but many in the livestock sector are developing linkages, adding value, and improving food safety across parts of the swine value chain. With National Meat Inspection Service (NMIS) training facilitated by PCCP, four slaughterhouses have earned AA accreditation from the NMIS, a significant improvement above the typical facilities in the Caraga region. Other facilities, especially those for horticulture, have not yet connected with the supply chain.

5. In-kind grants for cold-chain and storage facilities (Section IV, C5)

PCCP awarded 16 in-kind grants (IKGs) to help develop cold-chain infrastructure in Caraga. In-kind grants supported nine slaughterhouses, one meat-cutting plant, one dry storage facility for animal feed, one ice plant and cold storage facility, a mango processing facility, two multi-purpose facilities, and a trade and distribution center intended to serve horticulture. New and refurbished facilities began to open in 2017, and two are yet to fully operate and two have yet to open as of project close. While it is disappointing that the facilities did not come online in time to achieve results under PCCP, several have the potential to connect buyers to wider markets in the future.

6. Public-private partnerships for cold-chain and investments (Section IV, C6)

Local government units (LGUs), selected as the public partners for cold chain development, proved to be fairly ineffective partners. Many LGUs lacked the will and administrative capacity necessary to enter into agreements with private companies, plan facilities, gain municipal approval, and procure equipment. Once LGUs transfer ownership to cooperatives or private companies, facilities are more likely to succeed. The two facilities owned by Happy Enterprises and Resources, Inc. (HERI), a private company, are very successful, and partnerships among multiple private companies have created some of the project's most well-integrated market and trade relationships.

7. Market relationships and trade (Section IV, C7)

While ASPSI's analysis indicates an increase in total volume and value of trade among PCCP producers, the project fell short of targets for activities supporting FFPr SO2, expanded agricultural trade. Only 3,507 producers are benefiting from improved buyer-seller relationships, for example, compared to the project's target of 10,400, and only 1,922 producers are benefitting from improved trade capacity, compared to the project's target of 7,500⁴. In the final 20 months of the project, however, Winrock made significant progress toward outcomes in trade expansion, including organizing a large number of events for buyers and sellers.

8. Pathways towards sustainability (Section IV, C8)

ASPSI identified several likely and possible pathways towards sustainability, including:

- Increased technical capacity among producers in horticulture, livestock, and fisheries is likely to sustain increases in production, product quality, and farm-gate prices, especially combined with widespread availability of improved inputs.
- Successful integration of PCCP-supported cold chain facilities along the swine value chain: Pilmico, an input supplier, supports backyard swine farmers, who raise genetically improved hogs for sale to the HERI Meat Cutting Plant, which uses the Butuan Slaughterhouse to prepare the meat, which HERI sells to institutional buyers.

9. Lessons Learned and Recommendations (Section VI)

Create a location- and activity-specific work plan and risk-management plan linked to the Food for Progress logical framework. A well-designed, project-specific work plan and risk management plan might have helped Winrock recognize and rectify problems like the financing program's high loan default rates, ineffective in-kind grant partners, and over-emphasis on production interventions.

Conduct thorough value-chain mapping. Extensive value-chain mapping, local needs assessments, and market assessments should guide infrastructure investments in agriculture. Without a thorough understanding of local needs and constraints, project planners risk wasting resources on underused or under-valued facilities.

Improve slaughterhouses and provide relevant training to increase food safety. Training in hygiene, safe food handling, humane slaughter, and international standards paid off, resulting in new municipal ordinances that ban the practice of backyard slaughtering, and municipalities appear to be enforcing them.

Build capacity of public sector partners. As a whole, LGUs lacked the experience and capacity to forge business partnerships, plan projects, procure supplies, and operate facilities. Future projects should assess each LGU's capacity, provide targeted capacity-building, and support LGUs throughout the process.

Facilitate commercial micro-lending for agriculture through MFIs. Helping MFIs develop their own commercially viable small loan programs is more likely to result in sustainable financing for agriculture and fisheries than loan guarantees or other subsidies.

Integrate cold chain facilities along the supply chain. Connecting a project's facilities to one another could create a consistent low-temperature supply chain to reduce post-harvest losses, add value, and deliver high-quality products for trade through a central distribution hub, but will depend on having excellent management systems in place. The project, if extended, should manage the system initially while building local capacity to maintain operations after project close.

⁴ Winrock International. 11th Bi-Annual Report to USDA, Philippines Cold Chain Project (PCCP). (Draft, March 2019)

II. PROJECT PURPOSE AND BACKGROUND

With funding from the U.S. Department of Agriculture (USDA), Winrock International implemented the Philippine Cold Chain Project (PCCP), a five-year effort to increase agricultural productivity and expand trade for agricultural products in the Caraga region. The project area is in Region XIII, an administrative region in the Philippines, located in the north-eastern portion of the island of Mindanao. The primary products were timber, wood pulp, gold, silver, nickel, chromite, rice, banana, and coconut. PCCP's target community-based participants were 250 barangays in Caraga Region with a total of 7,500 households directly reached by the project.⁵ Between March 2014 and April 2019, Winrock implemented activities in all five provinces of Caraga: Agusan del Sur, Agusan del Norte, Surigao del Sur, Surigao del Norte, and Dinagat Islands. Interventions targeted commodities in three sectors: horticulture (mango, banana, and vegetables), livestock (swine), and fisheries (fin fish, lobster, and shrimp).

A. Results Framework

PCCP's outcomes supported the two strategic objectives of USDA's Food for Progress (FFPr) program: increased agricultural productivity (FFPr SO1) and expanded trade for agricultural products (FFPr SO2). To contribute to these strategic objectives, Winrock targeted specific mid-level, lower level, and foundational results within the Food for Progress results framework. PCCP reported on 59 performance indicators (USDA and Feed the Future indicators) and had several performance target changes over the life of project. (Please See **Annex 1, PCCP Results Framework and Selected Outcomes.**)

Increased Agricultural Productivity (FFPr SO1)			
	Increased use of improved agricultural techniques and technologies (FFPr 1.2)		
		Increased availability of improved inputs (FFPr 1.2.1)	
		Increased knowledge by farmers of improved agricultural techniques and technologies (FFPr 1.2.4)	
		Increased use of financial services (FFPr 1.2.3 & FFPr 2.2.3.1)	

Expanded Trade of Agricultural Products (FFPr SO2)			
	Increased value added to post-production agricultural products (FFPr 2.1)		
		Increased efficiency of post-production processes (FFPr 2.1.2)	
			Improved post-harvest infrastructure (FFPr 2.1.2.2)
			Increased use of improved post-production processing and handling practices (2.1.2.1)
		Improved quality of post-production agricultural products (FFPr 2.1.1)	
		Increased adoption of established standards by industry (FFPr 2.1.1.1)	

Together, the mid-level and lower-level results support three key foundational results:

- Improved capacity of key groups in the agriculture production sector (crops and smallholder farmers) (FFPr 1.4.4)
- Increased access to improved market information (FFPr 1.4.3 & FFPr 2.4.3)
- Improved capacity of key organizations in the trade sector (processing organizations and trade associations (FFPr 2.4.4)

⁵ Balay Mindanao Foundation, Inc. March 2014. Baseline Study Report Philippines Cold Chain Project.

B. Project Activities

Winrock designed 12 inter-related activities to achieve targeted outcomes for the foundational, lower-level, and mid-level results:

- 1. Create new agricultural producer groups and strengthen existing ones
- 2. Train agricultural producers on improved agricultural techniques for horticulture, fish, and livestock
- 3. Train agricultural producers in post-harvest handling and storage
- 4. Train agricultural producers in post-harvest processing
- 5. Develop agro-dealers and other input suppliers to provide improved inputs and technical recommendations
- 6. Provide financial services to producer association members
- 7. Provide grants for equipment
- 8. Provide grants for inputs
- 9. Develop and promote a media and technology use plan
- 10. Create new and strengthen existing trade associations
- 11. Develop new and strengthen existing buyer-seller relationships
- 12. Facilitate public-private partnerships

Winrock’s interventions targeted six commodities in three value chains: horticulture (vegetables, mango, and banana), fisheries (crustaceans and fin fish), and livestock (swine). Targeted commodities varied across the five provinces based on the local context. (See **Table 1.**)

Table 1. Targeted commodities by province

Commodity	Province				
	Agusan del Norte	Agusan del Sur	Surigao del Norte	Surigao del Sur	Dinagat Islands
Mango					
Banana					
Vegetables					
Crustaceans					
Fin fish					
Swine					

Figure 1. Map of PCCP provinces



C. Partnerships

To implement PCCP, Winrock worked with a team of local and international partners, including the Cold Chain Association of the Philippines, World Food Logistics Organization/Global Cold Chain Alliance, Southeast Asia Fisheries Development Center (SEAFDEC), East-West Seeds Company, Inc., and Pilmico Animal Nutrition Corporation. Pilmico, East-West, and SEAFDEC provided technical training on livestock, horticulture, and fisheries, respectively. **Pilmico** also led the successful Swine Repopulation Program to improve the genetic stock of hogs raised in Caraga. The **Cold Chain Association** worked to increase cold-chain industry standards by organizing fora, trainings, and seminars on effective handling, storage, and distribution of products in the cold chain.

First Community Cooperative (FICCO) managed the project's \$1.7 million loan guarantee, which included \$200,000 in cost share from Winrock, in support of small loans for project beneficiaries. FICCO established a micro-credit loan facility for agricultural producers and groups throughout the Caraga region. When FICCO's oversight of their loans led to high default rates, Winrock re-evaluated the suitability of the model in the Philippines and changed its role from loan guarantee provider to loan facilitator and involved **Rizal Microbank, Cantilan Bank, and Surigao Economic Development and Microfinance Foundation, Inc. (SEDFI)** as new financing providers. The new banks received capacity-building support but no funding. Winrock helped all four banks develop lending programs for small-scale agriculture. FICCO continued to provide loans, but without co-financing from PCCP.

Winrock also collaborated with Philippines government line agencies, notably the Department of Agriculture (DA), Department of Science and Technology (DOST), Department of Trade and Industry (DTI), and National Meat Inspection Service (NMIS). Local government units served as the public partners in PCCP's public-private partnerships for cold-chain investments.

The Department of Trade and Industry (DTI) Regional Office provided capacity-building support, information, and access to business development service providers in good manufacturing practices (GMP), Hazard Analysis Critical Control Point (HACCP), food safety and handling, and enterprise development. The Department of Agrarian Reform (DAR) Regional Office helped the project coordinate with provincial and municipal LGUs in Caraga.

The **National Meat Inspection Service (NMIS)** led the inventory, assessment, and selection of slaughterhouses for PCCP's in-kind grants (IKG) program. The NMIS helped prepare engineering plans and designs, scopes of work, and lists of equipment needs for

planned facility improvements. NMIS technical experts and international short-term technical consultants helped ensure proper installation of new equipment funded by IKGs and provided training to slaughterhouse staff. The NMIS also conducted AA accreditation for cold-chain facilities in the livestock sector.

III. RESEARCH METHODOLOGY

From January to March 2019, ASPSI conducted a research study to evaluate the effectiveness, relevance, impact, and sustainability of key components of the Philippines Cold Chain Project (PCCP). ASPSI collected and analyzed a rich set of data. Enumerators, researchers, and consulting experts surveyed 740 direct beneficiaries, facilitated nine focus group discussions, and interviewed 81 key informants. Researchers used a combined approach of quantitative and qualitative methods to analyze the data and compile key findings. The following sections describe ASPSI's research methodology.

A. Key Evaluation Questions

ASPSI designed this evaluation to answer the eight key evaluation questions as approved by USDA and set forth in the scope of work⁶:

1. To what extent did PCCP-supported beneficiaries apply new technologies and management practices in the three target commodities?
2. To what extent are the producer organizations supported by the project engaging in collective input procurement, collective marketing, or sharing of best practices?
3. How relevant was PCCP's approach in increasing producers' and other value chain actors' use of financial resources (e.g. credit/loans) as a tool to invest in their businesses? What were the quantitative and qualitative impacts, positive and negative, of the financing that PCCP facilitated?
4. To what extent are the cold chain and storage in-kind grant facilities supported by the project achieving the intended outcomes?
5. How effective has PCCP's facilitation approach been in business and supply chain management of the in-kind grant facilities, especially value-added products?
6. What have been the key outcomes and lessons learned from the private-public partnership engagement between the local government unit departments and the private-sector firms (slaughterhouses, marketing centers, infrastructure facilities, etc.)? What conditions are necessary for cold chain investments to be successful?
7. To what extent have PCCP interventions developed and strengthened new and existing market relationships, which have led to increased trade – locally, regionally, or internationally?
8. What pathways towards sustainability can be attributed to PCCP interventions in the three sectors?

B. Sample Sizes

1. Beneficiary-Based Survey

ASPSI used beneficiary-based sampling as its central data collection method. In consultation with Winrock, ASPSI determined that a region-wide sample size of 700 direct beneficiaries would provide enough data for meaningful evaluation. Based PCCP's total number of direct beneficiaries (37,330), and allowing for a non-response rate of 5%, ASPSI determined that the initial sample would be 740 beneficiaries.

To generate the sample of horticulture, livestock, and fisheries producers, ASPSI used two-stage systematic random sampling. Researchers allocated the samples proportionately and randomly to producers in the three sectors across the five provinces. ASPSI used a random number generator to create a list of 81 of the project's 261 producer groups (PGs). Using the membership lists of those 81 randomly selected producer groups, ASPSI used a random number generator to select the sample of 574 producers.

⁶ To align the eight evaluation questions with the two FFPr strategic objectives, ASPSI moved the first question listed in the Scope of Work from number 1 to number 7 on the list. All other questions remain in their original order.

The total final sample of 740 direct beneficiaries consisted of 574 producers, 100 people in the private sector, and 66 people in government. Of that sample, ASPSI enumerators interviewed 585 producers, while ASPSI researchers interviewed 88 people in the private sector and 62 people in government. (In the course of interviewing the randomly selected 574 producers, an additional 11 producers volunteered to participate, for a total sample of 585.)

Table 2 below shows the number of producers interviewed by commodity and province. (See **Annex 2, Research Methodology**, for additional information about sample sizes, including a breakdown of private-sector and government respondents by agricultural sector and province.)

Table 2. Beneficiary-based survey: Numbers of producers interviewed

Type of Respondent	Province					Total
	Agusan del Norte	Agusan del Sur	Surigao del Norte	Surigao del Sur	Dinagat Islands	
Horticulture						
Mango	40	—	—	—	—	40
Banana	39	—	—	—	—	39
Vegetables	18	34	—	13	35	100
Horticulture Total	97	34	—	13	35	179
Fisheries						
Crustaceans	—	—	60	12	33	105
Finfish	14	—	5	36	7	62
Fisheries Total	14	—	65	48	40	167
Livestock						
Swine	62	85	50	42	—	239
Livestock Total	62	85	50	42	—	239
Total Producers	173	119	115	103	75	585

2. Producer Groups

To assess producer groups' use of collective input procurement, collective marketing, and sharing of best practices (evaluation question 2), ASPSI surveyed leaders of 81 producer groups selected randomly from the 258 producer groups created or strengthened by the program.

C. Data Collection Methods

ASPSI collected primary data from January 24 – March 2, 2019. (See the data collection schedule in **Annex 3, Data Gathering Instruments**). Researchers used three methods to gather primary data from project beneficiaries and other stakeholders:

- Beneficiary-based field survey
- Key informant interviews (KIIs)
- Focus group discussions (FGDs)

Please refer to **Annex 3, Data Gathering Instruments**, for the sector-specific producer questionnaires (horticulture, livestock, and fisheries), questionnaires for people in private sector and government, and the lists of guiding questions for KIIs and FGDs.

1. Beneficiary-Based Field Survey

ASPSI researchers interviewed direct beneficiaries in person, using paper questionnaires to record responses. Evaluators created and pre-tested a questionnaire for each sub-group in the beneficiary-based survey: producers (horticulture, livestock, and fisheries), individuals in the private sector (input suppliers, processors, and traders), and individuals in government. ASPSI trained enumerators to administer questionnaires in paper form. Researchers compiled the results in spreadsheets. Enumerators interviewed a total of 585 producers, 88 people in the private sector, and 62 people in government.

2. Key Informant Interviews (KIs)

The team's lead consultant, two evaluation specialists, and a commodity specialist conducted a total of 81 key informant interviews. Key informant interview questions targeted PCCP's mid-level results, foundational outcomes related to strategic objective 2, and relevant key evaluation questions. (Please refer to the key informant interview survey instrument in **Annex 3, Data Gathering Instruments**.) Interviewees included the USDA Washington D.C. and Winrock's home-office program officer for PCCP. Interviewers prepared written summaries of key informant interviews.

ASPSI used key informant interviews as the primary basis for value chain mapping, a qualitative assessment of how well the project's cold-chain and storage facilities have linked to other parts of the agricultural value chain.

3. Focus Group Discussions (FGDs)

ASPSI organized eight focus group discussions, each one targeting a specific group of project beneficiaries or stakeholders across the five provinces. (Researchers originally planned a ninth FGD with horticulture input suppliers, but ultimately interviewed two respondents by phone due to scheduling difficulties.) A total of 38 people participated in focus group discussions; half (19) were women. (See **Annex 2, Research Methodology**, for numbers of women and men who participated in each FDG.)

An expert with relevant experience facilitated each FGD. FGDs took place from January 30 – February 1, 2019 in Butuan City (horticulture), Surigao City (fisheries), and San Francisco City (livestock). Focus group facilitators prepared written summaries of the discussions.

4. Secondary data

Researchers used secondary data from the following sources:

- PCCP DevResults (the project's monitoring and evaluation system, maintained by Winrock)
- Winrock's bi-annual project reports to USDA (2014-2019)
- Philippine Statistics Authority (PSA) database

D. Qualitative and Quantitative Analysis Methods

The research team employed a mixed-method approach that combines quantitative and qualitative analysis based on three sources of primary data: field surveys, key informant interviews, and focus group discussions. Using this triangulation approach allows evaluators to cross-check and validate responses from different sources, increasing accuracy. In addition, the use of both qualitative and quantitative analytical approaches enables more in-depth assessment of each key evaluation question. For example, survey data provides measurable quantitative data in cross-sectional snapshots of key actors along the value chain. Value-chain mapping generates qualitative data used to trace the linkages among actors and functions along the chain, thereby capturing relationships and dynamics.

1. Quantitative analysis methods

ASPSI used four quantitative techniques to analyze data from the beneficiary-based survey:

- Production function and cost function analysis (linear regression, multivariate analysis)
- Mean difference analysis (inferential statistics)
- Total volume and value of trade (weighted averages)
- Partial budget analysis
- Descriptive statistics

For the **production function analysis**, ASPSI created equations to model how different variables (including a variable representing participation in PCCP) affect production of the six commodities. ASPSI used the same process for **cost function analysis** to determine what effect PCCP participation might have on producers' costs. After running multiple linear regressions, ASPSI identified valid models and statistically significant results. For the two commodities with the largest numbers of participants (vegetables and swine), ASPSI created models to assess the effects of the different techniques and technologies introduced by the program.

To conduct **mean difference analysis**, an ASPSI researcher calculated the total volume of production before and after PCCP and the total farm income before and after PCCP for each commodity. Then, the researcher calculated the mean for all four values. The difference between the "before" and "after" means indicates the likely impact of the project on the average farmer's production and income.

ASPSI used weighted averages to estimate the **total volume and value of trade** that can be attributed to the project. An ASPSI researcher calculated mean values for the total amount produced, total amount sold, and sales price per kg before and after PCCP for each commodity, disaggregated by province. Then, the researcher multiplied the average values by the total number of PCCP beneficiaries producing each commodity in that province. Adding these totals together yielded the program-wide estimates.

ASPSI used **partial budget analysis** to estimate the project's impact on an individual farmer's profits. Researchers calculated average added returns (the difference between sales before and after PCCP) and reduced costs in fertilizer, pesticides, and labor. Added returns and reduced costs provide an estimate of additional profit due to project interventions.

2. Qualitative analysis methods

- Value-chain mapping
- Interview and discussion analysis

a) Value-Chain Mapping

ASPSI used value-chain mapping to assess selected cold-chain and storage facilities supported by in-kind grants (IKGs) from PCCP. Value chain mapping revealed how well the facilities linked to different parts of the value chain. For each value chain, an interdisciplinary team of ASPSI experts used a PCCP-supported post-harvest facility as a reference node and traced the product forward and backward across the specific value chain. To gather data, experts conducted key informant interviews (KIIs) with upstream and downstream value chain actors.

ASPSI researchers conducted value-chain mapping for mango, banana, fin fish, crustaceans, and swine. Selected IKG facilities were the Carmen Mango Processing and Marketing Center (CMPMC), Caraga Regional Integrated Marketing Center (CRIMC), Butuan Slaughterhouse, HERI Meat-Cutting Plant, and San Jose Ice Plant and Cold Storage Facility. The first four facilities are located around Butuan City, the last is on Dinagat Island.

Table 3. Commodities and PCCP-supported facilities selected for value-chain mapping

Sector and Commodity	PCCP-Supported Post-Harvest Facility
Horticulture (Mango)	Carmen Mango Processing and Marketing Center (CMPMC)
Horticulture (Banana)	Caraga Regional Integrated Marketing Center (CRIMC)
Fisheries (Fin Fish and Crustaceans)	San Jose Ice Plant and Cold Storage Facility

Livestock (Swine)	Butuan Slaughterhouse HERI Meat-Cutting Facility
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E. Study Limitations

This study’s constraints limit what ASPSI can conclude from the statistical analysis. Agricultural productivity and trade—the two outcomes of interest in this study—are affected by a wide range of external variables, including weather, markets, and government policies. Controlling for those variables would be beyond the scope of the analysis.

ASPSI relied on a “before and after” approach, comparing key data “before PCCP” and “with PCCP.” Researchers used the beneficiary-based survey to generate the “before PCCP” data. This means that the statistical analysis relies on a farmer’s ability to remember inputs (kg of fertilizer applied, for example) and outputs (kg sold, price/kg) from as long ago as five years in the past. Record-keeping is not widespread among beneficiaries, so these data are estimates. In addition, farmers reported production, sales, and other key data by growing period, and those time periods vary by commodity.

ASPSI designed the study to mitigate against uncertainty in the data. First, with sufficient responses, high estimates are likely to balance low estimates. Average production across a large number of farmers is a more reliable measure than a single farmer’s report. ASPSI used three different statistical methods that rely on mean values.

The data itself controls for some external variables. Respondents joined PCCP in different years, so “before PCCP” is an average across multiple years. This minimizes the impact of an unusual weather event or market change in any given year.

ASPSI used linear regression to test the relative impacts of the project’s different techniques and technologies on production, but the relatively small sample sizes for each commodity limited the number of statistically significant findings. Statistical analysis proved ineffective for mango and banana, two perennial crops with the smallest sample sizes (40 and 39 respondents, respectively). Creating a good statistical model for perennial crops is challenging because the time horizon is longer. On-farm investments might not yield results during the next growing season.

Given the study’s limitations, ASPSI was unable to establish causal links between USDA assistance and observed outcomes with statistical certainty. Instead, we’ve reported the key findings indicated by the quantitative data, supported by qualitative data gathered in focus group discussions and key informant interviews.

V. KEY FINDINGS

ASPSI used eight key evaluation questions to assess the effectiveness, relevance, efficiency, impact, and sustainability of the Philippines Cold Chain Project against its two strategic objectives, mid-level objectives, and foundational results. This section summarizes ASPSI's findings, organized by key evaluation question.

A. Profile of Beneficiary Farmers

Horticulture. PCCP targeted mango, banana, and vegetable producers for horticulture interventions. Among surveyed producers, average household income is PhP 7,768 (\$150) per month, the lowest of the three sectors. The average farm is two hectares in size. Banana farms and mango farms are larger, with average sizes of 1.79 ha and 1.43 ha, respectively. Vegetable farms average 0.67 ha in size.

Livestock. PCCP's livestock activities targeted swine, a commodity with widespread production and demand. Average monthly income for surveyed swine producers is PhP 11,084 (\$214), the highest of the three sectors. Surveyed producers typically raise swine in backyards, raising between one and ten pigs to marketable size. Women participate actively in swine feeding, health care, and sanitation. Thirty-six respondents (15%) were new to swine production, never having raised pigs prior to the project. (Some respondents had joined the project to raise swine but were not able to. They never received the piglets to be provided by PCCP through their producer groups.)

Fisheries. PCCP fisheries interventions targeted crustaceans and fin fish. Average monthly income for surveyed fisheries producers is PhP 9,277 (\$179). PCCP introduced the technique of cage culture for the production of fin fish (milkfish, grouper, and tilapia) and crustaceans (mudcrab/mangrove crab, vannamee, and lobster), along with pond operations in brackish water. Men typically manage fisheries, but the evaluation team found an exception: on Dinagat Island, women were actively involved in milkfish cage culture production. Women set up cages, procured supplies, and conducted fry/ fingerling seeding, feeding, harvesting, and marketing.

B. Overall Outcomes for Beneficiary Producers

1. Increased Agricultural Productivity (FFPr SO1)

ASPSI's analysis of quantitative and qualitative data indicates that PCCP interventions have increased agricultural productivity and incomes for participating horticulture farmers, livestock producers, and fisheries managers, with the exception of banana producers. The sections below summarize statistically significant results from ASPSI's production function analysis and mean difference analysis. ASPSI findings supported by at least one other type of analysis, such as partial budget analysis or total volume and value of trade. Different methods resulted in very different estimates of the actual increases in production and income, so the results should be taken as evidence of trends.

a) Production function analysis

Production function analysis (multivariate linear regression) yielded statistically significant results for vegetable, livestock, crustacean, and lobster producers:

- For each year of participation in PCCP, **vegetable** farmers produce an average of **244 kg** more per production cycle.
- PCCP participation increases **livestock** production by **321 kg** per production cycle.
- PCCP participation increases **crustacean** production by **33 kg** per production cycle.
- For each year of participation in PCCP, **lobster** farmers produce an average of **26 kg** more per production cycle.

Cost function analysis yielded two significant results. PCCP participation decreases costs for **mango** farmers by 1,657 PhP (\$32 USD) per production cycle. Participating **fin fish** producers spend 8,626 PhP (\$167 USD) less per production cycle. (In both cases, it's difficult to know whether farmer costs decreased due to more efficient methods or small input grants to producer groups, which

distributed improved inputs for free to members in 2018. (See **Annex 5, Production and Cost Function Analysis** for the full statistical analysis.)

b) Mean difference analysis

Using mean difference analysis, ASPSI found the following statistically significant changes in yield, total production, costs, and incomes for producers over the life of the project:

- **Total farm income** increased significantly for producers of crustaceans (260%), livestock (162%), and vegetables (185%). Mango producers' incomes increased by 25%. (Other analysis supports these findings but found more modest increases.)
- **Total production** doubled for livestock producers and increased by 63% for vegetable farmers.
- **Costs** of production decreased for vegetables (-42%) and livestock (-15%).

(See **Annex 6, Mean Difference Analysis**, for the full results.)

c) Partial budget analysis

Results of ASPSI's partial budget analysis support the statistically significant results from production function and mean difference analysis. The partial budget analysis does not include measures of statistical significance, however, so the results should be considered supporting information only. See **Annex 8, Partial Budget Analysis**, for discussion and results for each commodity, disaggregated by province.

C. Key Evaluation Questions

The sections below summarize the findings for each of the eight key evaluation questions that framed the research.

1. Application of New Technologies and Management Practices

Key Evaluation Question 1: To what extent did PCCP-supported beneficiaries apply new technologies and management practices in the three target commodities?

Key Outcomes

- ❖ According to PCCP data Winrock trained 22,426 farmers, nearly double the targeted number.
- ❖ Trained beneficiaries applied most of the production techniques and technologies they learned (fertilizer application, pesticide application, and plastic mulching), putting 10,643 hectares under improved methods. Among post-harvest technologies and techniques, grading and sorting had the highest adoption rates.
- ❖ Delays with PCCP-supported post-harvest facilities led to a lower use of post-harvest storage technologies and techniques due to unavailable storage facilities until 2017/18.

Outcomes measured by evaluation question 1 support the following results indicators:

Increased use of improved agricultural techniques and technologies (FFPr 1.2)

Increased availability of improved inputs (FFPr 1.2.1)

Increased knowledge by farmers of improved agricultural techniques and technologies (FFPr 1.2.4)

Winrock exceeded, by a large margin, the project's targets for numbers of producers adopting improved techniques and technologies. A total 22,426 producers applied improved agricultural technologies and/or techniques, more than double the target of 10,400⁷.

The project's large-scale training program is likely the primary reason for this outcome. Trainings and information campaigns reached significantly more than the targeted number of producers. During the life of the project, Winrock and its partners conducted 4,042 trainings, fora and meetings. Across the three sectors, PCCP had roughly equal representation at trainings from the three sectors (29% percent from the fisheries sector, 35% from horticulture and 35% from livestock).

ASPSI measured the adoption rates for specific technologies and practices through surveys with 585 randomly selected producers across the five provinces, three sectors, and six commodities. Interviewers asked farmers about each technology or technique introduced for their commodity. Farmers reported (1) whether they had learned about the improved technology/technique through PCCP; and (2) whether they had applied it.

Overall results

The project's improved technologies and management practices fall into three categories: production, post-harvest processing, and general farm management. Across the three sectors, adoption rates were highest for production techniques and technologies and lowest for post-harvest processing.

Production interventions were widely adopted. More than 80% of survey respondents adopted the following technologies and techniques:

- Horticulture: improved fertilization technology, pest and disease control, good agricultural practices
- Livestock: Biologics (90%) - Swine biologics refers to vaccines or substances made from organisms like probiotics. Drugs are also often considered as biologics.
- Fisheries: Feeding intensity, farm management, and food safety practices

Irrigation was one of the few production interventions with low application rates. Few horticulture farmers used irrigation, probably due to high cost of installing and purchasing irrigation equipment and this was introduced late in PCCP under the small inputs grants mechanism.

Post-harvest processing

Adoption rates were low for post-harvest technologies and techniques that required dedicated facilities. This is almost certainly because the project's cold chain, storage, and other post-harvest facilities didn't begin to open until 2017, and three have yet to open as of April 2019. In many cases, farmers didn't have a place to apply post-harvest techniques.

Few horticulture producers reported using packinghouse and storage practices, for example. The Caraga Regional Integrated Marketing Center (CRIMC), intended for this purpose, has not yet become fully operational as of project close (April 2019). In another example, 26 out of the 40 mango farmers in the survey reported learning how to use hot water treatment, but only two reported using it. As of February 2019, the Carmen Mango Processing and Marketing Center (CMPMC) had not yet installed the hot water treatment equipment purchased with a PCCP in-kind grant⁸.

The figures below show the percentage of producers of each commodity who learned and applied each production, post-harvest, and management technique covered in the project's farmer trainings. Accompanying summaries highlight high and low adoption rates and other trends.

a) Mango

Figure 2 shows the percentage of mango producers (out of a total of 40) who learned and adopted different improved technologies and techniques among mango producers. adoption rates were low for food safety and hygiene practices. High numbers of farmers learned about good agriculture practices (90%), food safety (90%), and farm management processes such as farm record keeping, farm

⁷ Winrock International. 11th Bi-Annual Report to USDA, Philippines Cold Chain Project (PCCP). (Draft, March 2019)

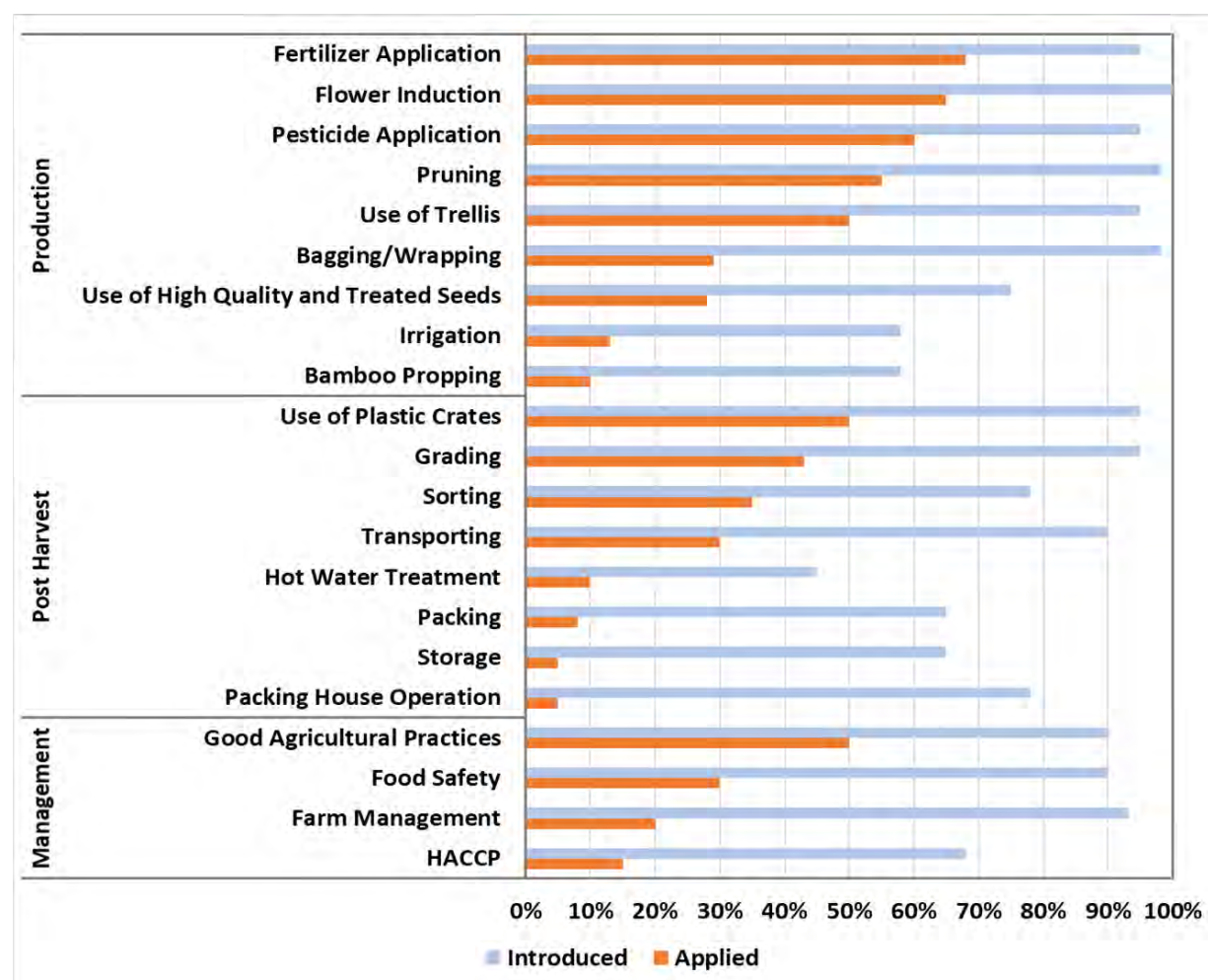
⁸ By April 2019 CMPMC had a fully installed hot water treatment equipment and was testing the 3-phase electricity source in preparation for operating the equipment in the mango harvest in June.

management, and financial management (90%), but only a small number applied the techniques. In focus groups, farmers explained that these innovations are time consuming.

Among production techniques, more than half of mango producers adopted fertilizer use (68%), flower induction (65%), pesticide application (60%), and pruning (55%). At the other end of the scale, few farmers used irrigation (13%) or bamboo propping (10%). As expected, less than 10% of mango farmers report using the four post-harvest techniques that require the mango processing center: hot water treatment, packing, storage, and packing house operation due to the reasons above.

Less than 30% of the mango producers applied food safety, farm management, or HACCP techniques, even though more than 90% reported learning the methods.

Figure 2. Mango Producers: Learning and application of technologies & techniques (n=40)

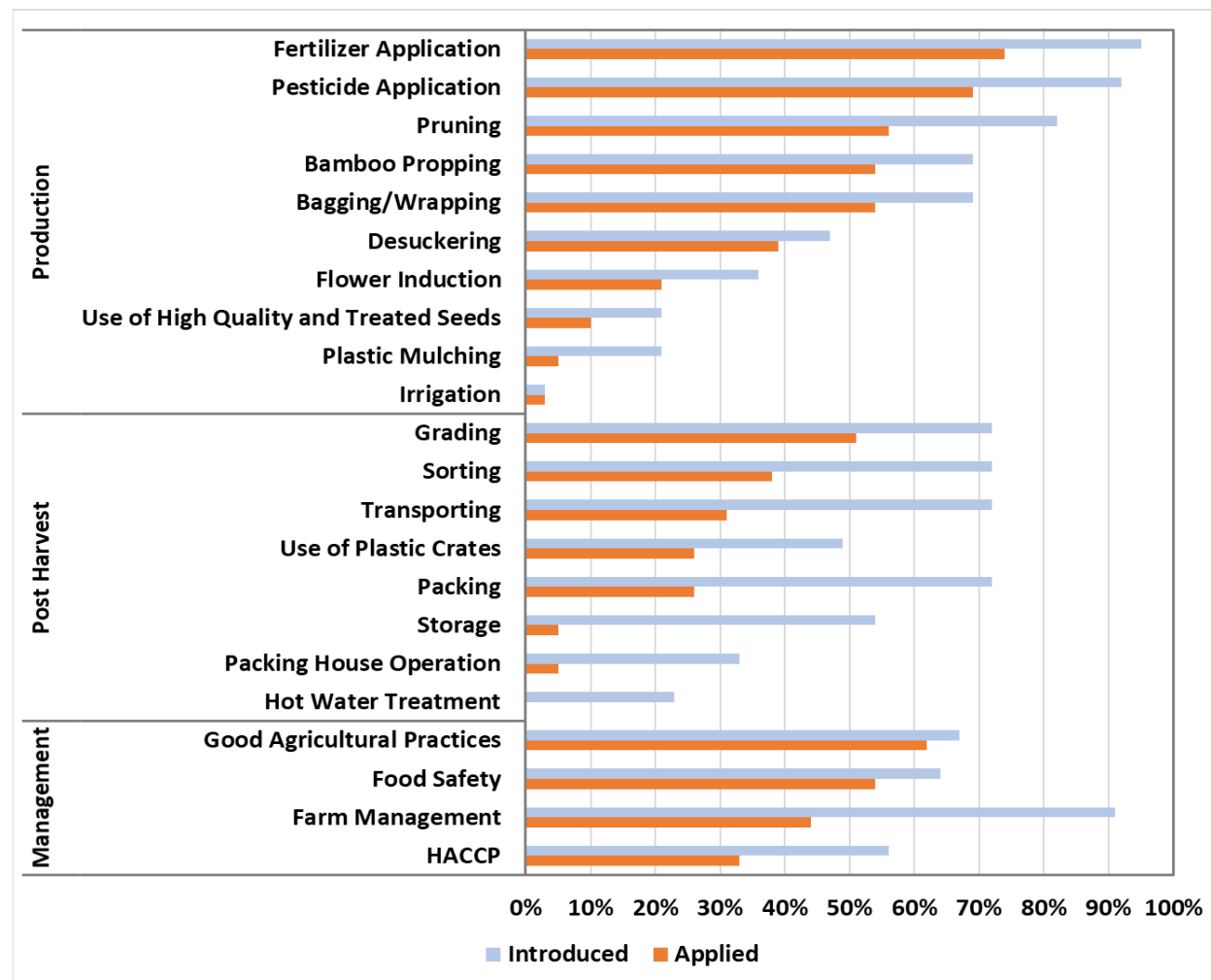


b) Banana

Figure 3 below shows the percentage of surveyed banana producers (39) who learned and adopted each PCCP intervention. Banana producers tended to apply the production techniques and farm management interventions they learned in PCCP trainings, but compared to mango producers, smaller percentages of banana producers reported learning about each technique. More than half of all banana producers applied five production techniques: fertilizer application, pesticide application, pruning, bamboo propping, and bagging and wrapping. Fewer than 10% used irrigation, plastic mulching, or improved seeds. As with mango producers, banana farmers did not adopt techniques that required the use of post-harvest facilities.

ASPSI's value-chain mapping for banana confirmed these high adoption rates. Producers appreciated the technology interventions provided by PCCP, particularly technical trainings and inputs such as plastic bags and plastic crates.

Figure 3. Banana Producers: Learning and application of technologies & techniques (n=39)



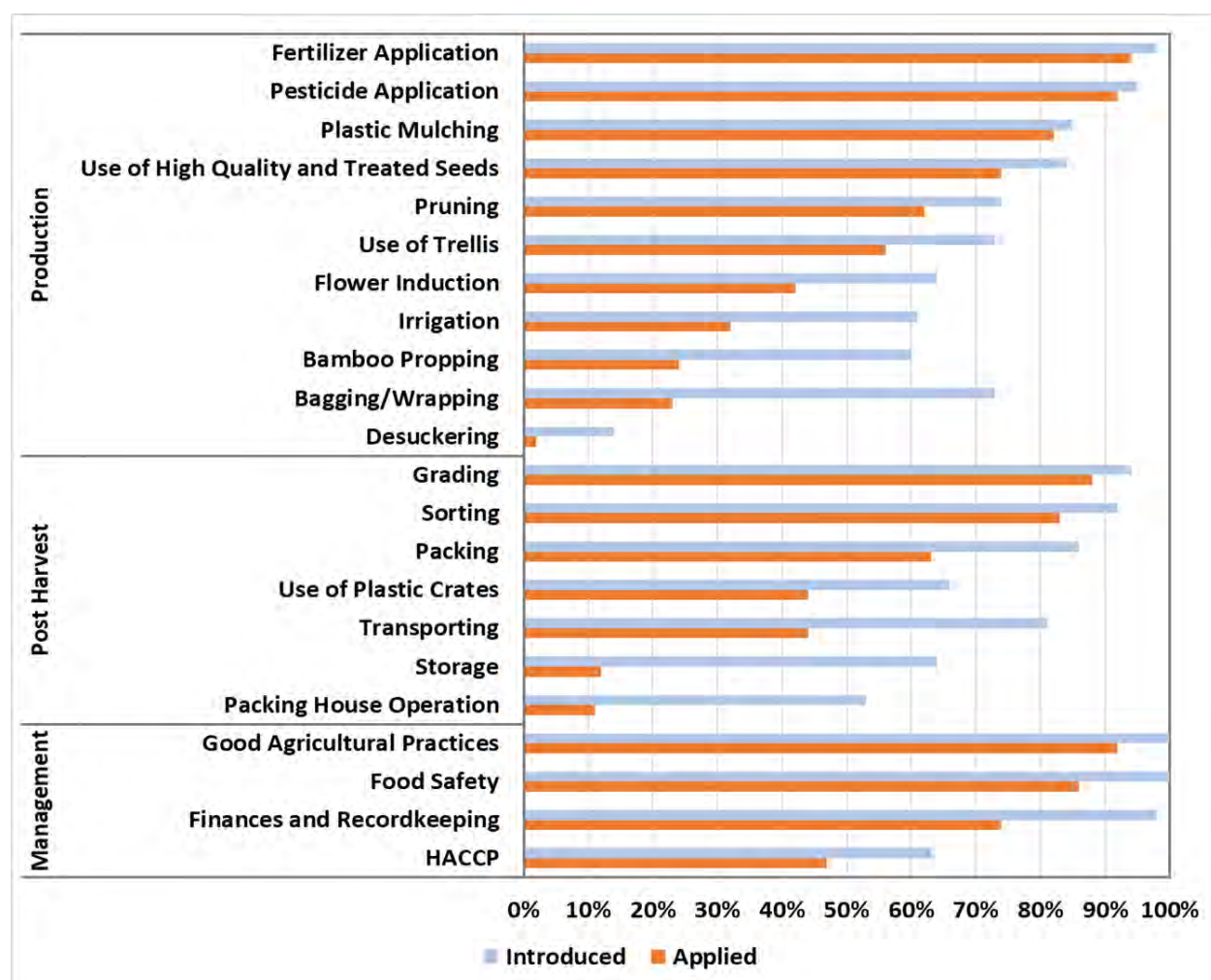
c) Vegetables

Figure 4 below shows learning and adoption rates of PCCP interventions among vegetable farmers. Adoption of new production techniques and technologies was generally high among vegetable farmers. Vegetable producers adopted four technologies and techniques at very high rates: improved fertilizer (94%), pesticide application (92%), plastic mulching (85%), and use of high-quality seeds (84%). Pruning and trellising were also popular. Only half of vegetable farmers introduced to irrigation decided to use it. Many producers continued to rely on rainwater, planting only in the rainy season.

Post-harvest techniques that did not require facilities—especially grading (88%), sorting (83%), and packing (63%)—saw high application rates.

Farm management practices were popular among vegetable producers. More than 90% reported using good agricultural practices. Use of food safety techniques and finances and recordkeeping were also very high.

Figure 4. Vegetable producers: Learning and adoption of technologies & techniques (n=100)

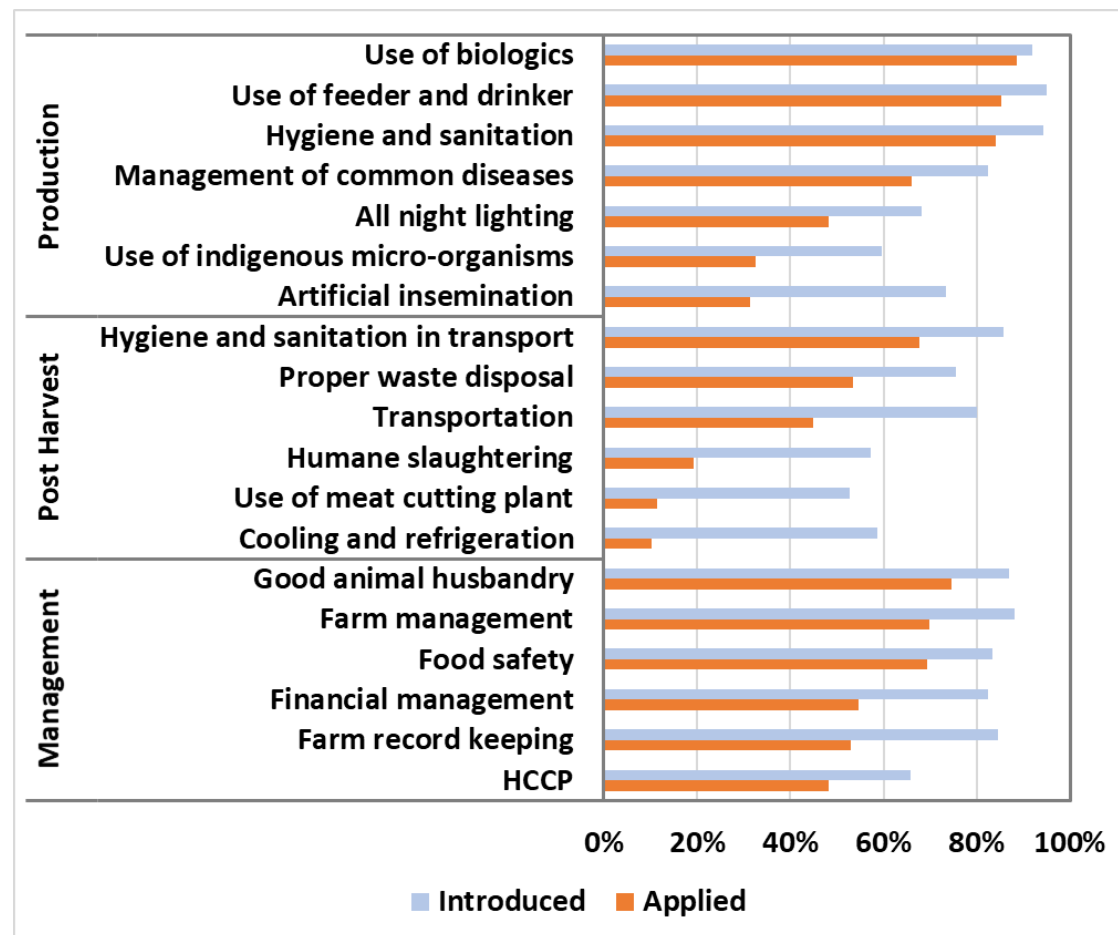


d) Livestock

Figure 5 below shows learning and application of PCCP technologies and techniques by livestock farmers. More than 80% of the 239 livestock producers surveyed reported using biologics, feeders and drinkers, and hygiene and sanitation. Fewer than 20% of livestock producers applied the three post-harvest interventions that require dedicated facilities: cooling/refrigeration, use of meat-cutting plants, and humane slaughtering.

Use of artificial insemination in swine is still relatively low (30%), but it might increase now that a new facility (AFPC) has opened (as of January 2019.) On average, livestock producers were more receptive to food safety and farm management techniques than other sector producers, perhaps because many food safety and hygiene practices are particularly important for raw meat. Roughly half of livestock producers adopted each safety or management technique.

Figure 5. Swine producers: Learning and application of technologies and techniques (n=239)

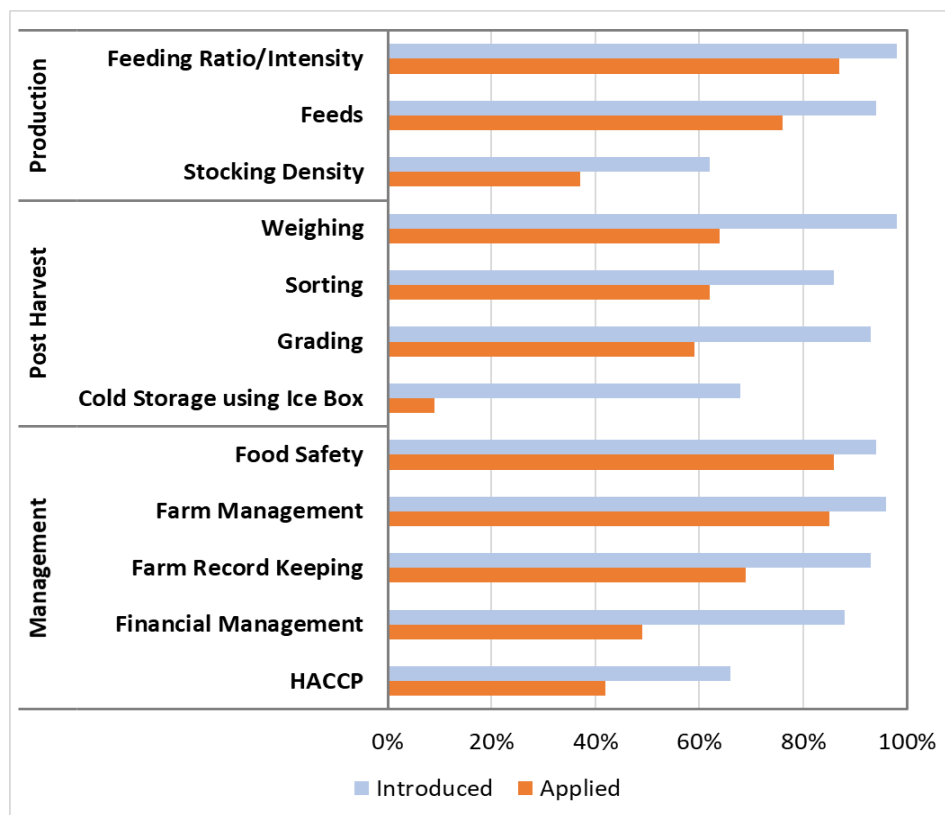


e) Lobster and other Crustaceans

Figure 6 below shows learning and application rates among PCCP crustacean producers. Producers of lobster and other crustaceans applied most of the technologies and techniques they learned in PCCP trainings, with the exception of the use of ice boxes for cold storage. As of March 2019, PCCP-supported San Jose Ice Plant and Cold Storage Facility in Dinagat Islands has been launched but is not yet in full operational use. Until it does, producers in that province must travel to Surigao City to purchase ice on a commercial scale.

The most widely applied production techniques and inputs are proper feeding ratios (87%) and feeds (76%). More than 80% of lobster/shrimp producers use food safety and farm management techniques.

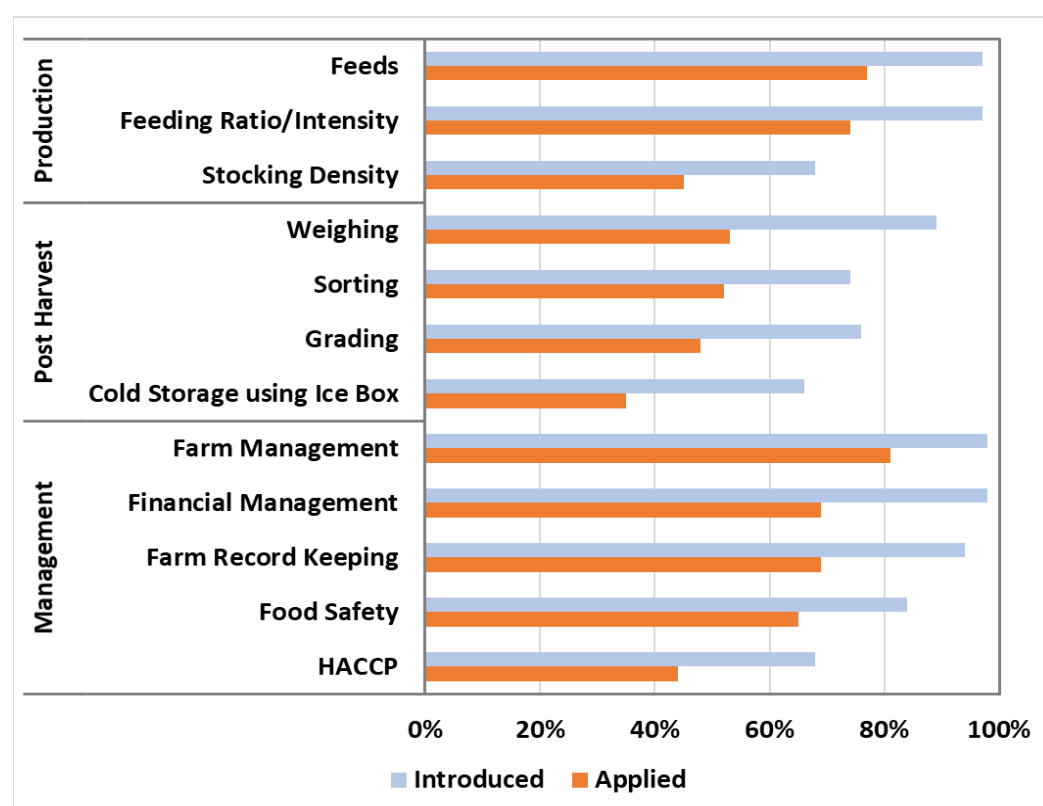
Figure 6. Lobster and other crustacean producers: Learning and application of technologies & techniques (n=105).



f) Fin Fish

Figure 7 below shows the percentages of fin fish producers who adopted PCCP-introduced technologies and techniques. Similar to lobster and crustacean producers, fin fish producers apply feed and recommended feeding ratios, but fewer producers report having learned about or applied proper stocking density. This is interesting given the tendency of some producers to overstock. Fin fish producers were receptive to farm management and food safety interventions, applying them at high rates. More than a third of fin fish producers use ice boxes for cold storage, a technology that proved unpopular with lobster producers, who feared it would freeze the lobsters.

Figure 7. Fin fish producers: Learning and application of improved technologies & techniques (n=62)



g) Traders and Processors

Using a value-chain perspective, PCCP included traders and processors as well as producers in its capacity-building activities. In all, 507 traders and processors and 552 agro-dealers participated in PCCP-led trainings⁹. Surveyed agro-dealers, traders, and processors said the trainings covered skills they needed. Input suppliers, traders, and processors received training in financial operations, business management, and customer service.

ASPSI found cases of traders improving their business operations after receiving PCCP training. Before participating in PCCP, a pork vendor in Butuan City purchased and re-sold one pig per week, earning a net profit of PhP 5,000 – 7,000 (\$100 – \$140). After participating in PCCP trainings on meat cutting and processing, the vendor used a FICCO loan to expand his business. As of 2019, the vendor processed four pigs per week, a four-fold increase. He attributed this increase to the trainings he attended and the loan he received. The vendor has begun using the Butuan Slaughterhouse supported by the project.

Also, in Butuan City, a “longganiza” processor attended training on food safety and product quality. He said he tripled the volume of his business primarily because of the product awareness campaign carried out by PCCP throughout the region.

h) Increased availability of improved inputs (FFPr 1.2.1)

To ensure availability of improved inputs beyond the life of the project, Winrock equipped 254 input suppliers in the region to provide 80 different improved inputs and technologies. Farmers must be willing to buy inputs at market prices, however, after the project ends. As of March 2019, 20,985 beneficiaries are using improved inputs, less than half the targeted number¹⁰.

Winrock linked selected input suppliers to producer groups, giving them guaranteed markets for their products. Creditworthy input suppliers who had been in business for at least a year could apply for loans as part of the FICCO small loans for agriculture program.

⁹ Source: PCCP DevResults Database Management System

¹⁰ Winrock International. PCCP 11th Bi-Annual Report to USDA. (Draft, March 2019)

An input supplier's first loan could be for up to PhP 50,000 (\$1,000), increasing to PhP 250,000 (\$5,000) for the second loan and up to PhP 500,000 (\$10,000) for third.

2. Collective Actions by Producer Organizations

Key Evaluation Question 2: To what extent are the producer organizations supported by the project engaging in collective input procurement, collective marketing, or sharing of best practices?

Key Outcomes

- ❖ Of the 81 sample producer groups, 32% of producer groups reported using collective input procurement.
- ❖ Most producers sourced farm inputs from local dealers, but the producer groups became another input source when PCCP was implemented
- ❖ 38% of producer groups reported using collective marketing, but results vary by commodity. Horticulture producer groups had notable successes.
- ❖ 72% of PGs reported sharing of best practices among members. Demonstration farms and text messaging facilitate sharing.

Activities targeting producer groups contribute to a key foundational result: Improved capacity of key groups in the agriculture production sector (FFPr 1.4.4).

a) Availability of inputs

PCCP targeted producer groups as potential sources of collective benefits for farmers. During the life of the project, Winrock developed and strengthened 258 new and existing producer groups (PGs), nearly meeting its target (260)¹¹. The project conducted 625 training sessions on quality and regulatory issues/practices and 314 training sessions on organizational capacity building, exceeding targets.

The impact of PCCP interventions on collective input procurement and marketing appears to be modest. In ASPSI's survey of 81 randomly selected PCCP producer groups, 32% reported engaging in collective input procurement, and 38% reported using collective marketing. Sharing of best practices was more widespread. Seventy-three percent of PGs reported sharing of best practices among members.

Several factors might have limited the use of collective procurement or marketing. Winrock's goal was to provide marketing training to at least one member of each producer group, but not all groups participated. This might be because producer groups didn't view collective procurement and marketing as priorities. Groups that did send members for training might have needed more organizational development or leadership training to implement new collective practices. In some producer groups, collective input procurement might have failed because members needed inputs at different times.

b) Collective input procurement

Out of the sample of 81 producer groups interviewed, 26 (32%) reported using collective input procurement. Horticulture PGs had the highest rate of use: 10 out of 22 (45%) reported using collective input procurement. Of the 24 fisheries groups, 15 (38%) used the practice. Swine producers used the practice the least; only seven out of 35 producer groups (20%) reported using collective input procurement. Furthermore, the lowest percentage is in swine, understandably because individual raisers started their operation upon the availability of piglets. Piglets were distributed by PCCP in different period due to limited availability. Since swine raising requires different inputs (especially type of feeds) depending on the stage of growth, it was difficult for producers to do collective input procurement with unsynchronized operation.

¹¹ Winrock International. 11th Biannual Report to USDA, Philippine Cold Chain Project (PCCP). (Draft, March 2019)

Before the project began, most producers sourced farm inputs from local dealers. During the project, producer groups became another source of inputs through the small input grants, e.g. irrigation equipment.

ASPSI asked the leaders whose groups use collective input procurement about the benefits. Sixteen of the groups (62%) cited the discounted price. Eight groups (31%) reported easier input sourcing, and two groups (both fin fish) cited lower transportation costs. When asked about the drawbacks of collective input procurement, most of the PG leaders reported no drawbacks. Seven respondents mentioned misunderstandings among members about the process. Small numbers of leaders cited high cost (4) and lower quality (2).

c) Increased availability of improved inputs (FFPr 1.2.1)

Winrock awarded 382 small input grants worth a total of \$379,317 to producer groups, nearly double the target number and more than double the target amount. Input grants encouraged producers to source improved inputs from producer groups.

Prior to participating in PCCP, the vast majority of producers purchased inputs from local agro-dealers. During the life of the project, producers across the three sectors accessed more of their inputs from producer groups. The sections below summarize sources of inputs for each sector before and during PCCP. (Refer to **Annex 4, Input Sources**, for a detailed breakdown of sources by input type.)

Horticulture

In horticulture, 83% of surveyed producers purchased inputs from local dealers prior to PCCP. About half of surveyed producers now purchase seeds, fertilizers and chemicals from producer groups or cooperatives.

Livestock

In livestock, most of the sample producers (90%) purchased inputs from local dealers before participating in the project. As of 2019, most livestock producers still purchase feed and biologics from agro-dealers, but 31% sourced their piglets from producer groups. Since producer groups received input grants for piglets and distributed them to farmers for free, PGs might not continue to be an outlet for piglets after the life of the project. Beneficiary farmers will have improved the genetic stock of their herds, though, which will enable them to breed and produce higher quality animals after the life of the project.

Fisheries

In fisheries, 97% of surveyed producers rely on local agro-dealers as their primary source of inputs. In contrast, 77 % of respondents reported purchasing fingerlings from producer groups supported by PCCP.

Producer groups might not sustain this increased availability of inputs beyond the life of the project. Farmers did not have to pay market prices for inputs purchased with PCCP grants, and it is not clear whether producers that received grants will engage in input procurement after the project ends.

d) Collective Marketing

ASPSI found that 38% of sampled producer groups have used collective marketing. Use varies widely by commodity, however. In horticulture, 67% of banana producer groups and 64% of vegetable PGs use collective marketing. In fisheries, nearly half (47%) of crustacean producers market collectively, but only 22% of fin fish producers use the practice. Twenty-nine percent of swine producers use collective marketing. Producer groups reported direct access to buyers and increased sales as benefits of collective marketing.

The relatively low rate of adoption overall might be due to the project's initial focus on production interventions. PCCP team conducted trainings for PGs on collective marketing relatively late in the project, as part of agro-enterprise development. Also, this might be affected by crop growth patterns, i.e. not all crustaceans being ready for sale at the same time or week.

Producer groups in horticulture, especially vegetables, achieved notable successes with collective marketing. PCCP helped the Bayugan High Value Grower Association (BAHIVEGA) to market their vegetables to institutional buyers like Robinsons Place, which operates a supermarket in Butuan City. The project paid the initial fee to display the vegetables in the supermarket. The Surigao Del Sur Vegetable Growers Association (SDSVGA) now sells its vegetables to Gaisano Mall in Butuan. The project helped the SDSVGA establish a collective farm.

e) Sharing of Best Practices

Among collective actions, sharing of best practices was the most widely adopted: 73% of PGs reported sharing among their members. By commodity, 100% of banana PGs reported sharing of best practices, followed by vegetables (86%), crustaceans (80%), swine (69%), finfish (67%) and mango (40%).

Producer group members share best practices during trainings (Farmer Field School and Farmers Field Training) and meetings. The demonstration areas and farms established for trainings facilitate sharing of best practices, providing a place for members to demonstrate and observe techniques and technologies. Producer groups also cited text messaging as a useful tool for sharing information and practices. Using text messages, farmers can easily request information from provincial coordinators, community organizing technicians, and others. Farmers reported learning from the East-West Seed technicians who served as resources the vegetable production trainings in all five provinces.

3. Financing as a Tool for Investment

Key Evaluation Question 3: How relevant was PCCP’s approach in increasing producers’ and other value chain actors’ use of financial resources (e.g. credit/loans) as a tool to invest in their businesses? What were the quantitative and qualitative impacts, positive and negative, of financing facilitated by the project?

Key Outcomes

- ❖ The Small Agricultural Production Loan (SAPL) program, administered by First Community Cooperative (FICCO) with a \$1.7 million loan guarantee from PCCP (with \$200,000 of the funding coming from Winrock as cost share), provided \$2,156,663 in loans to 1,328 PCCP beneficiaries.
- ❖ With technical support but no PCCP subsidies, Cantilan Bank, Rizal MicroBank (RMB), and Surigao Economic Development, and Microfinance Foundation, Inc. (SEDFI) provided an additional \$292,390 in loans to 143 beneficiaries.
- ❖ Winrock’s first financing intervention, an 80% loan guarantee that subsidized agricultural financing from FICCO, resulted in high default rates. FICCO had little incentive to properly vet borrowers, and this contributed to many borrowers treating the loans as grants.
- ❖ PCCP’s mid-course correction, transitioning from loan guarantor to technical advisor and loan facilitator, has increased the availability of microfinance for agricultural producers in Caraga.
- ❖ As a result of Winrock’s capacity-building, Cantilan Bank, RMB, SEDFI, and FICCO are disbursing commercially viable loans in agriculture in PCCP provinces and are poised to continue.

a) Relevance

Lack of access to financing is a pressing issue for farmers in Caraga. Banks and microfinance institutions serve the region, but they avoid loans for agriculture, viewing them as risky. Even banks with mandates that require them to devote 10% of their lending to agriculture steer clear of the sector, preferring to pay a fine.

Microfinance institutions struggle to evaluate applicants for small agricultural loans. Small-scale farmers generally lack the required credit history and documentation (especially business plans) to qualify for loans. Many farmers are heavily indebted to informal sources (loan sharks), making them high-risk borrowers.

In focus group discussions, farmers praised the PCCP financing program. Producers reported that before participating in PCCP, they struggled to invest in their farms.

b) Effectiveness

In response to lessons learned, Winrock’s approach to financing changed significantly midway through PCCP, from a loan guarantee fund to technical support for microfinance institutions. The loan guarantee fund led to nearly \$2.2 million in loans, but proved unsustainable over the long term. The second approach, technical support to microfinance institutions for commercial lending, resulted in only \$125,000 in loans, but is more likely to result in lending beyond the life of the project.

First intervention: loan guarantee fund

In year one PCCP launched the Small Agricultural Production Loan (SAPL) program to increase access to financing for project beneficiaries. The loan program aimed to catalyze producers’ investments in improved inputs and technologies, and to enable other actors in the supply chain to grow their businesses. The SAPL program supported increased use of financial services (FFPr 1.2.3), increased use of improved agricultural techniques and technologies (FFPr 1.2), and, ultimately, increased agricultural productivity (FFPr SO1).

Winrock provided its initial partner, First Community Cooperative (FICCO), with a \$1.7 million loan guarantee fund (\$200,000 funds were Winrock cost share) to support micro-credit loans to producers and other actors in the horticulture, livestock, and fisheries sectors in Caraga. PCCP accepted 80% of the risk. FICCO administered the SAPL program through its main offices and business centers in the five provinces in the region. The Philippine Crop Insurance Corporation (PCIC) insured all agricultural loans.

Between 2014 and 2017, FICCO awarded loans to PCCP beneficiaries across the three sectors and five provinces. Loans to fisheries accounted for 49% of the portfolio, followed by livestock (36%) and horticulture (15%). Surigao Del Sur received the most loans (34%). Dinagat Islands, the province with the smallest number of beneficiaries, received the least (9%). Surigao Del Norte (21%), Agusan Del Norte (18%), and Agusan Del Sur (18%) shared the rest of the portfolio. (Please refer to **Annex 9, Loans to Beneficiaries**, for detailed information about loans by sector, commodity and bank.)

Problems with the loan guarantee approach

The Small Agricultural Production Loan (SAPL) program increased access to financing, but only in the short-term, because repayment rates were very low. When the SAPL program began in 2014, the repayment rate was 80%. Microfinance institutions typically need a repayment rate of more than 95% to sustain lending¹², so even at the outset, the loan program was not on a path to sustainability. By 2017, only 20% of farmers were repaying loans. Instead of creating a pathway to increased lending to agriculture in Caraga, the loan guarantee fund provided one-time financing for project participants.

Several factors likely contributed to this problem. Critically, the 80% loan guarantee removed risk to the point that FICCO awarded loans that would not otherwise be commercially viable. The SAPL program focused on meeting lending targets; loan officers failed to properly vet and educate borrowers. According to Winrock, project beneficiaries knew about the loan guarantee, so many viewed the loans as grants. Others simply did not understand the loan terms. When farmers began defaulting at high rates, FICCO did not have sufficient staff for collections. Frequent visits to borrowers to collect payments proved costly.

The insurance provided by the Philippine Crop Insurance Corporation (PCIC) could have offset losses, but borrowers didn't understand how the policy worked. When farmers suffered losses like livestock deaths, they failed to file claims for reimbursement. Some surveyed farmers didn't realize they had insurance. Others didn't understand that they needed to submit claims for losses; they assumed that PCIP would repay their loans directly to FICCO.

Second intervention: Loan facilitation and technical support

When it became clear that the lending program was flawed, Winrock hired a financial consultant to assess the financial institutions in the Caraga Region. Based on the assessment, Winrock selected three new banks with the capacity to administer commercially viable loans for small-scale agricultural production. Winrock partnered with Rizal MicroBank (RMB), Cantilan Bank, and Surigao Economic Development and Microfinance Foundation, Inc. (SEDFI), and transitioned its role from loan guarantor to financing facilitator. Through training and technical assistance, Winrock built the banks' capacity to assess agriculture-related business plans and select creditworthy farmers. Winrock helped facilitate loans by vetting and endorsing prospective borrowers for consideration. The project continued to work with FICCO, but without providing a loan guarantee fund. Like the other banks, FICCO received technical assistance to create a self-sustaining loan program.

c) Positive impacts of financing

PCCP interventions resulted in 1,471 loans with a total value of more than \$2.4 million. **Table 4** below shows lending by financial institution, including loans to females. Women received 47% of project-supported loans, which made up 43% of the total value of loans.

Refer to **Annex 9, Loans to Beneficiaries**, for breakdowns of loans by province, sector, and commodity. (Please note: The data for FICCO includes loans under both financing interventions, the loan guarantee fund and the commercial lending program. Disaggregated data was not available.)

Table 4. Lending to PCCP beneficiaries by financial institution¹³

¹² Rosenberg, Richard. 2009. *Is 95% a Good Collection Rate?* Consultative Group to Assist the Poor (CGAP). <https://www.cgap.org/blog/95-good-collection-rate>

¹³ U.S. dollar values based on April 30, 2019 exchange rate (0.019292 PhP/USD)

Financial Institution	Number of Loans			Total Value of Loans		
	Females	Total	% to Females	Females	Total	% to Females
FICCO*	606	1328	46%	\$926,718	\$2,156,663	43%
Commercial Loans						
Rizal MicroBank	40	85	47%	\$107,167	\$202,373	53%
Cantilan Bank	45	56	80%	\$17,903	\$89,631	20%
SEDFI	1	2	50%	\$193	\$386	50%
Total Commercial	86	143	60%	\$125,263	\$292,390	43%
TOTAL	692	1471	47%	\$1,051,981	\$2,449,053	43%

* Includes FICCO's commercial lending after loan guarantee fund closed

The original SAPL program with FICCO enabled successful borrowers to invest in their farms, accumulate capital, build credit histories, and become regular members of FICCO. To promote saving and reinvestment, the loan program required beneficiaries to save 10% of net income per harvest. This helped producers save the PhP 3,000 in capital necessary to become a FICCO member. FICCO members receive dividends and patronage refunds.

In the long-term, Winrock's second financing intervention, capacity-building support to four microfinance institutions, has laid the foundation for increased agricultural lending in the region. Under this second intervention, repayment rates were higher. In ASPSI's microfinance focus group discussion, representatives from FICCO, Rizal MicroBank, and Cantilan Bank expressed interest in continuing to lend to project beneficiaries after the project ends. They reported that Caraga farmers and fisheries managers are demonstrating greater financial responsibility under the new commercial loan program. If Rizal MicroBank, Cantilan Bank, SEDFI, and FICCO continue to offer micro-loans for agriculture, Winrock's capacity-building and facilitation interventions will increase access to financing over the long-term.

d) Negative impacts of financing

The original SAPL program, supported by the project's loan guarantee fund, increased access to financing, but only temporarily. The sudden decision to stop the release of new loans under the SAPL FICCO left some producers without finance for their operations, hence they defaulted on their loan repayment. Farmers who defaulted, either willfully or because they thought the loan was a grant, now have poor credit histories. Beneficiaries who participate in future development projects might bring misconceptions or unrealistic expectations about loans.

e) Lessons learned

Future development projects should focus on building capacity for commercial lending to agriculture, not subsidized lending. As one of its lessons learned, Winrock cautioned against targets for numbers and total value of loans. Pressure to meet targets resulted in "loans for the sake of loans" rather than high-impact, sustainable lending. Building capacity for commercial micro-lending in agriculture results in fewer loans in the short-term, but results are more likely to be sustainable.

If used, loan guarantee funds must be carefully designed, and the guarantor should take on only a portion of the risk. If guarantees remove too much risk, banks have little incentive to develop commercially viable lending, and borrowers have little incentive to repay. The guarantor and bank leadership should keep information about the guarantee confidential to avoid influencing lending decisions and repayment.

For insured loans, borrowers must understand the types of losses covered and the claims process, and information needs to be clearly disseminated. Some of the producers who defaulted on FICCO loans suffered losses that would have qualified for insurance reimbursements. Borrowers did not understand how their loans were insured or what they needed to do to claim reimbursement.

Not all agricultural producers should receive loans. Just like borrowers in other sectors, farmers vary in their creditworthiness. Under the guaranteed loan program, FICCO awarded loans to farmers who lacked business plans, which meant they had not identified investments likely to increase returns. In some cases, production interventions should precede financing. Farms with low productivity and / or narrow profit margins are not likely to generate sufficient returns to repay loans.

4. In-Kind Grants for Cold Chain and Storage Facilities

Key Evaluation Question 4: To what extent are the cold chain and storage in-kind grant facilities supported by the project achieving the intended outcomes?

Key Outcomes

- ❖ Winrock used USDA funds to leverage \$2,385,651 in additional financing. Co-financing covered 71% of the total cost of the facilities and upgrades.
- ❖ Infrastructure investment is expensive and time consuming to finalize.
- ❖ Winrock supported 16 facilities with in-kind grants, installing a total of 49,459 m³ in new storage capacity in Caraga Region, just under the project target (50,000 m³).
- ❖ Local government units (LGUs), selected as the public partners for envisioned public-private partnerships, proved ineffective.
- ❖ Facilities vary widely in effectiveness, from operating successfully at full capacity (5 facilities) to not yet open and unlikely to succeed (one facility, the Caraga Regional Integrated Marketing Facility (CRIMC)).
- ❖ The Butuan Slaughterhouse and HERI Meat-Cutting Plant have developed strong linkages to the swine supply chain and are adding value.
- ❖ The Carmen Mango Processing Center (CMPC) and San Jose Ice Plant (A&M) have strong potential to decrease post-harvest losses and add value.

a) Outcomes in Support of FFPr Results

Through its in-kind grant program, PCCP helped develop 16 cold-chain and storage facilities in Caraga. PCCP met its target for improved post-harvest infrastructure (FFPr 2.1.2.2): the 16 facilities installed a total of 49,459 m³ in new storage capacity, just under the project target (50,000 m³)¹⁴. The in-kind grant program made efficient use of financial resources. Winrock used USDA funds to leverage \$2,385,651 in additional financing. Co-financing covered 71% of the total cost of the facilities and upgrades.

While the project installed the targeted amount of cold and dry storage capacity, that capacity is not yet fully online as of the close of the project, so related outcomes suffered. Five PCCP-supported processing and value-added firms that handle meat and fish have adopted international production and handling standards, compared to a target of 30 (FFPr 2.1.1.1)¹⁵. Eight agribusinesses are using improved cold chain as a result of USDA assistance, compared to a target of 50 (FFPr 2.1.2.1)¹⁶. Use of cold chain and standards adoption is likely to improve as more PCCP-supported facilities open and/or bring new infrastructure online.

¹⁴ Winrock International. 11th Bi-annual Report to USDA, PCCP. (Draft, March 2019)

¹⁵ Winrock International. 11th Bi-Annual Report to USDA, PCCP. (Draft, March 2019)

¹⁶ Winrock International. 11th Bi-annual Report to USDA, PCCP. (Draft, March 2019)

b) Facility Overview

The IKG portfolio consists of nine animal slaughterhouses, 5 multi-purpose processing, storage, and or trade facilities, one dry storage facility for animal feed, and one meat-cutting plant (See adjacent map, Source: Winrock). Eleven of the 16 facilities cater to the livestock sector; eight of those facilities are in Agusan del Norte. The project funded more livestock facilities because swine is the most developed of the six commodities, domestic demand for pork is very high, and LGUs more readily supported slaughterhouses than other facilities. Swine production is highest in Agusan del Norte.

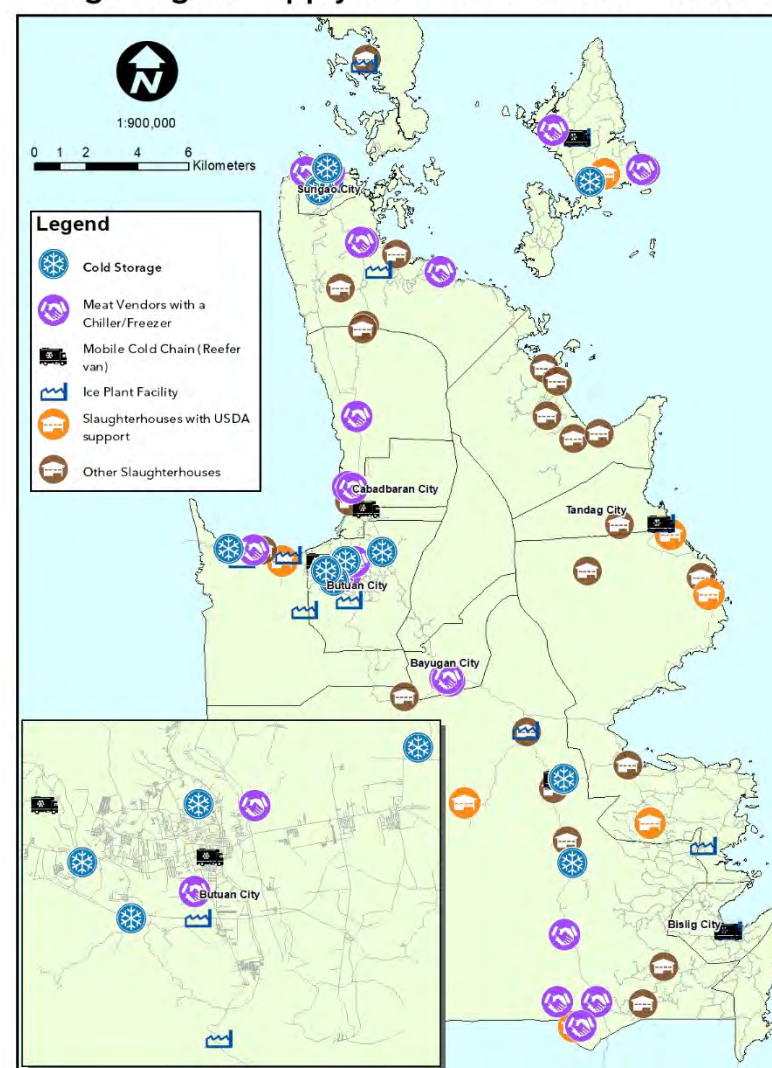
The project's focus on swine also reflects its emphasis on food safety, which requires reliable cold storage. Slaughterhouses and meat processing facilities in the Philippines typically have very low food safety standards. In partnership with the National Meat Inspection Service (NMIS), the project provided training to IKG recipients in safe food handling practices and standards.

Setbacks and delays have plagued the in-kind grant program; new facilities and equipment did not begin to come online until 2017. Local government units (LGUs), selected as the public partners for the program, were the primary cause of delays¹⁷. (For more information, refer to **Evaluation Question 6, Public-Private Partnerships**.)

Table 5 provides an overview of PCCP-supported facilities, grouped into five categories:

- **Successful facilities** are open and operating at a high percentage of their total capacity. IKG-funded equipment, cold storage, and other improvements are installed and online.
- **Operational facilities** are open and operating, with IKG-funded improvements installed and online. Their performance is average. Throughput is not necessarily a high percentage of total capacity, or capacity may be limited. Political conflict hinders some.
- **Unimproved facilities** were open and operating prior to PCCP, and they are currently operating. IKG-funded improvements, however, are not yet online.
- **Not yet open, likely to succeed:** These facilities are not yet open, or open only for limited uses, but expected to open successfully, with IKG-funded improvements in place, soon after April 2019.
- **Unknown: High Potential, Not Yet Open:** The Carmen Mango Processing and Marketing Center (CMPMC) was not yet open at the time of the evaluation; however how water treatment equipment was installed in February 2019 and the facility turned over to local entities the following month. Based on the current technical configuration and the political will of the operating partner, this facility has high potential to be successful, but could not be evaluated at the time of this study.
- **Not yet open, unlikely to succeed:** The Caraga Regional Integrated Marketing Center (CRIMC) does not appear to have the political will, local support, and operating partner it would need to succeed.

Caraga Region Supply and Cold Chain Investments



¹⁷ PCCP observation is LGUs had government funds to invest in infrastructure. Private sector partners were less likely to invest their resources¹⁷.

Table 5. Overview of post-harvest facilities supported by PCCP in-kind grants¹⁸¹⁹²⁰

Facility	Province	Sector	Partners	Grant Purpose	Completed	Status (as of April 2019)
Successful Facilities (5)						
HERI Dry Storage Warehouse	Agusan del Norte	Livestock	Happy Enterprises & Resources, Inc. (HERI)	Improvement: Roof and wall materials	Open continuously during improvements	Operating successfully at full capacity. Plans to increase storage capacity. Distribution hub for Pilmico feeds to 524 local outlets.
HERI Meat-Cutting Plant	Agusan del Norte	Livestock	Happy Enterprises & Resources, Inc. (HERI)	Improvement: Refrigeration equipment	May 2017	Operating successfully near full capacity. Additional shift planned to increase throughput. Higher prices for producers. NMIS “AA” accredited.
Liveberg Cold Storage Facility	Agusan del Norte	Livestock	Ralav Corporation	Improvement: Cold room	January 2018	NMIS-accredited “AA” cold storage facility. Contracted by Nestle Philippines, Inc. for product storage.
Buenavista Slaughterhouse	Agusan del Norte	Livestock	Buenavista LGU	Improvement: Off-floor equipment	May 2017	Operating successfully at high capacity.
Butuan Slaughterhouse	Agusan del Norte	Livestock	Butuan City LGU De Oro Ajec	Improvement: Cold room and railings	March 2017	Operating successfully at high capacity. NMIS “AA” accredited
Operational Facilities (4)						
Cagwait Slaughterhouse	Surigao del Sur	Livestock	Cagwait LGU	Improvement: Off-floor equipment	June 2017	Operating, but at less than half its capacity.
Santa Josefa Slaughterhouse	Agusan del Sur	Livestock	Santa Josefa LGU	Improvement: Off-floor equipment, transport	June 2017	Medium capacity, operating well.
Tago Slaughterhouse	Surigao del Sur	Livestock	Sowreap Corporation	Improvement of existing equipment	May 2017	Conflicts among LGU, municipality, and Sowreap have slowed operations. NMIS “AA” accredited.

¹⁸ ASPSI. Site visits and interviews. (February 2019)¹⁹ Winrock International. Progress Monitoring Report of the In-Kind Grant Facilities. (Updated March 2, 2019)²⁰ Winrock International. Communication with staff. (April 2019)

Facility	Province	Sector	Partners	Grant Purpose	Completed	Status (as of April 2019)
Talacogon Slaughterhouse	Agusan del Sur	Livestock	Talacogon LGU	Improvement: off-floor equipment	July 2017	Medium capacity, operating well.
Unimproved Facilities (3)						
Dapa Slaughterhouse	Surigao del Norte	Livestock	Dapa LGU	Improvement: Off-floor equipment	August 2017, new equipment not yet online.	Awaiting municipal ordinance and permit. NMIS training conducted.
Marihatag Slaughterhouse	Surigao del Sur	Livestock	Marihatag LGU	Improvement: Off-floor equipment, water supply, & holding pen	September 2016, new equipment not yet online.	Political changes preventing new equipment and holding pen from operating.
Surigao Slaughterhouse	Surigao del Norte	Livestock	Surigao LGU	Improvement: Cold room & A-frame	In operation before PCCP; cold room not yet open	Operating successfully at high capacity before PCCP. Cold room not yet open; awaiting local ordinance.
Not Yet Open, Likely to Succeed (2)						
San Jose Ice Plant and Cold Storage Facility	Dinagat Islands	Fisheries (all sectors)	A&M Cooperative, San Jose LGU	New equipment	Not yet open	Near completion. Will be first ice plant and cold storage in Dinagat Islands.
Agri-Pinoy Trading Center	Surigao del Norte	All sectors	Surigao del Norte Province LGU	Improvement: cold room facility	In use as trading center	Cold room not yet open, but near completion.
Unknown: High Potential, Not Yet Open (1)						
Carmen Mango Processing and Marketing Center (CMPMC)	Agusan del Norte	Horticulture (mango)	Carmen LGU, Southern Philippines Fresh Fruit Corporation	New facility: Packing house, cold room, hot water treatment	March 2017	Hot water treatment has been installed as of February 2019 and is ready for use. Planned transfer to Carmen Mango Producers Agricultural Cooperative (CMPAC).
Not Yet Open, Unlikely to Succeed (1)						
Caraga Regional Integrated Marketing Center (CRIMC)	Agusan del Norte	All sectors	Nasipit LGU (Prospective operator: Adfil)	New facility	Not yet open	Nasipit LGU delaying awarding contract to private sector company Adfil

ASPSI considers the facilities generally relevant because they meet identified needs of producers and other actors in the supply chains for the three commodities.

Since the in-kind grant program was unable to open cold chain and other facilities in time to achieve their intended outcomes, ASPSI analysis does not consider the IKG program an overall effective model for cold chain development. Nevertheless, the more successful facilities suggest best practices in partnerships, operations, and supply chain integration. (Please see **Key Evaluation Question 5, Business and Supply Chain Management**, and **Key Evaluation Question 6, Public-Private Partnerships** for more information.)

Given the time required to identify prospective investors, facilitate public-private partnerships, select locations, design facilities and upgrades, procure equipment, install facilities, train operators, connect new enterprises with clients, and train producers to use cold-chain facilities, Winrock may have felt pressure to begin awarding grants quickly. Winrock's current Chief of Party suggests that engaging prospective partners and operators early in the planning process and assessing current and past failures and successes would have resulted in better projects. In ASPSI's focus group discussion with PCCP staff, participants cited the need for thorough value-chain analysis before designing interventions at project start.

As Winrock prepares to leave the region, sustainability is a critical issue for the cold-chain facilities, especially those that are not yet operational. Initial evidence suggests that most PCCP-supported facilities have the potential to add value, increase efficiency, and improve quality for post-production agricultural products.

To evaluate the IKG program, ASPSI conducted site visits to five IKG-funded facilities: the Carmen Mango Processing and Marketing Center (CMPMC), San Jose Ice Plant and Cold Storage Facility, Butuan Slaughterhouse, HERI Meat-Cutting Plant, and Caraga Regional Integrated Marketing Center (CRIMC).

Butuan Slaughterhouse (Operated by De Oro Ajec) – Successful facility

As of March 2019, the newly refurbished De Oro Ajec Slaughterhouse is operating at full capacity, processing 130 – 150 pigs per day (about 3,900 – 4,500 heads per month). The facility is designed to maintain meat at a safe temperature, improve meat quality, and reduce post-slaughter losses. Winrock gave the slaughterhouse an IKG of a walk-in carcass chiller. A carcass chiller maintains animal carcasses at a temperature just above freezing (0 to 5°C). Maintaining this temperature prevents contamination and keeps the meat at the optimal temperature for handling and processing such as cutting, deboning, and shipping. Carcass chillers also produce more tender meat. The carcass chiller at the De Oro Ajec slaughterhouse can accommodate 200 pork carcasses per batch load.

HERI Meat-Cutting Plant – Successful facility

Happy Enterprises and Resources, Inc. (HERI), a private company, received an in-kind grant of refrigeration equipment from PCCP. The facility has a carcass chiller, storage area, cutting room, meat freezer, and dispatch area. As of March 2019, the HERI meat-cutting plant is operating at its target capacity of 30 pig carcasses per day. Management is planning to increase its throughput by adding an additional shift.

Carmen Mango Processing and Marketing Center (CMPMC) - Not yet fully operational, likely to succeed

The CMPMC is partially operating and has cold rooms and the hot water treatment equipment installed and PCCP staff have high hopes for its success. (Please see Evaluation Question 5 for a detailed assessment of the CMPMC as part of mango value-chain mapping.)

San Jose Ice Plant and Cold Storage Facility, Dinagat – Not yet fully open, likely to succeed

Once it opens, the San Jose Ice Plant and Cold Storage facility in Dinagat will be the first facility of its kind in the Dinagat Islands. Fisheries producers will have a local supply of ice to preserve lobster, fin fish, shrimp, and other crustaceans for packing and transport. Horticulture farmers will have access to cold storage for perishable vegetables.

Producers, processors, and traders in the Dinagat Islands have long relied on neighboring Surigao (a boat ride away) as their source of ice to preserve highly perishable goods. Without a local ice plant or cold storage facility, producers often had to sell their harvests immediately to avoid post-harvest losses.

The San Jose Ice Plant and Cold Storage Facility is scheduled to be fully operational in May of 2019. It's currently awaiting the installation of the three-phase electrical system, the water supply (through the San Jose Water District), and minor repairs and cleaning. A&M Cooperative will operate the facility. The cooperative will split net income on a 50-50 basis with the San Jose LGU.

Caraga Regional Integrated Marketing Center (CRIMC) – Not yet open, unlikely to succeed

The CRIMC in Nasipit has been built, but it has not yet opened. The facility was intended to serve as a packinghouse for bananas. CRIMC is strategically located close to the Port of Nasipit. The port authority has banned packing of bananas inside the port, so producers need a nearby packinghouse.

The facility itself is nearly ready; the Nasipit LGU only needs to complete the access to the facility's loading and handling areas. Unfortunately, the Nasipit LGU (still the facility's owner and operator) has not approved the prospective operator, despite months of delays, to finalize the transfer of operations to a private-sector partner. The LGU in charge of the CRIMC needs to complete the access to loading and handling areas. (Winrock reports that as of April 2019, access is nearly complete.) The operator needs to fit out the plant, but the LGU has not identified a business partner or sub-contractor to operate the plant.

Unfortunately, the new facility is already deteriorating. During the site visit, ASPSI researchers found that the facility is poorly maintained, even to the point of being vandalized.

c) Lessons Learned and Recommendations

Conduct a participatory needs assessment and commodity-specific value-chain mapping during project start-up. A better understanding of LGUs, producers, and commodity value chains might have resulted in more efficient development of facilities with greater local ownership.

Select motivated LGUs and provide capacity building. ASPSI finds that facilities operated by LGUs are much less likely to succeed. LGUs have poor track records managing facilities for income generation, particularly in Carmen and Nasipit. Winrock's current Chief of Party cites the lack of sound business plans as one reason for the LGU managed IKG program's disappointing outcomes, especially for the CRIMC.

Create an integrated plan for cold chain investment. With a more integrated plan for cold-chain investment, CRIMC could have served as a central connection point for the other facilities, providing a consolidated channel for trade. If the center opens successfully, it could still play that role.

Develop multiple facilities together along the same value chain, with a clear plan for integration and long-term sustainability. The project's most successful interventions linked facilities along different parts of the swine value chain. Future projects should use this integrated approach from the outset for all targeted commodities.

Develop plans early in the process in collaboration with each facility's stakeholders. Projects funded by in-kind grants will be more likely to succeed if stakeholders participate actively in planning the projects.

5. Business and Supply Chain Management of IKG-Supported Facilities

Key Evaluation Question 5: How effective has PCCP's facilitation approach been in business and supply chain management of the in-kind grant facilities, especially value-added products?

Key Outcomes

- ❖ In Agusan del Norte, linkages among the Butuan Slaughterhouse, HERI Meat-Cutting Plant, and Pilmico's PCCP-supported Swine Repopulation Program have generated a promising model for value added across the livestock value chain.
- ❖ The horticulture sector is underserved by IKG-funded facilities.
- ❖ The San Jose Ice Plant and Cold Storage Facility, the first of its kind in Dinagat, has the potential to increase trade and selling prices for fisheries producers.

The IKG-supported facilities opened much later than expected, and some remain yet to fully operate at the close of the project. This indicates that the facilitation approach was only marginally effective. To assess the potential impact of the facilities to add value to post-production agricultural products, ASPSI used value chain analysis, key informant interviews, and focus group discussions with actors in the supply chain.

ASPSI conducted value-chain analyses around five IKG-supported facilities representing the three sectors: horticulture (Caraga Regional Integrated Marketing Center (CRIMC) and Carmen Mango Processing and Marketing Center (CMPMC)), livestock (Butuan Slaughterhouse and the HERI Meat-Cutting Plant) and fisheries (San Jose Ice Plant and Cold Storage Facility). ASPSI found that business and supply chain linkages were strongest for livestock (swine) facilities and weakest for horticulture facilities. The IKG-funded facility for the fisheries sector is not yet fully operational.

a) Horticulture Value-Chain: Mangoes, Bananas, and Vegetables

As of February 2019, when ASPSI visited facilities, the fruit and vegetable processing and marketing facilities (CRIMC, CMPMC, and AgriPinoy Center) were not connected to the supply chain. No buying, selling, or trading was taking place. The Agri-Pinoy Center is ready to open, but the local LGU has prevented the facility from doing so, either due to lack of interest or administrative incompetence.

The lack of a coordinated supply of products—especially mangoes and vegetables—makes processing operations inefficient. In 2017, for example, a poor mango season reduced the supply, providing little input for the Carmen Mango Processing and Marketing Center (CMPMC). The facility might not be able to generate enough revenue serving only one commodity.

Facilities for the horticulture value chain would have benefitted from risk management plans to address problems in supply. Processing and storage facilities must be able to adapt to product seasonality.

Carmen Mango Processing and Marketing Center (CMPMC)

Since opening in 2017, the CMPMC has only served one client, who used the facility to store mango puree. The facility stopped serving that client due to the high cost of electricity (PhP 30,000/month), which couldn't be offset by revenue from a single user. To become profitable, the facility will need to attract a sufficient number of customers to reach economies of scale, where the marginal revenue from each new client is greater than the marginal cost of electricity to serve that client.

Winrock has worked to mitigate this initially disappointing result. Winrock negotiated with the Southern Philippine Fresh Fruit Corporation, a commercial private sector firm based in Davao City, to install a hot water treatment facility and link the facility to a new mango supply chain. As of March 2019, the LGU is scheduled to transfer facility management to a local mango cooperative, which could improve performance. PCCP facilitated a memorandum of understanding between the cooperative and the LGU; plans call for the transfer and equipment installation to occur by June 2019.

Winrock has high hopes for the CMPMC, given that it would meet a critical need for mango farmers. Post-harvest losses for mango can exceed 90% during the off season; a well-run processing facility could reduce those losses to less than 10%. According to Winrock’s monitoring and evaluation officer, the CMPMC could succeed if the partnership between the local mango cooperative and Southern Philippines Fresh Fruit Corporation enables farmers to provide the high-quality mangoes required for higher-value markets. If farmers meet the quality requirements for better markets, the higher selling price will more than offset what they must pay to use the CMPMC..

Caraga Regional Integrated Marketing Center (CRIMC)

The Caraga Regional Integrated Marketing Center (CRIMC) has been built, but as of April 2019, it has not yet opened. The CRIMC could generate value added in horticulture, especially for bananas. A huge volume of bananas (more than 100 containers per week) flows through the Nasipit port. Even if the facility only served as a packinghouse, it would meet an important local need. Farmers in ASPSI’s beneficiary survey cited a packinghouse as a critical need.

Unfortunately, as described under Key Evaluation Question 4, the new CRIMC facility is already in disrepair. Developing the CRIMC was especially challenging for PCCP. The Nasipit LGU generally failed to respond during project development; the condition of the facility suggests that the LGU will not manage it well. Winrock spearheaded a negotiation between the prospective operator (Adfil Corporation) and the LGU to make the facility operational, but the LGU continues to delay the project.

b) Livestock Value-Chain Mapping: Swine

PCCP-supported slaughterhouses and other livestock facilities are better connected to the market than those in the horticulture and fisheries sectors, and some are generating strong returns. Most IKG-funded slaughterhouses, though, still suffer from a low supply of pigs, logistical challenges, equipment problems, poorly defined business plans and management structures, and a lack of awareness or interest on the part of pig producers and meat processors. In many cases, facilities fail to promote themselves or offer incentives to entice pig producers away from traditional market channels.

PCCP’s most successful livestock facilities have developed strong linkages with one another and along the swine value chain. In Agusan del Norte, PCCP has linked producers in Pilmico’s Swine Repopulation Program with the Butuan Slaughterhouse run by De Oro Ajec and the HERI Meat-Cutting Plant. Together, the two cold-chain facilities reduce post-slaughter losses, protect food safety, and add value to meat products, while producers in the Swine Repopulation Program supply HERI with higher quality meat from genetically improved stock.

When Winrock began implementing PCCP, hog production in Caraga was declining due to low farm gate prices, high cost of inputs (especially feed), and low-quality meat that didn’t meet consumers’ tastes. Producers needed genetically improved pig varieties to produce the high-quality meat customers would pay for.

Under a subaward from Winrock, the Philippine Animal Nutrition Corporation (Pilmico) led and co-financed the highly successful **Swine Repopulation Program**, an in-kind loan program that began in year one of the project (2014). PCCP provided PhP 8 million in start-up funds; Pilmico contributed PhP 22 million in counterpart funds.

At the start of the Swine Repopulation Program, Pilmico distributed 540 genetically enhanced gilts as in-kind loans to livestock producers in the region. These producers established breeding farms, and Pilmico provided technical support and veterinary services. Pilmico has more than 450 outlets that supply agricultural inputs and services throughout all five provinces in Caraga, so the program was widely available to farmers.

After two to three generations of breeding, farmers paid off their “loans” by returning hogs to Pilmico for distribution to other producers. Each farmer returned four hogs for every gilt they had received. By the end of PCCP, breeding farmers had returned 1,417 gilts to Pilmico. Pilmico then distributed the genetically improved gilts to 503 additional producers to improve more herds.²¹

As pork quality improved, PCCP helped develop a high-quality meat-cutting facility. Established in May 2016 and opened in March 2017, the **Happy Enterprises and Resources, Inc. (HERI) Meat-Cutting Plant** is a state-of-the-art facility that cuts, packs and distributes fresh, high-quality meat. At slaughter, producers have access to the **Butuan Slaughterhouse** operated by De Oro Ajec,

²¹ Winrock International. 11th Bi-annual Report to USDA, PCCP. (Draft, April 2019)

where the IKG-funded carcass chiller prevents contamination. Both the Butuan Slaughterhouse and HERI Meat-Cutting Plant sought and earned “AA” accreditation from the National Meat Inspection Service (NMIS) for meeting food hygiene and safety standards.

To facilitate these supply chain linkages, PCCP connected swine farmers with the HERI Meat-Cutting Plant through buyer agreements. PCCP negotiated a two-tiered price structure, with a higher price for better meat. Previously, buyers paid 105 PhP/kg regardless of the size or quality of the live animal. In the new scheme, HERI pays 110 PhP/kg for meat from animals that weigh 90 – 115 kg. In ASPSI’s key informant interviews, **institutional buyers** reported that they preferred to source meat from the HERI Meat-Cutting Plant because it had a consistent supply and quality. In the final six months of the program, the HERI Meat-Cutting Plant generated processed 146 MT of pork (from approximately 1,417 animals, generating sales of \$378,895.

c) Fisheries Value-Chain Mapping: Lobster

ASPSI’s value chain mapping for lobster found that about 95 percent of lobsters produced in Caraga are sold in Manila. Local hotels and high-end restaurants purchase the remaining 5%. Producers sell their lobsters to local wholesalers who bring them to traders in Surigao City, which has holding facilities (aquaria) for live trade. These Surigao City traders have tie-up arrangements with exporters in Manila. Traders pack the lobsters in ice, seal them in styrofoam boxes, and send the lobsters by plane. This method ensures that the lobsters are alive when they reach their destination in Manila.

PCCP has helped develop better sources of seed stock and feed for lobster producers in Caraga. Before PCCP, lobster producers used low-quality, wild-caught seed stock and feed. Lobster producers fished each day, and whatever they caught (small fishes, sea urchins, mollusks, and/or other invertebrates) became lobster feed. This use of “trash” fish to feed lobster is an unsustainable practice.

Winrock worked with the Bureau of Fisheries and Aquatic Resources (BFAR) to test the use of commercial feed in lobster production. PCCP partnered with Santeh Feeds Corporation to conduct feeding trials and eventually commercially manufacture formulated lobster feed. Trials at BFAR were successful. Santeh Feeds plans to begin selling the commercial lobster feed developed through PCCP during the last quarter of 2019.

Before PCCP, producers caught seed stocks in the wild. Winrock worked with BFAR to conduct a lobster seed assessment in the region and recommended policy changes on sustainable management of lobster juveniles in the wild. Winrock facilitated financing for individuals interested in raising lobster juveniles for use by other producers. Lobster growers received some of the FICCO agricultural loan program’s largest loans.

Winrock also facilitated transportation with cooling or chilling. The new IKG-supported facility in Dinagat Islands, the San Jose Ice Plant and Cold Storage Facility run by A&M Cooperative, is scheduled to fully operate in May of 2019. The plant will be the first commercial source of ice for fish producers in Dinagat.

d) Lessons Learned

Select projects with local political support. LGU support for projects varied widely. Projects that lacked political support (such as CRIMC) faltered. Facilities with adequate political support (such as the San Jose Ice Plant, slaughterhouses, and the HERI meat-cutting plant) achieved better results. Future projects should conduct comprehensive stakeholder analysis to assess local support and possible political challenges.

Select projects with high local demand. Facilities with existing local demand are more likely to succeed. Demand for slaughterhouses and cold-storage was high among swine producers, for example, and fish producers in Dinagat wanted cold storage. As a result, livestock facilities and the San Jose Ice Plant are among the successful projects.

Assess the local context. Producers’ needs, infrastructure, and market access for a given commodity vary by location. Future projects should assess the local context to identify the best facilities to add value to agricultural products.

6. Public-Private Partnerships for Cold Chain Investments

Evaluation Question 6: What have been the key outcomes and lessons learned from the private-public partnership engagement between the local government unit departments and the private sector firms (slaughterhouses, marketing centers, infrastructure facilities, etc.)? What conditions are necessary for cold chain investments to be successful?

Key Outcomes

- ❖ Through 17 public-private partnerships, Winrock leveraged \$2,385,651 in public and private investment, 13% more than the project's target.
- ❖ DOST, DTI, and NMIS provided valuable food safety and standards training.
- ❖ LGUs were not effective public partners for cold chain investment. With a risk management plan, Winrock might have identified this problem early and developed a more successful partnership model
- ❖ PCCP's public-private partnerships for cold chain investments are more likely to succeed when private companies operate them.
- ❖ Sole private ownership and private-private partnerships resulted in successful facilities with strong linkages to the supply chain.

Through the in-kind grant program for post-harvest facilities, Winrock developed and facilitated 17 partnerships among the following public and private organizations:

Government partners

- Department of Science and Technology (DOST)
- Department of Trade and Industry (DTI)
- National Meat Inspection Service (NMIS)
- Local government units (LGUs)

Private-sector partners

- A&M Cooperative
- Adfil (prospective)
- De Oro Ajec
- Happy Enterprises and Resources, Inc. (HERI)
- Ralav Corporation
- Southern Philippines Fresh Fruit Corporation
- Sowreap Corporation

During the planning phase of the in-kind grant program for cold chain development, Winrock selected local government units (LGUs) to serve as the public partners in each public-private partnership. Winrock successfully facilitated 17 partnerships and leveraged more than \$2.3 million in public and private co-financing. In most cases, Winrock awarded in-kind grants to LGUs as the facilities' owners.

Unfortunately, many LGUs quickly became barriers to progress. LGUs controlled how quickly cold chain facilities were built, but they lacked the capacity and commitment to follow through.

DOST, DTI, and NMIS, on the other hand, emerged as strong public partners for cold-chain capacity building. Winrock also awarded some in-kind grants to private companies and facilitated a successful private-private partnership. The sections below describe the different roles played by public and private actors in PCCP's cold chain development activities.

a) Public-Private Partnerships

In PCCP's successful public-private partnerships, the local LGU owns the facility and a private company operates it. The model does not always succeed, however; the two partners must have a good working relationship and local political support. The Butuan and Tago slaughterhouses (described below) both have LGU owners and private-sector operators, but outcomes differ.

Butuan Slaughterhouse (De Oro Ajec)

Butuan Slaughterhouse has one of the project's most successful public-partnerships. The government of Butuan City granted a Concession Agreement to De Oro Ajec, a private firm, to improve and operate an outdated slaughterhouse that formerly used unsanitary methods. PCCP facilitated the partnership by helping the firm develop standard operating procedures for sanitation and good manufacturing processes. De Oro Ajec was eager to meet new NMIS sanitary guidelines. Today, the slaughterhouse is operating near full capacity using improved facilities and safety standards.

Tago Slaughterhouse (Sowreap Corporation)

In Tago, Surigao Del Sur, PCCP facilitated a partnership between the Tago LGU and Sowreap Corporation to improve the local slaughterhouse. The Tago municipal government awarded Sowreap a franchise agreement to build and operate an improved, 165 m² single-A-rated slaughterhouse. The facility's goal is to provide better services and an efficient butchering system that meets safe and sanitary meat handling standards for consumers. The plant is operating well below capacity.

b) Private Sector Ownership and Operation

Facilities owned and operated solely by private companies had positive impacts on producers and added value to the supply chain. Winrock awarded two in-kind grants directly to Happy Resources and Enterprises, Inc. (HERI) to upgrade two facilities, the HERI Meat-Cutting Plant and HERI Dry Storage Warehouse. Both facilities now operate at or near full capacity, and they have strong linkages at multiple points along the supply chain. ASPSI found that producers receive better prices for higher quality meat at the HERI Meat-Cutting Plant, and the plant's customers praise the quality and consistency of the product. The HERI Dry Storage Warehouse is also operating at full capacity, with plans to expand. The warehouse distributes Pilmico's animal feed to 454 outlets throughout Caraga. HERI plans to add an additional shift at the meat-cutting plant and additional storage at the warehouse.

c) Private-Private Partnerships

The project's most successful model for value-chain integration links swine producers to a chain of private-sector partners: Pilmico (an input and service provider), Butuan Slaughterhouse (run by De Oro Ajec), the Happy Enterprises and Resources, Inc. (HERI) Meat-Cutting Plant, and HERI's institutional buyers. The success may be due to the use of a complete value chain development approach involving all the key players in the value chain. (For information about this integrated model, please refer to **Key Evaluation Question 5**.)

d) Public Sector Support Services

PCCP demonstrated that national government partners can increase the effectiveness and impact of cold chain investments by providing food safety training, accreditation, and technical support. The **Department of Trade and Industry's** Regional Office in Caraga provided capacity building in good manufacturing practices (GMPs), the hazard analysis critical control point (HACCP) preventative food safety approach, food handling, and enterprise development.

The **National Meat Inspection Service** (NMIS) helped PCCP and local government units develop and design slaughterhouses. At the planning stage, the NMIS led inventory-taking, assessment, and selection of slaughterhouses for IKGs. The NMIS provided technical assistance for engineering plans and design, scopes of work, and equipment lists for the selected slaughterhouses. NMIS technical experts worked with the local government units that owned the slaughterhouses to ensure proper equipment installation.

The **Department of Science and Technology (DOST)** provided food safety trainings in 13 cities and municipalities, most of which had IKG-supported facilities. Training participants received food safety supplies. The DOST distributed 300 sets of food-grade plastic cutting boards and stainless-steel knives to meat vendors and meat shops. Plastic cutting boards and knives are important for safe meat handling. Plastic has a smoother, less permeable surface than wood, which can harbor microorganisms that contaminate meat.

e) Lessons Learned

Public-private partnerships posed some challenges for the project. Some local government units (LGUs) took far more time than expected to vet and sign agreements with private-sector partners. LGUs struggled to comply with U.S. government and Winrock procurement policies, which delayed the purchase of supplies and equipment. They also had to secure new ordinances from local municipalities, which required political support. In many municipalities, political conflict makes project approval challenging.

Create a risk management plan. ASPSI recommends that any future projects develop risk management plans to mitigate against failed partnerships and long delays. Winrock did not have this in place, and project staff struggled to manage setbacks with planned facilities.

Choose capable public sector partners. As a whole, LGUs were not effective public sector partners for PCCP's in-kind grants program. Most LGUs in the Philippines lack the experience and capacity to forge business partnerships, plan projects, procure supplies, and operate facilities.

Distribute high-quality, field-tested supplies. Future projects should source high-quality food safety supplies and test them with local users before distributing them widely. Participants in the DOST food safety training participants interviewed by ASPSI reported limited use of the plastic cutting boards. The plastic tended to chip off and mix with the meat. Vendors reported that their customers expected to see wooden cutting boards, and they did not respond well to the plastic. Meat cutters found that the steel knives became blunted through prolonged use.

Consider government policies, regulations, and enforcement. Government regulations governing food safety can influence whether cold-storage, processing, and storage facilities succeed. Demand for cold-storage and processing facilities increases when governments adopt and enforce strong food safety requirements. Government policies and regulations can attract and, in some cases, require the private sector to use these facilities to ensure food safety throughout post-harvest processing, storage, packing, and transport. . On the other hand, when regulations are not enforced, demand for facilities that ensure food safety is likely to remain low..

f) Recommendations and Necessary Conditions for Successful Cold-Chain Investments

ASPSI proposes the following necessary conditions for successful cold-chain investments:

- Successful cold-chain investments require strong planning. Projects should begin with participatory needs assessments, value-chain mapping, and thorough feasibility studies that consider past and current failures and successes.
- The project facilitator must understand each partner's policy and operational constraints, provide capacity building as needed, and allow sufficient time for development, procurement, installation, and approvals.
- Project developers should assess local, regional, national, and international markets and standards for promising products identified through value-chain mapping.

The type of facility proposed must be a priority for local government, and the facilities should provide services that meet strong, increasing local demands.

- Local government ordinances must support cold-chain development. Where ordinances are not yet in place, partners must have the political capital to gain municipal approval.
- To succeed, a cold chain project must have an experienced commercial partner prepared to invest time and resources from the onset. The cold chain investors should prepare a sound business plan.
- For the cold chain investment to be successful, ensuring cost sharing by both the LGU and the private sector and co-owning the venture is essential. The provision of cold chain operation and management trainings and widespread information campaigns about the benefits of the facility to the value chain players is important.

- The project must have a risk management plan to mitigate against delays. The plan should include alternative actions for cases where partners lack the organizational capacity or interest to follow through with plans.
- Project developers should use a value-chain approach, designing facilities that will link to producers, input suppliers, processors, traders, and/or other value chain actors to maximize opportunities to add value.
- Facility operators must have technical, operations, and management experience and expertise, or access to support services.

The following conditions, while not necessary, increase support and demand for cold chain investment:

- Lack of enforcement of food handling regulations impedes cold-chain development. If the government enforced food safety standards, the demand for cold-chain storage would increase.
- Information, education, and awareness-raising campaigns about food safety and standards could increase consumer demand for a safer food supply. Consumers could, in turn, create a market for safely prepared products that meet food handling standards.
- Facility operators should actively seek clients through promotion, advertising, and/or incentives. Some IKG-funded facilities are operating below capacity because local producers don't see the need for their services. Commercial advertising could increase the demand for cold chain storage among producers and processors.

7. Market Relationships and Trade

Key Evaluation Question 7: To what extent have PCCP interventions developed and strengthened new and existing market relationships, which have led to increased trade locally, regionally, or internationally?²²

Key Outcomes

- ❖ Data indicates that the volume of kilograms produced and sold increased. Horticulture and crustacean producers had particularly good margins. Vegetable farmers produced an average of 45% more, but average returns increased by 70%. Crustacean production increased by 15%, but the value of sales increased by 41%.
- ❖ Total volume and value of trade increased significantly for swine with production increased by 90% and sales increased by 100%.
- ❖ PCCP beneficiaries sold an estimated total of 9,734 MT of agricultural products during the last production cycle, 2,651 MT more than they sold the year before joining the project²³.
- ❖ Estimated total value of sales for the last production cycle was \$22.2 million, an increase of \$8.3 million over pre-PCCP levels.
- ❖ Delays opening IKG-funded post-production facilities have limited the project's outcomes in market linkages and trade expansion, but several facilities have the potential to link producers to new, more profitable markets.

a) Expanded Trade for Agricultural Products (FFPr SO2)

ASPSI's analysis indicates that the total volume and value of trade increased as a result of PCCP for all commodities except bananas. The analysis did not include tests for statistical significance, but the strongest findings—expanded trade for swine, vegetables, and fin fish—are supported by the production function and mean difference analysis.

Table 6 below shows the estimated total volume and value of trade for PCCP beneficiaries, including estimated increases due to project interventions. ASPSI estimated PCCP farmers' total volume of trade in kg and volume of sales in PhP by aggregating weighted averages from the beneficiary survey data. To estimate the impact of PCCP, ASPSI calculated the difference between pre-project and post-project production and sales. "Before PCCP" is the producer's data for the last production cycle before the producer joined the project. (Production cycle varies by commodity.) "With PCCP" is the producer's most recent data.

During their most recent production cycle, beneficiaries sold 90% more swine, 59% more fin fish, 43% more vegetables, 15% more crustaceans, and 10% more mango than in the production cycle before they joined the project. Banana producers sold 21% less, unfortunately, due to adverse weather events in 2017.

Based on ASPSI's calculations, PCCP farmers traded a total of 9,734 MT during the last production cycle, 2,651 MT (37%) more than before they joined the program. The total value of trade for participating farmers during the last production cycle was \$22.2 million, an increase of \$8.3 million over "before PCCP" levels. Overall results were best for swine; volume of production increased by 90% and value of sales increased by 100%.

Table 6. Estimated total volume and value of trade for PCCP producers²⁴

	Before PCCP	With PCCP	Difference	% Change
	Volume of Trade in kg			
Mango	3,263 MT	3,592 MT	330 MT	10%

²² In the original scope of work, this question was listed as number 1.

²³ ASPSI volume and value of trade calculations. (Source: ASPSI beneficiary survey data.)

²⁴ ASPSI volume and value of trade calculations. (Source: ASPSI beneficiary survey data.)

	Before PCCP	With PCCP	Difference	% Change
Banana	132 MT	104 MT	-28 MT	-21%
Vegetables	1,018 MT	1,453 MT	434 MT	43%
Swine	1,334 MT	2,532 MT	1,197 MT	90%
Finfish	1,173 MT	1,865 MT	692 MT	59%
Crustaceans	165 MT	189 MT	24 MT	15%
Total	7,084 MT	9,734 MT	2,651 MT	37%
Value of Sales in PhP (Total in USD)				
Mango	81,549,875 PhP	96,972,120 PhP	15,422,245 PhP	19%
Banana	1,052,352 PhP	830,592 PhP	-221,760 PhP	-21%
Vegetables	42,754,656 PhP	72,697,100 PhP	29,942,444 PhP	70%
Swine	172,764,263 PhP	345,327,371 PhP	172,563,108 PhP	100%
Finfish	121,969,536 PhP	214,498,690 PhP	92,529,154 PhP	76%
Crustaceans	299,536,608 PhP	421,782,680 PhP	122,246,072 PhP	41%
Total (PhP)	719,627,290 PhP	1,152,108,553 PhP	432,481,263 PhP	60%
Total (USD)	\$13,905,646	\$22,262,654	\$8,357,008	60%

For all commodities except banana, estimates of total value of sales with PCCP increased by a greater percentage than total volume of production, indicating that producers earned higher prices. Across all commodities, the volume of kg produced increased by 37%, while the value of sales increased by 60%. Horticulture and crustacean producers had particularly good margins. Vegetable farmers produced an average of 45% more, but average returns increased by 70%. Crustacean production increased by 15%, but the value of sales increased by 41%.

Higher selling prices might indicate progress toward FFPr 2.1, Increased value added to post-production agricultural products. PCCP producers might have earned higher prices by:

- Negotiating better prices through improved buyer-seller relationships
- Producing higher-quality products that fetch higher prices
- Preserving and adding value through post-harvest storage and processing

The margin of error could be very wide, however, negating some differences between increases in the value of trade compared to the volume of trade. In addition, modest price increases might be caused by inflation or increased demand. This study's limitations preclude determining which interventions led to higher prices, but the general trend indicates gains from activities under SO2. Refer to **Annex 7, Total Volume and Value of Trade**, for calculations disaggregated by province and commodity.

b) Increased selling prices

ASPSI's analysis indicates that PCCP producers earned higher prices for vegetables, mango, and crustaceans. (See **Table 7.**) We cannot conclude with certainty that PCCP trade interventions resulted in these better prices, but the results might indicate success improving product quality and/or trade relationships.

Inflation likely accounts for part of the price increases. Since the "pre-PCCP" price is the most recent price a farmer earned before joining the program, the effect of inflation would increase with each year of program participation. In 2018, the Philippines had a particularly high inflation rate of 5.21%.²⁵ As a result, the price increases for mango might not represent real gains for farmers.

Table 7. Increased sales prices according to two different analysis methods

²⁵ Statista.com. Accessed April 30, 2019. <https://www.statista.com/statistics/578717/inflation-rate-in-philippines/>

Commodity	Estimated Increase in Average Price According to Two Different Analysis Methods	
	Method 1: Mean variance analysis	Method 2: Total volume and value of trade calculations
Mango	12%	8%
Vegetables	21%	19%
Crustaceans	19%	23%

c) Market relationships built and strengthened

Swine

Through production interventions, Pilmico's PCCP-supported Swine Repopulation Program is helping swine farmers increase the genetic quality of their herds, which enables them to access new markets for high-quality meat. Winrock negotiated a buyer's agreement between the HERI Meat Cutting Plant and small-scale hog producers with higher prices for animals that weigh more at slaughter. Butuan Slaughterhouse connects producers with the HERI plant by preparing animals for processing. With a consistent supply of high-quality meat, the HERI Meat-Cutting Plant has attracted new institutional buyers. Both Butuan Slaughterhouse and HERI Meat-Cutting Plant are NMIS-accredited "AA" facilities, giving all members of the value chain access to markets for meat products that meet hygiene and safety standards.

Lobster

Through its interventions in the lobster industry, Winrock has created a market for commercial lobster feed, which is better for lobster production and more sustainable than the use of "trash" fish. SanteH Feeds Corporation, Winrock's partner during product trials, will begin manufacturing the feed commercially in the last quarter of 2019.

Mango

PCCP brought Davao-based mango buyer Southern Philippines Fresh Fruit Corporation (SPFFC) to Carmen, a region that previously had only one mango buyer. The increase in competition among traders benefitted producers. Farmers reported that, with more than one buyer to negotiate with, they were able to get higher prices for their mangoes..

d) Regional and international trade

According to ASPSI's survey data, PCCP did not connect producers to regional or international markets. PCCP staff did not specifically track trade of commodities outside the Caraga Region. All farmers except lobster producers sell their products in Caraga. Mango, banana, and fin fish producers sell their goods wholesale to local traders; most vegetable farmers sell directly to consumers. For producers with higher quality stock, traders pay more for larger hogs and lobsters to meet demand in regional and national markets in Cebu and Manila. Producers sell smaller animals (pigs weighing 80-120 kg/head and lobsters weighing one kg or less) live to traders in the area.

e) Project Activities for Increased Trade

Access to market information

Winrock's interventions linking buyers and sellers achieved ambitious targets in support of increased access to improved market information, the foundational result that supports both FFPr SO1 and FFPr SO2. As a result of the project, 455 private enterprises, producer groups, and trade and business associations are using updated market information, exceeding the target (260) by more than half²⁶. According to Winrock, 158 PGs (60%) are using market information regularly.

Among producers surveyed by ASPSI, reliance on buyers for market information changed very little over the course of the project. Results showed a modest decrease (19%) in horticulture farmers' reliance on buyers, a slight decrease for livestock producers (7%), and no change for fisheries producers.

²⁶ Winrock International. 11th Bi-annual Report to USDA, PCCP. (Draft, March 2019)

Several factors might have impacted the relatively low use of new sources of market information. In some cases, improved market information may not be the limiting factor for individual small-scale producers, so they chose to continue using the same source. It's also possible that ASPSI's survey failed to capture new sources of market information. The producer questionnaire names producer groups and buyers specifically, but farmers would have had to volunteer any other market information channels when asked about "others."

Linkages between buyers and sellers

In the final year of the project, Winrock organized numerous market trade fairs, buyer-seller events, and fora to help develop direct linkages between buyers and sellers. Market linkages take time to develop, though, and the project spent the first two years focused on production, financing, and IKG facility development. As a result, Winrock fell short of output targets for buyer-seller linkages, with the number of buyer-seller events reaching less than half of the 500 target. The number of producers benefiting from these events were only 2,650 (in a target of 10,400). For agro-enterprise development and clustering, initial trainings were done. In the case of mango, PCCP brought Davao mango buyers (SPFFC) to Carmen to increase competition among traders and farmers reported that this improved the farm price of mango, and creating this competition had an effect and impact.

Since accessing distant markets requires packinghouses, cold storage, and other post-harvest facilities, delays in opening IKG-funded facilities hindered Winrock's ability to connect producers to new markets. If the near-complete cold storage and processing facilities open and operate successfully, Winrock's interventions might ultimately expand trade beyond the Caraga region.

8. Pathways to Sustainability

Evaluation Question 8: What pathways towards sustainability can be attributed to PCCP interventions in the three sectors?

Key Outcomes

- ❖ Built capacity and new agriculture lending portfolios among PCCP’s three partner micro-finance institutions in Caraga
- ❖ Increased technical capacity among producers multiplied by information sharing within PGs
- ❖ Availability of improved inputs from trusted providers (such as artificial insemination services from Pilmico)
- ❖ Improved genetic quality in the region’s swine herds
- ❖ Successful model of supply chain integration for swine (Pilmico producers, Butuan Slaughterhouse, HERI Meat-Cutting Plant) with AA-certified cold chain facilities
- ❖ Potential for two new facilities, the Carmen Mango Processing and Marketing Center (CMPMC) and San Jose Ice Plant and Cold Storage, to open new and higher-value markets for mango, crustaceans, and fish.

Winrock’s **assistance to microfinance institutions (MFIs)** has created a possible pathway to sustainable financing for farmers. In ASPSI’s focus group with microfinance institutions, FICCO’s representative indicated that the cooperative now awards more loans in agriculture and aquaculture as a result of its lending with PCCP loan guarantee fund. Rizal Microbank and Cantillan Bank have added small agricultural loans to their portfolios.

Increased technical capacity among participating producers, who adopted improved techniques and technologies at high rates, could provide a pathway to sustainability, especially when combined with strengthened producer groups. Farmers are likely to continue to share best practices and use text messages to consult with experts.

Winrock met targets for **increased access to improved inputs**, and exceeded targets for input grants to producer groups. Through PCCP training, input grants, and demonstration farms, producers have learned and applied a wide range of improved inputs. Pilmico, a trusted supplier of animal feed, is providing artificial insemination services to farmers. ASPSI’s analysis indicates that AI increases production by 365 kg per production cycle.

Improved genetic quality of swine breeding stock throughout the region creates a strong pathway to sustained improvements in productivity, product quality, and profits for swine farmers. Participants in the Swine Repopulation Program receive improved gilts as “loans”, establish breeding farms, and ultimately return four hogs for every gilt they had received as loan repayment. Private-sector partner Pilmico then redistributes genetically improved breeding stock to new groups of farmers, creating a multiplier effect.

In Agusan del Norte, **integrated swine production, processing, storage, and trade** activities are adding value at multiple points of the supply chain. In the middle of the value chain, Butuan Slaughterhouse and the HERI meat-cutting plant provide a safe, AA-accredited cold chain for that adds value to pork, with connections to small-scale producers on one end and large institutional buyers on the other.

New facilities could add significant value and connect producers to more lucrative distant markets. The Carmen Mango Processing Center (CMPC) could open **higher-value and off-season markets for mango growers**, who lose 90% of any product they don’t sell fresh. The San Jose Ice Plant and Cold Storage Facility will provide the first **commercial ice and cold storage** in Dinagat Islands, where lobster farmers and other fisheries producers have no way to preserve their highly perishable products for shipping to more lucrative markets.

VI. CONCLUSIONS

PCCP was effective in establishing partnerships with private and public sector given the broad scope and geographic coverage, especially because of the successful attainment of targets. Activities under SO1, especially agricultural training for farmers, were very effective. PCCP significantly increased the application of improved technologies and techniques among producers of the six commodities, achieving nearly double the targets for number of individuals and number of hectares under improved management. Producers in ASPSI's survey reported high rates of adoption. As hoped, these intermediate results led to increased agricultural productivity. ASPSI's statistical analysis showed that participation in the program had a positive, statistically significant impact on production for vegetables, livestock, and lobster. Costs decreased for mango and fin fish producers.

Total production and volume and value of sales increased over "before PCCP" levels for all beneficiaries except banana producers, who suffered losses due to inclement weather in 2017. ASPSI deems Winrock's training in improved techniques and technologies highly relevant, since farmers readily adopted the interventions and achieved the ultimate objective of the program, increased agricultural productivity.

Winrock's activities under SO2 were less effective even though the project exceeded its volume and value of sales targets. Since post-harvest facilities opened late in the life of the project, there's not enough data to determine how well they generate added value or open up new markets for producers. ASPSI's initial evidence suggests that growers, buyers, traders, and consolidators have connected directly or indirectly to the slaughterhouses in Buenavista, Butuan, and Santa Josefa.

Winrock persevered in the final year of the project, ensuring nearly all IKG-funded facility improvements occurred despite the many challenges posed by LGUs as public partners. ASPSI suggests a better initial plan, though, could have diverted this staff time and energy toward high-impact projects that met clear local needs.

One of the most important impacts of the project's slaughterhouse improvements is increased food safety. PCCP provided training in hygiene, safe food handling, humane slaughter, and international standards. PCCP-supported training resulted in new municipal ordinances banning the practice of backyard slaughtering, and municipalities appear to be enforcing them. After receiving PCCP training, four facilities in the region have earned AA accreditation from the National Meat Inspection Service (NMIS): Tago Slaughterhouse, Buenavista Slaughterhouse, the HERI Meat-Cutting Plant, and the Liveberg Cold Storage Facility.

VII. LESSONS LEARNED AND RECOMMENDATIONS

Create a logical framework and risk-management plan during project start-up.

PCCP's project design might have led to the IKG program's disappointing outcomes. During project start-up, project staff should have translated PCCP results framework into a logical framework and designed an accompanying risk management plan that accounted for the local operational context. A well-designed logical framework and risk management plan might have helped Winrock recognize problems like low loan repayment, ineffective LGU partners, and over-emphasis on production interventions, while also suggesting alternative strategies.

Engage government to create an enabling environment for cold chain development.

National, regional, and local government agencies have important roles to play in cold-chain management. If the Philippines government enforced food safety standards, for example, demand for accredited cold-chain storage facilities would increase. Public information campaigns promoting food hygiene and safety could motivate customers to demand safe products that meet handling standards.

Similarly, if the national government mandated broad changes to ordinances, such as banning backyard slaughter, facilities could begin operating much more quickly. At the local level, many IKG-funded facilities stalled while awaiting new municipal ordinances. With supportive ordinances already in place, private partners wouldn't have to wait months or years between investing and generating revenue. Risk would decrease for the private sector, spurring more investment.

National policies and standards for product grading, packaging, transportation, and other parts of the supply chain would also help create an enabling environment for cold-chain and other post-harvest interventions.

Use an integrated value chain approach.

Unbalanced implementation may have threatened sustainability. For the first two years, Winrock reported significant progress toward targeted results in agricultural training, support to producer groups, IKGs, and financing, but little progress toward targeted outcomes in strengthening markets, developing new markets, linking buyers and sellers, value-added post-harvest processing, and trade.

In key informant interviews, project staff cited frequent Chief of Party turnover as one reason for the unbalanced implementation. Three different COPs led the project during its five years of operation, which may have contributed to the lack of collective and sustained vision. Staff members reported that each COP had different priorities.

Fortunately, the project's final COP brought a true value chain perspective. He focused on reducing postharvest losses, a critical problem for the project's commodities and an essential part of the Food for Progress results framework. In the final year of the project, Winrock delivered cold chain facilities with the potential to reduce post-harvest losses, increase product quality, and connect farmers with better markets, but four facilities have not yet opened as of April 2019.

Integrate cold chain facilities with one another and the supply chain.

Connecting the project's facilities to one another could create a consistent low-temperature supply chain to reduce post-harvest losses, add value, and deliver high-quality products for trade through a central distribution hub. Winrock designed the Caraga Regional Integrated Marketing Center (CRIMC) in Naispit to serve as a hub for trade, with the capacity to become a packinghouse and reefer bay given its proximity to the port. Unfortunately, the CRIMC is unlikely to succeed.

Schedule facility-dependent interventions when facilities are available.

Farmers applied most improved technologies and techniques at high rates, indicating a willingness to adopt new methods. Adoption of post-harvest technologies and techniques was low, though. The project trained farmers in post-harvest methods that required facilities, but those facilities did not begin to open until 2017, and some have not yet opened as of April 2019.

Facilitate commercial micro-lending for agriculture through MFIs.

Done well, increasing access to financing for small farms can catalyze investment in improved inputs and technologies, increasing productivity and profitability. Instead of a loan guarantee fund that removes all risk, development organizations should help MFIs incorporate micro-loans to agriculture within their existing policies and portfolios. Otherwise, increased access to financing is short-lived.

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Final Endline Evaluation

Philippines Cold Chain Project (PCCP)

USDA Food for Progress (FFPr) Program

ANNEXES

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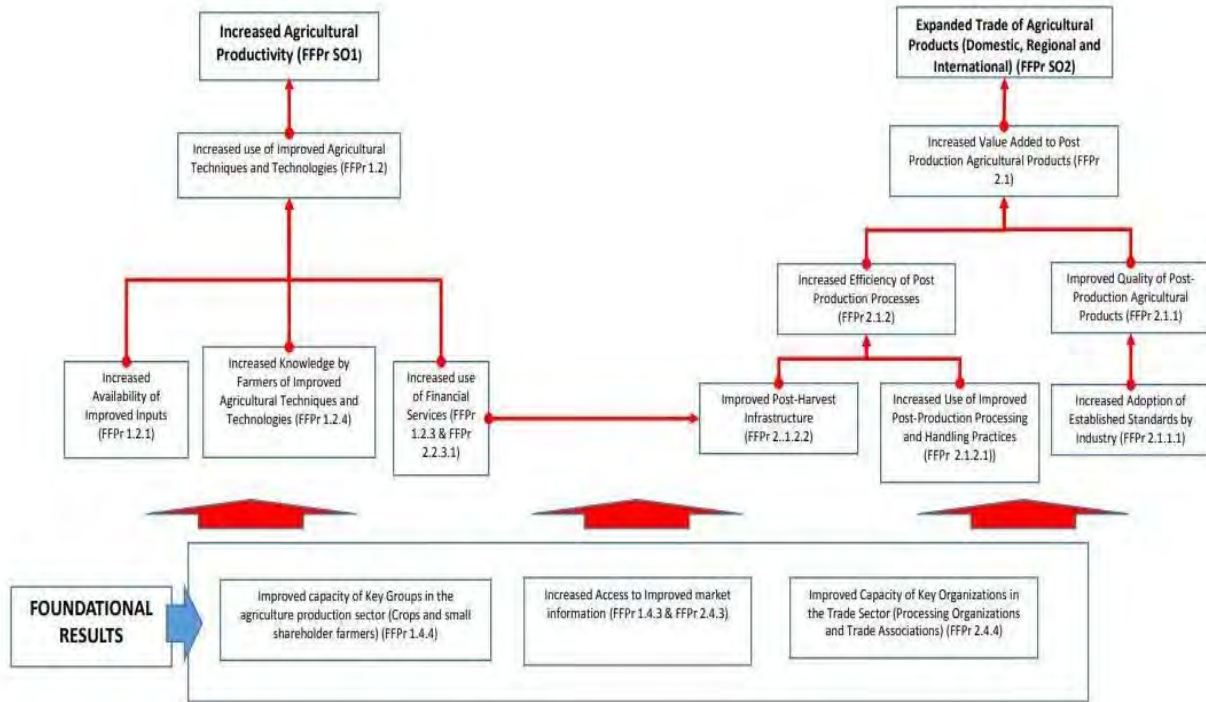
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ANNEX 1. PCCP RESULTS FRAMEWORK AND SELECTED OUTCOMES

A. PCCP Results Framework



B. Summary of Baseline Indicator Results, Baseline Study Report 2014

Result	Indicator	Study Finding ¹	Baseline	Existing Target	Proposed Final Target
Contributions to Feed the Future	Number of hectares under improved techniques or technologies as a result of USDA assistance	Farm 72 Pond 5	0	500	500
	Number of farmers and others who have applied new techniques or technologies as a result of USDA assistance	Farmer 824 Fisher 45	0	7,500	7500
	Number of individuals receiving short-term agricultural sector productivity or food security training as a result of USDA assistance	Female 870 Male 885	0	7,500	7500
	Value of agricultural and rural loans provided under USDA assistance	\$586,534	0	\$4,500,000	\$4,500,000
	Number of private enterprises, producers organizations, women's groups, trade and business associations, water users associations and community-based organizations (CBOs) that applied new technologies or management practices as a result of USDA assistance	1	0	1750 ²	500
	Number of public-private partnerships formed as a result of USDA assistance	1	0	12	12
	Number of jobs attributed to USDA assistance	600	0	10,000	10,000
	Total increase in installed storage capacity (dry or cold storage) as a result of USDA assistance	0	0	50,000 ³	25,000
	Number of farmers and others using financial services as a result of USDA assistance	Farmer 0 Fisher 0	0	7,500	7,500
	Number of farmers and others who have received training on improved agricultural techniques and technologies as a result of USDA assistance	Farmer 0 Fisher 0	0	8,000	8,000
Increased Agricultural Productivity	Market value percentage increase of agricultural products sold by assisted associations as a result of USDA assistance	\$158,863	0	5	5
	Number of individuals benefiting directly from USDA-funded interventions	Female 0 Male 0	0	137,500 ⁴	137,500
	Number of individuals benefiting indirectly from USDA-funded interventions	0	0	2,100,000 ⁵	300,000

¹ The Baseline Study Findings is taken from the result of the HH survey. The figures and values were considered as the existing situation of the target project participants in the premise that there is no USDA assistance yet put in place.

² The number of organizations in the project coverage area is estimated to be 591 only. This target appears to be very high in comparison.

³ Very little existing cold storage exists in the project area. This target is slightly high based on existing facilities.

⁵ Total population of the project coverage area is 340,801 while the total population of Caraga is 2,429,224. The target appears to be high in comparison.

Result	Indicator	Study Finding¹	Baseline	Existing Target	Proposed Final Target
Improved Capacity of Key Groups in the Agriculture Production Sector (Coops and Small Shareholder Farmers)	Number of private enterprises, producer organizations, water user associations, women's groups, trade and business associations and community-based organizations in the agricultural production sector that applied new technologies or management practices as a result of USDA assistance	0	0	1000 ⁶	250
	Number of members of organizations that have applied improved market information as a result of USDA assistance	0	0	15,000 ⁷	3750
	Number of organizations that have applied gender inclusion at leadership, professional, management and technical levels as a result of USDA assistance	184	0	250	30
Increased Use of Improved Agricultural Techniques and Technologies	Number of hectares under improved techniques or technologies as a result of USDA assistance	Farm 72 Pond 5	0	500	500
	Number of farmers and others who have applied new techniques or technologies as a result of USDA assistance	70	0	15,000 ⁸	7500
	Number of individuals demonstrating a basic level of proficiency in sanitary and phytosanitary standards as a result of USDA assistance	0	0	220	220
Increased Access to Improved Market Information	Number of cooperatives that regularly provide updated market information to their members as a result of USDA assistance	69	0	250	250
	Number of sources/outlets for agriculture market information as a result of USDA assistance	69	0	500	500
	Number of agricultural producers who used up-to-date market information and/or good agricultural practices as a result of USDA assistance	2,754	0	15,000 ⁹	7500

⁶ The number of organizations in the project coverage area is estimated to be 591 only. This target appears to be very high in comparison.

⁷ The number of organizations in the project coverage area is estimated to be 591 only. This target appears to be very high in comparison.

⁸ This target should reflect 500 groups at 15 members a group and match FTF indicator.

⁹ This target should reflect 500 groups at 15 members a group.

Result	Indicator	Study Finding¹	Baseline	Existing Target	Proposed Final Target
Increased Availability of Improved Inputs	Number of private enterprises, producers organizations, women's groups, trade and business associations, water users associations and community- based organizations (CBOs) that applied new technologies or management practices as a result of USDA assistance	0	0	250 ¹⁰	0
	Number of farmers that applied new technologies or management practice as a result of USDA assistance	70	0	15,000 ¹¹	7500
Increased Knowledge by Farmers of Improved Agricultural Techniques and Technologies	Number of farmers and others who have applied new technologies or technologies as a result of USDA assistance	824	0	7,500	7500
Expanded Trade of Agricultural Products (Domestic, Regional and International)	Market value percentage increase of agricultural products sold by assisted associations as a result of USDA assistance	Value (USD) of domestic market for indicator agricultural products (mangoes, cabbage, freshwater prawns, and saltwater prawns) sold as a result of USDA assistance: \$3,042,977 Value (USD) of international trade (exports) for indicator agricultural products (mangoes, cabbage, freshwater prawns, and saltwater prawns)	0	5	5

¹⁰ This indicator is redundant and not related to inputs – would suggest removing.

¹¹ This indicator is redundant and not related to inputs – would suggest modifying indicator to highlight the use of improved inputs and reducing target to match target farmer groups.

Result	Indicator	Study Finding¹	Baseline	Existing Target	Proposed Final Target
		sold as a result of USDA assistance: \$16,364			
Increased Access to Improved Market Information	Number of private enterprises, producers organizations, women's groups, trade and business associations, water users associations and community-based organizations that applied new technologies or management practices as a result of USDA assistance (updated market information and/or good agricultural practices prior to selling)	69	0	250	250
	Number of agriculturalists who have access to current market or good agricultural practices information via media, associations and suppliers as a result of USDA assistance	23,814	0	700,000 ¹²	100,000
Improved Capacity of Key Organizations in the Trade Sector (Processing Organizations and Trade Associations)	Number of private enterprises, producers organizations, women's groups, trade and business associations, water users associations and community-based organizations (CBOs) that applied new technology or management practices as a result of USG assistance	0	0	25	25
	Number of trade associations who have applied new techniques or technologies in marketing and productivity as a result of USDA assistance	0	0	5	5
	Number of organizations that have applied gender inclusion at leadership, professional, management and technical levels as a result of USDA assistance	0	0	250 ¹³	5
Increased Value Added to Post Production Agricultural Products	Number of jobs attributed to USDA assistance	Female 0 Male 0	0	10,000	10,000
	Percent increase in revenues from agricultural products at farm gate as a result of USDA assistance	0	0	10	10
Improved Quality of Post-Production	Volume (metric tons) of Agricultural Products Certified as Meeting International Standards as a result of USDA assistance	0	0	40	40

¹² The total number of members of agricultural households in the project coverage area is estimated to be 218,453 only. This target appears to be very high in comparison.

¹³ Trade organization gender inclusion is much more challenging so target appears to be very high.

Result	Indicator	Study Finding¹	Baseline	Existing Target	Proposed Final Target
Agricultural Products					
Increased Adoption of Established Standards by Industry	Number of processing and value-added firms processing meat and fish who are using international production and handling standards as a result of USDA assistance	0	0	30	30
Increased Efficiency of Post Production Processes	Number of agricultural producers reporting decreases in post-harvest losses from post-harvest handling techniques and technologies as a result of USDA assistance	0	0	7,500	7,500
	Percentage of decrease of total harvests lost during post-harvest / transit by farmers as a result of USDA assistance	0	0	10	10
Increased Use of Improved Post-Production Processing and Handling Practices	Number of farmers and others who have applied new techniques or technologies as a result of USDA assistance	0	0	7,250	7,250
	Number of private enterprises, producers organizations, women's groups, trade and business associations, water users associations and community-based organizations (CBOs) that applied new technologies or management practices as a result of USDA assistance	0	0	250	250
	Number of agribusinesses using improved processing as a result of USDA assistance	0	0	50	50
	Number of agribusinesses using improved cold chain as a result of USDA assistance	0	0	50	50
Improved Post-Harvest Infrastructure	Total increase in installed storage capacity (dry or cold storage) as a result of USDA assistance (cubic meters)	0	0	25,000	25,000

C. Selected PCCP Outcomes Relative to Project Targets

Source: Winrock International 11th Biannual Report to USAID (Draft, March 2019)
(Repeated phrases in indicators have been removed for brevity.)

Results Indicator	Target	Result
Activity 1: Create New Agricultural Producer Groups and Strengthen Existing Ones		
Number of producer groups/cooperatives created or strengthened	260	258
Activity 2: Train Agricultural Producers on Improved Agricultural Techniques for Horticulture, Fish, and Livestock		
Number of training sessions conducted for agricultural producers	950	1,042

Number of individuals who have received short-term agricultural sector productivity training (total)	20,132	22,491
Number of producers who have received short-term agricultural sector productivity training	18,847	20,216
Number of people in government who have received short-term agricultural sector productivity or food security training	285	799
Number of people in firms who have received short-term agricultural sector productivity or food security training	1,000	1,476
Number of females who have received training	5,044	12,605
Number of producer groups/cooperatives trained in improved techniques or technologies	284	377
Activity 3: Train Agricultural Producers in Post-Harvest Handling and Storage		
Number of training sessions in post-harvest or storage conducted for agricultural producers	500	542
Activity 4: Train Agricultural Producers in Post-Harvest Processing		
Number of producer groups/cooperatives trained in post-harvest processing and storage processing	260	177
Number of training sessions in post-harvest processing conducted for agricultural producers	500	325
Activity 5: Develop Agro dealers and Other Input Suppliers to Provide Improved Inputs and Technical Recommendations		
Number of agricultural input suppliers in region offering improved inputs	254	254
Number of specific improved inputs available to agricultural producers in region	35	80
Number of agricultural producers in target area using improved inputs	44,000	20,985
Activity 6: Provide Financial Services to Producer Association Members		
Value of loans provided	\$4,500,000	\$2,615,621
Value of loans provided (females)	\$2,025,000	\$1,347,886
Number of training sessions in improved financial services conducted for producer groups	601	602
Number of individuals receiving financial services	12,635	12,361
Number of individuals receiving financial services (females)	7,422	7,255
Number of loans disbursed as a result of USDA assistance	13,500	1,244
Activity 7: Provide Grants for Equipment		
Number of equipment grants provided	19	18
Value of grants provided for equipment purchases	\$1,085,098	\$1,353,041
Total increase in installed storage capacity (dry or cold storage)	50,000	49,459
Activity 8: Provide Grants for Inputs		
Number of input grants provided	201	382
Value of input grants provided in USD\$	\$176,240	\$379,317
Activity 9: Develop and Promote a Media and Technology Use Plan		
Number of information campaigns completed on improved market and food safety information	33	34

Number of producer associations/cooperatives that regularly provide updated market information to their members	260	158
Activity 10: Create New and Strengthen Existing Trade Associations		
Number of producer associations/cooperatives with staff trained in market analysis and productivity	68	34
Number of trade association events conducted	32	41
Number of producer group members benefiting from marketing, international production & handling standards training of groups/cooperatives	10,400	12,548
Activity 11: Develop New and Strengthen Existing Buyer-Seller Relationships		
Number of producers in target area benefiting from improved buyer-seller relationships	10,400	3,507
Number of buyer-seller events conducted to facilitate buyer-seller relationships	500	195
Activity 12: Facilitate Public-Private Partnerships		
Number of public-private partnerships formed	16	19
Number of producers benefiting from improved trade capacity (indirect)	7,500	1,922
Value of public and private sector investment leveraged by USDA assistance (in USD\$)	\$2,111,627	\$2,385,651

Contributions to Feed the Future Indicators

Result Indicator	Mod #4 LOP Target	Life of Project Result
Number of hectares under improved techniques or technologies as a result of USDA assistance		
Number of hectares under improved techniques or technologies (Total)	4,000	10,643
Number of hectares under improved techniques or technologies (crop genetics)	3,000	4,071
Number of hectares under improved techniques or technologies (disease management)	3,000	9,244
Number of hectares under improved techniques or technologies (pest management)	3,000	7,350
Number of hectares under improved techniques or technologies (soil-related fertility)	2,000	7,354
Number of hectares under improved techniques or technologies (irrigation)	2,000	842
Number of individuals who have applied new techniques or technologies as a result of USDA assistance		

Number of individuals who have applied new techniques or technologies (Total)	10,400	27,502
Number of individuals who have applied new techniques or technologies (female)	4,680	14,753
Number of individuals who have applied new techniques or technologies (crop genetics)	7,800	19,019
Number of individuals who have applied new techniques or technologies (disease management)	7,800	13,603
Number of individuals who have applied new techniques or technologies (pest management)	7,800	9,896
Number of individuals who have applied new techniques or technologies (soil-related fertility and conservation)	5,500	10,793
Number of individuals who have applied new techniques or technologies (irrigation)	5,500	1,773
Number of individuals who have received short-term agricultural sector productivity or food security training as a result of USDA assistance		
Number of individuals who have received training (total)	10,400	22,471
Number of individuals who have received training (male)	5,720	9,880
Number of individuals who have received short-term agricultural sector productivity training (female)	4,680	12,591
Number of individuals who have received short-term agricultural sector productivity training (new)	10,400	21,213
Number of individuals who have received short-term agricultural sector productivity training (continuing)	7,800	11,473
Value of loans provided as a result of USDA assistance		
Value of loans provided as a result of USDA assistance	\$4,500,000	\$2,615,621
Value of loans provided (male)	\$2,475,000	\$1,267,735
Value of loans provided (female)	\$2,025,000	\$1,347,886
Number of private enterprises, producer organizations, water user associations, women's groups, trade and business associations and community-based organizations (CBOs) that applied new technologies or management practices as a result of USDA assistance		
Number of organizations that applied new technologies or management practices	1,750	2,236

Number of organizations that applied new technologies or management practices (new)	1,750	613
Number of organizations that applied new technologies or management practices (continuing)	1,315	1,692
Number of private enterprises that applied new technologies or management practices	1,230	1,144
Number of producer organizations that applied new technologies or management practices	260	330
Number of trade and business associations that applied new technologies or management practices	260	59
Number of Public-Private Partnerships formed as a result of USDA assistance		
Number of public-private partnerships formed	16	19
Number of public-private partnerships formed (multi-focus)	-	1
Total increase in installed storage capacity (dry or cold storage) as a result of USDA assistance		
Total increase in installed storage capacity (dry or cold storage) as a result of USDA assistance (cubic meters)	50,000	49,459
Total increase in installed dry storage capacity	45,216	45,216
Total increase in installed cold storage capacity	28,000	4,243
Increased Agricultural Productivity (FFPr SOI)		
Number of individuals benefiting directly from USDA-funded interventions	65,000	40,407
Number of individuals benefiting directly from USDA-funded interventions (male)	35,750	18,465
Number of individuals benefiting directly from USDA-funded interventions (female)	29,250	21,942
Number of individuals benefiting directly from USDA-funded interventions (new)	65,000	40,407
Number of individuals benefiting directly from USDA-funded interventions (continuing)	32,948	33,927
Number of individuals benefiting indirectly from USDA-funded interventions	1,000,000	815,803
Market value percentage increase of agricultural products sold by assisted associations as a result of USDA assistance	0	0

Improved Capacity of Key Groups in the Agriculture Production Sector (FFPr 1.4.4)		
Number of private enterprises, producer organizations, and trade and business associations that applied improved techniques and technologies as a result of USDA assistance	1,000	1,397
Number of private enterprises that applied improved techniques and technologies	480	1,142
Number of producer organizations that applied improved techniques and technologies	260	330
Number of trade and business associations that applied improved techniques and technologies	260	59
Number of members of organizations that have applied improved market information	10,400	13,928
Increased Use of Improved Agricultural Techniques and Technologies (FFPr 1.2)		
Number of hectares under improved techniques or technologies as a result of USDA assistance (continuing)	4,000	8,523
Number of producer groups/cooperatives that regularly provide updated market information to their members	260	158
Number of sources/outlets for agriculture market information	50	406
Number of agricultural producers who used up-to-date market information and/or good agricultural practices	10,400	18,216
Number of agriculturalists who have access to current market or good agricultural practices information via media, associations and suppliers as a result of USDA assistance	700,000	667,278
Increased Availability of Improved Inputs (FFPr 1.2.1)		
Number of producer groups/cooperatives benefitting from improved input grants	260	82
Number of agricultural producers in target area using improved inputs	44,000	20,985
Increased Knowledge by Farmers of Improved Agricultural Techniques and Technologies (FFPr 1.2.4)		
Value of sales by project beneficiaries (in USD\$)	20,000,000	33,206,047
Value of sales by project beneficiaries (horticulture)	3,120,000	5,860,624
Value of sales by project beneficiaries (fisheries)	9,740,000	18,727,341

Value of sales by project beneficiaries (livestock)	7,140,000	8,618,082
Volume of commodities (metric tons) sold by project beneficiaries	15,000	36,056
Volume of commodities (metric tons) sold by project beneficiaries (horticulture)	3,960	10,796
Volume of commodities (metric tons) sold by project beneficiaries (fisheries)	2,040	8,387
Volume of commodities (metric tons) sold by project beneficiaries (livestock)	9,000	16,873
Increased Access to Improved Market information (FFPr 2.4.3)		
Number of private enterprises, producers organizations, and trade and business associations that applied new technologies or management practices as a result of updated market information prior to selling (Total)	260	455
Number of private enterprises that applied new technologies or management practices as a result of updated market information and/or GAP	68	218
Number of producers organizations that applied new technologies or management practices as a result of updated market information and/or GAP	124	114
Number of trade and business associations that applied new technologies or management practices as a result of updated market information and/or GAP	68	8
Improved Capacity of Key Organizations in the Trade Sector (Processing Organizations and Trade Associations) (FFPr 2.4.4)		
Number of private enterprises, producers organizations, and trade and business associations that applied new technology or management practices	25	25
Number of private enterprises that applied new technologies or management practices	6	4
Number of producer organizations that applied new technologies or management practices	13	9
Number of trade and business associations that applied new technologies or management practices	6	12
Increased Value Added to Post Production Agricultural Products (FFPr 2.1)		
Number of jobs attributed to USDA assistance	10,000	2,502
Number of jobs attributed to USDA assistance (male)	5,500	1,516

Number of jobs attributed to USDA assistance (female)	4,500	986
Percent increase in revenues from agricultural products at farm gate as a result of USDA assistance	10%	49%
Improved Quality of Post-Production Agricultural Products		
Volume of metric tons agricultural products certified as meeting international standards as a result of USDA assistance	4,000	4,664
Increased Adoption of Established Standards by Industry (FFPr 2.1.1.1)		
Number of processing and value-added firms processing meat and fish who are using international production and handling standards as a result of USDA assistance	30	5
Increased Efficiency of Post-Production Processes (FFPr 2.1.2)		
Number of agricultural producers reporting decreases in post-harvest losses from post-harvest handling techniques and technologies as a result of USDA assistance	10,400	11,988
Increased Use of Improved Post-Production Processing and Handling Practices (FFPr 2.1.2.1)		
Number of agribusinesses using improved cold chain as a result of USDA assistance	50	8
Improved Post-Harvest Infrastructure (FFPr 2.1.2.2)		
Total increase in installed storage capacity (dry or cold storage) as a result of USDA assistance (cubic meters)	50,000	49,459
Total increase in installed storage capacity (dry or cold storage) as a result of USDA assistance (cubic meters) (Dry)	45,216	45,216
Total increase in installed storage capacity (dry or cold storage) as a result of USDA assistance (cubic meters) (Cold)	28,000	4,243.40
Total increase in installed storage capacity (dry or cold storage) as a result of USDA assistance (cubic meters) (Refurbished)	15,000	0
Total increase in installed storage capacity (dry or cold storage) as a result of USDA assistance (cubic meters) (New)	50,000	49,459.40

ANNEX 2. RESEARCH METHODOLOGY

A. Sample Sizes

Beneficiary-based survey: Numbers of individuals interviewed, private sector and government

Type of respondent	Province					Total
	Agusan del Norte	Agusan del Sur	Surigao del Norte	Surigao del Sur	Dinagat Islands	
Private Sector						
Agro-dealers	4	4	4	4	4	20
Traders	4	4	4	4	4	20
Fisheries	4	—	4	4	4	16
Horticulture	4	4	—	4	4	16
Livestock	4	4	4	4	—	16
Private Sector Total	20	16	16	20	16	88
Government						
Fisheries	10	—	3	3	3	19
Horticulture	11	3	3	3	3	23
Livestock	11	3	3	3	—	20
Government Total	32	6	9	9	6	62

Producer group leaders interviewed by commodity and province

Commodity	Province					Total
	Agusan del Norte	Agusan del Sur	Surigao del Norte	Surigao del Sur	Dinagat Islands	
Mango	5	—	—	—	—	5
Banana	4	—	—	—	—	4
Vegetables	2	4	—	3	5	14
Crustaceans	0	—	7	3	5	15
Finfish	2	—	1	5	1	9
Swine	7	15	7	5	—	34
TOTAL	20	19	15	16	11	81

Total numbers of participants in focus group discussions

Focus Group	Total Number	Number of Women
Horticulture producers	13	4
Livestock producers	11	7
Fisheries producers	14	8
Livestock input suppliers	3	2
Fisheries input suppliers	10	3
Government Line Agencies	5	3
Local Government Unit	6	3
Microfinance institutions	7	0
PCCP Team	10	2
Total	79	32

ANNEX 3. DATA GATHERING INSTRUMENTS

A. Field Data Collection Schedule

Item	Dates
Farmers' Survey	
Agusan del Norte	January 24 – February 1
Agusan del Sur	January 25 – February 1; February 7 – 12
Surigao Norte	January 27 – February 2
Surigao Sur	February 7 – 12
Dinagat Islands	January 31 – February 3
Focus Group Discussion	
Horticulture	January 30
Fisheries	February 1
Livestock	February 2
People in Government	February 4
Microfinance institution	February 4
PCCP team	February 4
Input suppliers	
*Fisheries	February 1
*Livestock	February 2
*Partners	February 4
Key Informant Interview (Producer Group)	
Agusan del Norte	January 29 – 30; February 4 – 12
Agusan del Sur	February 2; February 4 – 7
Surigao del Norte	January 27 – 30; February 7 – 8
Surigao del Sur	February 1; February 7 – 11
Dinagat Islands	February 3 – 8
Key Informant Interview (People in Firm)	
Agusan del Norte	February 1 - 2
Agusan del Sur	February 1; February 4 – 6
Surigao del Norte	February 1; February 11 – 13
Surigao del Sur	February 7 – 10
Dinagat Islands	February 1
Key Informant Interview (People in Government)	
Agusan del Norte	February 1
Agusan del Sur	February 1; February 4 – 6
Surigao del Norte	February 11 – 13
Surigao del Sur	February 7 – 10
Key Informant Interview (PCCP Team)	March 4
Value chain mapping	February 13 – 15

B. Beneficiary-Based Survey Questionnaires

1. Farmer Questionnaire: Horticulture

Questionnaire No: _____

Endline Evaluation of the Philippine Cold Chain Project HORTICULTURE

Barangay: _____ Municipality: _____ Province: _____

A. Socio-economic and Demographic Profile

1. Name
2. Address
3. Contact Number
4. Age
5. Sex ☐ Male ☐ Female
6. Civil Status ☐ Single ☐ Married ☐ Widow/er
7. Years of Schooling
8. Household Size
9. Household Monthly Income

B. Farm Profile

Commodity: ☐ Mango ☐ Banana ☐ Vegetables, specify _____

Item

Answer

1. Farm Size (ha)
 - 1.1 Before
 - 1.2. As PCCP beneficiary
2. Tenure Status (pls. check) ☐ Owned ☐ Tenant ☐ Leased
☐ Contractor (applicable for mango only) _____

C. Producer Group Affiliation and Farmer's PCCP Participation History (This section aims to determine the membership of the respondent in a farmer's organization before and with PCCP and the benefits derived from being a member of organization established/ supported by the PCCP.)

1. Name of Producer Group Affiliated: _____
2. Is the PG established by the PCCP? ☐ Yes ☐ No
3. When did you become a member (year)? _____ and reasons for joining: _____
4. Requirements to qualify as member _____
5. When did you become a project beneficiary _____ (year)
6. PCCP requirements for you to qualify as beneficiary _____
7. Assistance/interventions received as beneficiary of the PCCP.

Intervention Introduced

Adopted? (Check if yes)

Production

☐ flower induction ☐ fertilizer application
☐ bagging/wrapping ☐ irrigation
☐ bamboo propping ☐ pesticide application
☐ pruning ☐ plastic mulching
☐ flower induction ☐ use of trellis
☐ desuckering ☐ Others (please specify)
☐ use of high quality and treated seeds _____

☐ flower induction ☐ fertilizer application
☐ bagging/wrapping ☐ irrigation
☐ bamboo propping ☐ pesticide application
☐ pruning ☐ plastic mulching
☐ flower induction ☐ use of trellis
☐ desuckering ☐ Others (please specify)
☐ use of high quality and treated seeds _____

Post-harvest handling and storage

☐ Grading ☐ Storage
☐ Sorting ☐ Hot Water Treatment
☐ Transporting ☐ Use of Plastic Crates
☐ Packing ☐ Others, specify
☐ Packing House Operation
☐ Good Agricultural Practice (GAP)
☐ Food Safety
☐ Hazard Analysis and Critical Control Point (HACCP)
☐ Others (please specify)

☐ Grading ☐ Storage
☐ Sorting ☐ Hot Water Treatment
☐ Transporting ☐ Use of Plastic Crates
☐ Packing ☐ Others, specify
☐ Packing House Operation
☐ Good Agricultural Practice (GAP)
☐ Food Safety
☐ Hazard Analysis and Critical Control Point (HACCP)
☐ Others (please specify)

Farm management

☐ Farm record keeping
☐ Farm management
☐ Financial management

☐ Farm record keeping
☐ Farm management
☐ Financial management

Marketing and enterprise development

☐ Market information
☐ Improve buyer-seller relationship
☐ Participation to trade events
☐ Others (please specify)

☐ Market information
☐ Improve buyer-seller relationship
☐ Participation to trade events
☐ Others (please specify)

Others (specify)

D. Adoption of Intervention (This aims to determine the adoption of specific technology/intervention introduced through the PCCP such as the use of fertilizers and pesticides; improved farm preparation and maintenance practices; and harvest and post-harvest practices. These will be compared with the interventions used before participating in the project. Corresponding cost and labor requirement using the interventions shall also be determined. Input and credit sources shall also be identified before and with PCCP.)

1. Production technology

1.a. Application of physical inputs (average per production period)

With project (production area used ____ ha)

Technology/Intervention (specify the technology introduced)	Average quantity of physical inputs per production unit (e.g. kg/ha; liters/ha)		Labor input in adopting the intervention (mandays/ha)	
	Recommended	Actually Applied	Recommended	Actually Applied

Seeds/planting materials

Fertilizer

Pesticides/Chemicals

Others

Before the project (production area used: ____ ha)

Technology/Intervention (specify the technology introduced)	Average quantity of physical inputs per production unit (e.g. kg/ha; liters/ha)		Labor input in adopting the intervention (mandays/ha)	
	Recommended	Actually Applied	Recommended	Actually Applied

Seeds/planting materials

Fertilizer

Pesticides/Chemicals

Others

1.b. Farm preparation, maintenance and harvesting practices

Practice (identify, where applicable, the specific recommended practice)	With Project		Before Project	
	Labor input (mandays per production unit)	Total Labor Cost	Labor requirement (mandays per production unit)	Total Labor Cost

1. Farm Preparation (specify)

2. Maintenance (specify)

3. Harvesting (specify)

c. Use of Postharvest Facilities

c.1. Do you need a post-harvest facility for your produce? ☐ Yes ☐ No

Are there post-harvest facilities near your place where you can access for your produce?

☐ Yes, specify name and location _____

☐ No

c.2. As project participant, have you accessed/used a post-harvest facility? ☐ Yes ☐ No

If yes, identify the facility:

Post-Harvest Facilities Used and Location	Quantity involved	Associated Fee
☐ Cold Storage/Cold Room -		
☐ Dry Storage -		
☐ Packing house -		
☐ Hot Water Treatment facility -		
Procedure in accessing the facility		

Benefits derived from using the facility

Problems encountered in accessing the facility

If no, why?

d.1 Do you experience postharvest losses? ____ Yes ____ No

If yes, please indicate rate of losses (in %)

Before PCCP project intervention _____

After PCCP project intervention _____

2. Input Support

a. Before becoming a PCCP participant, where do you usually source your farm inputs?

Name of input supplier/dealer: _____

Distance from the farm ____ (km) and transportation expenses incurred _____

Is it difficult to source your farm inputs? Why? _____

b. Since becoming a project participant, where do you source your farm inputs?

Inputs (specify)	Source of Inputs		Distance from farm (km)	Transportation cost incurred (in pesos)
	Producer Group (Check)	Agri Input Supplier/Dealer (specify)		
Production Inputs				
Seeds/planting materials				
Fertilizer				
Pesticides/Chemicals				
Others, specify:				
Tools and Equipment (specify)				

After the project, is it easier to source your inputs? Why? _____

c. Buying arrangement (in terms of payment, quantity of inputs, hauling, etc)

Buying Arrangement (in terms of)

	Payment	Quantity of Inputs	Hauling	Others
If sourced from the PG				
If sources for the agri-supplier/dealer				

3. Credit Support

a. Credit/Financial Assistance as Project Participant

a.1 Have you accessed credit/financial assistance from the following lending institutions?

___ FICCO ___ Cantillan Bank ___ RMB

a.2 If Yes, fill out the following table:

Year	Total Amount Received	Interest Rate	Amount Paid	Reason for default/low repayment rate	Credit Provider	Uses of Credit
------	-----------------------------	------------------	----------------	---	--------------------	----------------

a.3 If no, why? _____

Are you aware of PCCP facilitating your access to this financial assistance/credit?

___ Yes ___ No

E. Farm Production Performance

1. Production Performance with Project Participation

Item	Per Production Period	Indicate production period
Total quantity produced (kg)		
Production area (ha)		
Yield		
Quantity Sold		
Price received (in Pesos)		
Gross value of production		

2. Production Performance Before Project Participation

Item	Per Production Period	Indicate production period
Total quantity produced (kg)		
Production area (ha)		
Yield		
Quantity Sold		
Price received (in Pesos)		
Gross value of production		

F. Marketing

1. Marketing practices as project participant

Market outlet (i.e. trader, wholesaler, direct consumer, etc.)	Quantity Sold	Quality Requirements of the market	Price received	Problems encountered
Before PCCP beneficiary				

After PCCP
beneficiary

2. Specific post-harvest interventions

2.1 Were you assisted by the project for post-harvest interventions? ___ Yes ___ No

2.1.1 If yes, what are these interventions?

- | | |
|---|--|
| ☐ Grading | ☐ Storage |
| ☐ Sorting | ☐ Hot Water Treatment |
| ☐ Transporting | ☐ Use of Plastic Crates |
| ☐ Packing | ☐ Others, specify |
| ☐ Packing House
Operation | |

Others (specify) _____

a. Were you assisted by the project in direct market linkage? ___ Yes ___ No

2.2.1 If yes, how?

- ☐ provided with market information
- ☐ Improve buyer-seller relationship
- ☐ Participation to trade events
- ☐ Others (please specify) _____

2.3 Did you benefit from such direct market linkage? ___ Yes ___ No

2.3.1 If Yes, how?

- ☐ increased sales
- ☐ received premium prices
- ☐ price information
- ☐ market information
- ☐ new buyers/markets

Others (specify) _____

3. Sources of Market Information

a. *Prices*

a.1. Before the project, how do you know the price of the commodity?

a.2. After the project, how do you know the price of the commodity?

b. *Standard*

b.1 Before the project, what is the recommended standard of the commodity?

b.2 After the project, what is the recommended standard of the commodity?

G. Farm Financial Performance (This section, along with Section E, will be used to determine and compare the cost and return per commodity before and with project participation. Partial budget for after

participation will be determined using data in Section D (Item 2.1) and Section E). Partial budget will identify the specific technologies or changes in farm practices attributable to the program intervention and capture the added income, added cost, reduced income and reduced cost associated to such technology/practice)

1. Cash farm expenses per production cycle

Item	With Project Participation	Before Project Participation
Seeds/planting material		
Fertilizer		
Pesticides/Chemicals		
Labor		
Post-harvest handling/Storage		
Land rent		
Miscellaneous:		
Water		
Electricity		
Others, specify:		
Total Cash Cost		

2. Capital Investment

Item	Purchase Price	Present Value	Year Purchased	Years more to last
Sprayer				
Nets				
Styrofoam boxes				
Pails				

2. Farmer Questionnaire: Livestock

Questionnaire No.: _____

End Line Evaluation of the Philippine Cold Chain Project
LIVESTOCK

Barangay: _____ Municipality: _____ Province: _____

A. Socio-economic and Demographic Profile

1. Name
2. Address
3. Contact Number
4. Age
5. Sex ☐ Male ☐ Female
6. Civil Status ☐ Single ☐ Married ☐ Widow/er
7. Years of Schooling
8. Household Size
9. Household Monthly Income

B. Farm Profile (Swine)

- | Item | Answer |
|--------------------------|--------|
| 1. No. of head | |
| 1.1. Before | |
| 1.2. As PCCP beneficiary | |
| 2. Scale | |
| 2.1. Backyard | |
| 2.2. Commercial | |

C. Producer Group Affiliation and Farmer's PCCP Participation History (This section aims to determine the membership of the respondent in a farmers organization before and with PCCP and the benefits derived from being a member of organization established/ supported by the PCCP.)

1. Name of Producer Group Affiliated: _____
2. Is the PG established by the PCCP? ☐ Yes ☐ No
3. When did you become a member (year) ? _____ and reasons for joining:

4. Requirements to qualify as member _____
5. When did you become a project beneficiary _____ (year)
6. PCCP requirements for you to qualify as beneficiary _____
7. Assistance/interventions received as beneficiary of the PCCP project.

Intervention Introduced

Adopted? (Check if yes)

1.1. Improved production techniques

- | | | | |
|--|---|--|---|
| ☐ use of feeder and drinker | ☐ use of biologics (e.g. vaccines, vitamins, etc.) | ☐ use of feeder and drinker | ☐ use of biologics (e.g. vaccines, vitamins, etc.) |
| ☐ artificial insemination | ☐ management of common diseases | ☐ artificial insemination | ☐ management of common diseases |
| ☐ hygiene and sanitation | ☐ indigenous micro-organism | ☐ hygiene and sanitation | ☐ indigenous micro-organism |
| ☐ all night lighting | ☐ Others (please specify) | ☐ all night lighting | ☐ Others (please specify) |

1.2. Post-harvest handling and storage

- | | | | |
|--|--|--|--|
| ☐ transportation | ☐ meat cutting | ☐ transportation | ☐ meat cutting |
| ☐ hygiene and sanitation | ☐ proper waste disposal | ☐ hygiene and sanitation | ☐ proper waste disposal |
| ☐ cooling and refrigeration | ☐ humane slaughtering | ☐ cooling and refrigeration | ☐ humane slaughtering |

1.3. Application of standards

- | | |
|--|--|
| ☐ Good Animal Husbandry | ☐ Good Animal Husbandry |
| ☐ Food Safety | ☐ Food Safety |
| ☐ Hazard Analysis and Critical Control Points (HACCP) | ☐ Hazard Analysis and Critical Control Points (HACCP) |
| ☐ Others (please specify) | ☐ Others (please specify) |

1.4. Farm management

- | | |
|---|---|
| ☐ Farm record keeping | ☐ Farm record keeping |
| ☐ Farm management | ☐ Farm management |
| ☐ Financial management | ☐ Financial management |

1.5. Marketing and enterprise development

- | | |
|--|--|
| ☐ Market information | ☐ Market information |
| ☐ Improve buyer-seller relationship | ☐ Improve buyer-seller relationship |
| ☐ Participation to trade events | ☐ Participation to trade events |
| ☐ Others (please specify) | ☐ Others (please specify) |

1.6. Others (Specify)

D. Adoption of Intervention (This aims to determine the adoption of specific technology/intervention introduced through the PCCP such as the use of fertilizers and pesticides; improved farm preparation and maintenance practices; and harvest and post-harvest practices. These will be compared with the interventions used before participating in the project. Corresponding cost and labor requirement using the interventions shall also be determined. Input and credit sources shall also be identified before and with PCCP.)

1. Production technology

a. Application of physical inputs (average per production period)

With project (No. of head _____)

Technology/Intervention (specify the technology introduced)	Average quantity of physical inputs per production unit (e.g. unit/head)		Labor input in adopting the intervention	
	Recommended	Actually Applied	Recommended	Actually Applied
Use of feeders and drinkers				
-piglet booster				
-pre-starter				
-grower				
-finisher				
Immunization				

Before the project (No. of head _____)

Technology/Intervention (specify the technology/intervention used)	Average quantity of physical inputs per production unit (e.g. unit/head)		Labor input before adopting the intervention	
	Recommended	Actually Applied	Recommended	Actually Applied
Use of feeders and drinkers				
-piglet booster				
-pre-starter				
-grower				
-finisher				
Immunization				

b. Use of Postharvest Facilities

b.1. Do you need a post-harvest facility for your produce?

Are there post-harvest facilities near your place where you can access for your produce?

___ Yes, specify name and location _____

___ No

b.2. As project participant, have you accessed/used a post-harvest facility?

If no, why? _____

If yes, identify the facility:

Post-Harvest Facilities Used and Location	Quantity involved	Associated Fee
Cold Storage		
Slaughter house		
Meat cutting		

Procedure in accessing the facility

Benefits derived from using the facility

Problems encountered in accessing the facility

c.1 Do you experience postharvest losses? ____ Yes ____ No

If yes, please indicate rate of losses (in %)

Before PCCP project intervention _____

After PCCP project intervention _____

2. Input Support

a. Before becoming a PCCP participant, where do you usually source your farm inputs?

Name of input supplier/dealer: _____

Distance from the farm ____ (km) and transportation expenses incurred _____

Is it difficult to source your farm inputs? Why? _____

b. Since becoming a project participant, where do you source your farm inputs?

Inputs (specify)	Source of Inputs		Distance from farm (km)	Transportation cost incurred (in pesos)
	Producer Group (Check)	Agri Input Supplier/Dealer (specify)		
Production Inputs (e.g piglet supplier, feeds, biologics, etc.)				

Tools and Equipment (specify)

After the project, is it easier to source your inputs? Why? _____

Buying arrangement (in terms of)

	Payment	Quantity of inputs	Hauling	Others
If sourced from the PG				
If sourced from the agri-supplier/dealer				

3. Credit Support

b. Credit/Financial Assistance as Project Participant

a.1 Have you accessed credit/financial assistance from the following lending institutions?

___ FICCO ___ Cantillan Bank ___ RMB

a.2 If Yes, fill out the following table:

Year	Total Amount Received	Interest Rate	Amount Paid	Reason for default/low repayment rate	Credit Provider	Uses of Credit
------	-----------------------------	------------------	----------------	---	--------------------	----------------

a.3 If no, why ? _____

Are you aware of PCCP facilitating your access to this financial assistance/credit?

___ Yes ___ No

E. Farm Production Performance

1. Production Performance with Project Participation

Item	Per Production Period	Indicate production period
Total quantity produced (no. of head)		
Total quantity produced (ave. kg/head)		
Quantity Sold (no. of head)		
Price received (in Pesos)		
Gross value of production		

2. Production Performance Before Project Participation

Item	Per Production Period	Indicate production period
Total quantity produced (no. of head)		
Total quantity produced (ave. kg/head)		

Quantity Sold (no. of head)

Price received (in Pesos)

Gross value of production

F. Marketing of Produce

1. Marketing practices as project participant

	Market outlet (i.e. trader, wholesaler, direct consumer, etc.)	Quantity Sold	Quality Requirements of the market	Price received	Problems encountered
Before PCCP beneficiary					
After PCCP beneficiary					

2. Specific post-harvest interventions

2.1. Were you assisted by the project for post harvest interventions?

☐ Yes ☐ No

2.1.1 If yes, what are these interventions?

☐ transportation

☐ hygiene and sanitation

☐ cooling and refrigeration

☐ meat cutting

☐ proper waste disposal

☐ humane slaughtering

Others (specify) _____

2.2. Were you assisted by the project in direct market linkage? ☐ Yes ☐ No

2.2.1 If yes, how?

☐ provided with market information

☐ Improve buyer-seller relationship

☐ Participation to trade events

☐ Others (please specify)

Others (specify) _____

2.3 Did you benefit from such direct market linkage? ☐ Yes ☐ No

2.3.1 If Yes, how?

☐ increased sales

☐ received premium prices

☐ price information

☐ market information

- _____ new buyers/markets
 Others (specify) _____
3. Sources of Market Information
- a. *Prices*
- a.1. Before the project, how do you know the price of the commodity? _____

- a.2. After the project, how do you know the price of the commodity? _____

- b. *Standard*
- b.1 Before the project, what is the recommended standard of the commodity?

- b.2 After the project, what is the recommended standard of the commodity?

G. Farm Financial Performance (This section, along with Section E, will be used to determine and compare the cost and return per commodity before and with project participation. Partial budget for after participation will be determined using data in Section D (Item 2.1) and Section E). Partial budget will identify the specific technologies or changes in farm practices attributable to the program intervention and capture the added income, added cost, reduced income and reduced cost associated to such technology/practice)

- a. Cash farm expenses per production cycle

Item	With Project Participation	Before Project Participation
Piglet		
Feeds		
Biologics		
Labor		
Miscellaneous:		
Water		
Electricity		
Others, specify:		
Total Cash Cost		

- b. Capital Investment

Item	Purchase Price	Present Value	Year Purchased	Years more to last
------	----------------	---------------	----------------	--------------------

3. Farmer Questionnaire: Fisheries

Questionnaire No.: _____

End Line Evaluation of the Philippine Cold Chain Project
FISHERIES

Barangay _____ Municipality _____ Province: _____

A. Socio-economic and Demographic Profile

1. Name
2. Address
3. Contact Number
4. Age
5. Sex ☐ Male ☐ Female
6. Civil Status ☐ Single ☐ Married ☐ Widow/er
7. Years of Schooling
8. Household Size
9. Household Monthly Income

B. Farm Profile (Fisheries)

- | Item | Answer |
|--------------------------|---|
| 1. No. of fingerling/fry | |
| 1.1. Before | |
| 1.2. As PCCP beneficiary | |
| 2. Scale (pls. check) | ☐ Backyard ☐ Commercial |

C. Producer Group Affiliation and Farmer's PCCP Participation History (This section aims to determine the membership of the respondent in a farmers organization before and with PCCP and the benefits derived from being a member of organization established/ supported by the PCCP.)

1. Name of Producer Group Affiliated: _____
2. Is the PG established by the PCCP? ☐ Yes ☐ No
3. When did you become a member (year) ? _____ and reasons for joining: _____
4. Requirements to qualify as member _____
5. When did you become a project beneficiary _____ (year)
6. PCCP requirements for you to qualify as beneficiary _____
7. Assistance/interventions received as beneficiary of the PCCP project. _____

- | Intervention Introduced | Adopted? (Check if yes) |
|--|-------------------------------|
| 7.1. Improved production technology/techniques (specify commodity) | |
| _____ stocking density | _____ stocking density |
| _____ feeding ratio/intensity | _____ feeding ratio/intensity |
| _____ feeds | _____ feeds |
| _____ Others (please specify) | _____ Others (please specify) |

Intervention Introduced	Adopted? (Check if yes)
7.2. Post-harvest handling and storage (specify commodity)	
☐ Sorting	☐ Sorting
☐ Weighing	☐ Weighing
☐ Grading	☐ Grading
☐ Cold Storage using ice box	☐ Cold Storage using ice box
7.3. Application of standards (specify commodity) _____	
☐ Food Safety	☐ Food Safety
☐ Hazard Analysis and Critical Control Point (HACCP)	☐ Hazard Analysis and Critical Control Point (HACCP)
☐ Others (please specify)	☐ Others (please specify)
7.4. Farm management (specify commodity) _____	
☐ Farm record keeping	☐ Farm record keeping
☐ Farm management	☐ Farm management
☐ Financial management	☐ Financial management
7.5. Marketing and enterprise development (specify commodity) _____	
☐ Market information	☐ Market information
☐ Improve buyer-seller relationship	☐ Improve buyer-seller relationship
☐ Participation to trade events	☐ Participation to trade events
☐ Others (please specify)	☐ Others (please specify)
7.6. Others (specify)	
_____	_____
_____	_____
_____	_____

D. Adoption of Intervention (This aims to determine the adoption of specific technology/intervention introduced through the PCCP such as the use of fertilizers and pesticides; improved farm preparation and maintenance practices; and harvest and post-harvest practices. These will be compared with the interventions used before participating in the project. Corresponding cost and labor requirement using the interventions shall also be determined. Input and credit sources shall also be identified before and with PCCP.)

1. Production technology

1.a. Application of physical inputs (average per production period)

With project (No. of fingerlings _____)

Technology/Intervention (specify the technology introduced)	Average quantity of physical inputs per production unit (e.g. unit/cage*)	Labor input in adopting the intervention
--	---	---

	Recommended	Actually Applied	Recommended	Actually Applied
--	-------------	---------------------	-------------	---------------------

Fingerlings

Feeds
Use of fish cage

*** Specify size of cage**

Before the project (No. of fingerlings _____)	Average quantity of physical inputs per production unit (e.g. unit/cage*)		Labor input in adopting the intervention	
Technology/Intervention (specify the technology introduced)	Recommended	Actually Applied	Recommended	Actually Applied
Fingerlings				
Feeds				
Use of fish cage				

1.b. Use of Postharvest Facilities

b.1. Do you need a post-harvest facility for your produce?
Are there post-harvest facilities near your place where you can access for your produce?

___ Yes, specify name and location _____
___ No

b.2. As project participant, have you accessed/used a post-harvest facility?

If no, why? _____

If yes, identify the facility:

Post-Harvest Facilities Used and Location	Quantity involved	Associated Fee
Cold Storage		
Transportation		

Procedure in accessing the facility

Benefits derived from using the facility

Problems encountered in accessing the facility

c.1 Do you experience postharvest losses? ___ Yes ___ No
If yes, please indicate rate of losses (in %)

Before PCCP project intervention _____

After PCCP project intervention _____

2. Input Support

a. Before becoming a PCCP participant, where do you usually source your farm inputs?

Name of input supplier/dealer: _____

Distance from the farm ____ (km) and transportation expenses incurred _____

Is it difficult to source your farm inputs? Why?

b. Since becoming a project participant, where do you source your farm inputs?

Inputs (specify)	Source of Inputs		Distance from farm (km)	Transportation cost incurred (in pesos)
	Producer Group (Check)	Agri Input Supplier/Dealer (specify)		
Production Inputs (e.g fingerling/fry, feeds, biologics, etc.)				
Fingerlings				
Feeds				
Tools and Equipment (specify)				
Green net				
Hapa net				
Nylon				
Rope				
Bamboo				
Pump Boat (in case of low tide and oxygen loss in the fish cage)				
Saline Tank (used in harvesting)				

After the project, is it easier to source your inputs? Why?

c. Buying arrangement (in terms of payment, quantity of inputs, hauling, etc)

	Buying arrangement (in terms of)			
	Payment	Quantity of inputs	Hauling	Others
If sourced from the PG				
If sourced from the agri-supplier/dealer				

3. Credit Support

c. Credit/Financial Assistance as Project Participant

a.1 Have you accessed credit/financial assistance from the following lending institutions?

___ FICCO ___ Cantillan Bank ___ RMB

a.2 If Yes, fill out the following table:

Year	Total Amount Received	Interest Rate	Amount Paid	Reason for default/low repayment rate	Credit Provider	Uses of Credit
------	-----------------------	---------------	-------------	---------------------------------------	-----------------	----------------

a.3 If no, why ?

Are you aware of PCCP facilitating your access to this financial assistance/credit?

___ Yes ___ No

E. Farm Production Performance

1. Production Performance with Project Participation

Item	Per Production Period	Indicate production period
Total quantity produced (kg)		
Total quantity produced (ave. kg)		
Quantity Sold (kg)		
Price received (in Pesos)		
Gross value of production		

2. Production Performance Before Project Participation

Item	Per Production Period	Indicate production period
Total quantity produced (kg)		
Total quantity produced (ave. kg)		
Quantity Sold (kg)		
Price received (in Pesos)		
Gross value of production		

F. Marketing of Produce

1. Marketing practices as project participant

	Market outlet (i.e. trader, wholesaler, direct consumer, etc.)	Quantity Sold	Quality Requirements of the market	Price received	Problems encountered
Before PCCP beneficiary					
After PCCP beneficiary					

3 Specific post-harvest interventions

2.1 Were you assisted by the project for post-harvest interventions?

___ Yes ___ No

2.1.1 If yes, what are these interventions?

___ Sorting

- ☐ Weighing
- ☐ Grading
- ☐ Cold Storage using ice box

Others (specify) _____

2.2. Were you assisted by the project in direct market linkage? ☐ Yes ☐ No

2.2.1 If yes, how?

- ☐ provided with market information
- ☐ Improve buyer-seller relationship
- ☐ Participation to trade events
- ☐ Others (please specify)

2.3 Did you benefit from such direct market linkage? ☐ Yes ☐ No

2.3.1 If Yes, how?

- ☐ increased sales
- ☐ received premium prices
- ☐ price information
- ☐ market information
- ☐ new buyers/markets

Others (specify) _____

4 Sources of Market Information

a. Prices

a.1. Before the project, how do you know the price of the commodity?

a.2. After the project, how do you know the price of the commodity?

b. Standard

b.1 Before the project, what is the recommended standard of the commodity?

b.2 After the project, what is the recommended standard of the commodity?

G. Farm Financial Performance (This section, along with Section E, will be used to determine and compare the cost and return per commodity before and with project participation. Partial budget for after participation will be determined using data in Section D (Item 2.1) and Section E). Partial budget will identify the specific technologies or changes in farm practices attributable to the program intervention and capture the added income, added cost, reduced income and reduced cost associated to such technology/practice)

1. Cash farm expenses per production cycle

Item	With Project Participation	Before Project Participation
Fingerling/fry		
Feeds		
Net		
Bamboo poles		
Styrofoam boxes		
Labor		
Depreciation (e.g. boats, etc.)		
Rental expenses		
Gasoline		
Miscellaneous:		

Water
Others, specify:
Wire
Tying materials

Total Cash Cost

2. Capital Investment				
Item	Purchase Price	Present Value	Year Purchased	Years more to last
Motorized boat				

4. Government Representative Questionnaire

1. Profile

- 1.1. Name _____
- 1.2. Address _____
- 1.3. Contact number _____
- 1.4. Age _____
- 1.5. Marital status _____
- 1.6. Educational attainment (Years of Formal Education) _____
- 1.7. Government Agency Affiliation _____
- 1.8. Core Function of Agency _____
- 1.9. Number of years in Government Service _____
- 1.10. Position/Designation _____
- 1.11. Core Function of Position/Designation _____

2. Awareness of PCCP, Its Interventions and Accomplishments

- 2.1. Are you aware of the PCCP/Winrock Project in CARAGA? ___Yes;___No. If yes, how did you learn about the project?

- 2.2. Please state briefly what you think are the goals/objectives of PCCP/Winrock Project in CARAGA

- 2.3. Please state briefly what you think are the interventions of the PCCP/Winrock Project in CARAGA

- 2.4. Please state briefly what you think are the major accomplishments of the PCCP/Winrock Project

3. Involvement in PCCP Project

- 3.1. Is your agency involved in any PCCP assistance/intervention? ___Yes;___No. If yes, what was the assistance/intervention and what was the role of your agency?

- 3.2. Was the collaboration smooth? ___Yes; ___No. If no, what were the major constraints/problems encountered and how were these

addressed/resolved? _____

3.3. Have you been personally involved in this collaboration as representative of your agency? ___ Yes; ___ No. If yes, what was the intervention/assistance and what was your specific involvement?

3.4. Do you think the intervention/assistance was relevant to the needs of CARAGA? ___ Yes; ___ No. If no, why not?

3.5. Do you think the intervention/assistance was implemented effectively? ___ Yes; ___ No. If no, why not?

3.6. Do you think the intervention/assistance was implemented efficiently? ___ Yes; ___ No. If no, why not?

4. Public-Private Partnership

4.1. Is your agency involved in any public-private partnership facilitated by PCCP? ___ Yes; ___ No. If yes, what is this partnership?

4.2. What is the role of your agency?

4.3. What is the role of the private partner?

4.4. Who are the beneficiaries of the project which is the subject of partnership?

4.5. What are the major achievements of such partnership?

4.6. Do you think the project which is the subject of partnership relevant to the needs of CARAGA?

___ Yes; ___ No. If no, why not _____

4.7. Do you think the project which is the subject of partnership is implemented effectively?

___ Yes; ___ No. If no, why not _____

4.8. Do you think the project which is the subject of partnership is being implemented efficiently?

___ Yes; ___ No. If no, why not _____

5. Trainings Attended

5.1. Have you attended any training conducted or sponsored by PCCP? ___ Yes; ___ No

5.2. If yes, what are these trainings _____

5.3. What were your significant learnings from the training? _____

5.4. Were you able to apply any of those learnings? ___ Yes; ___ No. Please explain your answer

5.5. Were the learnings able to improve the delivery of your function as government servant? ___ Yes; ___ No. If yes, how? _____

5.6. Would you recommend the training you attended to your co-workers? ___ Yes; ___ No. If no, why not? _____

6. Market Information

6.1. Do you know of any intervention/assistance of the PCCP project designed to improve access to price information? ____ Yes; ____ No

1.1. If yes, what are these? _____

6.2. Do you think they are effective? ____ Yes; ____ No. Please explain your answer

6.3. Do you know of any intervention/assistance of the PCCP project designed to improve access to product supply information? ____ Yes; ____ No
If yes, what are these? _____

6.4. Do you think they are effective? ____ Yes; ____ No. Please explain your answer _____

6.5. Do you know of any intervention/assistance of the PCCP project designed to improve access to product demand information? ____ Yes; ____ No

6.6. If yes, what are these? _____

6.7. Do you think they are effective? ____ Yes; ____ No. Please explain your answer

7. Market Relationships and Expanded Trade

7.1. Are you aware of any assistance/intervention of PCCP designed to link farmers to the market? ____ Yes; ____ No. If yes, what are these?

1.2. Do you think they are effective? ____ Yes; ____ No. Please explain your answer

1.3. Are you aware of any assistance/intervention of PCCP designed to link traders and processors to the market?
____ Yes; ____ No. If yes, what are these? _____

1.4. Do you think they are effective? ___ Yes; ___ No. Please explain your answer _____

1.5. Do you think the effort of PCCP to link farmers, traders and processors to the market resulted to expanded trade of major agricultural products in CARAGA? ___ Yes; ___ No. Please explain your answer _____

1.6. Do you think the PCCP project thru its interventions/assistance was able to develop new markets for agricultural products of CARAGA? ___ Yes; ___ No. Please explain your answer _____

8. Product Quality, Safety and Adoption of Standards

8.1. Are you aware of any assistance/intervention of PCCP designed to improve product quality? ___ Yes; ___ No.

8.2. If yes, what are these? _____

8.3. Do you think they are effective? ___ Yes; ___ No. Please explain your answer _____

8.4. Are you aware of any assistance/intervention of PCCP designed to improve adoption of food safety measures? ___ Yes; ___ No.

8.5. If yes, what are these? _____

8.6. Do you think they are effective? ___ Yes; ___ No. Please explain your answer _____

8.7. Are you aware of any assistance/interventions of PCCP designed to improve the adoption of industry Standards (e.g. GAP, HACCP, etc)? ___ Yes; ___ No.

8.8. If yes, what are these? _____

8.9. Do you think they are effective? ____ Yes; ____ No. Please explain your answer _____

8.10. Do you think the PCCP project thru its interventions/assistance on improving product quality, safety and adoption of product standards resulted to new markets and expanded trade?

____ Yes; ____ No. Please explain your answer _____

9. Credit/Financial Assistance

8.1. Are you aware of any assistance/intervention of PCCP designed to facilitate access to credit? ____ Yes; ____ No

8.2. If yes, how was access facilitated? _____

8.6. Do you think the facilitated financial assistance able to improve the production, processing and trade of major agricultural products in CARAGA? ____ Yes; ____ No

8.7. If yes, how? _____

10. Use of In-Kind Grant (IKG) Facilities

10.1. Are you aware of any IKG (e.g. cold chain, slaughterhouse, packinghouse, integrated market facilities, etc) established by PCCP in CARAGA? ____ Yes; ____ No.

10.2. If yes, what are these? _____

10.3. Do you think these IKGs are really important? ____ Yes; ____ No. Please explain your answer _____

10.4. Do you think the IKGs are generating much benefit for CARAGA? ____ Yes; ____ No. Please explain your answer _____

10.5. Do you think the IKGs will help result to better productivity and expanded trade of major commodities of CARAGA?

____ Yes; ____ No. Please explain your answer

Overall View of the PCCP Project

Please indicate your agreement/disagreement with the following statements:

10.6. The PCCP Project in CARAGA is relevant to the needs of the region
____ agree; ____ somewhat agree; ____ don't know; ____ somewhat disagree ____ disagree

10.7. The PCCP Project in CARAGA was implemented efficiently
____ agree; ____ somewhat agree; ____ don't know; ____ somewhat disagree ____ disagree

10.8. The PCCP Project in CARAGA was able to improve productivity in major commodities (e.g. banana, mango, vegetables; crustaceans, finfish and swine)
____ agree; ____ somewhat agree; ____ don't know; ____ somewhat disagree ____ disagree

10.9. The PCCP Project in CARAGA was able to expand the trade (locally, regionally and internationally) In major commodities (e.g. banana; mango; vegetables; crustaceans, finfish and swine)
____ agree; ____ somewhat agree; ____ don't know; ____ somewhat disagree ____ disagree

10.10. The improvements in productivity and expansion in trade achieved under the PCCP project can be sustained even after the PCCP project has terminated
____ agree; ____ somewhat agree; ____ don't know; ____ somewhat disagree ____ disagree

11. Other Observations

Please indicate whatever observations you have regarding the PCCP Project in CARAGA

12. Recommendations

Please indicate your recommendations to improve the PCCP Project in CARAGA

5. Processor Questionnaire

1. Profile

- 1.1. Name _____
- 1.2. Address _____
- 1.3. Contact number _____
- 1.4. Age _____
- 1.5. Marital status _____
- 1.6. Educational attainment (Years of Formal Education) _____
- 1.7. Number of years in processing business _____
- 1.8. Form of Business Organization (Pls check) _____ Single
Proprietorship; _____ Partnership;
_____ Family Corporation; _____ Private Corporation; _____ Cooperative
- 1.9. Average monthly business income _____
- 1.10. Major commodities processed (Specify)

- 1.11. Processing function: _____ Primary; _____ Secondary; _____ Primary and secondary

2. Membership in trade association

- 2.1. Are You a member of any trade association? _____ Yes; _____ No
- 2.2. If yes, name of the association _____
- 2.3. Was the association established by PCCP? _____ Yes; _____ No
- 2.4. If Yes, how was it established? _____

- 2.5. Was the association strengthened by PCCP? _____ Yes; _____ No
- 2.6. If Yes, how was it strengthened? _____

3. Procurement volume, sources and buying price

- 3.1. Indicate supply source, volume and price of commodities you are processing?

3.2.

Commodity	Major Sources	Average Weekly Volume Procured Before PCCP	Average Buying Price Before PCCP	Average Weekly Volume Procured After PCCP	Average Buying Price Before PCCP	Remarks

- 3.3. Have you noticed any increase in the supply of the commodities you are processing when the PCCP project started operating in your area? _____ Yes; _____ No

3.4. If yes, in what commodities you are processing have you observed increase in supply?

3.5. How would you describe the increase in supply?

____ Very Large; ____ Large; ____ Moderate; ____ Minimal

4. Marketed Volume

4.1. Where do you sell your processed product and the volume and prices at which you sell them:

Commodity	Major Market of your Products	Average Weekly Volume Sold Before PCCP	Average Buying Price Before PCCP	Average Weekly Volume Sold After PCCP	Average Buying Price After PCCP	Remarks
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4.2. Have you noticed any increase in the demand of the commodities you are processing when the PCCP project started operating in your area? ____ Yes; ____ No

4.3. If yes, in what commodities you are processing have you observed increase in demand?

4.4. How would you describe the increase in demand?

____ Very Large; ____ Large; ____ Moderate; ____ Minimal

4.5. What are the major reasons for the increase in demand?

5. Market Information

5.1. Prior to the PCCP project (i.e. before 2013), where do you source your information about the prevailing price of the commodities you are processing?

5.2. Under PCCP (i.e. after 2013) where do you source your information about the prevailing prices of the Commodities you are processing?

5.3. Do you know of any intervention/assistance of the PCCP project designed to improve your access to information about market prices? ____ Yes; ____ No

5.4. If yes, what are these? _____

5.5. Do you think they are effective? ____ Yes; ____ No. Please explain your answer _____

5.6. Prior to the PCCP project (i.e. before 2013), where do you source your information about the supply of the commodities you are processing?

5.7. Under PCCP (i.e. after 2013) where do you source your information about the supply of the commodities you are selling? _____

5.8. Do you know of any intervention/assistance of the PCCP project designed to improve your access to information about supply? ____ Yes; ____ No

12.1. If yes, what are these? _____

5.9. Do you think they are effective? ____ Yes; ____ No.
Please explain your answer _____

5.10. Prior to the PCCP project (i.e. before 2013), where do you source your information about the demand for the commodities you are processing?

5.11. Under PCCP (i.e. after 2013) where do you source your information about the demand for the commodities you are processing?

5.12. Do you know of any intervention/assistance of the PCCP project designed to improve your access to information about demand? ____ Yes; ____ No

5.13. If yes, what are these? _____

- 5.14 Do you think they are effective? ____ Yes; ____ No. Please explain your answer _____

6. Market Relationships

- 6.1. Are you aware of any assistance/intervention of PCCP designed to link farmers to the market?

____ Yes; ____ No.

- 6.2. If yes, what are these? _____

- 6.3. Do you think they are effective? ____ Yes; ____ No. Please explain your answer _____

- 6.4. Are you aware of any assistance/intervention of PCCP designed to link processors to the market?

____ Yes; ____ No.

- 6.5. If yes, what are these? _____

- 6.6. Do you think they are effective? ____ Yes; ____ No. Please explain your answer _____

- 6.7. Do you think the effort of PCCP to link farmers and processors to the market resulted to expanded trade of your product?

____ Yes; ____ No. Please explain your answer _____

- 6.8. Do you think the PCCP project thru its interventions/assistance was able to develop new markets for your product? ____ Yes; ____ No.

Please explain your answer _____

Trainings Attended

- 6.9. Have you attended any training conducted or sponsored by PCCP? ____ Yes; ____ No

6.10. If yes, what are these trainings _____

6.11. What were your significant learnings from the training? _____

6.12. Were you able to apply any of those learnings? ____ Yes; ____ No. Please explain your answer

6.13. Were the learnings able to improve your processing business?
____ Yes; ____ No. If yes, how? _____

7. Product Quality, Safety and Adoption of Standards

7.1. Are you aware of any assistance/intervention of PCCP designed to improve product quality?
____ Yes; ____ No.

7.2. If yes, what are these? _____

7.3. Do you think they are effective? ____ Yes; ____ No. Please explain your answer _____

7.4. Are you aware of any assistance/intervention of PCCP designed to improve adoption of food safety measures?
____ Yes; ____ No.

7.5. If yes, what are these? _____

7.6. Do you think they are effective? ____ Yes; ____ No. Please explain your answer _____

7.7. Are you aware of any assistance/interventions of PCCP designed to improve the adoption of industry standards (e.g. GAP, HACCP, etc)?
____ Yes; ____ No.

7.8. If yes, what are these? _____

7.9. Do you think they are effective? ____ Yes; ____ No. Please explain your answer _____

7.10. Do you think the PCCP project thru its interventions/assistance on improving product quality, safety and adoption of product standards resulted to new markets and expanded trade?

____ Yes; ____ No. Please explain your answer

Credit/Financial Assistance

8.1. Are you aware of any assistance/intervention of PCCP designed to facilitate access to credit?
____ Yes; ____ No

8.2. If yes, how was access facilitated? _____

8.3. Did you access such assistance? ____ Yes; ____ No

8.4. If yes, how much did you borrow? _____;
From where did you borrow? _____ What was the interest rate? _____

8.5. Where did you use the borrowed amount? _____

8.6. Was the credit/financial assistance able to improve your processing business? ____ Yes; ____ No

8.7. If yes, how? _____

8.8. Were you able to fully repay your loan? ____ Yes; ____ No. Please explain your answer _____

8. Use of In-Kind Grant (IKG) Facilities

8.1. Are you aware of any IKG (e.g. cold chain, slaughterhouse, packinghouse, integrated market facilities, etc) established by PCCP in CARAGA?
____ Yes; ____ No

8.2. If yes, what are these? _____

8.3. Have you used any of the facility? ____ Yes; ____ No

8.4. If yes, which facility have you used? _____

8.5. How much did you have to pay for its use? _____

8.6. Is it easy to get access to the facility? ____ Yes; ____ No. Please explain your answer _____

8.7. Was the facility able to improve your processing business?
____ Yes; ____ No. Please explain your answer _____

9. Overall View of the PCCP Project

Please indicate your agreement/disagreement with the following statements:

- 9.1. The PCCP Project in CARAGA is relevant to the needs of the region
____ agree; ____ somewhat agree; ____ don't know; ____ somewhat disagree ____ disagree
- 9.2. The PCCP Project in CARAGA was implemented efficiently
____ agree; ____ somewhat agree; ____ don't know; ____ somewhat disagree ____ disagree
- 9.3. The PCCP Project in CARAGA was able to improve productivity in major commodities (e.g. banana, mango, vegetables; crustaceans, finfish and swine)
____ agree; ____ somewhat agree; ____ don't know; ____ somewhat disagree ____ disagree
- 9.4. The PCCP Project in CARAGA was able to expand the trade (locally, regionally and internationally). In major commodities (e.g. banana; mango; vegetables; crustaceans, finfish and swine)
____ agree; ____ somewhat agree; ____ don't know; ____ somewhat disagree ____ disagree
- 9.5. The improvements in productivity and expansion in trade achieved under the PCCP project can be sustained even after the PCCP project has terminated

____ agree; ____ somewhat agree; ____ don't know; ____ somewhat disagree ____ disagree

10. Other Observations

Please indicate whatever observations you have regarding the PCCP Project in CARAGA

11. Recommendations

Please indicate your recommendations to improve the PCCP Project in CARAGA

6. Trader Questionnaire

1. Profile

- 1.1. Name _____
- 1.2. Address _____
- 1.3. Contact number _____
- 1.4. Age _____
- 1.5. Marital status _____
- 1.6. Educational attainment (Years of Formal Education) _____
- 1.7. Number of years in trading business _____
- 1.8. Average monthly household income _____
- 1.9. Major commodities traded (Specify) _____
- 1.10. Trading function:
_____ Assembler; _____ Assembler/Wholesaler; _____ Wholesaler
_____ Wholesaler/Retailer; _____ Retailer

2. Membership in trade association

- 2.1. Are You a member of any trade association? _____ Yes; _____ No
- 2.2. If yes, name of the association _____
- 2.3. Was the association established by PCCP? _____ Yes; _____ No
- 2.4. If Yes, how was it established? _____

- 2.5. Was the association strengthened by PCCP? _____ Yes; _____ No
- 2.6. If Yes, how was it strengthened? _____

3. Procurement volume, sources and buying price

3.1. Indicate supply source, volume and price of commodities you are trading:

Commodity	Major Sources	Average Weekly Volume Procured Before PCCP	Average Buying Price Before PCCP	Average Weekly Volume Procured After PCCP	Average Buying Price Before PCCP	Remarks
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3.2. Have you noticed any increase in the supply of the commodities you are trading when the PCCP project started operating in your area?

___ Yes; ___ No

3.3. If yes, in what commodities you are trading have you observed increase in supply? _____

3.4. How would you describe the increase in supply?

___ Very Large; ___ Large; ___ Moderate; ___ Minimal

4. Marketed Volume

4.1. Where do you sell your product and the volume and prices at which you sell them:

Commodity	Major Market of your Products	Average Weekly Volume Sold Before PCCP	Average Buying Price Before PCCP	Average Weekly Volume Sold After PCCP	Average Buying Price After PCCP	Remarks
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4.2. Have you noticed any increase in the demand of the commodities you are trading when the PCCP project started operating in your area? ___ Yes; ___ No

4.3. If yes, in what commodities you are trading have you observed increase in demand? _____

4.4. How would you describe the increase in demand? _____ Very Large;
_____ Large; _____ Moderate; _____ Minimal

4.5. What are the major reasons for the increase in demand? _____

5. Market Information

5.1. Prior to the PCCP project (i.e. before 2013), where do you source your information about the prevailing price of the commodities you are trading? _____

5.2. Under PCCP (i.e. after 2013) where do you source your information about the prevailing prices of the commodities you are trading? _____

5.3. Do you know of any intervention/assistance of the PCCP project designed to improve your access to information about market prices?
_____ Yes; _____ No

5.4. If yes, what are these? _____

5.5. Do you think they are effective? _____ Yes; _____ No. Please explain your answer _____

5.6. Prior to the PCCP project (i.e. before 2013), where do you source your information about the supply of the commodities you are trading? _____

5.7. Under PCCP (i.e. after 2013) where do you source your information about the supply of the commodities you are trading? _____

5.8. Do you know of any intervention/assistance of the PCCP project designed to improve your access to information about supply? _____ Yes; _____ No

5.9. If yes, what are these?

5.10. Do you think they are effective? ____ Yes; ____ No. Please explain your answer

5.11. Prior to the PCCP project (i.e. before 2013), where do you source your information about the demand for the commodities you are trading?

5.12. Under PCCP (i.e. after 2013) where do you source your information about the demand for the commodities you are trading?

5.13. Do you know of any intervention/assistance of the PCCP project designed to improve your access to information about demand? ____ Yes; ____ No

5.14. If yes, what are these?

5.15. Do you think they are effective? ____ Yes; ____ No. Please explain your answer

6. Market Relationships

6.1. Are you aware of any assistance/intervention of PCCP designed to link farmers to the market? ____ Yes; ____ No.

6.2. If yes, what are these?

6.3. Do you think they are effective? ____ Yes; ____ No. Please explain your answer

6.4. Are you aware of any assistance/intervention of PCCP designed to link traders to the market? ____ Yes; ____ No.

6.5. If yes, what are these?

6.6. Do you think they are effective? ____ Yes; ____ No. Please explain your answer

6.7. Do you think the effort of PCCP to link farmers and traders to the market resulted to expanded trade of your product? ___ Yes; ___ No. Please explain your answer _____

6.8. Do you think the PCCP project thru its interventions/assistance was able to develop new markets for your product? ___ Yes; ___ No. Please explain your answer _____

7. Trainings Attended

7.1. Have you attended any training conducted or sponsored by PCCP? ___ Yes; ___ No

7.2. If yes, what are these trainings? _____

7.3. What were your significant learnings from the training? _____

7.4. Were you able to apply any of those learnings? ___ Yes; ___ No. Please explain your answer _____

7.5. Were the learnings able to improve your trading business? ___ Yes; ___ No. If yes, how? _____

8. Product Quality, Safety and Adoption of Standards

8.1. Are you aware of any assistance/intervention of PCCP designed to improve product quality? ___ Yes; ___ No.

8.2. If yes, what are these? _____

8.3. Do you think they are effective? ___ Yes; ___ No. Please explain your answer _____

8.4. Are you aware of any assistance/intervention of PCCP designed to improve adoption of food safety measures?

____ Yes; ____ No.

8.5. If yes, what are these?

8.6. Do you think they are effective? ____ Yes; ____ No. Please explain your answer _____

8.7. Are you aware of any assistance/interventions of PCCP designed to improve the adoption of industry standards (e.g. GAP, HACCP, etc)? ____ Yes; ____ No.

8.8. If yes, what are these?

8.9. Do you think they are effective? ____ Yes; ____ No. Please explain your answer _____

8.10. Do you think the PCCP project thru its interventions/assistance on improving product quality, safety and adoption of product standards resulted to new markets and expanded trade? ____ Yes; ____ No. Please explain your answer _____

9. Credit/Financial Assistance

8.1. Are you aware of any assistance/intervention of PCCP designed to facilitate access to credit? ____ Yes; ____ No

8.2. If yes, how was access facilitated?

8.3. Did you access such assistance? ____ Yes; ____ No

8.4. If yes, how much did you borrow? _____; From where did you borrow? _____

What was the interest rate? _____

8.5. Where did you use the borrowed amount?

8.6. Was the credit/financial assistance able to improve your trading business? ____ Yes; ____ No

8.7. If yes, how?

8.8. Were you able to fully repay your loan? _____ Yes; _____ No. Please explain your answer _____

10. Use of In-Kind Grant (IKG) Facilities

10.1. Are you aware of any IKG (e.g. cold chain, slaughterhouse, packinghouse, integrated market facilities, etc) established by PCCP in CARAGA? _____ Yes; _____ No.

10.2. If yes, what are these?

10.3. Have you used any of the facility? _____ Yes; _____ No

10.4. If yes, which facility have you used?

10.5. How much did you have to pay for its use?

10.6. Is it easy to get access to the facility? _____ Yes; _____ No. Please explain your answer

10.7. Was the facility able to improve your trading business? _____ Yes; _____ No. Please explain your answer

11. Overall View of the PCCP Project

Please indicate your agreement/disagreement with the following statements:

11.1. The PCCP Project in CARAGA is relevant to the needs of the region
_____ agree; _____ somewhat agree; _____ don't know; _____ somewhat
disagree _____ disagree

11.2. The PCCP Project in CARAGA was implemented efficiently

___ agree; ___ somewhat agree; ___ don't know; ___ somewhat disagree
___ disagree

11.3. The PCCP Project in CARAGA was able to improve productivity in major commodities (e.g. banana, mango, vegetables; crustaceans, finfish and swine)
___ agree; ___ somewhat agree; ___ don't know; ___ somewhat disagree ___ disagree

11.4. The PCCP Project in CARAGA was able to expand the trade (locally, regionally and internationally)
In major commodities (e.g. banana; mango; vegetables; crustaceans, finfish and swine)
___ agree; ___ somewhat agree; ___ don't know; ___ somewhat disagree ___ disagree

11.5. The improvements in productivity and expansion in trade achieved under the PCCP project can be sustained even after the PCCP project has terminated
___ agree; ___ somewhat agree; ___ don't know; ___ somewhat disagree ___ disagree

12. Other Observations

Please indicate whatever observations you have regarding the PCCP Project in CARAGA

13. Recommendations

Please indicate your recommendations to improve the PCCP Project in CARAGA

C. Key Informant Interview Questions

1. In-Kind Grants Value Chain Mapping Key Informant Interview Questions

1. Profile

- 1.1. Name of Enterprise: _____
- 1.2. Location: _____
- 1.3. Name of KII Respondent: _____
- 1.4. Contact Details of Respondent: _____
- 1.5. Classification of KII Respondent (Pls. Check):
 _____ Owner/Operator of Enterprise; _____ Employee of Enterprise
 _____ Client of Enterprise; _____ Others (Pls. Specify)
- 1.6. Classification of In-Kind Grant Facility (Pls. Check)
 _____ Slaughterhouse; _____ Ice Plant; _____ Cold Storage/Chilling Room
 _____ Dry Storage _____ Packinghouse; _____ Integrated Market Facility
 _____ Training Room; _____ Food Safety Equipment; _____ Others (Specify)

2. Historical Background

Ask the respondent to narrate based on his knowledge the reasons behind the establishment of the IKG, how it was established (who were the main players) and the process involved in the establishment. Determine whether there were challenges/difficulties encountered and how these were addressed.

3. Basic Information on the IKG

Ask the respondent about the capacity of the IKG, who are the clients (both backward and forward actors in the supply chain) and the arrangements associated with its use (e.g. payment for commodities stored in cold storage facility, payment for slaughterhouse facility, etc.). Determine if the facility is part of an unbroken cold chain, i.e. low temperature supply chain from farm to market or whether it is just a stand alone facility operating at a given node in the supply chain.

4. Capacity Utilization

Determine capacity utilization by asking about business volume (i.e. how much tonnage is stored per given period for cold storage facilities, how much tonnage is processed in slaughterhouse facility, etc) and how to address under capacity or over capacity problems.

5. Benefits from the IKG

Ask about the benefits derived from use of an IKG. For storage facility (either cold or dry) and even ice plant, benefits may include reduction in product spoilage, minimized quality deterioration, better sales timing (i.e. storing the product for sale at period of better prices), larger market reach, etc. For slaughterhouses benefits may include assurance of food safety, compliance to sanitary standards, etc. Do quantitative estimate of benefits as much as possible.

6. Operational Problems and Sustainability

Identify technical and financial problems associated with operating the IKG and how these are being addressed. Inquire about the sustainability aspect, i.e. whether it can continue to operate even after the PCCP project.

7. Ask the respondent to indicate their level of agreement on the following statements:

- 7.1. The presence and availability of the IKG encourages producers of agricultural commodities in CARAGA to produce more

- 7.2. ___agree; ___somewhat agree; ___don't know; ___somewhat disagree ___disagree
 The presence and availability of the IKG resulted to expansion in agricultural trade locally (i.e. in their locality)
 ___agree; ___somewhat agree; ___don't know; ___somewhat disagree ___disagree
- 7.3. The presence and availability of the IKG resulted to expansion in agricultural trade regionally (i.e. CARAGA region)
 ___agree; ___somewhat agree; ___don't know; ___somewhat disagree ___disagree
- 7.4. The presence and availability of the IKG resulted to expansion in agricultural trade internationally (i.e. more agricultural exports from CARAGA)
 ___agree; ___somewhat agree; ___don't know; ___somewhat disagree ___disagree
- 7.5. The IKGs are relevant interventions to improve agricultural production and trade in CARAGA
 ___agree; ___somewhat agree; ___don't know; ___somewhat disagree ___disagree
- 7.6. The IKGs are effective interventions to improve agricultural production and trade in CARAGA
 ___agree; ___somewhat agree; ___don't know; ___somewhat disagree ___disagree
- 7.7. The IKGs are operating efficiently in CARAGA
 ___agree; ___somewhat agree; ___don't know; ___somewhat disagree ___disagree

2. Producer Group Key Informant Interview Questions

Name: _____
 Position: _____
 Name of Producer Group: _____
 Sector: _____
 Total number of members: _____ No. of PCCP beneficiaries: _____

1. When and how was your PG established?

2. What was the role of PCCP in establishing your PG?

3. What was the role of PCCP in strengthening your PG?

4. How did your PG learn about PCCP?

5. How did your PG become a PCCP beneficiary?

6. What specific interventions/assistance were provided by the PCCP to your producer group?

i. Training (specify trainings received)

ii. Production Technology (specify what technologies were received)

iii. Input Support (specify what inputs were received)

iv. Credit Support (specify credit assistance provided)

7. What was the process of accessing the assistance from the PCCP project?

8. What was the role of your PG in extending the PCCP assistance to your members?

7. What are the key changes that happened (positive and negative) to your PG as a result of the PCCP intervention?

8. What are the key changes that happened (positive and negative) to the members of your PG as a result of the project?

9. Were your members able to increase the yield of their produce as a result of the PCCP project? If yes, how? How much was the improvement?

10. Please give an estimate of how many of your members adopted the production technologies/improved practices promoted by PCCP (specify the technologies and the percentage of your members who adopted the technologies)

11. Was your PG assisted by the PCCP in improving the quality of the produce of your members? If yes, what specific assistance was given?

12. Was your PG assisted by PCCP in complying to certain standards (e.g. GAP, HACCP, etc). If yes, what assistance was provided?

13. Was your PG assisted by PCCP in marketing the produce of the PG members? If yes, what assistance was provided?

14. Has there been any improvement in the price received by your members for their produce because of the PCCP interventions? If yes, how much was the improvement?

15. Does your PG engage in collective input procurement for your members? If yes, how does this benefit your members?

16. Does your PG engage in collective marketing of farm output for your members? If yes, how does this benefit your members?

17. Does your PG enable the members to share best practices in production? If yes, how?

18. Does your PG enable the members to share best practices in marketing? If yes, how?

19. Did your PG receive financial resources from PCCP for lending to your members? If yes, how much and how was it relented to members?

20. Did PCCP help your PG in accessing loans from financial institutions (e.g. banks, MFIs, etc.). If yes how much loan was accessed and from where?

21. Did the PCCP assistance of facilitating loans for your PG and your members result in greater investment of your members in their farm enterprise? If yes, please cite specific cases of significant increase in investment by your members in their farm enterprise

22. Did PCCP help your PG access postharvest facilities (e.g. cold storage, slaughterhouse, packing house, etc). If yes, how?

23. Does your PG or members of your PG benefit from any postharvest facilities established or provided by PCCP? If yes, what facilities and what and how much benefit does your PG or your members derive from such?

24. Please answer the following questions (tick the appropriate answer):

24.1. Our PG is now stronger because of PCCP assistance/interventions

___ Highly Agree; ___ Agree; ___ Don't know; ___ Disagree; ___ Highly Disagree

24.2. Our PG is now more effective in serving our members because of PCCP assistance/interventions

___ Highly Agree; ___ Agree; ___ Don't know; ___ Disagree; ___ Highly Disagree

24.3. Our PG is now more efficient in serving our members because of PCCP assistance/Interventions

___ Highly Agree: ___ Agree; ___ Don't know; ___ Disagree; ___ Highly Disagree

24.4. The interventions of PCCP are relevant to our PG

___ Highly Agree: ___ Agree; ___ Don't know; ___ Disagree; ___ Highly Disagree

24.5. The interventions of PCCP are relevant to the members of our PG

___ Highly Agree: ___ Agree; ___ Don't know; ___ Disagree; ___ Highly Disagree

24.6. Our PG can now better sustain its operation because of PCCP assistance/interventions

___ Highly Agree: ___ Agree; ___ Don't know; ___ Disagree; ___ Highly Disagree

24.7. The members of our PG now have higher production because of PCCP assistance/ Interventions

___ Highly Agree: ___ Agree; ___ Don't know; ___ Disagree; ___ Highly Disagree

24.8. The members of our PG now have better quality output because of PCCP assistance/ Interventions

___ Highly Agree: ___ Agree; ___ Don't know; ___ Disagree; ___ Highly Disagree

24.9. The members of our PG now receive better prices for their produce because of PCCP assistance/Interventions

___ Highly Agree: ___ Agree; ___ Don't know; ___ Disagree; ___ Highly Disagree

24.8. Sourcing of production inputs is now easier because of PCCP assistance/Interventions

___ Highly Agree: ___ Agree; ___ Don't know; ___ Disagree; ___ Highly Disagree

24.10. Production cost incurred by the members of our PG is now lower because of PCCP assistance/Interventions

___ Highly Agree: ___ Agree; ___ Don't know; ___ Disagree; ___ Highly Disagree

24.11. The members of our PG are now investing more in their farms because of PCCP assistance/interventions

___ Highly Agree: ___ Agree; ___ Don't know; ___ Disagree; ___ Highly Disagree

24.12. The postharvest facilities established by PCCP are significantly benefiting our PG

___ Highly Agree: ___ Agree; ___ Don't know; ___ Disagree; ___ Highly Disagree

24.13.. The postharvest facilities established by PCCP are significantly benefitting the members of our PG

___ Highly Agree: ___ Agree; ___ Don't know; ___ Disagree; ___ Highly Disagree

24.14. The PCCP interventions on production are relevant to our PG and our members

___ Highly Agree: ___ Agree; ___ Don't know; ___ Disagree; ___ Highly Disagree

25. Please provide your recommendations on how to further improve PCCP's assistance on production

26. Please provide your recommendations on how to further improve PCCP's assistance on marketing

27. Please provide your recommendations on how to further improve PCCP's assistance on the provision of postharvest facilities

28. Please provide your recommendation on how to further improve PCCP's assistance on credit facilitation

29. Please provide your recommendation on how PCCP can further strengthen your PG

30. Other Comments/Suggestions

D. Focus Group Discussion Guide Questions

1. Producer Groups: FGD Guide Questions

A. History of the PG

1. When was the PG established?
2. How many are the members of the PG? (disaggregate by sex, if possible):
M=___ F=___
3. What are the major objectives/goals in forming the PG?
4. What are the key issues/problems encountered in farming. (This should highlight the relevance of the interventions of PCCP)
5. What are the commodities supported by the PG?

Average volume of production:

Commodity: _____

Volume of production per production cycle: _____

No. of production cycle per year: _____

6. Major funding source of the PG?
7. Are there other support received from other institutions/agencies? (Please, identify)

Funding Agency/Institution	Type of support (e.g. training, equipment, inputs, etc.)	Title of project/support	Amount	Year
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Note: PCCP should be identified as one of the sources of support

B. Awareness and Involvement with PCCP Project

1. Are you aware of PCCP. Probe on the associated projects/interventions?
2. What are the perceived objectives/goals of the PCCP?
3. What are the expected outputs? (Elicit/request to enumerate project outputs/outcomes)
4. What motivated the PG to participate in the PCCP? (identify issues/concerns where PCCP played important role)
5. Who/what were the focal persons/institutions involved in the PCCP? Describe the specific roles.

Focal Person/Institution (e.g. govt,
private, input dealer, etc.)

Roles

6. What are the interventions/programs provided by PCCP?

Type of support	Specifics (Describe the support provided)
Technical/technology-based interventions (i.e. production, cultural management, post-harvest, processing, etc.)	
Financial/enterprise management (i.e. record keeping, buying of inputs, loan/credit, etc.)	
Marketing-related interventions	

Others:

C. Interventions provided by PCCP

1. How did PCCP interventions supported the PG?
 - a. Technical/technological aspect (Note to probe on technologies on production, post-harvest and processing technologies)
 - a.1. To what extent did PCCP interventions able to develop and strengthen new or existing technologies?
 - a.2. What is the rate of adoption of the technologies/management practices introduced by PCCP? (Probe on how the adoption of technologies/management practices were promoted and level of acceptance)
 - a.3. Did the technologies improved the following:
 1. Production/harvest/productivity
 2. Quality of produced
 - a.4 Were you able to use the IKGs/facilities or equipment provided through PCCP?
 - b. Financial/enterprise management
 - b.1 Did PCCP able to provide support in accessing financial institutions? Probe on the role of PCCP in connecting the PGs to sources of funds (i.e. microfinance, banks, etc.)
 - b.2 To what extent did PCCP interventions able to develop and strengthen the financial/enterprise management of the PG? (e.g. bookkeeping, record keeping, etc.).
 - b.3 How relevant was PCCP's approach in increasing producers' and other value chain actors' use of financial resources (e.g. credit/loans) as a tool to invest in their businesses?
 - b.4 What were the quantitative and qualitative effects/impacts, positive and negative, of the financing that PCCP facilitated?
 - c. Marketing
 - c.1 Did PCCP able to provide support in developing/improving marketing of the commodities (raw or processed form)?
 - c.2. What are the support provided? (i.e. linkages developed, markets created)

c.3. To what extent did PCCP interventions able to develop and strengthen the marketing of PG's products? Inputs required?

Note: Probe on the role of PCCP in increasing trade (local, regional or international)

D. Benefits derived from the Phil-Am interventions

1. Given the technologies provided by PCCP, what are the major skills, learnings and benefits derived from the interventions provided by the project? (Probe on the improvement of knowledge)

Interventions

Skills, Learnings, Benefits

2. What are the observed changes in terms of the following:
 - a. productivity of the farm
 - b. availability of improved inputs
 - c. access to post production/processing facilities (cold chains and storage through IKGs)
 - d. access and use of financial resources
 - e. adoption of established industry standards; sanitary and phytosanitary practices, HACCP
 - f. strengthening the PGs capacity
 - g. facilitation of public-private partnership; market linkages

E. Perception on project effectiveness

1. Given all the outputs observed and the identified benefits from PCCP, (Provide synthesis to the participants of the earlier discussion on the programs and related benefits from PCCP), do you think the project was able to achieve these expected outputs/outcomes?
2. What are the accomplishments of the project/interventions and how would you rate their effectiveness in achieving the goals of the project? (e.g. no. of trainings provided, major skills, learnings and benefits derived)
3. How would you rate the project's level of effectiveness in achieving its expected outputs/outcomes? (Rank using Likert scale, 5 being most effective).

F. Initial impacts/immediate outcomes of the project

1. What are the major changes observed at the household and in the community due to PCCP interventions? (Highlight both positive and negative changes/outcomes from the project)

Note on the key outcomes and lessons learned from the private-public partnership engagement between the local government unit departments and the private sector firms (slaughterhouses, marketing centers, infrastructure facilities, etc.)? What conditions are necessary for cold chain investments to be successful?

2. Were the initial outcomes also benefitted other individuals/communities outside the project area? (Probe on the observed effects to other communities)

G. Perception on the efficiency of the PCCP interventions

1. What are the resources needed to achieve certain outputs?
2. Do you think the project/interventions was able to maximize the use of these resources?
3. How would you rate the project's level of efficiency in achieving its expected outputs/outcomes (using Likert Scale)?

H. Sustainability of the project implementation

1. Do you think the benefits derived from the project will be sustained after the project is completed?
2. What are the factors that will contribute to its sustainability/possible discontinuance? Identify what pathways towards sustainability can be attributed to PCCP interventions in the three sectors?
3. Are there other possible projects/initiatives needed to complement or to ensure the sustainability of the project?

I. Implementation concerns

1. What are the observed issues/problems in the project implementation?
2. What are the problems encountered in participating to the project?
3. Do you think there problems would impede the sustainability of the project?
4. What are the suggested solutions/mitigating measures to address the issues/problems encountered?

2. Government and Line Agency Representatives: FGD Guide Questions

A. Validation of the development problems being addressed

The series of questions under this section is intended to assess the relevance of PCCP. Relevance will be assessed based on policy or governance issues/problems identified prior to the implementation of PCCP and whether PCCP was able to address these issues.

1. What are the key policy or governance problems/issues in Caraga Region/area? (e.g. regulators are not well informed of the standards, limited capacity of the LGUs, no active roles in projects related to cold chains, etc.)
2. Identify factors/causes of the development problems/issues (Note: to use problem tree analysis)

B. Validation of the PCCP interventions

The series of questions under this section is intended to assess the extent of support provided to the LGUs, government offices and line agencies through the PCCP interventions. The level of participation of government partners will also be determined.

1. What are the interventions/programs provided by PCCP?. This question seeks to determine the interventions developed or enhanced by PCCP (e.g. trainings on food security, standards, private-public partnership)
2. What are your roles and functions in implementing the project or conduct of activities?

C. Perception on project performance

The series of questions under this section is the core of the evaluation. It is intended to provide the important parameters to assess the performance of the project.

1- Effectiveness

- a. Were you able to use the skills and knowledge obtained from the trainings/seminars? Cite instances (e.g. tools use in the conduct of technology demo, FFS, etc.)
- b. Are the IKGs/facilities/equipment useful? Do you think the project was able to achieve its objectives in establishing the facilities?
- c. How would you rate the project's level of effectiveness in achieving its expected outputs/outcomes? (Rank using Likert scale, 5 being most effective).

2- Efficiency

- a. What are the resources needed to achieve certain outputs? (Participants to identify the resources needed for certain projects, estimate costs, time and personnel needed)
- b. Do you think the project/interventions was able to maximize the use of these resources?
- c. How would you rate the project's level of efficiency in achieving its expected outputs/outcomes (using Likert Scale)?

3- Initial impacts/immediate outcomes of the project

- a. What are the major changes observed in the area/capacity of the LGU/government agencies staff resulting from PCCP interventions? (e.g. policies institutionalized to adopt standards, more LGUs and line agencies are knowledgeable of the standards and food security policies, private-public partnerships were forged, etc.)

Probe on the key outcomes and lessons learned from the private-public partnership engagement between the local government unit departments and the private sector firms (slaughterhouses, marketing centers, infrastructure facilities, etc.); impacts of the financial resources facilitated (e.g. loans or credits; availability of cold chains; access to post production/processing facilities (cold chains and storage through IKGs)?

- b. Specifically, what conditions are necessary for cold chain investments to be successful?
- c. Were the initial outcomes also benefitted other individuals/communities outside the project area? (Probe on the observed effects to other communities)

4. Sustainability of the project implementation

- a. Does the LGUs and line agencies have sustainability plan for the project (including M&E system to monitor progress)? How is the transition from project completion?
- b. Identify what pathways towards sustainability can be attributed to PCCP interventions in your area?

D. Opportunities realized as a result of the project

The set of questions in this section is intended to determine and probe on certain concerns of PCCP Winrock such as expansion in market, expansion in trade, increase productivity, etc. The set of questions is in consideration of the two primary objectives of PCCP: to increase productivity and expand trade.

1. What are the opportunities realized from PCCP interventions? Probe on the following possible opportunities realized:
 - a. New facilities under the private-public partnership
 - b. Strengthen delivery of extension services
 - c. Enhancement of compliance to food safety standards
 - d. Regularity of slaughterhouse inspections
2. What are the contributing factors to realize these opportunities?
3. What are the possible threats that will impede the realization of these opportunities?

E. Problems in implementation of PCCP

1. What are the observed issues/problems in project implementation?
2. What are the problems encountered in participating in the project?
3. Do you think these problems would impede the sustainability of the project?
4. What are the suggested solutions/mitigating measures to address the issues/problems encountered?

F. Recommendations to project sustainability

1. Do you think the benefits derived from the project will be sustained after the project is completed?
2. What are the factors that will contribute to its sustainability/possible discontinuance? Probe on recommendations to manage the facilities, equipment, etc.
3. Are there other possible projects/initiatives needed to complement or to ensure the sustainability of the project?

3. Traders, Input Dealers, and Processors (Private Sector): FGD Guide

Questions

A. Validation of the development problems being addressed

The series of questions under this section is intended to assess the relevance of PCCP. Relevance will be assessed based on development issues/problems related to trading, marketing and processing which are identified prior to the implementation of PCCP and whether PCCP was able to address these issues.

1. What are the key trading and processing problems/issues in Caraga Region/area? (e.g. limited storage facilities, no cold chains, limited supply of products/raw materials, limited supply of good seeds/stocks, etc.)
2. Identify factors/causes of the development problems/issues (Note: to use problem tree analysis)

B. Validation of the PCCP interventions

The series of questions under this section is intended to assess the extent of support provided to the input dealers, traders and processors through the PCCP interventions. Their level of participation to the project will also be determined.

1. What are the interventions/programs provided by PCCP?. This question seeks to determine the interventions developed or enhanced by PCCP (e.g. trainings on food security, standards, private-public partnership; technologies on improved inputs, etc.)
2. What are your roles and functions in the value chain? What is your level of participation in project implementation?

C. Perception on project performance

The series of questions under this section is the core of the evaluation. It is intended to provide the important parameters to assess the performance of the project.

1. Effectiveness

- a. Were you able to use the skills and knowledge obtained from the trainings/seminars? Cite instances (e.g. ease in sourcing products/raw materials/financial resources, etc.)
- b. Are the IKGs/facilities/equipment useful? Do you think the project was able to achieve its objectives in establishing these facilities?
- c. How would you rate the project's level of effectiveness in achieving its expected outputs/outcomes? (Rank using Likert scale, 5 being most effective).

2. Efficiency

- a. What are the resources needed to achieve certain outputs? (Participants to identify the resources needed for certain projects, estimate costs, time and personnel needed)
- b. Do you think the project/interventions were able to maximize the use of these resources?
- c. How would you rate the project's level of efficiency in achieving its expected outputs/outcomes (using Likert Scale)?

3. Initial impacts/immediate outcomes of the project

- a. What are the major changes observed in the area/capacity of the input dealers, traders and processors resulting from PCCP interventions? (e.g. knowledgeable of the standards and food security policies, private-public partnerships were forged, availability of cold storage, etc.)

Probe on the key outcomes and lessons learned from the private-public partnership engagement between the local government unit departments and the private sector firms (slaughterhouses, marketing centers, infrastructure facilities, etc.); impacts of the financial resources facilitated (e.g. loans or credits; availability of cold chains; access to post production/processing facilities (cold chains and storage through IKGs)?

- b. Specifically, what conditions are necessary for cold chain investments to be successful?
- c. Are the initial outcomes also benefitting other individuals/communities outside the project area? (Probe on the observed effects to other communities)

4. Sustainability of the project implementation

Identify what pathways towards sustainability can be attributed to PCCP interventions in your area?

D. Opportunities realized as a result of the project

The set of questions in this section is intended to determine and probe on certain concerns of PCCP such as expansion in market, expansion in trade, increase productivity, etc. The set of questions is in consideration of the two primary objectives of PCCP: to increase productivity and expand trade.

1. What are the opportunities realized from PCCP interventions? Probe on the following possible opportunities realized:
 - a. New facilities under the private-public partnership
 - b. Enhancement of the food safety standards
 - c. Wider market reach/expanded trade
 - d. Minimal handling losses
2. What are the contributing factors to realize these opportunities?
3. What are the limiting factors in realizing these opportunities?

E. Problems in implementation of PCCP

1. What are the observed issues/problems in project implementation?
2. What are the problems encountered in participating in the project?
3. Do you think these problems would impede the sustainability of the project?
4. What are the suggested solutions/mitigating measures to address the issues/problems encountered?

F. Recommendations for project sustainability

1. Do you think the benefits derived from the project will be sustained after the project is completed?
2. What are the factors that will contribute to its sustainability? Probe on recommendations to manage the facilities, equipment, etc.
3. Are there other possible projects/initiatives needed to complement or to ensure the sustainability of the project?

4. Micro-Finance Institutions: FGD Guide Questions

A. Validation of the development problems being addressed

The series of questions under this section is intended to assess the relevance of PCCP. Relevance will be assessed based on development issues/problems related to rural finance which are identified prior to the implementation of PCCP and whether PCCP was able to address these issues.

1. What are the key rural finance problems/issues in Caraga Region/area? (e.g. limited supply of credits, no collateral hence limited access to financing, nature of business/project is different (production cycle) no financing scheme tailor fitted to production cycle of the commodity, etc.)
2. Identify factors/causes of the development problems/issues (Note: to use problem tree analysis)

B. Validation of the PCCP interventions

The series of questions under this section is intended to assess the extent of support provided to the MFIs through PCCP.

1. Did PCCP able to facilitate the access of financial resources through credit/loans?
2. What are the loan/credit mechanisms in place under the project? Probe whether mechanisms vary by client (e.g. farmers, input dealers, processors, etc.)
3. What is your level of participation in the project implementation?

C. Perception on project performance

The series of questions under this section is the core of the evaluation. It is intended to provide the important parameters to assess the performance of the project.

1. Effectiveness

- a. In relation to financial resources, do you think the project was able to achieve its goals/objectives (e.g. increase access to financial resources, ease of accessing loans)
- b. How would you rate the project's level of effectiveness in achieving its expected outputs/outcomes? (Rank using Likert scale, 5 being most effective).

2. Efficiency

- a. What are the resources needed to achieve certain outputs (e.g. establishing partnership with the MFIs, information dissemination)? (Participants to identify the resources needed for certain projects, estimate costs, time and personnel needed)
- b. Do you think the project/interventions was able to maximize the use of these resources?
- c. How would you rate the project's level of efficiency in achieving its expected outputs/outcomes (using Likert Scale)?

3. Initial impacts/immediate outcomes of the project

What are the major changes observed in the area/capacity of the beneficiaries/stakeholders to access loans? (e.g. increase access to financial resources, increase number of borrowers, decrease delinquency in payment, etc.)

Probe on the key outcomes and lessons learned from the private-public partnership engagement between the local government unit departments and the private sector firms (slaughterhouses, marketing centers, infrastructure facilities, etc.); impacts of the financial resources facilitated (e.g. loans or credits; availability of cold chains; access to post production/processing facilities (cold chains and storage through IKGs)?

4. Sustainability of the project implementation

Identify what pathways towards sustainability can be attributed to PCCP interventions in your area?

D. Opportunities realized as a result of the project

The set of questions on this section is intended to determine and probe on certain concerns of PCCP Winrock such as expansion in market, expansion in trade, increase productivity, etc. The set of questions is in consideration of the two primary objectives of PCCP: to increase productivity and expand trade.

1. What are the opportunities realized from PCCP interventions? Probe on the following possible opportunities realized:
 - a. New loan windows facilitated/increase in financial resources available
 - b. Increase in number of borrowers
 - c. Increase financing for cold chains
2. What are the contributing factors to realize these opportunities?
3. What are the possible threats that will impede these opportunities to develop?

E. Problems in implementation of PCCP

1. What are the observed issues/problems in the project implementation?
2. What are the problems encountered in participating to the project?
3. Do you think these problems would impede the sustainability of the project?
4. What are the suggested solutions/mitigating measures to address the issues/problems encountered?

F. Recommendations to project sustainability

1. Do you think the benefits derived from the project will be sustained after the project is completed?
2. What are the factors that will contribute to its sustainability/possible discontinuance? Probe on recommendations to manage the facilities, equipment, etc.
3. Are there other possible projects/initiatives needed to complement or to ensure the sustainability of the project?

5. PCCP Team: FGD Guide Questions

A. Validation of the development problems and solutions

The set of questions under this section is intended to assess the relevance of PCCP interventions from the point of view of the project implementers themselves (i.e. PCCP team). Relevance will be assessed by clarifying the development problems being addressed and the set of solutions being pursued through the project.

High perishability of agricultural products is a primary problem in agricultural development. In more advanced countries, this is addressed thru low temperature supply chain (i.e. cold chain).

Cold chain typically refers to an unbroken chain of low temperature transport (e.g. use of refrigerated vans) and storage of products from farm to market. What is the cold chain model originally envisioned by PCCP for CARAGA and how close or how far is the project from achieving such vision? What have been the major constraints in fully realizing the vision? How was the PCCP management addressing these constraints?

Presumably, the PCCP results framework and project design were based on certain basic assumptions (as should be the case if logical framework is used). For instance, the mid-term review of PCCP pointed out that one of the major assumptions which served as basis in the PCCP project design and which eventually turned out not to be true was that there were strong producer groups in CARAGA (the PGs were found to be much weaker). What were some of the other assumptions and how did these actually turn out during actual implementation? What did the management do to address the situation?

The application of risk management process is integral to any development project. Before actual implementation, possible risks are identified, classified and rated (i.e. low, medium, high risk) and appropriate risk management plan is formulated. In the PCCP project, an example of such risk is the failure of loan recipients to actually pay their loan (low repayment rate). How is PCCP management handling this problem of low repayment rate? Was management able to anticipate this risk and if so, what was the original plan to manage the risk? What were the other major risks encountered during project implementation? Were these anticipated? If yes, what was the original risk management plan? How is management actually handling the risks?

B. Validation of the PCCP interventions

The series of questions under this section is intended to assess the extent of the support to the project participants/stakeholders of the three targeted commodity groups: horticulture, livestock and fisheries.

1. What are the interventions given? (List of results/initial feedbacks on the interventions will be validated with the PCCP team)
2. How are interventions/activities designed and executed?

C. Validation of project performance

The series of questions under this section is designed to probe into some parameters of project performance such as effectiveness, efficiency, impact and sustainability. Initial

findings/feedback on project implementation will be validated with the PCCP team as much as possible.

1. Personally and as project implementers, what positive changes do you want to see among the PGs and the farmer beneficiaries before you can say that the PCCP project has been successful? Are you seeing those changes in the field? Are you satisfied with what you are seeing? What are the gaps and how should these be addressed?
2. Personally and as project implementers, what positive changes do you want to see among the traders and processors in CARAGA before you can say that the PCCP project has been successful? Are you seeing those changes in the region? Are you satisfied with what you are seeing? What are the gaps and how should these be addressed?
3. Personally and as project implementers, what positive changes do you want to see among government people in CARAGA, particularly in terms of how they facilitate production and trade in CARAGA. With the capacitation and interventions provided by the PCCP project, are you now seeing the changes that you want to see among these people in government? Are you satisfied with what you are seeing? What are the gaps and how should these be addressed?
4. Personally and as project implementers, what positive changes do you want to see among the IKG facilities in terms of operation, utilization and sustainability before you can say that the PCCP project has been effective? Are you seeing those changes already? Are you satisfied with what you are seeing? What are the gaps and how should these be addressed?
5. Personally and as project implementers, what positive changes do you want to see in the productivity of major agricultural products in CARAGA as a result of the PCCP project? Are you seeing those changes in the field? Are you satisfied with what you are seeing? What are the gaps and how should these be addressed?
6. Personally and as project implementers, what positive changes do you want to see with regards to agricultural trade in CARAGA locally, regionally and internationally? Are you seeing those changes already? Are you satisfied with what you are seeing? What are the gaps and how should these be addressed?
7. Sustainability
 - a. What is the sustainability plan for the project? Who or what agencies/institutions will manage the project outputs/facilities/IKGs once PCCP terminates? What transition activities have been conducted and those that are yet to be conducted?
 - b. What are the dissemination activities to promote the results of the project?

D. Implementation Problems and Lessons Learned

1. What are the observed issues/problems in project implementation? (e.g. project operation, conduct of activities, M&E, etc.)
2. What are the suggested solutions/mitigating measures to address the issues/problems encountered?
3. What are your insights and lessons learned?

ANNEX 4. INPUT SOURCES

A. Horticulture

Input sources before and with PCCP

Input and Source	Percentage of Producers Using Source			
	Mango	Banana	Vegetables	All
Input Sources before PCCP	(n=29)	(n=36)	(n=72)	(n=137)
Local Agro dealers	72%	78%	83%	80%
Producer Groups / Cooperatives	0	0	13%	2%
Other*	28%	22%	4%	18%
Input Sources with PCCP				
Seeds/Planting Materials	(n=20)	(n=14)	(n=94)	(n=128)
Local Agro dealers	20%	36%	47%	41%
Producer Groups / Cooperatives	15%	14%	47%	38%
Other*	65%	50%	6%	20%
Fertilizer	(n=21)	(n=21)	(n=94)	(n=136)
Local Agro dealers	81%	67%	51%	58%
Producer Groups / Cooperatives	5%	5%	46%	33%
Other*	14%	29%	3%	9%
Chemicals / Pesticides	(n=19)	(n=20)	(n=81)	(n=120)
Local Agro dealers	100%	90%	61%	72%
Producer Groups / Cooperatives	0	5%	39%	28%
Other*	0	5%	0	1%

* Other input sources include Department of Agriculture, neighbors

B. Livestock

Input sources before and with PCCP

Input and Source	Swine Producers Using Source
Input Sources before PCCP	(n= 222)
Local Agro dealers	90%
Producer Groups/Cooperatives	8%
Other*	2%
Input Sources with PCCP	
Piglets	(n=151)
Local Agro dealers	52%
Producer Groups / Cooperatives	30%
Other*	18%
Feeds	(n=220)
Local Agro dealers	85%
Producer Groups / Cooperatives	15%

Other*	0
Biologics	(n=164)
Local Agro Dealers	82%
Producer Groups / Cooperatives	13%
Other*	5%

* Other input sources include Department of Agriculture, neighbors

C. Fisheries

Input sources before and with PCCP

Item	Finfish	Crustaceans	All
Input Sources before PCCP	(n=40)	(n=67)	(n=107)
Local Agro Dealers	97%	97%	97%
Producer Groups / Cooperatives	0	0	0
Other*	3%	3%	3%
Input Sources with PCCP			
Fingerlings	(n=48)	(n=88)	(n=136)
Local Agro Dealers	38%	23%	28%
Producer Groups / Cooperatives	11%	77%	68%
Other*	52%	0	4%
Feeds	(n=48)	(n=88)	(n=136)
Local Agro Dealers	89%	10%	45%
Producer Groups / Cooperatives	9%	22%	16%
Other*	2%	68%	39%
Green Nets	(n=48)	(n=88)	(n=136)
Local Agro Dealers	74%	46%	54%
Producer Groups / Cooperatives	5%	1%	39%
Other*	21%	53%	7%
Hapa Nets	(n=29)	(n=74)	(n=103)
Local Agro Dealers	65%	50%	54%
Producer Groups / Cooperatives	7%	50%	88%
Other*	28%	0	38%

* Others include Bureau of Fisheries and Aquatic Resources, other producers

ANNEX 5. PRODUCTION AND COST FUNCTION ANALYSIS

ASPSI specified production functions for the commodities covered by the project to determine the effects of inputs, improved techniques and technologies, and program participation on production. In general, adjusted R-squared values (measures of how well the model captures the factors that influence output) are low. R-squared values are most likely low because the models don't account for all the relevant variables, and/or because the relationships among variables are not linear. Despite low adjusted R-squared values, the production function regressions produced some meaningful, statistically significant results.

ASPSI also specified cost functions for each of the six commodities, but only the regressions for mango and fin fish produced statistically significant results

Summary of statistically significant results:

Production

- Participation in the PCCP increases crustacean production by 33 kg per production cycle.
- For each year that a vegetable farmer participates in the program, she produces 244 kg more per production cycle (99% confidence).
- Participation in the PCCP increases livestock production by 321 kg per production cycle.
- Use of artificial insemination increases livestock production by 316 kg per production cycle.
- Use of feeders and drinkers increases livestock production by 230 kg per production cycle.
- Use of indigenous microorganisms decreases production by 322 kg per production cycle.
- For each year that a crustacean farmer participates in the program, she produces 26 kg more per production cycle. (99% confidence)

Costs

- Participation in the PCCP decreases costs for mango farmers by 1,657 PhP per production cycle. (99% confidence)
- Participation in the PCCP decreases costs for fin fish farmers by 8,626 PhP per growing cycle.

A. Mango and Banana Results

Statistical modeling didn't yield useful results for mango and banana. ASPSI specified two different production functions and ran regressions of both for each commodity, but project participation had no statistically significant impact on production. In the second mango regression, all input variables except for bagging had negative coefficients; it's unlikely that all inputs, techniques, and technologies cause decreases in production. ASPSI found one statistically significant result for mango: PCCP participation appears to decrease costs by PhP 1,657 per production cycle. For banana, ASPSI did not generate a valid production function that yielded meaningful results.

The production models for mango and banana most likely failed to capture the relationships between the variables. It is extremely difficult to create accurate production functions for perennial crops since there is a time lag between inputs and output. Inputs applied by farmers in one season may not impact yield until subsequent seasons. In addition, mango and banana had the smallest sample sizes (40 and 39, respectively) out of the six commodities; smaller samples

make statistical modeling less reliable.

For these crops, estimated volume and value of trade, mean variance analysis, and partial budget analysis are better measures of gains in productivity and incomes.

B. Mango

Mango Cost Function

$tcmango = f(adopt, output, fert, chem, labor)$

Where:

Tcmango = total cash cost of mango production, in Php

Adopt = dummy variable representing participation to the PCCP: before PCCP = 0; with PCCP = 1

Output = total production, in kg

Fert = cost of fertilizers, in Php

Chem = cost of chemicals and pesticides, in Php

Labor = labor cost, in Php

tcmango	Coef.	Std. Err.	t	P>t
adopt	-1657.06	606.477	-2.73	0.008
output	-0.08452	0.057297	-1.48	0.145
fert	1.326623	0.095326	13.92	0
chem	1.0624	0.049694	21.38	0
labor	1.019578	0.109354	9.32	0
_cons	1383.951	504.3305	2.74	0.008
Number of observations			73	
Prob>F			0.000	
R-squared			0.9823	
Adj R-squared			0.981	

Participation in the PCCP decreases costs for mango farmers by 1,657 PhP. (99% confidence interval)

Mango Production Function

Model does not capture production function. No statistically meaningful results.

C. Banana

Banana Cost Function

No statistically significant results.

Banana Production Function

Prob > F is not significant.

D. Vegetables

Vegetables (Regression 1, general)

Output = f (hectares, fertilizer, pesticide, years of participation, pccp participation, province1, province2, province4)

Where:

Output = volume of production, in kg

Hectares = no. of hectares

Fertilizer = volume used, in kg

Pesticide = volume used, in liters

Years of participation = no. of years

PCCP Participation = dummy variable (0- before; 1- after)

Province1 = dummy variable (0- not ADN; 1- ADN)

Province2 = dummy variable (0- not ADS; 1- ADS)

Province4 = dummy variable (0- not PDI; 1- PDI)

Vegetables (Regression 1, general)

(Statistically significant variables appear in bold.)

Output	Coef.	Std. Err.	t	P > t	[90% Conf. Interval]	
hectares	651.381	276.7647	2.35	0.020	193.7752	1108.987
fertilizer	-2.080636	1.157262	-1.80	0.074	-3.994066	-.1672059
pesticide	200.2372	64.00477	3.13	0.002	94.41103	306.0634
yrs_part	224.9996	104.7678	2.15	0.033	51.77542	398.2237
participation	-288.4204	374.9817	-0.77	0.443	-908.4192	331.5784
prov1	-60.35771	328.0037	-0.18	0.854	-602.6826	481.9672
prov2	350.7131	279.6667	1.25	0.211	-111.6909	813.1171
prov4	-76.88712	281.8651	-0.27	0.785	-542.9259	389.1517
_cons	-126.0027	260.392	-0.48	0.629	-556.5376	304.5323
			Number of obs =		188	
			F (8, 179) =		5.94	
			Prob > F =		0.0000	
			R-squared =		0.2097	
			Adj R-squared =		0.1744	
			Root MSE =		1172.7	

In the first regression for vegetables, the variable representing years of participation has a positive impact on production. Each year in the program increases production by an average of 224 kg (97% confidence).

ASPSI ran a second regression to determine whether specific technologies and techniques introduced by the program had an observable effect on production. Results were not statistically significant for any of the interventions, but the analysis reinforced the positive effect of years of participation. The second regression showed that each year in the program increases production by 244 kg (99% confidence).

Vegetables (Regression 2, Specific Interventions)

Output = f (hectares, high quality seeds, irrigation, plastic mulching, trellis, fertilizer, pesticide, years of participation, province1, province2, province4)

Where:

Output = volume of production, in kg

Hectares = no. of hectares

High Quality Seeds = dummy variable (0 if not adopted; 1 if adopted)

Irrigation = dummy variable (0 if not adopted; 1 if adopted)

Plastic mulching = dummy variable (0 if not adopted; 1 if adopted)

Use of trellis = dummy variable (0 if not adopted; 1 if adopted)

Fertilizer = volume used, in kg

Pesticide = volume used, in liters

Years of participation = no. of years

Province1 = dummy variable (0- not ADN; 1- ADN)

Province2 = dummy variable (0- not ADS; 1- ADS)

Province4 = dummy variable (0- not PDI; 1- PDI)

Vegetables (Regression 2, Specific Interventions)

Source	SS	df	MS	Number of obs	=	188
Model	70404866.4	11	6400442.4	F(11, 176)	=	4.67
Residual	241073668	176	1369736.75	Prob > F	=	0.0000
				R-squared	=	0.2260
				Adj R-squared	=	0.1777
Total	311478535	187	1665660.61	Root MSE	=	1170.4

output	Coef.	Std. Err.	t	P> t	[90% Conf. Interval]	
hectares	690.9576	279.2336	2.47	0.014	229.2287	1152.686
highqualityseeds	-159.0452	280.7616	-0.57	0.572	-623.3007	305.2103
irrigation	-290.1284	275.9561	-1.05	0.295	-746.4377	166.1808
plasticmulching	-421.9231	316.067	-1.33	0.184	-944.5581	100.7119
trellis	324.3453	306.0427	1.06	0.291	-181.7139	830.4045
fertilizer	-2.147738	1.162489	-1.85	0.066	-4.069979	-.2254959
pesticide	183.4914	65.04507	2.82	0.005	75.93566	291.0472
yrs_part	244.3646	82.24028	2.97	0.003	108.3756	380.3536
prov1	-101.6075	329.6767	-0.31	0.758	-646.7468	443.5318
prov2	289.1049	284.9744	1.01	0.312	-182.1166	760.3265
prov4	-49.46244	282.1877	-0.18	0.861	-516.076	417.1511
_cons	-84.7879	251.3822	-0.34	0.736	-500.4628	330.887

Production function analysis for vegetables found that the number of hectares, amount of fertilizer, and amount of pesticides all impact vegetable production. The pesticide variable is also positive and highly significant. Each liter of pesticides increases production by 183 kg. This is logical since insect pests can drastically reduce output when left uncontrolled.

The fertilizer variable is significant but negative. According to the results, each kg of fertilizer applied decreases yield by an average of 2.1 kg. This indicates that the farms were probably already at the stage of diminishing returns, where increased fertilizer output actually decreases yield.

The number of years of project participation is positive and highly significant, which means project participation improves total output. Each year of participation increases production by an average of 244 kg.

E. Swine

1. Production Function 1: General

Output = f (no. of head, feeds, years of participation, pccp participation, province2, province3, province4)

Where:

Output = volume of production, in kg

Head = no. of head

Feeds = volume used, in kg

Years of participation = no. of years

PCCP Participation = dummy variable (0- before; 1- after)

Province2 = dummy variable (0- not ADS; 1- ADS)

Province3 = dummy variable (0- not SDN; 1- SDN)

Province4 = dummy variable (0- not SDS; 1- SDS)

Results (production function 1)

Output	Coef.	Std. Err.	t	P > t	[90% Conf. Interval]	
heads	61.3636	6.6973	9.16	0.000	50.31752	72.40959
feeds	13.3728	11.6138	1.15	0.250	-5.78208	32.52768
ysr_part	-44.8945	34.7504	-1.29	0.197	-102.20910	12.42007
pccppart	321.0672	134.4971	2.39	0.018	99.23837	542.8961
prov1	-71.6390	103.2660	-0.69	0.488	-241.95780	98.67981
prov2	316.3282	95.4577	3.31	0.001	158.88780	473.7686
prov3	58.4115	99.3250	0.59	0.557	-105.40730	222.2303
_cons	-127.2215	94.0282	-1.35	0.177	-282.30410	27.86115
			Number of obs =		350	
			F (7, 342) =		23.1	
			Prob > F =		0	
			R-squared =		0.321	
			Adj R-squared =		0.3071	
			Root MSE =		599.6	

ASPSI's first regression for livestock production shows three statistically significant variables: number of heads in herd, PCCP participation, and producing swine in province 2 (Agusan del Sud.) Participation in the program **increases swine production by an average of 321 kg** (92% confidence). The method used for the province variables uses Agusan del Norte as the control. Results show that swine farmers in Agusan del Sud produce an average of 316 kg more than their counterparts in Agusan del Norte, with a confidence level of 99%.

Production Function 2: Project Interventions

In a second swine production regression, ASPSI created a model to determine the relative effects of different techniques and technologies introduced by the PCCP.

Output = f (no. of head, feeds, artificial insemination, biologics, indigenous microorganism, hygiene and sanitation, management of diseases, feeder and drinker, all night lighting, years of participation, province2, province3, province4)

Where:

Output = volume of production, in kg

Head = no. of head

Feeds = volume used, in kg

Artificial insemination = dummy variable (0 if not adopted; 1 if adopted)

Biologics = dummy variable (0 if not adopted; 1 if adopted)

Indigenous microorganism = dummy variable (0 if not adopted; 1 if adopted)

Hygiene and sanitation = dummy variable (0 if not adopted; 1 if adopted)

Management of diseases = dummy variable (0 if not adopted; 1 if adopted)

Feeder and drinker = dummy variable (0 if not adopted; 1 if adopted)

All night lighting = dummy variable (0 if not adopted; 1 if adopted)

Years of participation = no. of years

Province2 = dummy variable (0- not ADS; 1- ADS)

Province3 = dummy variable (0- not SDN; 1- SDN)

Province4 = dummy variable (0- not SDS; 1- SDS)

Results (production function 2)

Output	Coef.	Std. Err.	t	P > t 	[90% Conf. Interval]	
heads	60.8807	6.5133	9.35	0.0000	50.13767	71.62380
feeds	18.5942	11.2344	1.66	0.0990	0.06425	37.12421
ai	365.1034	97.3556	3.75	0.0000	204.52500	525.68180
biologics	-156.3208	193.8473	-0.81	0.4210	-476.05270	163.41120
indmicroorganism	-321.8074	108.2482	-2.97	0.0030	-500.35210	-143.26260
hygieneandsanitation	106.6887	157.9483	0.68	0.5000	-153.83140	367.20890
mgtofdiseases	166.6164	155.0738	1.07	0.2830	-89.16254	422.39530
feederanddrinker	229.6802	121.1075	1.9	0.0590	29.92528	429.43520
allnightlighting	120.0338	103.5365	1.16	0.2470	-50.73937	290.80710
yrs_part	-58.4438	36.1110	-1.62	0.1070	-118.00540	1.11770
prov1	-5.9142	100.6473	-0.06	0.9530	-171.92200	160.09360
prov2	437.4383	96.5525	4.53	0.0000	278.18450	596.69220
prov3	101.0079	99.3297	1.02	0.3100	-62.82673	264.84250
cons	-206.9144	93.0398	-2.22	0.0270	-360.37440	-53.45444
			Number of obs =		350	
			F (13, 336) =		16.35	
			Prob > F =		0	
			R-squared =		0.3875	
			Adj R-squared =		0.3638	
			Root MSE =		574.55	

Results indicate that the use of artificial insemination, indigenous microorganisms, and feeders and drinkers impacted production. Results indicate that artificial insemination increases production by 365 kg, while the use of feeders and drinkers increases production by 230 kg. (Levels of confidence are 99% and 94%, respectively.)

This second regression found an even higher benefit for farmers in Agusan del Sud compared with Agusan del Norte, an increase in production of 437 kg with a 99% confidence level.

F. Crustaceans

Production Function

Output = f (fry, size of cage, stocking density, feed ratio, feeds, years of participation, province1, province3)

Where:

Output = volume of production, in kg

Fry = no. of fry, in pieces

Size of cage = size of cage, in square meters

Stocking density = dummy variable (0 if not adopted; 1 if adopted)

Feed ratio = dummy variable (0 if not adopted; 1 if adopted)

Feeds = dummy variable (0 if not adopted; 1 if adopted)

Years of participation = no. of years

Province1 = dummy variable (0- not SDN; 1- SDN)

Province3 = dummy variable (0- not PDI; 1- PDI)

Results

Source	SS	df	MS	Number of obs	=	182
Model	2081189.35	8	260148.669	F(8, 173)	=	19.49
Residual	2308919.81	173	13346.3573	Prob > F	=	0.0000
				R-squared	=	0.4741
				Adj R-squared	=	0.4497
Total	4390109.16	181	24254.7467	Root MSE	=	115.53

output	Coef.	Std. Err.	t	P> t	[90% Conf. Interval]	
fry	.0136105	.0012456	10.93	0.000	.0115507	.0156703
sizeofcage	.005852	.0026869	2.18	0.031	.0014087	.0102953
stockingdensity	29.9248	25.77394	1.16	0.247	-12.69779	72.5474
feedratio	-73.74484	41.28255	-1.79	0.076	-142.0142	-5.475514
feeds	-29.55286	35.43736	-0.83	0.405	-88.15594	29.05023
yrs_part	26.34192	9.895421	2.66	0.008	9.977773	42.70607
prov1	49.89	35.92157	1.39	0.167	-9.51382	109.2938
prov3	28.01723	39.30281	0.71	0.477	-36.97819	93.01265
_cons	5.422488	35.32634	0.15	0.878	-52.99701	63.84198

ASPSI constructed a lobster production model to test the relative impact of different technologies and techniques introduced by the project: stocking density, feed ratio, and quality feeds. The adjusted R-squared value, while still relatively low at 0.45, is higher than in some of the other intervention-specific regressions.

Results show that the number of fry and total cage size have positive, statistically significant effects on production, but the effect is small. The number of years of participation in the project is positive and statistically significant (99% confidence), indicating that **for each year of participation, lobster farmers increase their output by 26 kg**, which means those who have

been participating in the project for longer period have greater output. Use of the feed ratio intervention has a negative effect, however: producers who adopted the feed ratio technique saw an average decrease in production of 74 kg (92% confidence.)

This model for lobster production may be flawed, given that the two primary inputs (fry and cage size) have such a small impact on production. It's possible that lobster farmers in the region have reached the recommended stocking threshold, decreasing the impact of additional fry. The relationship among the variables is probably not linear.

G. Fin Fish

Production Function

Output = f (fry, size of cage, stocking density, feed ratio, feeds, years of participation, province1, province2)

Where:

Output = volume of production, in kg

Fry = no. of fry, in pieces

Size of cage = size of cage, in square meters

Stocking density = dummy variable (0 if not adopted; 1 if adopted)

Feed ratio = dummy variable (0 if not adopted; 1 if adopted)

Feeds = dummy variable (0 if not adopted; 1 if adopted)

Years of participation = no. of years

Province1 = dummy variable (0- not ADN; 1- ADN)

Province2 = dummy variable (0- not SDN; 1- SDN)

Results

Source	SS	df	MS	Number of obs	=	72
Model	142557971	8	17819746.3	F(8, 63)	=	8.56
Residual	131193147	63	2082430.91	Prob > F	=	0.0000
				R-squared	=	0.5208
				Adj R-squared	=	0.4599
Total	273751118	71	3855649.55	Root MSE	=	1443.1

output	Coef.	Std. Err.	t	P> t	[90% Conf. Interval]	
fry	-.0188195	.0050514	-3.73	0.000	-.0272524	-.0103866
sizeofcage	-.0023007	.0182081	-0.13	0.900	-.0326974	.0280959
stockingdensity	-1794.839	530.8935	-3.38	0.001	-2681.114	-908.5643
feedratio	777.5012	931.388	0.83	0.407	-777.36	2332.362
feeds	1837.758	969.9324	1.89	0.063	218.5506	3456.965
yrs_part	48.85296	305.0968	0.16	0.873	-460.4763	558.1822
prov1	2841.171	452.3337	6.28	0.000	2086.044	3596.298
prov2	2956.33	817.9364	3.61	0.001	1590.865	4321.795
_cons	534.1201	274.8414	1.94	0.056	75.29932	992.9409

The results for milkfish show that the number of fry is highly significant, but with a small, negative coefficient. This means that increasing the number of milkfish fry would decrease output. The production function may already be at the stage of diminishing returns. Milkfish growers in Caraga have a tendency to overstock their cages.

As indicated by the results, the project is probably not increasing the volume of output for milkfish producers. As shown, producers who adopted the stocking density recommended by the project would realize a significant decrease in production: 1,794 kg (99% confidence level.) This result is plausible in a situation where overstocking is the problem. Using the appropriate stocking density would benefit the producer by lowering costs.

ASPSI's cost function analysis for milkfish produced a statistically significant, negative coefficient for the project participation variable, which means participation in the project decreases a producer's costs per unit of output. Combining these two analyses show that milkfish producers' net income increases by more than PhP 19,000 per production cycle.

Cost Function

Totalcost = f(project, output, frycost, feedcost, laborcost, othercost)

Where:

Total cost = cost of production of lobster (P/cage)
 Project = participation to PCCP (during PCCP = 1; before PCCP = 0)
 Output = production (kg)
 Fry cost = total cost of lobster fry (P)
 Feedcost = total cost of feeds (P)
 Laborcost = total labor cost (P)
 Othercosts = costs of other inputs (boat rental, gasoline, nets) (P)

Results

totalcost	Coef.	Std. Err.	t	P>t
project	-8625.51	5141.331	-1.68	0.099
output	1.124278	0.807945	1.39	0.169
frycost	1.063007	0.099088	10.73	0
feedcost	1.002135	0.026215	38.23	0
laborcost	2.800281	1.620381	1.73	0.089
othercosts	1.324994	1.045178	1.27	0.21
cons	4474.034	5226.813	0.86	0.396
Number of Observations				65
Prob>F				0.000000
R-squared				0.9842
Adj R-squared				0.9826

Participation in the program decreases costs for fin fish producers by 8,626 PhP (90% confidence)

ANNEX 6. MEAN DIFFERENCE ANALYSIS

The tables below show the results of mean difference analysis for the 6 commodities. Statistically significant results appear in bold. Results in grey are not statistically significant. The confidence interval for statistically significant results appears under each table.

A. Mango

Total number of respondents: 40

Outcome variable	Before PCCP	After PCCP	Mean Difference	Percent Change
Yield (kg/ha)	3676	3922	246	
Cost of production (PhP/kg)	15	12	-3	
Total production (kg/farm)	5458	5981	523	
Selling price (PhP/kg)	25	28	3	12%
Total sales (PhP)	133,480	155,325	21,845	16%
Total income (PhP)	105,339	131,248	25,909	25%

94% confidence level

Results indicate that mango farmers participating in PCCP increased their incomes by an average of 25%, or 25,909 PhP per production cycle. Since the average increases in sales (16%) and selling price (12%) are less than the increase in income, the increase in income is likely due to both increased production and better prices.

B. Banana

Total number of respondents: 39

Outcome variable	Before	After	Mean Difference	Percent Change
Yield (kg/ha)	234	211	-23	
Cost of production (PhP/kg)	34	23	-11	
Total production (kg/farm)	259	298	39	
Selling price (PhP/kg)	8	9	1	13%
Sales (PhP)	1994	2682	688	35%
Total farm income (PhP)	-6035	-2829	3206	

95% confidence level

Mean difference analysis for banana yielded two statistically significant results: sales increased by an average of 35% and selling price increased by 13%. While yield and production results are not statistically significant, the relatively higher increase in sales relative to selling price indicates that increased production contributed to the increase in sales revenue.

C. Vegetables

Total number of respondents: 100

Outcome variable	Before PCCP	After PCCP	Mean Difference	Percent Change
Yield (kg/ha)	898	1,373	475	53%
Cost of production (PhP/kg)	36	21	-15	

Total production (kg)	499	813	314	63%
Selling price (PhP/kg)	42	51	9	21%
Total sales (PhP)	25,019	54,516	29,497	118%
Total farm income (PhP)	16,482	47,008	30,526	185%

95% confidence level

Mean variance analysis indicates that vegetable farmers benefited from both production and trade interventions. Compared to pre-PCCP levels, yield, production, selling price, and total sales all increased, contributing to an average increase in income of 185%.

D. Swine

Total number of respondents: 239

Outcome variable	Before PCCP	After PCCP	Mean Difference	Percent change
Total quantity produced (no. of heads)	7	14	7	
Total production (kg)	251	755	504	201%
Cost of production (PhP/kg)	4,864	4,146	-719	
Selling price (PhP/kg)	124	142	18	
Sales (PhP)	38,975	94,330	55,355	142%
Total farm income (PhP)	11,806	30,931	19,126	162%

95% confidence level

For swine farmers, mean difference analysis indicates that total production and total farm income increased significantly.

E. Fin Fish

Total number of respondents: 62

Outcome variable	Before PCCP	After PCCP	Mean Difference	Percent Change
Total quantity produced (kg)	5820	7836	2017	
Cost of production (PhP/kg)	212	62	-150	
Selling price (PhP/kg)	124	270	146	118%
Total sales (PhP)	172,751	203,072	30,320	
Total farm income (PhP)	35026	54167	19141	

99% confidence level

Mean difference analysis for fin fish yielded one statistically significant result: average selling price for fin fish increased by 146 PhP/kg.

F. Crustaceans

Total number of respondents: 105

Outcome variable	Before PCCP	After PCCP	Mean Difference	Percent Change
Total quantity produced (kg)	107	135	28	
Cost of production (PhP/kg)	2,239	1,360	-879	-39%

Selling price (PhP/kg)	1,780	2,124	344	19%
Total Sales	86,195	141,619	55,424	64%
Total farm income (Php)	21,176	76,145	54,969	260%

99% confidence level

Mean variance analysis indicates that crustacean producers made significant gains in total farm income with PCCP. An increase in selling price had a modest impact on the outcome. Since the results for production and cost of production are not statistically significant, we cannot conclude the relative impact of those variables on income.

ANNEX 7. TOTAL VOLUME AND VALUE OF TRADE

A. Total Volume and Value of Trade by Commodity

1. Mango

Total number of PCCP mango producer groups: 20

Production

	Quantity Produced (kg)	Total no. of members	Total Production (kg)	Price	Value
Before PCCP	5,299	635	3,364,865	25	84,121,625
After PCCP	5,808	635	3,688,080	27	99,578,160

Trade

	Quantity Sold (kg)	Total no. of members	Total Sales Volume	Price	Value
Before PCCP	5,137	635	3,261,995	25	81,549,875
After PCCP	5,656	635	3,591,560	27	96,972,120

2. Banana

Total number of PCCP banana producer groups: 14

Production

	Total Quantity Produced (kg)	Total Members	Volume	Price	Value
Before PCCP	265	504	133,560	8	1,068,480
After PCCP	290	504	146,160	8	1,169,280

Trade

	Quantity Sold (kg)	Total Members	Volume	Price	Value
Before PCCP	261	504	131,544	8	1,052,352
After PCCP	206	504	103,824	8	830,592

3. Crustaceans

Total number of PCCP crustacean producer groups: 44

Production

	Total Quantity Produced (kg)	Total Members	Volume	Price	Value
Before PCCP	100	1,721	172,100	1,813	312,017,300
After PCCP	113	1,721	194,473	2,228	433,285,844

Trade

	Quantity Sold (kg)	Total Members	Volume	Price	Value
Before PCCP	96	1,721	165,216	1,813	299,536,608
After PCCP	110	1,721	189,310	2,228	421,782,680

4. Swine

Total number of PCCP swine producer groups: 110

Production

	Average Volume of Production (kg per producer)	Total Number of Swine Producers	Total Volume of Production (kg)	Average Sales Price (PhP)	Total Value of Production (PhP)
Before PCCP	390	3,421	1,334,190	129	172,764,263
After PCCP	740	3,421	2,531,540	136	345,327,371

Trade

	Average Volume of Trade (kg sold per producer)	Total # of swine producers	Total Volume of Trade (kg)	Average Sales Price (PhP)	Total Value of Sales (PhP)
Before PCCP	390	3,421	1,334,190	129	172,764,263
After PCCP	740	3,421	2,531,540	136	345,327,371

5. Fin Fish

Total number of PCCP fin fish producer groups: 30

Production

	Average production per producer (kg)	Total # of Producers	Volume	Price	Value
Before PCCP	1,274	922	1,174,628	104	122,161,312
After PCCP	2,991	922	2,757,702	115	317,135,730

Trade

	Quantity Sold (kg)	Total Members	Volume	Price	Value
Before PCCP	1,272	922	1,172,784	104	121,969,536
After PCCP	2,023	922	1,865,206	115	214,498,690

B. Total Volume and Value of Trade by Province, Disaggregated by Commodity

1. Agusan del Norte

Mango

Production

Total No. of PGs = 20

	Total Quantity Produced (kg)	Total Members	Volume	Price	Value
Before PCCP	5,299	635	3,364,865	25	84,121,625
After PCCP	5,808	635	3,688,080	27	99,578,160

Trade

	Quantity Sold (kg)	Total Members	Volume	Price	Value
Before PCCP	5,137	635	3,261,995	25	81,549,875
After PCCP	5,656	635	3,591,560	27	96,972,120

Banana

Production

Total No. of PGs = 14

	Total Quantity Produced (kg)	Total Members	Volume	Price	Value
Before PCCP	265	504	133,560	8	1,068,480
After PCCP	290	504	146,160	8	1,169,280

Trade

	Quantity Sold (kg)	Total Members	Volume	Price	Value
Before PCCP	261	504	131,544	8	1,052,352
After PCCP	206	504	103,824	8	830,592

Vegetables

Production

Total No. of PGs = 6

	Total Quantity Produced (kg)	Total Members	Volume	Price	Value
Before PCCP	622	216	134,352	44	5,911,488
After PCCP	835	216	180,360	51	9,198,360

Trade

	Quantity Sold (kg)	Total Members	Volume	Price	Value
Before PCCP	571	216	123,336	44	5,426,784
After PCCP	824	216	177,984	51	9,077,184

Swine

Production

Total No. of PGs = 24

	Total Quantity Produced (kg)	Total Members	Volume	Price	Value
Before PCCP	270	670	180,900	128	23,171,481
After PCCP	610	670	408,700	141	57,328,349

Trade

	Quantity Sold (kg)	Total Members	Volume	Price	Value
Before PCCP	270	670	180,900	128	23,171,481
After PCCP	610	670	408,700	141	57,328,349

Fin Fish

Production

Total No. of PGs = 4

	Total Quantity Produced (kg)	Total Members	Volume	Price	Value
Before PCCP	2,430	143	347,490	67	23,281,830
After PCCP	5,104	143	729,872	110	80,285,920

Trade

	Quantity Sold (kg)	Total Members	Volume	Price	Value
Before PCCP	2,430	143	347,490	67	23,281,830
After PCCP	1,925	143	275,275	110	30,280,250

2. Agusan Del Sur

Vegetables

Production

Total No. of PGs = 13

	Total Quantity Produced (kg)	Total Members	Volume	Price	Value
Before PCCP	600	402	241,200	52	12,542,400
After PCCP	1,098	402	441,396	65	28,690,740

Trade

	Quantity Sold (kg)	Total Members	Volume	Price	Value
Before PCCP	598	402	240,396	52	12,500,592
After PCCP	1,066	402	428,532	65	27,854,580

Swine

Production

Total No. of PGs = 45

	Total Quantity Produced (kg)	Total Members	Volume	Price	Value
Before PCCP	660	1,387	915,420	135	123,920,405
After PCCP	1,040	1,387	1,442,480	107	154,042,439

Trade

	Quantity Sold (kg)	Total Members	Volume	Price	Value
Before PCCP	660	1,387	915,420	135	123,920,405
After PCCP	1,040	1,387	1,442,480	107	154,042,439

3. Surigao del Norte

Swine

Production

Total No. of PGs = 23

	Total Quantity Produced (kg)	Total Members	Volume	Price	Value
Before PCCP	234	743	173,862	118	20,449,648
After PCCP	492	743	365,556	111	40,558,438

Trade

	Quantity Sold (kg)	Total Members	Volume	Price	Value
Before PCCP	234	743	173,862	118	20,449,648
After PCCP	492	743	365,556	111	40,558,438

Fin Fish

Production

Total No. of PGs = 5

	Total Quantity Produced (kg)	Total Members	Volume	Price	Value
Before PCCP	313	151	47,263	124	5,860,612
After PCCP	1,654	151	249,754	104	25,974,416

Trade

	Quantity Sold (kg)	Total Members	Volume	Price	Value
Before PCCP	312	151	47,112	124	5,841,888
After PCCP	1,652	151	249,452	104	25,943,008

Crustaceans

Production

Total No. of PGs = 21

	Total Quantity Produced (kg)	Total Members	Volume	Price	Value
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Before PCCP	112	707	79,184	1,681	133,108,304
After PCCP	108	707	76,356	2,295	175,237,020

Trade

	Quantity Sold (kg)	Total Members	Volume	Price	Value
Before PCCP	110	707	77,770	1,681	130,731,370
After PCCP	108	707	76,356	2,295	175,237,020

4. Surigao Del Sur

Vegetables

Production

Total No. of PGs = 8

	Total Quantity Produced (kg)	Total Members	Volume	Price	Value
Before PCCP	450	245	110,250	29	3,197,250
After PCCP	356	245	87,220	32	2,791,040

Trade

	Quantity Sold (kg)	Total Members	Volume	Price	Value
Before PCCP	441	245	108,045	29	3,133,305
After PCCP	370	245	90,650	32	2,900,800

Swine

Production

Total No. of PGs = 18

	Total Quantity Produced (kg)	Total Members	Volume	Price	Value
Before PCCP	325	621	201,825	137	27,714,609
After PCCP	612	621	380,052	124	47,126,448

Trade

	Quantity Sold (kg)	Total Members	Volume	Price	Value
Before PCCP	260	621	161,460	137	22,171,687
After PCCP	612	621	380,052	124	47,126,448

Fin Fish

Production

Total No. of PGs = 18

	Total Quantity Produced (kg)	Total Members	Volume	Price	Value
Before PCCP	989	529	523,181	132	69,059,892
After PCCP	2,248	529	1,189,192	119	141,513,848

Trade

	Quantity Sold (kg)	Total Members	Volume	Price	Value
Before PCCP	980	529	518,420	132	68,431,440
After PCCP	2,235	529	1,182,315	119	140,695,485

Crustaceans

Production

Total No. of PGs = 10

	Total Quantity Produced (kg)	Total Members	Volume	Price	Value
Before PCCP	255	306	78,030	1,240	96,757,200
After PCCP	218	306	66,708	1,373	91,590,084

Trade

	Quantity Sold (kg)	Total Members	Volume	Price	Value
Before PCCP	231	306	70,686	1,240	87,650,640
After PCCP	210	306	64,260	1,373	88,228,980

5. Dinagat Islands

Vegetables

Production

Total No. of PGs = 18

	Total Quantity Produced (kg)	Total Members	Volume	Price	Value
Before PCCP	225	931	209,475	47	5,655,825
After PCCP	389	931	362,159	27	15,210,678

Trade

	Quantity Sold (kg)	Total Members	Volume	Price	Value
Before PCCP	222	931	206,682	27	5,580,414
After PCCP	377	931	350,987	42	14,741,454

Fin Fish

Production

Total No. of PGs = 1

	Total Quantity Produced (kg)	Total Members	Volume	Price	Value
Before PCCP	46	75	3,450	120	414,000
After PCCP	46	75	3,450	120	414,000

Trade

	Quantity Sold (kg)	Total Members	Volume	Price	Value
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Before PCCP	46	75	3,450	120	414,000
After PCCP	46	75	3,450	120	414,000

Crustaceans

Production

Total No. of PGs = 13

	Total Quantity Produced (kg)	Total Members	Volume	Price	Value
Before PCCP	49	708	34,692	2,110	73,200,120
After PCCP	75	708	53,100	2,472	131,263,200

Trade

	Quantity Sold (kg)	Total Members	Volume	Price	Value
Before PCCP	49	708	34,692	2,110	73,200,120
After PCCP	67	708	47,436	2,472	117,261,792

ANNEX 8. PARTIAL BUDGET ANALYSIS

A. Partial budget analysis by commodity

Commodity	Increase in Income (PhP)	Increase in Cost (PhP)	Net Increase in Income (PhP)
Mango	21,622	0	21,622
Banana	1,396	0	1,396
Vegetables	23,996	2,155	21,841
Swine	53,106	24,646	28,459
Finfish	41,704	27,206	14,498
Crustaceans	41,753	11,712	30,041

1. Summary of Key Results

Vegetables

Vegetable farmers across the four provinces reported different increases and decreases in costs for seeds, fertilizer, chemicals, and labor. In Agusan del Norte, costs decreased for all four inputs decreased. In Agusan del Sur, costs for fertilizer decreased but costs for chemicals increased. In Surigao del Sur, costs for seeds and labor increased while costs for fertilizer and chemicals decreased. In Dinabat Islands, costs decreased for seeds and chemicals but increased for fertilizer and labor.

These variations could be due to the specific vegetables produced, the types and amounts of input grants to producer groups, farm sizes across provinces, and individual farmers' decisions about which improved inputs and practices to apply.

Not all decreased input costs reflect increased productivity. Many farmers received certain inputs for free through the project's input grants to producer groups.

Swine

Net costs increased for all swine producers. Swine producers spent significantly more for piglets, feed, biologics, and labor, but their total returns increased by a large margin. Farmers spent more on feed than any other input, but the investment appears to increase profit. In Agusan del Norte, for example, swine farmers spent 29,113 PhP more on feed while participating in PCCP; total added costs were 56,309 PhP. Despite spending more, farmers in Agusan del Norte made an average profit of 60,985 PhP.

Crustaceans

Crustacean producers in Surigao del Norte spent more on fingerlings alone (43,303 PhP) than they earned in added returns (32,529 PhP). In Dinabat Islands, fingerlings were also the greatest cost increase (24,341 PhP), but returns increased by more (43,808 PhP). In Surigao del Sur, on the other hand, producers spent 14,660 PhP less on fingerlings.

Fin Fish

Results are not useful due to errors in data.

B. Partial budget analysis by commodity, disaggregated by province

Commodity / Province	Gains (A)		Losses (B)		Change in profit (A-B)
	Added sales	Reduced costs	Added costs	Reduced sales	
Mango					
Agusan del Norte	16,700	4,922	0		21,622
Banana					
Agusan del Norte	481	915	0		1,396
Vegetables					
Agusan del Norte	25,311	6,274	0		31,585
Agusan del Sur	48,872	704	351		49,225
Surigao del Sur	0	3,446	4,040	3,081	-3,675
Dinabat Islands	14,950	2,263	2,143		14,800
Swine					
Agusan del Norte	117,294	0	56,309		60,985
Agusan del Sur	36,829	0	19,133		17,696
Surigao del Norte	26,862		15,760		11,102
Surigao del Sur	43,951	3,460	7,722		39,689
Crustaceans					
Surigao del Norte	32,529	1,363	51,342		-17,449
Surigao del Sur	153,384	20,260	173,644	6,579	167,065
Dinabat Islands	81,707	6,300	37,899		43,808
Fin Fish					
Agusan del Norte	130,298	13,276	3,063		140,511
Surigao del Norte	133,670	5,750	7,023		132,397
Surigao del Sur	121,543		120,997		546
Dinabat Islands					

C. Mango

1. Mango, Agusan del Norte

Gains (A), PhP		Losses (B), PhP	
Added Returns Sales	16,700	Added Costs	
Total Added Returns	16,700	Total Added Costs	0
Reduced Costs Fertilizer Chemicals	1,151 3,357	Reduced Returns	

Labor	414		
Total Reduced Costs	4,922	Total Reduced Returns	0
Sub – Total (A)	21,622	Sub – Total (B)	0
Net Change in Profit (A-B):		21,622	

D. Banana

1. Banana, Agusan del Norte

Gains (A), PhP		Losses (B), PhP	
Added Returns		Added Costs	
Sales	481		
Total Added Returns	481	Total Added Costs	0
Reduced Costs		Reduced Returns	
Fertilizer	340		
Chemicals	575		
Total Reduced Costs	915	Total Reduced Returns	0
Sub – Total (A)	1,396	Sub – Total (B)	0
Net Change in Profit (A-B):		1,396	

E. Vegetables

1. Vegetables, Agusan del Norte

Gains (A), PhP		Losses (B), PhP	
Added Returns		Added Costs	
Sales	25,311		
Total Added Returns	25,311	Total Added Costs	0
Reduced Costs		Reduced Returns	
Seeds	1,236		
Fertilizer	451		
Chemicals	742		
Labor	3,845		
Total Reduced Costs	6,274	Total Reduced Returns	0
Sub – Total (A)	31,585	Sub – Total (B)	0
Net Change in Profit (A-B):		31,585	

2. Vegetables, Agusan del Sur

Gains (A), PhP		Losses (B), PhP	
Added Returns		Added Costs	
Sales	48,872	Chemicals	351
Total Added Returns	48,872	Total Added Costs	351
Reduced Costs		Reduced Returns	

Fertilizer	704		
Total Reduced Costs	704	Total Reduced Returns	0
Sub – Total (A)	49,576	Sub – Total (B)	351
Net Change in Profit (A-B):		49,225	

3. Vegetables, Surigao del Sur

Gains (A), PhP		Losses (B), PhP	
Added Returns		Added Costs	
Sales	0	Seeds	2,340
		Labor	1,700
Total Added Returns	0	Total Added Costs	4,040
Reduced Costs		Reduced Returns	
Fertilizer	1,504	Reduced Sales	3,081
Chemicals	1,942		
Total Reduced Costs	3,446	Total Reduced Returns	3,081
Sub – Total (A)	3,446	Sub – Total (B)	7,121
Net Change in Profit (A-B):		-3,675	

4. Vegetables, Dinagat Islands

Gains (A), PhP		Losses (B), PhP	
Added Returns		Added Costs	
Sales	14,950	Fertilizer	272
		Labor	2,141
Total Added Returns	14,950	Total Added Costs	272
Reduced Costs		Reduced Returns	
Seeds	2,158		
Chemicals	105		
Total Reduced Costs	2,263	Total Reduced Returns	0
Sub – Total (A)	17,213	Sub – Total (B)	2,413
Net Change in Profit (A-B):		14,800	

F. Swine

1. Swine, Agusan del Norte

Gains (A), PhP		Losses (B), PhP	
Added Returns		Added Costs	
Sales	117,294	Piglets	7,137
		Feeds	29,113
		Biologics	1,747
		Labor	18,312
Total Added Returns	117,294	Total Added Costs	56,309
Reduced Costs	0	Reduced Returns	

Total Reduced Costs	0	Total Reduced Returns	0
Sub – Total (A)	117,294	Sub – Total (B)	56,309
Net Change in Profit (A-B):		60,985	

2. Swine, Agusan del Sur

Gains (A), PhP		Losses (B), PhP	
Added Returns Sales	36,829	Added Costs Piglets Feeds Biologics Labor	4,963 9,547 643 3,980
Total Added Returns	36,829	Total Added Costs	19,133
Reduced Costs		Reduced Returns	
Total Reduced Costs	0	Total Reduced Returns	0
Sub – Total (A)	36,829	Sub – Total (B)	19,133
Net Change in Profit (A-B):		17,696	

3. Swine, Surigao del Norte

Gains (A), PhP		Losses (B), PhP	
Added Returns Sales	26,862	Added Costs Piglets Feeds Biologics Labor	5,847 8,085 193 1,635
Total Added Returns	26,862	Total Added Costs	15,760
Reduced Costs		Reduced Returns	
Total Reduced Costs	0	Total Reduced Returns	0
Sub – Total (A)	26,862	Sub – Total (B)	15,760
Net Change in Profit (A-B):		11,102	

4. Swine, Surigao del Sur

Gains (A), PhP		Losses (B), PhP	
Added Returns Sales	43,951	Added Costs Feeds Biologics	7,422 300
Total Added Returns	43,951	Total Added Costs	7,722
Reduced Costs Piglets Labor	1,449 2,011	Reduced Returns	
Total Reduced Costs	3,460	Total Reduced Returns	0
Sub – Total (A)	47,411	Sub – Total (B)	7,722

Net Change in Profit (A-B):	39,689
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G. Crustaceans

1. Crustaceans, Surigao del Norte

Gains (A), PhP		Losses (B), PhP	
Added Returns Sales	32,529	Added Costs Fingerlings	43,303
		Feeds	5,711
		Labor	2,328
Total Added Returns	32,529	Total Added Costs	51,342
Reduced Costs		Reduced Returns	
Total Reduced Costs	1,363	Total Reduced Returns	0
Sub – Total (A)	33,893	Sub – Total (B)	51,342
Net Change in Profit (A-B):		-17,449	

2. Crustaceans, Surigao del Sur

Gains (A), PhP		Losses (B), PhP	
Added Returns Sales	153,384	Added Costs Feeds	5,829
		Bamboo Poles	750
Total Added Returns	153,384	Total Added Costs	6,579
Reduced Costs Fingerlings	14,660	Reduced Returns	
Net	3,950		
Labor	1,650		
Total Reduced Costs	20,260	Total Reduced Returns	0
Sub – Total (A)	173,644	Sub – Total (B)	5,829
Net Change in Profit (A-B):		167,065	

3. Crustaceans, Dinagat Islands

Gains (A), PhP		Losses (B), PhP	
Added Returns Sales	75,407	Added Costs Fingerlings	24,341
		Bamboo Poles	2,046
		Rental Expenses	9,750
		Gasoline	1,762
Total Added Returns	75,407	Total Added Costs	37,899
Reduced Costs Feeds	2,750	Reduced Returns	
Net	1,104		
Styrofoam	2,446		
Total Reduced Costs	6,300	Total Reduced Returns	0

Sub – Total (A)	81,707	Sub – Total (B)	37,899
Net Change in Profit (A-B):		43,808	

H. Fin Fish

1. Fin Fish, Agusan del Norte

Gains (A), PhP		Losses (B), PhP	
Added Returns		Added Costs	
Sales	130,298	Fingerlings	3,063
Total Added Returns	130,298	Total Added Costs	3,063
Reduced Costs		Reduced Returns	
Feeds	13,276		
Total Reduced Costs	13,276	Total Reduced Returns	0
Sub – Total (A)	143,574	Sub – Total (B)	3,063
Net Change in Profit (A-B):		140,511	

2. Fin fish, Surigao del Norte

Gains (A), PhP		Losses (B), PhP	
Added Returns		Added Costs	
Sales	133,670	Fingerlings	5,690
		Net	1,333
Total Added Returns	133,670	Total Added Costs	7,023
Reduced Costs		Reduced Returns	
Feeds	4,250		
Bamboo Poles	1,500		
Total Reduced Costs	5,750	Total Reduced Returns	0
Sub – Total (A)	139,420	Sub – Total (B)	7,023
Net Change in Profit (A-B):		132,397	

3. Fin Fish, Surigao del Sur

Gains (A), PhP		Losses (B), PhP	
Added Returns		Added Costs	
Sales	121,543	Fingerlings	23,107
		Feeds	93,550
		Net	2,733
		Bamboo Poles	1,607
Total Added Returns	121,543	Total Added Costs	120,997
Reduced Costs		Reduced Returns	
Total Reduced Costs	0	Total Reduced Returns	0
Sub – Total (A)	121,543	Sub – Total (B)	120,997
Net Change in Profit (A-B):		546	

4. Fin Fish, Dinagat Islands

Gains (A), PhP		Losses (B), PhP	
Added Returns Sales	0	Added Costs Net	2,700
Total Added Returns	0	Total Added Costs	2,700
Reduced Costs		Reduced Returns	
Total Reduced Costs	2,700	Total Reduced Returns	0
Sub – Total (A)	2,700	Sub – Total (B)	2,700
Net Change in Profit (A-B):		0	

ANNEX 9. LOANS TO BENEFICIARIES

1. Loans by beneficiary, province, and financial institution

Financial Institution	Number of loans			Loan Amount (PhP)		
	Male	Female	Total	Male	Female	Total
Agusan del Norte						
FICCO	114	82	196	9,809,611	8,366,610	18,176,221
Rizal Micro Bank	33	7	40	3,720,000	725,000	4,445,000
Total	147	89	236	13,529,611	9,091,610	22,621,221
Agusan del Sur						
FICCO	115	172	287	7,363,068	9,787,302	17,150,370
Rizal Micro Bank	10	30	40	965,000	4,330,000	5,295,000
Total	125	202	327	8,328,068	14,117,302	22,445,370
Dinagat Islands						
FICCO	74	77	151	5,914,543	5,462,656	11,377,199
Total	74	77	151	5,914,543	5,462,656	11,377,199
Surigao del Norte						
FICCO	138	149	287	12,152,889	13,035,490	25,188,379
Rizal Micro Bank	2	2	4	250,000	300,000	550,000
Cantilan Bank	7	22	29	1,100,000	350,000	1,450,000
SEDFI	1	1	2	10,000	10,000	20,000
Total	148	174	322	13,512,889	13,695,490	27,208,379
Surigao del Sur						
FICCO	281	126	407	28,514,052	11,384,318	39,898,370
Rizal Micro Bank		1	1		200,000	200,000
Cantilan Bank	4	23	27	2,618,000	578,000	3,196,000
Total	285	150	435	31,132,052	12,162,318	43,294,370
All						
FICCO	722	606	1328	63,754,163	48,036,376	111,790,539
Rizal Micro Bank	45	40	85	4,935,000	5,555,000	10,490,000
Cantilan Bank	11	45	56	3,718,000	928,000	4,646,000
SEDFI	1	1	2	10,000	10,000	20,000
Total	779	692	1471	72,417,163	54,529,376	126,946,539

2. Average loan amount (in PhP) by commodity

Commodity	Average Loan Amount (PhP)		
	FICCO	Cantilan Bank	Rizal Micro Bank
Banana	8,000		
Vegetables	26,200	15,000	
Swine	114,393	150,000	
Finfish	277,687	27,500	15,000
Crustaceans	90,451		

3. Horticulture loans (PhP) by province

Source of Loan/Commodity	Agusan del Norte	Agusan del Sur	Surigao del Norte	Total
Cantilan Bank				
Vegetables			700,000	700,000
Cantilan Bank Total			700,000	700,000
FICCO				
Banana	2,626,188			2,626,188
Mango	1,042,550			1,042,550
Vegetables	286,430	115,530		401,960
FICCO TOTAL	3,955,168	115,530		4,070,698
Total	3,955,168	115,530	700,000	4,770,698

4. Livestock loans (PhP) by province

Source of Loan/Commodity	Agusan del Norte	Agusan del Sur	Surigao del Norte	Surigao del Sur	Total
Cantilan Bank			750,000		750,000
FICCO	8,309,501	15,660,351	5,998,353	9,347,516	39,315,721
Rizal Micro Bank	125,000	4,130,000	550,000		4,805,000
Unclassified		1,165,000			1,165,000
Total	8,434,501	20,955,351	6,548,353	9,347,516	46,035,721

5. Fisheries loans (PhP) by province

Source of Loan/Commodity	Agusan del Norte	Agusan del Sur	Dinagat Islands	Surigao del Norte	Surigao del Sur	Total
Cantilan Bank						
Milkfish (Garungan)					1,350,000	
Milkfish (Growout)					1,846,000	
Cantilan TOTAL					3,196,000	3,196,000
FICCO						
Milkfish (Garungan)	2,181,604					2,181,604
Milkfish (Growout)	3,729,948				8,000,810	11,730,758
Prawn					10,043,752	10,043,752
Siganid					100,000	100,000
Tilapia		440,239			183,652	623,891
Vannamei					7,462,330	7,462,330
Mudcrab				25,085	1,460,010	1,485,095
Lobster		934,250	11,377,199	19,164,941	3,300,300	34,776,690
FICCO TOTAL	5,911,552	1,374,489	11,377,199	19,190,026	30,550,854	68,404,120
Rizal Microbank						
Milkfish (Garungan)	4,320,000					4,320,000
Milkfish (Growout)					200,000	200,000
Rizal TOTAL	4,320,000				200,000	4,520,000
SEDFI						
Lobster				20,000		20,000
SEDFI TOTAL				20,000		20,000

TOTAL	10,231,552	1,374,489	11,377,199	19,210,026	33,946,854	76,140,120
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ANNEX 10. FOCUS GROUP DISCUSSION REPORTS

A. Microfinance Institutions

I. Executive Summary

This report summarizes the key findings from the focus group discussions conducted with microfinance institutions involved in the implementation of the Philippine Cold Chain Project in Caraga Region. The discussions revealed a positive perception on the project performance. The FGD gave valuable insights on the problem encountered by the PCCP partners in the implementation of the project. Recommendations for sustainability were also provided.

II. Methodology

Focus group discussions were held on February 4 with the Microfinance Institutions and People in Firms particularly, input suppliers to explore their views on PCCP interventions, their perception on project performance, initial impacts of the project, problems and opportunities. Recommendations for project sustainability were also determined.

III. Limitation

The team had difficulty in getting the participation of people in firms. We have been trying to reach Eastwest Seed Philippines as well as other input suppliers, traders and processors, but to no avail. The Eastwest provide technical services to producer groups through its Farmer Field School methodology. They trained farmers appropriate technologies and techniques for successful horticulture production.

Profile of Respondents

Three (3) microfinance institutions participated in the FGD: 1) First Community Cooperative (FICCO); 2) Rizal Microbank; and 3) Cantillan Bank. The participants from FICCO were from two (2) branches: Butuan City and M. Calo, represented by the branch managers and account officers.

FICCO	Rizal Microbank	Cantillan Bank
Branch Manager- FICCO M. Calo Account Officer- FICCO M. Calo	Head- Butuan Branch Account Officer- Butuan Branch	Head- Butuan Branch
Branch Manager- FICCO Butuan Account Officer- FICCO Butuan		

Rizal Microbank was represented by the Branch Head and Account Officer. Cantillan Bank, on the other hand, was represented by the Branch Head.

Findings

Special Agricultural Project Loan (SAPL)

a. Type of Loans

Under the Special Agricultural Project Loan (SAPL), there are two types of loan: 1) producers covering aquaculture, horticulture and livestock (swine) production; and 2) input supplier loan.

i. Producers

Under the aquaculture loan, the producers may apply for the production of the following commodities: 1) bangus; 2) danggit; 3) crabs; 4) lobster; 5) prawns; 6) shrimp (vannamei); 7) tilapia; and 8) lapu-lapu. For horticulture: 1) mango; 2) banana (cardava); 3) ampalaya; 4) eggplant; 5) sweet pepper; and 6) lettuce. Lastly for livestock, only swine production is covered.

ii. Suppliers

Fingerlings and agri-vet suppliers that are members of FICCO and are PCCP-accredited may also apply for loans provided they have been engaged in the business for more than 1 year. The maximum loanable amount is PhP500,000.00 payable for 12 months. The input suppliers are required to issue post-dated checks.

b. Loan Procedure

i. Requirements

To avail the loan, the following are required from each applicant:

1. The beneficiaries should undergo the PCCP-prescribed training programs and attend a half-day pre-membership seminar with FICCO.
2. Must have existing facility
3. Security of tenure
4. Must be experienced in the area of business or at the least, PCCP-trained

The documentary requirements include the following:

1. Filled-up application form
2. Loan structure with business plan/project proposal
3. Recommendation from the chairman of the PG
4. Co-maker
5. Valid IDs of the applicant and co-maker
6. Accomplished PCIC forms

The amount of loan will vary depending on the project proposal and commodity type ranging from PhP10,000 to more than PhP500,000. The amount proposed should be justified. The cooperative determines the capacity to pay of the borrower by conducting credit investigations/field visits.

The deposit requirement for any loan amount will be the same depending on when the loan is being applied (i.e. first, second, third). During the first availment of loan, no deposit equity shall be required. The applicant would only be required to pay PhP170.00 for the opening of the account: PhP100 share capital, PhP 40 MBA enrollment and PhP 30 membership fee. The registration fee of PhP50 may be given within five (5) months.

To avail a second loan, the beneficiary should have been converted into a regular member with deposit of at least PhP3,000 and savings of PhP500 or 10% of the net income of the project whichever is higher.

The loans are designed to be paid upon harvest.

c. Interest rates and service fees

No matter the loan term, there is a fixed interest rate of 13% per annum for both producers and input suppliers. The difference however can be observed on service fees where higher is charges for loans of more than 1 year.

Interest on loan and service fees

Loan term	Interest	Service fees
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Less than 1 year	13% per annum	1% for the whole term
1 year up	13% per annum	2% for the whole term

Input Suppliers

The loan structure for input suppliers cover the fingerlings suppliers and agri-vet suppliers. The supplier should be a regular FICCO member and accredited by the PCCP. Given this, the supplier is expected to have completed the entrepreneurial and/or business management training offered by PCCP. Moreover, the supplier should be engaged in the business for more than 1 year. The maximum loanable amount is PhP500,000 payable in 1 year. The supplier should also issue post-dated checks to FICCO for security purposes. Unlike in the producers where service fee is subsidized by PCCP, the supplier is charged but still a very minimal one-time service fee of 1%.

Positive impacts

There have been observed increase in the number of borrowers to venture on various agricultural and aquaculture production. The increase in number of PCCP beneficiaries engaged in the production of different commodities also increased the number of traders/buyers who are in need of financial services. This provided a new opportunity to FICCO. New loan policies were developed by the cooperative to include the traders/buyers in the credit line facility.

Problems in implementation

Low repayment rate continued to be an issue. The program started strong where the distribution of good payor is said to be at about 80% since it started releasing loans in 2014. Drastic decline has been observed since 2017 with good payors estimated to be down to around 20%. The main contributing factor is said to be the shift in policy direction. The sudden decision to stop the release of new loans left some of the producers with nothing to finance the production of different agricultural commodities thereby leading to inability to pay. The production is also easily affected by climatic factors and infestation especially for crops.

For swine, marketing difficulties and animal deaths were problems. Marketing was an issue because farmers do not know where to sell their produce. This highlights the importance of timing in the implementation designs. The pigs are ready; the market is not. Because of this, the hogs are either sold at a very low price or slaughtered for consumption.

In some instances, the account officers would take the initiative to report to PCIC the cases of death of animals and calamity so farmers could avail the insurance. But even at PCIC, there is lack of manpower and logistics to do field evaluation to validate damage claims. The farmer-borrowers are not able to maximize the insurance to take care of their debts. In other cases, the farmers are not aware how to file/apply for claims. Others are even not aware at all that their loan with FICCO also covers insurance.

The MFIs think that the way information was processed and disseminated may have also affected the implementation of the program. Because PCCP served as loan guarantee provider, some farmers did not consider the service that they received as a loan but as a grant. Some did not pay intentionally.

The rise in the number of delinquent borrowers caused shortage in manpower and logistics on the side of FICCO to manage the collection of debts. The frequent visits to borrowers to collect payments have been costly.

1. Perception on Project Performance

The MFIs have the same rating on their perceived effectiveness of the project. All rated the project's level of effectiveness at 4. Despite some problems encountered, FICCO believes that overall it is effective. Access to financial resources increased, their credit line facility expanded and the process of accessing loans was modified in partnership with PCCP to accommodate farmers and ensure that their business venture would succeed. FICCO increased its agricultural, aquaculture and livestock loan products in terms of commodities and loan amount. As a consequence, loan borrowers also increased.

But there is still room for improvement particularly in addressing issue of delinquent accounts. The project would have been more effective if the risk in the collection of debts had been considered in planning and implementation. There was also weak monitoring if the loan was utilized for its intended purpose.

In the case of Rizal Microbank and Cantillan Bank, the two have witnessed high motivation of farmers from their recent engagements. With already financially literate farmers, they believe that process of application and collection would be much easier. Even more as these farmers are also supported with technical assistance in growing their farm.

2. Initial impacts/immediate outcomes of the project

Because more small hold farmers were able to access loans, they were also able to scale up production and use modern techniques/technologies. They were also linked to the accredited input suppliers thereby ensuring quality inputs are used in the production process. In the latter part of the project, especially for hogs, more facilities have become available for slaughter and meat cutting.

3. Recommendations for project sustainability

Collection remains a threat for sustainability. The roles and responsibilities of each party involved in the provision of loan should be clearly stated. Monitoring if the loans were utilized for intended purpose and the status of the project itself should be a joint responsibility of both the project implementer and the MFIs. Strong partnership with government agencies should also be developed (e.g. PCIC). The PCIC should be invited in the training/seminars to inform the farmers of the benefits and procedures to apply for claims. They should also be accountable in the processing of claims.

Monitoring of project status is very important. Without proper assistance, farmers use combined techniques which is not always leading to good quality of the product. The problem is compounded when traders would come and buy produce at a very low price because of perceived low quality of backyard raising.

The MFIs also recommended continued training on credit worthiness to improve the mentality of the borrowers. It should be cleared out from the start that they are loans, subject for payment. The personnel involved in providing financial services should also be trained on customer handling. The training, coaching, orientation, and support needed for personnel to deliver the intervention should be clearly defined.

More focus should be given on the marketing side of the project. The implementation have been biased on the production side. Information on prices should also be available to farmers to ensure that they are not disadvantaged by traders. The linking of farmers to buyers and institutional markets should be fast tracked.

The design of the program should be re-evaluated as the project ends. The implementer should make sure that production and marketing interventions are already strategically located in proper areas. There should be zoning in the production of different commodities and the establishment of facilities in support to them should be matching to achieve the desired outcomes of the project. The interventions need not only be effective but practical. The level of efficiency should be considered (e.g. access to facilities- time, money, materials).

B. Producer Groups

I. Executive Summary

This report summarizes the key findings from the focus group discussions conducted with the producer groups (PGs) among the horticulture, livestock and fisheries sectors under the Philippine Cold Chain Project (PCCP) in Caraga Region. The discussions highlighted the interventions provided to the PGs and how they were capacitated by PCCP, issues and problems encountered during the project implementation were discussed as well as the suggestions on how the benefits from the project can be sustained. In general, the farmer beneficiaries from the PGs rated the PCCP very effective in implementing the project.

II. Methodology

A. Profile of the Respondents

The FGDs were conducted with the respective PGs from the three sectors, one FGD per sector. Selected PG representatives from all the five provinces participated in the series of FGDs conducted on January 30-February 1, 2019 in Butuan City (horticulture group), Surigao City (fisheries group) and San Francisco City (livestock group). There were 38 PG participants, of which 50% are female and 50% are male (Table 1). These participants represent 38 PGs, 50% of which were formed by PCCP.

Farmers from the horticulture sector are vegetable “pinakbet” growers and banana and mango farmers. The vegetables being cultivated are eggplant, tomato, okra, string beans, bell pepper, and bitter melon. For the plantation crops, carabao mango and cardava or saba are grown.

Table 1. Focus group discussion participants: Producer Groups

Province	Horticulture		Livestock		Fisheries		All	
	Male	Female	Male	Female	Male	Female	Male	Female
Agusan del Norte	3	1		4	3		6	5
Agusan del Sur	3		1	2			4	2
Surigao del Norte					1	1	1	1
Surigao del Sur	2		3	1	2	3	7	4
Dinagat Islands	1	3				4	1	7
TOTAL	9	4	4	7	6	8	19	19

III. Highlights Producer Group FGD

A. Development problems in CARAGA

In general, farmers from all sectors considered limited sources of viable seeds or animal stock and source of financial capital for the production of vegetables, swine and fisheries products as the major concerns to develop these sectors (Table 2). Farmers pointed out that some of the seeds coming from the Department of Agriculture have low germination rate, hence, poor production. For the capital, farmers usually do not have access to loans from formal institutions like cooperatives or banks.

Table 2. Development issues in Caraga by sector

HORTICULTURE	LIVESTOCK	FISHERIES
1- Limited source of viable seeds for vegetable production	1- Limited source of piglets as initial stock for swine raising	1- Limited source of fingerlings for milkfish, unpredictable supply of lobster seedlings (since coming from the wild)
2- Limited financial capital for vegetable production	2- Limited financial capital to sustain the requirement for feeds	2- High incidence of diseases (e.g. white spots for mangrove crabs)
3- Low prices for vegetable products	3- Limited number of agricultural technicians to provide technical assistance, especially during disease outbreaks	3- High mortality of fingerlings and produce during transportation
4- Limited knowledge of proper handling, packaging and transporting techniques	4- Limited market to sell swine/meat products	4- Poor water quality due to pollution

B. Validation of the PCCP Interventions

1. Introduction of PCCP in Caraga

Farmer participants joined the PCCP in 2015. In 2015, PG formation and initial trainings were conducted. This was validated with the PCCP Team which indicated that the initial two years (2013-2014) of the project were devoted to administrative concerns and forging partnerships and linkages.

The PCCP team introduced the project in coordination with the LGUs, accompanied by agricultural technicians or commodity experts from the offices of the PAO and PVET.

2. PCCP Interventions

a. Trainings

Training provided by PCCP focused on production technologies to increase productivity and improved post-harvest practices. Table 3 presents the major technological interventions provided to the farmers.

In addition, farmers from the horticulture sector pointed out of the soil test conducted by PCCP. Most of the farmers mentioned that it was the first time that their farms were tested for soil quality for proper fertilizer recommendation and soil management.

2. Table 3. PCCP training interventions for farmers

Horticulture	Livestock	Fisheries
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1- Seed production including seed selection and production of planting materials	1- Feeding management and FCR	1- Feeding management and FCR including raising feeds (e.g. sea urchins) for lobster
2- Proper fertilizer and pesticide application considering the number and timing of application	2- Off-floor dressing and use of slaughter houses	2- Optimal stocking density for milkfish
2- Production of organic inputs and alternative pesticides (e.g. FFJ, plant juices, insect traps, etc.)	3- Meat processing	3- Management of resources for wildlings of lobster
3- Maintenance and sanitation in banana plantation to manage BBTV	4- Organizational development	4- Checking of water quality
4- Post-harvest techniques to prolong the shelf life of the vegetables (e.g. proper handling of products,		4- Post-harvest management and practices (e.g. maintenance of temperature level during transport, use of refractometer, etc.)
5- Sorting and grading		
6- Use of plastic crates in transporting vegetables		
7- Organizational development		
b. Small in-kind grants (SIG)		

The small in-kind grants are material inputs provided to selected PGs. The following are the material inputs received by the PGs.

3. Table 4. Small in-kind grants provided to producer groups

Horticulture	Livestock	Fisheries
1- Drip irrigation	1- Piglets and gilts	1- Milkfish fingerlings, lobster wildlings/seedlings
2- Plastic crates		2- Refractometer
3- Power sprayer		3- Washing tub/banyera
4- Drums		4- Plastic crates
5- Water pump		
6- Washing tub		
7- Weighing scale		
8- Plastic mulch		

For the vegetable growers, the beneficiaries were confused of the mechanism in paying the SIG to serve as the seed money for the PG. It was not explained to them that the material inputs will be paid back to the PG. Collection was made by Eastwest and once the PGs have their bank accounts, the money will be given back for deposit to serve as the seed money or revolving fund of the PGs.

c. Market linkages

Market trade fairs, buyer-seller events/fora, direct linking to buyers (especially with lobsters), and clustering approach for agro-enterprise development were organized. Farmers are now knowledgeable of a number of buyers, hence, they can negotiate better prices among traders.

The community organizing technician (COT) and provincial coordinators (PCs) were very material in directly linking the farmers to the buyers.

d. Financial Assistance

All the farmers noted of the very important assistance provided by PCCP in accessing loan from FICCO. Majority are first time borrowers from formal institution like FICCO. The farmers emphasized that the “Special Production Loan Assistance (SPLA)” provided them easy access loan for the capital requirement needed in the production of vegetables, swine and fisheries commodities.

In accessing the loan, no capital build-up is needed. Borrowers were required of the P350.00 fee for documents and meals during the cooperative seminar and attendance to the cooperative seminar.

The SPLA for the various commodities is detailed in Table 5. Farmers are receiving material inputs equivalent to the amount of loan, no cash is given to them. The timing of loan releases is based on the production cycle and actual period of input (e.g. fertilizer, pesticide, feeds, etc.) application. This means that the initial release of loan is when the seeds, piglet or fry/fingerlings are already available. Initial set of material inputs provided include the seeds or animal stock and the initial fertilizers or feeds needed (e.g. starter).

Loan application and release were fast which lasted only for five working days. However, major bottleneck is the limited availability of seeds and initial animal stock which caused delay in loan releases. Another major concern is the abrupt change in the institutional arrangement between FICCO and PCCP. Some of the loans were not released anymore despite construction of pigpens as farmer counterpart.

4. Table 5. SPLA of FICCO under the PCCP, by sector.

Commodity	Amount of Loan	Details of Loan	Interest Rate and Loan Duration
Horticulture	At least P10,000.00	Loan is for seeds, fertilizers and pesticides. Some materials like plastic mulch can also be included.	13% per annum. Interest rate depends on the production cycle/duration. Usually loan is for 4 months or 4.33% for the vegetable production.
Swine	P91,200.00	Loan is computed P7,600 per piglet. This is computed based on a 12-	13% per annum. Interest rate depends on the

		piglet level production. The loan includes the cost of piglet and the necessary feeds needed.	production cycle/duration. Usually loan is for 4 months or 4.33% for the gestation of hog fattener.
Fisheries	P150,000.00 – P250,000.00	Loan window is quite large since the cost of production is also high.	13% per annum. Interest rate depends on the production cycle/duration.

C. Effectiveness of the PCCP Implementation

1. PCCP Effectiveness

In terms of effectiveness, all the farmers rated PCCP as very effective (numerical rating of 4-5, 5 being the highest). Farmers are really grateful of the assistance provided by PCCP especially on the knowledge imparted to them as well as the introduction to formal loans through FICCO.

It was also noted that the COTs and PCs are really very helpful and can be approached any time. They have provided an enabling environment for the farmers to access technological interventions both for production and post-harvest as well as addressing issue on capital requirement through the easy-access loan provided by SPLA of FICCO.

2- Initial Outputs Observed

The following are the initial outputs effects observed by the farmers.

5. Table 6. Observed PCCP outputs, by sector.

Horticulture	Livestock	Fisheries
1- Increased productivity by at least 20%	1- Improved quality of meat/carcass	1- Increased productivity of fisheries commodities/products
2- Improved quality of produce	2- Improved knowledge on feeding ratio	2- Reduced mortality during transport of fingerlings/fry
3- Prices received were increased:	3- Increased knowledge of technological interventions to improve production and breed of animals (e.g. adoption of AI)	3- Improved quality of produce
Bitter gourd – from P30.00/kg to P65.00/kg	4- Increased access/use of the established slaughter houses. If slaughtering is still done in the barangays, off-	4- Increased knowledge of the market (e.g. increased linkage to more traders)
String beans – from P10.00/kg to P35.00/kg		5- Increased access to input suppliers
Eggplant – from P20.00/kg to P35.00/kg		

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|--|---|
| Tomato – from
P250.00/crate to
P500.00/crate | floor slaughtering is
ensured. |
| Bell pepper – from
P45.00/kg to P85.00/kg | 5- Increased supply of
locally-sourced meat
and animal stocks (e.g.
piglets, gilts and semen
for the AI) |
| 4- Increased knowledge of
the market (e.g.
increased linkage to
more traders) | 6- Increased knowledge of
the market (e.g.
increased linkage to
more traders) |
| 5- Farmers practice
improved technologies
and plant varieties | 7- Policies or local
ordinances have been
crafted for the strict
implementation of the
policy prohibiting the
slaughtering of animals
in unauthorized areas
(e.g. backyard). |
| 6- Farmers practice
improved post-harvest
practices (e.g.
prolonging the shelf life
of some leafy
vegetables) and
perform sorting and
grading | |

D. Issues and Problems

The farmers provided the following issues observed in the project implementation.

Horticulture	Livestock	Fisheries
1- Delayed release of small in-kind grant (SIG).	1- Delayed release of small in-kind grant (SIG).	1- Mortality is high for the initial fingerlings provided.
2- No standard set of materials/SIGs was given.	2- No policies/procedure in claiming insurance. Farmers do not know how to claim insurance when animals die due to disease or calamity.	2- Delayed release of small in-kind grant (SIG).
3- No policies/procedure in claiming insurance. Farmers do not know how to claim insurance when crops are damage of calamities/ diseases/pests.	3- Limited availability of swine stock or piglets hence, farmers cannot access loan.	3- No policies/procedure in claiming insurance. Farmers do not know how to claim insurance when animals die due to disease or calamity.
4- Policies in managing the SIG is not clear. There was confusion in raising the seed money through the payment from SIG.	4- The mechanism for the repayment scheme for the initial gilt provided (four (4)-25kg pigs per gilt) is not clear to the farmers.	4- Changes in mechanism/policy for availing loan with FICCO is not also properly provided to farmers. They just learned of the arrangement when they
5- Some farmers were not able to avail of the	5- Changes in mechanism/policy for availing loan with FICCO	

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|--|---|--|
| <p>FICCO loan due to outstanding loans of PG members from the livestock and fisheries sectors.</p> <p>6- Changes in mechanism/policy for availing loan with FICCO is not also properly provided to farmers. They just learned of the arrangement when they cannot anymore access the loan.</p> | <p>is not also properly provided to farmers. They just learned of the arrangement when they cannot anymore access the loan.</p> | <p>cannot anymore access the loan.</p> |
|--|---|--|

E. Recommendations for Sustainability

In terms of sustainability, farmers believed that the benefits derived from PCCP will be sustained, especially if PCCP will be extended. The LGU was not seen as a vehicle to continue the project, since majority of the initiatives of the government have stopped.

The following were the recommendations for project sustainability:

6. Table 7. Sustainability measures for PCCP

Horticulture	Livestock	Fisheries
1- Similar project will be implemented in Caraga or if the project will be extended.	1- Federation of PGs to be stronger. The federation will also serve as the key unit to oversee the development of the PGs and the whole swine industry in the region.	1- Similar project will be implemented in Caraga or if the project will be extended.
2- Continuous conduct of trainings on technical aspects		5- Continuous conduct of trainings on technical aspects
3- More trainings on crop insurance and loan management	2- Continuous conduct of trainings on technical aspects	6- More trainings on crop insurance and loan management
4- Facilities/infrastructure will be provided	3- More trainings on crop insurance and loan management	
5- Source of capital will be provided		

C. Government Line Agencies and Local Government Units

I. Executive Summary

This report summarizes the key findings from the focus group discussions conducted with the government line agencies and local government units (LGUs) which participated in the implementation of the Philippine Cold Chain Project (PCCP) in Caraga Region. The discussions highlighted the key roles of these institutions in the implementation of PCCP, the issues and problems encountered during the project implementation as well as the suggestions on how the benefits from the project can be sustained. In general, the people in government viewed the cold chain project as a very ambitious initiative but doable. For the case of Caraga, the cold chain project still has a very long way to go before its objectives can be fully achieved.

II. Methodology

A. Profile of the Respondents

The FGDs were conducted with key government line agencies and LGUs involved in the PCCP implementation on February 4, 2019 at the Embassy Hotel, Butuan City. The following were the participants during the FGD, 45% male and 55% female (Table 1).

The line agencies that participated in the FGD included the Department of Trade and Industry (DTI), Bureau of Fisheries and Aquatic Resources (BFAR), Department of Agricultural Regional Field Office (DA-RFO), National Meat Inspection Services (NMIS) and the Department of Agrarian Reform (DAR). On the other hand, LGU representatives came from Dinagat Island, Agusan del Norte and Agusan del Sur. On the other hand key informant interviews were conducted with LGU representatives from Surigao del Norte and Surigao del Sur.

Table 1. FGD participants from the people in government.

GOVERNMENT OFFICE	MALE	FEMALE	ALL
Line Agencies	2	3	5
Local Government Unit	3	3	6
TOTAL	5	6	11

III. Highlights of the FGD with the members

A. Development Problems in CARAGA

Key problems in relation to policy and governance cited by the participants included the limited capacity in terms of skills and the number of personnel in the government offices. Specifically, for the LGUs, the number of agricultural technicians (ATs) are very limited and they have become generalist that address issues and concerns for all commodities in the municipality/province.

In terms of implementing policies (e.g. prohibition of backyard slaughtering), NMIS have very limited staff to monitor the activities in the region. While there are deputized personnel in the selected municipalities, the number is still limited. Moreover, for the fisheries sector, government agencies like BFAR and LGUs do not have fish inspectors to check quality of fisheries products

in the market or to examine whether the fish were caught using dynamite or illegal fishing methods.

B. Validation of the PCCP Interventions

1- Participation to the PCCP Implementation (What are your roles and functions in implementing the project or conduct of activities?)

The government agencies and the LGUs were very crucial in establishing the PCCP in the region. Memorandum of Agreement (MOA) and Memorandum of Understanding (MOU) were forged among government agencies and PCCP stipulating the provision of office space for the PCCP team and possible counterparts from the government agencies. Among others, experts from the government agencies were consulted in drafting and preparing for the modules for the technical trainings and in providing specification of equipment and material inputs for the production of vegetables, mango and banana as well as swine and fisheries products. They also served as resource persons and technical consultants for PCCP.

2- PCCP Interventions

The primary intervention provided by PCCP is the capacity building provided to the farmers and the ATs through the series of trainings given.

Specifically, for swine production, slaughterhouses (SH) were established or improved. In the region, NMIS targeted for 17 slaughterhouses to be improved with the PCCP implementation however, of this target, only eight (8) were established or improved. Currently, there are three AA slaughterhouses in the region. PCCP provided for the railings in the slaughterhouses to promote the off-floor dressing. Trainings were also given to SH operators and farmers to demonstrate and showcase the advantages of off-floor dressing and humane killing of animals. For the fisheries sector, technologies were provided for the sustainable production of fisheries resources, use of fish counters, use refractometer to monitor condition of water and adoption of improved post-harvest practices to reduce mortality of fisheries products (i.e. lobster)

The provision of the in-kind grants (IKGs) are very material in improving the production and post-harvest practices in Caraga for vegetables, swine and fisheries commodities. Specifically, hygienic and sanitary condition are prioritized in the trainings for food safety. DTI have also noted of the promotion of HACCP in processing.

C. Validation of the Effectiveness of the PCCP Implementation

1. PCCP Effectiveness

In terms of effectiveness, the government agencies rated PCCP very effective, a rating of 5 was given. The agencies emphasized on the huge assistance given to Caraga in terms of capacity building. Human resources, at the farmer level and the LGU and government agency-level, were beefed up. The infrastructure was also improved through the IKG support.

The agencies also pointed out that PCCP was able to support their respective extension services provided to the farmers/fisherfolks. Given the limited number of technical experts from the government offices and LGUs, the trainings provided through PCCP provided the necessary

extension services to the local constituents. Since PCCP trainings were aligned to the agricultural programs and focus in Caraga, the LGUs and government offices were able to attain some targets for their areas. The limited resources of the government, especially in LGUs, were also augmented by PCCP. Cost-sharing was done between the government agencies and LGUs and PCCP in the conduct of FFS, FFTs and other technical trainings.

2. Initial Outputs Observed and Opportunities Realized from PCCP

The following are the initial outputs/impacts observed in Caraga:

- a. Farmers are now adopting improved technologies on production and post-harvest practices.
- b. Policies (e.g. ordinances), specifically for livestock, were enacted and are being implemented in selected municipalities. Prohibition of slaughtering of hogs in inappropriate areas like backyards are implemented in the municipalities of Buenavista, Agusan del Norte and Santa Josefa, Agusan del Sur.

More farmers are accessing the slaughterhouses following standards for off-floor slaughtering.

- c. Infrastructure in the form of IKGs are available in the region.
- d. Partnership between PCCP and the government were initially forged and strengthen. The line agencies were consulted on the specifications required for the equipment to be installed in the IKGs. For the slaughterhouses, NMIS trained the operators and constantly being consulted in operating the machines in the slaughterhouses.
- e. Farmers were able to access loans from formal institutions like FICCO.

D. Problems in Project Implementation

No implementation plan was laid out with the line agencies. Particularly noted is the issue of the seeming inconsistency in the coordination with these agencies. They relate the issue to the changes in PCCP Management which was not communicated with them. Hence, at some point the agencies thought that PCCP or Winrock is not anymore operating in the region. Re-engagement became difficult as the agencies do not have idea of the workplan of PCCP and they somehow loss the enthusiasm for the project.

The change in management also caused some issues in implementing activities with partner government agencies. A case in point is DTI's proposed mobile mariculture in Surigao City in 2014. PCCP was part of the project but when the COP changed, PCCP did not join the initiative anymore. Notice was not given to DTI, although the Provincial Coordinator was present during the launching of the DTI project in 2016.

E. Sustainability of the project implementation or the benefits from the project

Although partnership has been forged between PCCP and the government agencies through MOA and MOU, sustainability plan is not included in the agreement. The participants were expecting that an exit conference with PCCP/Winrock to turn over the project's initiatives to the LGUs and the concerned government agencies. The exit conference should include the plans to continue the benefits derived from the project.

It was pointed out that the cold chain initiative is quite new and is perceived to be ambitious for Caraga. However, the group also recognized that it can be done and PCCP was a big help in achieving the vision of cold chain. Several factors need to be considered including political environment to support and push for the initiative.

In order to sustain the initial benefits derived from the project and to continue the cold chain initiative, the participants suggested the following:

- 1- The government and succeeding projects to complement PCCP should look into alternative sources of energy to sustain the operation of the IKGs. One of the primary issues in the IKG operation is the very high cost of electricity. In Dinagat Island, the estimated cost of electricity in operating the ice plant is about P12.00/kwh. While the provincial government has programmed some financial support for the operation of the ice plant, sources of no cost energy such as solar and wind may be explored.
- 2- Waste water treatment should also be part of the sustainability plan. The participants noted of the current issue of poor water quality in Brgy. Masao, Agusan del Norte where milkfish is grown.
- 3- Evaluation of the carrying capacity of water resources for the production of fisheries products in ponds and cages. The increase in production of fisheries commodities may also post possible deterioration of water resources in Caraga.
- 4- Policy formulation and implementation should also be done. For the operation of slaughterhouses, the local ordinances should be enacted to strictly implement the prohibition of slaughtering of animals in inappropriate or unauthorized areas (e.g. backyard).

There should also be control of the fish cage/pen operation. Concerned agencies should have regular monitoring of the operation of these fish cages and fish pens. Stocking density and allowable area of operation should be evaluated. Necessary policies on the regulation of fish cage/pen operation should be formulated and implemented.

Strict implementation of the policy of prohibiting export of fingerlings and fry. Noted are potential issues of illegally selling lobster seedlings to foreign traders (e.g. Vietnamese). These buyers are offering high prices on lobster seedlings and illegally transporting them outside the country.

- 5- Quarantine check points are also seen as necessary, if production of swine will increase due to PCCP interventions. Preventive mechanisms are necessary to sustain the development of the industry.

D. Input Dealers

I. Executive Summary

This report summarizes the key findings from the focus group discussions and key informant interview conducted with the input dealers of the horticulture, livestock and fisheries sectors under the Philippine Cold Chain Project (PCCP) in Caraga Region. The discussions highlighted the interventions provided to the input dealers and how they were capacitated by PCCP, the issues and problems encountered during the project implementation as well as the suggestions on how the benefits from the project can be sustained. In general, the input dealers rated the PCCP implementation effective.

II. Methodology

A. Profile of the Respondents

The FGDs were conducted with the respective input dealers from the fisheries and livestock sectors. These were farmers who also served as input dealers as organized and authorized by PCCP itself (does not include Pilmico). Representatives from the five provinces participated in the series of FGDs conducted on February 1-2, 2019 in Surigao City (fisheries group) and San Francisco City (livestock group). There were 13 input dealers, of which 38% are female and 62% are male (Table 1). It is important to note that majority of the input dealers are also farmers and members of the various producer groups in the region.

On the other hand, representative from Eastwest, the primary input dealer for the horticulture sector, was interviewed through phone. Ms. Marilyn Dacara, the point person for PCCP is currently based in Bukidnon.

Table 1. FGD participants from the input dealers.

PROVINCE	LIVESTOCK		FISHERIES		ALL	
	Male	Female	Male	Female	Male	Female
Agusan del Norte		2	2		2	2
Agusan del Sur	1				1	
Surigao del Norte				2		2
Surigao del Sur			4	1	4	1
Dinagat Islands			1		1	
TOTAL	1	2	7	3	8	5

III. Highlights of the FGD with the Input Dealers

A. Development problems in CARAGA

In general, the input dealers emphasized the issue in sourcing good quality planting materials and animal stock. For the swine industry, the major issue is the source of piglets. There are very few producers of piglets in the region. The same is true for the fisheries sector. The vegetable production, on the other hand, is mainly depending on own harvest or farm produce for seeds which has affected level of productivity. For milkfish, majority of the fry/fingerlings is

coming from other provinces such as Bohol, General Santos City and Samar. In some instances, when the local supply is really low, imported fry is sourced from Indonesia.

Another major concern is the source of capital. Swine raising and aquaculture of fisheries commodities such as milkfish, shrimp, lobster and mudcrab are capital intensive enterprises. Hence, input dealers also require large capital to sustain operation and finance production of these commodities.

B. Validation of the PCCP Interventions

a. Trainings

The input dealers especially the supplier of animal stock (e.g. piglets, fry/fingerlings) also underwent series of trainings. Because they are also farmers and member of their respective PGs, they participated in the capability building provided by PCCP. The trainings were focused on production technologies to increase productivity of animal stock. They also join the trainings on improved post-harvest practices. Table 2 presents the major technological interventions provided to the input dealers. The participants also emphasized on the trainings provided for financial management and simple accounting procedures.

Table 2. Training interventions given to the input dealers

LIVESTOCK	FISHERIES
1- Artificial insemination	1- Feeding management and FCR including raising feeds (e.g. sea urchins) for lobster
2- Feeding management and FCR	2- Optimal stocking density for milkfish
3- Off-floor dressing and patronage of slaughter houses	3- Management of resources for wildlings of lobster
4- Meat processing	4- Checking of water quality
5- Organizational development	5- Post-harvest management and practices (e.g. maintenance of temperature level during transport, use of refractometer, etc.)
6- Financial management, record keeping and simple accounting procedures	6- Organizational development
	7- Financial management, record keeping and simple accounting procedures

On the other hand, unlike the input dealers for the livestock and fisheries sectors, Eastwest served as the primary source of quality seeds as well as the main resource person/trainers for the vegetable farmers. Trainings for the horticulture sector/vegetable farmers were provided through farmers field school (FFS) and farmers field trainings (FFT). These were season-long trainings (depending on the gestation/production period of the crop) attended and must be completed by farmers.

b. Small In-Kind Grant (SIG)

The small in-kind grants (SIG) are material inputs provided to selected input dealers. The following are the material inputs received by the input dealers.

Table 3. Small in-kind grants provided to the PGs.

LIVESTOCK	FISHERIES
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1- Piglets, gilts and boar

1- Milkfish fry, lobster
wildlings/seedlings
2- Refractometer
3- Washing tub/banyera
4- Plastic crates
5- Probiotics

c. Market linkages

The farmer-producers turned input suppliers/dealers served as primary source of inputs by the PG members. They are the direct input suppliers of their co-member/farmer from their respective PGs as well as other farmers.

d. Financial Assistance

All the input dealers particularly emphasized on the very important assistance provided by PCCP in accessing loan from FICCO. Majority are first time borrowers from formal institution like FICCO. The input dealers pointed out that through the loan accessed to FICCO they were able to expand production and be engaged as input suppliers. For the livestock sector, the loan from FICCO were able to expand production of piglets and established store for feeds. The case was also the same for the fisheries sector, majority were first time input dealers. Through the PCCP project, loan from FICCO supported the establishment of their business/enterprise ventures.

Loan accessible for the input dealers ranged from P250,000.00 to P500,000.00 with 13% interest per annum. The participant pointed out that they can renew the loan subject to loan repayment performance, good payors were given second cycle of loan.

For the case of Eastwest, they also served as the collector loan from the vegetable PGs. It was noted that this role was requested by the first COP to facilitate the collection of loan. Eastwest agents/staff were based and living in the area with the farmers, hence, they have established trust and good relationships with the farmers.

C. Effectiveness of the PCCP Implementation

2. PCCP Effectiveness

In terms of effectiveness, the input dealers rated PCCP as very effective (numerical rating of 4-5, 5 being the highest). Especially for the livestock and fisheries sectors, they are really grateful of the assistance provided by PCCP especially on the knowledge imparted to them as well as the introduction to formal loans through FICCO.

2- Initial Outputs Observed

The following are the initial outputs effects observed by the input dealers.

Table 4. Observed PCCP outputs, by sector.

HORTICULTURE	LIVESTOCK	FISHERIES
7- Farmers practice improved production technologies/practices	8- New input suppliers were developed.	6- New input suppliers were developed.
8- Farmers planted improved varieties of vegetables	9- Increased knowledge of technological interventions to improve production and breed of animals (e.g. adoption of AI)	7- Increased availability of fry/fingerlings
9- Farmers practice improved post-harvest practices (e.g. prolonging the shelf life of some leafy vegetables) and perform sorting and grading	10- Increased access/use of the established slaughter houses.	8- Reduced mortality during transport of fingerlings/fry
10- Increased access to formal loans	11- Increased knowledge on the source of animal stock and quality feeds	9- Improved quality of produce
	12- Increased knowledge of the market (e.g. increased linkage to more traders)	10- Increased access to input suppliers
	13- Policies or local ordinances have been crafted for the strict implementation of the policy prohibiting the slaughtering of animals in unauthorized areas (e.g. backyard).	11- Increased access to formal loans

D. Issues and Problems

The input dealers provided the following issues observed in the project implementation.

Table 5. Observed problems and issues, by sector.

HORTICULTURE	LIVESTOCK	FISHERIES
7- Delayed release of small input grant (SIG). Pointed out because of the procurement delays.	6- Delayed release of small input grant (SIG).	7- Delayed release of small input grant (SIG)
8- Policies in managing the SIG is not clear. There was confusion in raising the seed money through the payment from SIG.	7- No policies/procedure in claiming insurance.	8- No policies/procedure in claiming insurance.
	8- Changes in mechanism/policy for availing loan with FICCO is not also properly relayed. They just learned of the arrangement when they	9- Changes in mechanism/policy for availing loan with FICCO is not also properly relayed. They just learned of the arrangement when they

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| <p>9- Policies on loan collection are not in place/clear with the beneficiaries.</p> <p>10- Multiple roles requested to the trainers (trainers and loan collector)</p> <p>11- Changes in mechanism/policy or reportorial requirement for the additional role requested as loan collector</p> | <p>cannot anymore access the loan.</p> | <p>cannot anymore access the loan.</p> |
|--|--|--|

E. Recommendations for Sustainability

In terms of sustainability, the input dealers believed that the benefits derived from PCCP will be sustained, especially if PCCP will be extended. This was especially pointed out by the input dealers from the livestock and fisheries group. The LGU was not seen as a vehicle to continue the project, since they have observed that LGU-led initiatives were coterminous with the officials or that the agriculture sector is not given due priority.

The following were the recommendations for project sustainability.

Table 6. Sustainability measures for PCCP.

HORTICULTURE	LIVESTOCK	FISHERIES
6- For a similar project to take off from the initiatives/accomplishments of PCCP. Projects should provide clear plans and policies on all aspects.	4- Federation of PGs to be stronger. To include the input dealers as part of the federation.	1- Similar project be implemented in Caraga and continue the accomplishments achieved by PCCP.
7- Facilities/infrastructure will be provided by the project if extended	5- Assistance in sourcing capital and providing continuous training on financial management and values on loan repayment.	2- Continuous conduct of trainings on technical aspects especially on emerging technologies.
8- Assistance in sourcing capital and providing continuous training on financial management and values on loan repayment.	6- More trainings on crop insurance and loan management	3- Strengthen the initiative on cold chain.
		10- More trainings on crop insurance and loan management

E. Private-Sector Firms

I. Executive Summary

This report summarizes the key findings from the focus group discussions conducted with people in firms involved in the implementation of the Philippine Cold Chain Project in Caraga Region, particularly EMGE Agrivet and Pilmico. The discussions revealed a positive perception on the project performance. The FGD gave valuable insights on the problem encountered by the PCCP partners in the implementation of the project. Recommendations for sustainability were also provided.

II. Methodology

Focus group discussions were held on February 4, 2019 with the input suppliers to explore their views on PCCP interventions, their perception on project performance, initial impacts of the project, problems and opportunities. Recommendations for project sustainability were also determined.

Profile of the Respondents

There were two (2) firms who participated in the FGDs composed of 3 representatives from Pilmico and one representative from EMGE Agrivet Supply. Below is the composition of the participants:

Name	Agency	Position
Medel D. Delabahan	Pilmico	Operations Manager
Joel H. Brangca	Pilmico	Technical Supervisor
Mary Kholeen C. Suarez	Pilmico	Data Analyst
Bengie Rollon	EMGE Agrivet	Owner/Manager

EMGE Agrivet supply is a PCCP-accredited input supplier. It sells almost all kind of fertilizer and chemicals, veterinary products and feeds for hogs and poultry, among others. It is located in Butuan City, Agusan del Norte.

Pilmico, on the other hand, is both input supplier and IKG-recipient of the PCCP. It provides feeds, counselling on animal health and nutrition and management, and superior piglets to farmers. It has over 450 outlets covering all the five (5) provinces in Caraga region.

III. Findings from the FGDs

A. Key Issues Related to Trading, Marketing and Processing

Prior to the implementation of the PCCP, there was a declining production of hogs in the region as observed by the two firms. The main factor causing this issue is low farmgate prices, high cost of input (e.g. feeds) and marketing. The specific problems in marketing include access to market, limited information where to sell their product, and lack of state-of-the art facilities (e.g. meat cutting plant).

The low farmgate price is attributed to the quality of meat. The genetics of pork quality is an issue that need addressing. The quality of meat is observed to have thick fats which is less preferred by customers. Given this, the pork produced in Caraga region is not being patronized by the locals.

It was also mentioned that the competition among agro-vet supplier cause confusions in the part of the customers on what are the best inputs and practices to use.

B. PCCP Involvement of the Firms and Opportunities Realized

Winrock International through the PCCP project sourced farm inputs, particularly feeds, for the Hog Fattening Program. The input dealers deliver the feeds to the beneficiaries. The payments are collected from Winrock.

The two firms are also involved by PCCP in the trainings on topics such as customer handling, financial management and marketing, among others.

The involvement of Pilmico is bigger compared to EMGE Agrivet Supply. Through its partnership with PCCP, programs were developed to address three main problems in swine industry in the region: 1) shortage in supply; 2) enhancing the genetic profile; and 3) increasing the quality of meat products.

Pilmico leads the Swine Repopulation Program. The program started in 2014 with provision from PCCP worth PhP8-million which Pilmico matched with PhP22-million counterpart funds to buy gilts and to cover the costs for trainings, operational expenses, veterinary and technical support and monitoring. P16-million was used to buy 540 gilts. The initial target was 450 but as the actual price was cheaper, they were able to buy more gilts. The Swine Repopulation Program is a loan program. The 540 gilts were distributed to seed the program. The beneficiaries should be able to return to the program four (4) 25-kilos of hogs for breeding per 1 gilt received.

The application process requires attendance to project orientation/seminar. They will be oriented on vaccination, how to breed, record-keeping, and other relevant topics. Personnel from Pilmico will visit the site for evaluation to check the capacity of the farmers. They should have a gestating pen, nursery pen and equipment to avail the program.

To enhance the genetic profile of the swine in the region, the Genetic Material Processing Center was established, also in partnership with PCCP. The genetic improvement is necessary to address low carcass recovery. The Center is located in Butuan City. The PCCP supported the establishment of the center by providing equipment such as semen ref, microscope and water bath.

After the intervention to improve quality through genetic improvement, to improve the meat products, the meat-cutting plant was established last May 2016 and inaugurated on March 2017. It is a state-of-the-art facility that cuts, packs and distributes fresh, quality meat. The project meat-cutting plant is a joint project of Happy Enterprises and Resources and PCCP. The business model involves Pilmico to what they call as "Buy-Back Program". The list of farms that have hogs that are ready for harvest are forwarded by Pilmico to Happy Enterprises.

In turn, Pilmico is supporting capacity building activities of the PCCP's Hog Fattening Program. It provides technical assistance by assigning Animal Production Specialists as field point persons. It supports the conduct of technical orientation seminars and trainings to farmers organized by PCCP.

In the case of EMGE Agrivet Supply, their partnership with PCCP expanded their markets and

they became more knowledgeable of new technologies/input that they can offer to their clients.

C. Perception on PCCP Performance

EMGE Agrivet Supply rated the project performance as 5. It has been able to use the knowledge and skills obtained from the trainings. Other than having new clients, the project also helped establish linkages to other sources of agricultural products. They became more updated of the recent technologies and techniques in production. The owner believes the project has paved the way for the significant progresses observed in the hog sector in the region.

The Pilmico rating was 4. The project has been effective in meeting its objective. However, there are areas for improvement especially in the Hog Fattening Program

of the PCCP. Low repayment rate on feeds is observed. Although the loans are insured, the project would have been more effective if farmers will also become more accountable and credit worthy to help them develop a more sustainable livelihood.

D. Initial impacts/immediate outcomes of the project

Among the major impacts observed in the area are the following. As a result of the capacity building activities of PCCP:

1. There has been widespread adoption of technologies, particularly artificial insemination (AI).
2. There has been improvement in the management and farm facilities of the farmers. More farmers have expanded their area of production.
3. Increase in the number of hog producers
4. Appreciation of good quality

Other than those directly involved in the PCCP, other farmers in the region is observed to shift from traditional boar to AI. The traditional boar handler learned from the PCCP beneficiaries.

E. Problems in Implementation

Problems were encountered in the implementation of the project.

Swine Repopulation Project and GMPC

1. There have been delays in payment of breeding stock. The payment system consists of four 25 kilograms gilt of acceptable quality per breeding stock received. However, many of the gilts intended for payment were not able to meet the quality requirements. On average, only 10% of gilts were acceptable hence, these resulted to the delay of the payment of breeding stock. The delinquency has been increasing. It started to about 40% of total loans to about 60-80% this time. The delay is attributed to undesirable gilts which is a result of the far distance between the GMPC and breeders. There are certain criteria that must be met before the gilts are accepted. Based on experience, on the average, only 10% of gilts per province can be accepted.

2. The long distance between the GMPC and breeders would require cold storage. The temperature should also be closely monitored. The current practice is that some personnel would bring the semen to the Animal Production Specialists in the provinces. They have no way to monitor if the handling was done properly. Most of the problems occur in the four other provinces: Surigao del Norte, Surigao del Sur and Agusan del Sur, and Dinagat Island.
3. Given the above problems, farmers use local boar to breed. And expectedly, the first party could not be accepted because it will not meet the standards. This also leads to Problem No. 1, delay in the payments.
4. Lastly, also included in the problems observed is the attitude of the raisers. The programs are not being followed. A case in point is the vaccination program which leads to stale birth. Some would also not pay intentionally considering the program is a grant and not a loan.

F. Recommendations for project sustainability

Satellite GMPCs (e.g. per province), should be established to increase the repopulation program. This will lead to high supply of good quality pigs in the region. In turn, this will increase number of raisers leading to increase in income/employment opportunities. Storage facility with temperature logger should be made available to facilitate the transport of semen while keeping its quality high. This would increase the conception rate by about 80% based on laboratory experiments. And as a result, would increase the collection.

In terms of proper management, the farmers should be continually trained. Refresher trainings should be conducted. There also a need to improve the mentality of the farmers by including in the seminar credit worthiness.

Careful planning of programs and interventions were also recommended. There is a time lag in the interventions in production and marketing that needs to be addressed. Further research on genetic improvement.

F. PCCP Winrock Team

I. Executive Summary

This report summarizes the key findings from the focus group discussion conducted with the Philippine Cold Chain Project (PCCP) team in Caraga Region. The discussions highlighted how the staff implemented the project based on the project's vision and objectives, the mechanisms and activities in achieving such vision were also discussed as well as the accomplishments of the team. The FGD provided valuable insights on the problems encountered by the PCCP staff in implementing the project. Recommendations for sustainability were also provided.

II. Methodology

The FGD was conducted on February 4, 2019 at the Embassy Hotel in Butuan City. The FGD was attended by the following PCCP staff, 8 males and 2 females:

Name	Position
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Olegario A. Tensa Jr.	Technical Director (former M&E Officer, served as OIC-COP prior to Nick Richards)
Nielo L. Tingzon	M&E Officer (Sir Nono)
Eduardo T. Rosales	Provincial Coordinator, ADS
Julieto Caringas	Provincial Coordinator, SDN
Abelardo Yandug	Provincial Coordinator, PDI
Gema Tingcoy	Provincial Coordinator, ADN
Inocencio Constante	Medium-enterprises Development Specialist
Joselito Nobillos	Fisheries Specialist
Roger Golarte	Micro Finance Coordinator
Irish Jane Calungsod	Communication and Media Specialist

The FGD started at 1:30 PM and ended at 5:30PM. The highlights of the FGD is presented below.

III. Highlights of the FGD with the PCCP Team

A. Development problems in CARAGA

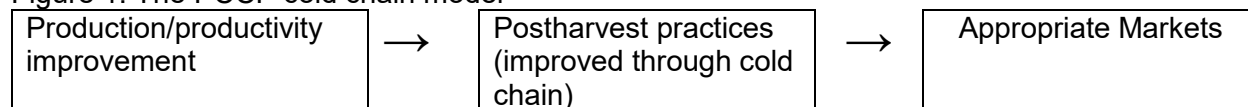
CARAGA is highly dependent in agriculture and fisheries and is considered to have great potential in developing these sectors. Major issue is the sustainability of supply of food as there is very high domestic importation of food (e.g. vegetables, livestock and poultry products and fisheries products) from other provinces such as Bukidnon, Davao and General Santos City. It was emphasized that the production cannot saturate the market. Another issue posted is the relatively poor quality of agriculture and fisheries products. In terms of marketing, farmers were also receiving low prices and are usually in the mercy of the traders, they are usually “binabarat” (unreasonably low bargain price). The availability of capital and access to loan is also seen as major bottleneck of farmers.

B. The PCCP Cold Chain Model

- 1- What is the cold chain model originally envisioned by PCCP for CARAGA and how close or how far is the project from achieving such vision?

The PCCP cold chain project is focused on agricultural and fisheries commodities mainly due to its perishability. It is envisioned as a vehicle towards increasing productivity and expanding trade/market in the region. The PCCP team believed that prior to achieving the benefits of cold chain interventions, productivity and market should be developed and strengthened. The PCCP model started with sustainable supply of good quality products from a developed production system. Production of agriculture and fisheries commodities was strengthened first and then the postharvest practices were improved through cold chain technologies. Cold chain technologies are envisioned to enhance the postharvest practices thereby prolonging and extending the quality of products. The benefits from improved production and postharvest practices are achieved by linking the producers to appropriate markets.

Figure 1. The PCCP cold chain model



In terms of how far the accomplishment to the vision, the cold chain initiative is still in its early stage and still has a long way to go. PCCP has just started the cold chain initiative.

- 2- What have been the major constraints in fully realizing the vision?

The PCCP interventions were more focused on the two main objectives indicated in the Results Framework of USDA: increasing productivity and expanding trade. The team believed that cold chain has not yet prosper since production systems are not yet fully developed.

3- How was the PCCP management addressing these constraints?

The PCCP project provided various technological interventions through trainings and capacity development to achieve the vision of increasing productivity and expanding trade. The formation of new producer groups (PGs) were done during the early stage of the project (2013-2014) while the series trainings were provided in 2015-2017.

Insight: No established criteria in selecting the PGs was presented.

PCCP also forged linkages with the local government units and the IKG sub-grantees through Memorandum of Agreement (MOA) and Memorandum of Understanding (MOU). The MOA with the LGUs indicated the provision of space for the PCCP office to be established in each province. For the case of Province of Dinagat Island (PDI), however, Provincial Local Government Unit (PLGU) just assisted in looking for office space to be rented by PCCP.

On the other hand, the agreement between PCCP and the sub-grantee stipulates the roles and counterpart of PCCP and the sub-grantees/awardees such as the LGU (e.g. operation/establishment of the slaughterhouses), DOST (for food safety), and others.

C. Validation of the Plans and Targets using the Results Framework

1- Planning and setting of targets

It was revealed during the FGD that the project has not laid out a complete/comprehensive plan for the project. The PCCP is using the Results Framework (RF) from USDA as reference in setting targets. The RF indicated improved productivity and increased market as major indicators. However, this RF was not translated into a logical framework indicating the set of objectives and activities, the verifiable indicators and assumptions. This log frame could have served as basis in identifying targets for the projects as well as establishing the risk management plan. The group cannot really discuss on how the targets for the project were set/planned.

Note: There have been changes in the composition of the team. For example, the Technical Director joined PCCP mid-implementation of the project.

The modification of targets provided to them was assumed to be increased because budget was increased. Case in point is the initial target for beneficiaries set at 7,500 which was increased to 10,400. The increase in target was associated to the relative increase in budget release to PCCP. Since the budget was increased, it was expected that more beneficiaries can be covered by the project.

The two main indicators for achieving the targets of improved productivity and expanded trade are volume and value. Beneficiaries are monitored of the volume of production and equivalent value for their produce. On the other hand, for expanded trade, PCCP's strategy was to promote buyer-seller relationship through trade fairs and meet-ups.

For the IKGs established, feasibility studies were not conducted to determine viability of the grant. Hence, reports have been received that the IKGs are not able to maximize its use/purpose. E.g. Carmen Mango Processing and Marketing Center, the Caraga Regional Integrated Marketing Center in Nasipit and the Cold Storage for the Agri-Pinoy Trading Center in Surigao del Norte. Production of horticultural and fisheries products are small, hence, capacity of these IKGs are not maximized. Further, the cost of electricity (estimated at P30,000.00 per month) to operate these IKGs is quite high. This has impact in terms of the capacity of the LGUs to sustain the operation of these IKGs.

2. Risk Management

The project does not have risk management plan. Since no logical framework was crafted, the team also has not taken into consideration possible risks that would impede the successful implementation of the project activities/intervention. Respective strategies to manage such risks were also not identified (e.g. high delinquency in loan payment).

D. Validation of the PCCP Interventions

1- Trainings

Capability building of PGs was provided through various trainings in 2015-2017.

Trainings for the horticulture sector/vegetable farmers were provided through farmers field school (FFS) and farmers field trainings (FFT). These were season-long trainings (depending on the gestation/production period of the crop) conducted by Eastwest and other experts from the PLGUs and government line agencies.

The FFS and FFT were conducted only with the horticultural PGs. FFS is considered a formal school where farmers are enrolled and should come regularly to complete/graduate from the courses. This is conducted by partners like Eastwest. On the other hand, FFT is provided for farmers' trial or demonstration to test the technologies. This is shorter than FFS and is also conducted by Eastwest and some PLGUs and ATs and other experts.

For the livestock and fisheries sectors, trainings were provided on a modular basis. Specifically for swine, intervention for genetic improvement was provided through the partnership with Pilmico/Happy Enterprises. The genetically improved swine was used for the repopulation "repop" program facilitated by Pilmico. The "repop" initiative started in 2015 and was massively implemented in 2016-2017.

In the conduct of trainings, resource persons were pooled from major partner-input suppliers such as Eastwest and Pilmico, institutions like SEAFDEC, various regional offices of government line agencies in Caraga such as the National Meat Inspection Services (NMIS), the Department of Science and Technology (DOST), the Department of Trade and Industry (DTI), the Bureau of Fisheries and Aquatic Resources (BFAR), and the Department of Agriculture (DA), PLGUs and ATs.

The preparation of modules and reference materials for the trainings were consulted with the commodity specialists of PLGUs and experts from the government line agencies. Technological gaps are determined to serve as guide in identifying focused areas in terms of technological interventions.

Small in-kind grants (SIG)

The small in-kind grants which included material inputs for the production of vegetables, hog raising and fisheries (e.g. drip irrigation, plastic crates, weighing scale, fry, fry selector/counter, refractometer, piglets, gilts, etc.) were provided to selected PGs depending on their capacity, location and commodity. The objective was to have equitable distribution of SIG in all provinces and all sectors.

The SIG serves as start-up materials for the PG to sustain the production of the commodities. The costs of the materials provided through the SIG should be paid back by the PG to serve as the PG's seed money. PGs need to come up with policy for sustainability to continue to generate more resources for the group. Income generated are pooled as Demo Fund (to serve

as seed money) by Eastwest until the PGs become stable. Eastwest also served as the collector of the payment and once the PGs already have their bank accounts, Eastwest would return the money for deposit.

Market linkages

Market trade fairs, buyer-seller events/fora, direct linkaging to buyers (especially with lobsters), and clustering approach for agro-enterprise development were organized to address the expanded trade targets. Farmers are now knowledgeable of a number of buyers, hence, they can haggle prices among traders. For the agro-enterprise development and clustering, initial trainings and planning were done especially in horticulture sector.

The community organizing technician (COT) and provincial coordinators (PCs) were very material in directly linkaging the farmers to the buyers.

Financial Assistance

PCCP forged an agreement with the First Community Cooperative (FICCO) to provide financial assistance, through loan, to the farmer-beneficiaries. The objective is for the farmers to avail of easy access formal loans. The loan is in the form of in-kind materials, meaning no cash is released to the borrowers. Loans are designed to be released based on the production cycle of the commodities and the timing of use of inputs.

The easy access loan is described as an artificial environment that provided special treatment for the farmer-beneficiaries. The following are some of the key features of the loan window provided by FICCO under the PCCP:

- 1- No capital build-up (CBU) required to the farmer beneficiaries
- 2- No service charge for the initial two cycle of loans. This is under the Special Production Loan Assistance (SPLA). The service fee is actually charged against the guarantee fund from PCCP/Winrock.
- 3- Borrowers only need to attend the initial seminar and pay for the initial fee, estimated at P350.00.

The arrangement under SPLA is designed for three cycles of loan only. After which, it is hoped that the farmer-beneficiaries become regular members of the cooperative and access loan following the regular system of FICCO. The special loan window under PCCP was provided to encourage the farmers to start accessing formal loans and for them to eventually be part or be mainstreamed to the regular system for loans.

However, since most of the beneficiaries did not reach the third cycle of loan, the initial design for the farmer-beneficiaries to become regular members of FICCO cannot be observed. On the other hand, the PCCP team pointed out that if farmer-beneficiaries are expecting that the SPLA will be a lifetime arrangement, this is not sustainable. The special loan window under PCCP is a form of distortion to the market and may post issues on sustainability. Hence, it was only designed to be implemented during the initial years of the project, until the farmers are able to establish their production and have been used to the system/process of loaning from formal institutions.

Given the high number of delinquent accounts, PCCP provided motorcycles to FICCO and satellite offices for easy collection and transaction to the provinces.

The engagement with FICCO ended in 2017 following the new policy direction of the new COP. PCCP shifted from being a loan guarantee provider to facilitator of financial services. The

beneficiaries are linked to Rizal Microbank and Cantilan Bank.

E. Validation of the PCCP Performance

1. Effectiveness

The group highlighted that they were able to achieve the project targets and, in some areas, over exceeded the targets for the improved productivity. PCCP was able to provide trainings on new production techniques and technologies, adoption/application of postharvest technologies and food safety (e.g. availing of the services of slaughterhouses for off-floor dressing) practices were introduced and improved, and farmers became aware and adopted components of GAP and GMP, although there were no certified farms.

On the other hand, for the expanded trade some targets were not achieved e.g. trainings on agro-enterprise development. According to the PCs, the trainings and activities for the agro-enterprise development was affected by the issue on financing arrangement with FICCO in 2017.

The group are satisfied with the results of the project especially in terms of increasing productivity of farmers. For the marketing, more trainings are needed for the enterprise development. The cold chain initiative has still a long way to go. Infrastructure (e.g. chillers and cold storages) especially in the wet markets are seldom available. The project was able to observe good practice in the Municipality of Prosperidad, a non-PCCP beneficiary. In Prosperidad, meat vendors in the wet market have chillers to complete the cold chain from the slaughter house to the market.

2. Initial Outputs/Effects

Among the initial outputs observed is the forging of PGs to a federation. A case in point is the initiative of the PGs from the municipality of Bayogan to federate into the Bayogan High Value Vegetable Association. The association was able to penetrate institutional markets such as Robinsons.

Others include high adoption rate particularly on the application of improved post-harvest technologies and food safety. In selected municipalities, policies are also being implemented to prevent the slaughtering in households/backyards.

3. Efficiency

In terms of monitoring and evaluation, reportorial requirements such as weekly and monthly reports are provided from the field activities/operations. Regular field visits are being conducted by the COTs and PCs.

F. Sustainability of the project implementation

The group recognized the importance of sustaining the benefits derived from the project. However, the PCCP team has also recognized that a sustainability plan was not established to institutionalized the initial effects/benefits from PCCP.

Efforts to enjoin the participation of the LGUs (e.g. invitation to trainings and monitoring) in implementing the project has always been done, however, LGUs were not really enthusiastic to engage in the PCCP initiative. The LGU participation was deemed very important so that initial benefits/impacts of the project can be sustained once PCCP is completed.

Transition or weaning activities have not been conducted with other partners, taking into consideration where the LGUs or the government line agencies can take off from the PCCP initiative or the complementary activities that can be sustained.

In the course of discussion, the team have mentioned the following initiatives conducted to sustain some initiatives of the project:

- 1- For the swine industry/sector. Establishment of the Swine Industry Development of Caraga, Inc. (SIDCI). This is a SEC-registered group established in April 2018 composed of major stakeholders/players of the swine industry in the region (e.g. Hog Raisers Associations, Government Agencies like DA, individual growers, corporations, etc.).

SIDCI is envisioned to serve as the primary arm in developing the swine industry in Caraga providing services and assistance to all stakeholders in the region. This is currently being pushed and supported by the DA-Caraga. It is also considered as the legacy of the current COP.

- 2- For the horticulture sector. Linking the Bayogan High Value Vegetables Grower Associations to institutional buyers like Robinsons. PCCP was able to jump start the entry of PGs to institutional buyers by providing support for the fee/payment of display. Currently, the federation was able to sustain the relationship with Robinsons on a consignment basis.
- 3- For the fisheries sector. Drafting of the Lobster Roadmap for resource management. In recognition of the high dependence of the lobster industry to the quality of marine resources, the road map is envisioned to lay out the plan in sustainably producing the lobster in Caraga. This initiative is in partnership with BFAR as lead. A consultant from James Cook University was also hired.

G. Issues in project implementation

The team mentioned of the following crucial issues in project implementation.

- 1- Changes in the management/leadership of PCCP (e.g. change of COP). Some of the pertinent issues documented were related to the change in the management of COP.
 - a. Management strategies and priorities are different among COPs. Some activities/initiatives/arrangement initially planned with the former COP were not pursued by the next COP (e.g. abrupt change that led to the ceased-off of the loan arrangement with FICCO).

Farmers were not prepared of the sudden change on the institutional arrangement with FICCO causing delays in loan releases and in some cases, loans were not released anymore after the loan window agreement with FICCO stopped. This has caused dismay and loss of interest in paying loans. Some farmers also incurred loans for establishing their counterparts such as pigpens and fish ponds/cages.

 - b. Other partners have waned their enthusiasm in partnering with PCC ("napaso"). PCCP have encountered difficulty in engaging these agencies again to the project. This might be the reason also why some line agency partners/LGUs do not attend activities of PCCP.
- 2- No clear terms of reference (TOR) between partners and PCCP staff in the field.
 - a. For monitoring the borrowers. PCs and COTs expects FICCO to monitor the performance of the borrowers. This means that FICCO should have constant monitoring of the status of loans, possible reasons of delinquency and mechanisms of collecting the loans.

Reported case that some farmers did not pay the loan because it is under guarantee fund was validated. The PCs claimed that there was information

leakage to the farmers. It was claimed that FICCO told the farmers that the loans are under guarantee, hence, some farmers did not pay the loan.

- b. For the LGUs specifically the ATs. Participation to the project is not clear. Despite the constant invitation in all activities, participation is low. PCCP was also envisioned to be transferred to the LGUs, however, their poor participation posted issues on sustaining the project activities once it is completed.
- 3- Policies not clearly laid out

The PCCPs concept of the SIG as a grant is not quite clear to the PGs. As a grant, the SIG is given to the PGs. However, the mechanism to pay back the grant to the PG to serve as seed money for the PG was misunderstood by the farmer-members as loan. It was not clear to the members that the cost of the SIG should be plowed back to the group to serve as start-up capital/seed money for the PG to sustain the production of the commodity.

- 4- Issues in project design
 - a. IKGs. Some are not functional and could not be maximized because the sizes are not suitable
 - b. Timing of interventions. Much of the focus were on production, diversification came late hence, the whole chain was not ready.
 - c. The design was based on the USDA framework, some risks and assumptions were not adjusted to local conditions. Assumptions and indicators for the cold chain is not clear since the indicators are concentrated on productivity and trade.
 - d. Project duration. While the project duration is five years, the preparatory activities, mostly administrative in nature, took two years to complete. The effective implementation of the project activities was only three years. This was considered short to fully observe the expected effects/impacts to the farmers

H. Recommendation

- 1- To establish a clear plan and project design indicating project expected outputs and indicators, activities to address such, assumptions and respective risk management plan to address potential threats and risks.
- 2- To have continuous training and seminar related to financial management to include the value of paying loans, etc. One-time and short seminar on the mechanism of availing loans in formal institutions such as cooperative (e.g. FICCO) is not sufficient. There should be program to inculcate to borrowers the value of money and the responsibilities associated with availing loans.
- 3- To establish sustainability plan which incorporate, among others, the key activities to sustain the operations or the benefits derived from the project, the network of institutions (e.g. LGUs, private sectors, etc.) needed to sustain the project, the transitory activities and other resources needed.
- 4- Streamline reportorial requirements so as to minimize reports and maximize the human resources available. Preparation of reports takes time also.
- 5- Build stronger public-private-partnership especially for the management of IKGs and to integrate/connect the whole chain. This would involve government agencies such as DTI, DOST, DA, the academe (e.g. CSU), and Chamber of Commerce, among others.

ANNEX 11. IN-KIND GRANT FACILITIES AND EQUIPMENT

Source: Winrock International. PCCP DevResults database.

Province and Facility	Grantee	Approved Grant (USD)	Approved Amended Grant (USD)	Spent Grant (USD)	Grantee Co-Financing (USD) \$	Storage Capacity (m ³)	Sector
Agusan del Norte							
Roof and Wall of the Dry Storage	Happy Enterprises	89,305	89,387	89,387	622,603	3,200	Trade
Slaughterhouse Improvement Project	LGU of Buenavista	29,797	21,508	20,713	104,297	-	Livestock
Caraga Regional Integrated Marketing Center	LGU of Nasipit	250,371	254,448	227,158	43,817	3,616	All sectors
Chilling Room & Railings to the Butuan City Slaughterhouse	De Oro, AJECC	118,252	124,540	127,248	1,555,502	281	Livestock
Meat Cutting Plant Refrigeration Equipment	HERI	93,878	93,878	99,048	163,265	153	Livestock
Clean Food Facility Project-Chopping Board	DOST 13	34,693	34,693	21,326	18,231	-	Livestock
Cold Storage Facility (RALAV)	RALAV	91,957	91,957	85,235	252,536	3,200	Livestock
Carmen Mango Processing & Marketing Center	LGU of Carmen	268,311	245,805	216,830	101,434	3,600	Horticulture
Agusan del Sur							
Slaughterhouse Improvement Project	LGU of Talacogon	28,696	17,278	17,261	14,617	-	Livestock
Slaughterhouse Improvement Project	LGU of Sta. Josefa	20,507	15,685	15,685	26,087	-	Livestock
Surigao del Norte							

Cold Storage for the Agri-Pinoy Trading Center	PLGU-Surigao del Norte	33,404	31,879	31,876	19,470	171	All sectors
Chilling Room & A Frame to the Surigao City Slaughterhouse	LGU Surigao	36,420	51,116	41,739	6,809	17	Livestock
Slaughterhouse Improvement Project	LGU of Dapa	28,696	15,935	15,935	7,954	-	Livestock
Surigao del Sur							
Slaughterhouse Improvement Project	LGU of Marihatag	46,636	37,380	37,380	7,297	-	Livestock
Slaughterhouse Improvement Project	LGU of Cagwait	28,696	16,739	16,739	18,259	-	Livestock
Slaughterhouse Improvement Project	SOWREAP/Alvin Ty	19,609	19,609	19,609	55,650	-	Livestock
Dinagat Islands							
Ice Plant and Cold Storage	A&M MPC	99,089	141,461	144,536	16,447	140	All sectors
Total		1,318,315	1,303,293	1,227,705	3,034,275		
Total Expenditures (Spent Grant and Grantee Co-Financing, in USD)							4,261,980

ANNEX 12. VALUE CHAIN MAPPING

A. Mango Value Chain

About 9.9% of Caraga households are involved in mango production with more than half of these producing Carabao mango. Carmen is the major mango producer in Caraga. Their 629 hectares (60,000 trees mostly 30 plus years old) for them produces the best mango in Mindanao for its sweetness, texture and shelf life, a product of the very suitable soil (calcareous) and climate (mostly dry). Thus, even other mango producing areas are using the name 'Carmen' for their mango to entice buyers. Carmen mango according to them has better quality and with longer shelf-life than DavSur which is 'Lutabon'. The findings and recommendations on Mango across the supply Chain are detailed below by node and summarized in Table 1.

1. Carmen Mango Processing and Marketing Center (CMPMC)

The Carmen Mango Processing and Marketing Center is located in the town of Carmen, ADN just behind the wet market (Figure 1). Construction started on October 26, 2015 and is about 90% complete as of February 13, 2019. The approved budget is P 10,889,.00 (USD 245,805.38 0). The packing area appears to be too big for the present volume of mango being harvested in Carmen with a dry storage capacity of 3,600 m³. Harvest is also seasonal June-July and November- December that can render the area unused for several months given the fast turn-over of fresh mango, unless other related commodities will also be packed in the area.

The cold storage is apparently too big for the present potential use: storage of processed mango puree. There is the issue of high cost of electric bill around P30,000/month which can make it a virtual white elephant. In the first place the LGU only wanted to improve the old mango processing facility in terms of state-of-the-art equipment. It also lacks proper approval of BFAD (which has been a long-time issue with the LGU according to PCCP).



Figure 1. Carmen Mango Processing and Marketing Center (CMPMC) facility.

Inputs

Problems - High cost of production inputs. Total expenses on chemical fertilizers and pesticides run up to P50,000/ ha.

PCCP Interventions - Bulk buying of inputs by PCCP, to be paid after harvest. They were provided to them even though not explicitly requested by the growers. PCCP also facilitated linkage of producers with input providers for direct buying and more appropriate inputs. Training on Vermicomposting was also conducted.

Output/Outcome - Lower prices of the inputs thus reducing production cost when PCCP procured the inputs.

Problem/Issues - Bulk buying was not pursued by the mango association/coop. Vermicomposting was also not picked up by the growers being not suitable under mango trees because of spraying.

Recommendations- The system of bulk buying should be pursued by the coop. Vermicomposting can be done not necessarily under the mango trees. Other methods of organic fertilizer production can also be done. Aside from water pumps for irrigation, water catchments can also be installed for irrigation.

Production

Problems - Low yields (50-75% lower than the average potential harvests of 75-100 kg/tree 12-15 years of age) and poor quality (50-68% of the total harvest was afflicted by scab insect damage (Nora-nora), wind scars and latex burn) (PCCP baseline study report). Prenda, that is, the mango plantation is rented out to contractors. This results to rapid decline in mango productivity because the contractors would induce the trees to flower 2x a year. Lack of water for irrigation during the dry months. Danger in bagging century old trees.

PCCP Interventions - A total of 14 mango producer groups were organized into associations and Cooperative. (Another 47 vegetable producer groups were organized across CARAGA). Training on GAP, mango production including pruning, soil analysis, linkage to input providers such as water pumps for irrigation and pest management.

Output/Outcome - Improvement in yield by 5-9%, appearance by about 20% and eating quality by 10% because of proper fertilization which also help minimize pests and diseases. This translates to about P18,000/ha/yr increase in income.

Problem/Issues - Only a few are practicing the essential lessons specially on worker's health and safety, some still continue to smoke even while spraying pesticides. Use of proper PPE is also viewed as a mere nuisance and inconvenient.

Recommendations - the LGU and DA should continue the promotion of the technologies that has been proven to be effective focusing on the farmers/groups that are more willing to adopt new technologies.

Postharvest/Trading

Problems - inefficient trading due to too many redundant layers adding to cost as well post harvest losses with more than necessary handlers (mostly untrained or not practicing proper handling procedures).

PCCP Interventions - training on proper handling, sanitation and packaging after harvest

Output/Outcome - reduction in postharvest losses and improvement of fruit quality/appearance with proper handling. Eg. When there are ants make prevent stains from the ants which could burn the skin of mangoes.

Problem/Issues - low adoption rate attributable to many factors

Recommendations - the LGU and DA should continue the promotion of the technologies that has been proven to be effective

Processing/Packing House

Problems - over-ripe and LO (left overs) are processed into mango puree, however the capacity of the old processing facility of LGU was not enough. Dried mango is another processed product but the LGU wanted better equipment to improve capacity and quality of the products.

PCCP Interventions - PCCP built a cold storage room and DTI provided another unit for a total floor area of 112 m2 within the packing facility complex (Figure 2) . This is supposedly intended for the storage of processed grade mango for continuous production of dried mango. There is also a plan for Hot Water Treatment (HWT) tanks to be installed to prevent anthracnose and minimize losses.

Output/Outcome - The storage rooms have only been used once by a Korean client who initially

was intending to export mango to Korea but was delayed due to incomplete export documents.



Figure 2. Cold storage facility inside the mango packing area (Carmen Mango Processing and Marketing Center)

The HWT while not yet in place is most welcome for the Coop and the LGU as this can prolong the shelf life of mango. They plan to use these to store mangoes for processing so there will be a continuous supply of raw material even during the off-season.

Problem/Issues - The main problem is the high cost of power to operate the cold storage running to about P30,000/month. The storage is at present too big for the volume that will be stored given the fast turn-over of fresh mango. Even the LO can be sorted for the local CARAGA wet markets leaving just a small volume for storage. There might not be sustained. Alternative sources of power is being proposed such as solar but the present solar power technology might not be enough to supply the power requirement of the Cold Storage. The packing area is open with a lot of birds nesting on the rafters which poses food safety risks from the droppings and other contaminants.

Recommendations - for the facility to be used properly the Cooperative can use the packing house for mango buying and packing with seed capital from LGU as well as hauling trucks to minimize transport cost. But this would also need a good business plan, proper LGU Ordinances and policies to ensure sustainability and minimize conflicts of interest given that some of the members of the Coop are also mango buyers/traders.

Marketing

Problems - Limited market options since the growers and local traders are just waiting for buyers from the outside to come in. Many growers are also financially tied up with the contractors and buyers.

PCCP Interventions - PCCP invited buyers (processors and exporters) from Davao City. Mango

Summits were also conducted which involved market encounters.

Output/Outcome - Improvement in selling price with the entry of buyers from Davao by P10-25/kg.

Problem/Issues - The intervention had significant positive impact but the Carmen players were in a passive mode in the arrangement. They were just “waiting” for the Davao buyers to come in thus they were unable to maximize their income from the transactions and unable to explore other possible markets.

Recommendations - It would good if the local market players can be assisted to develop more active linkages for fresh mangoes and processing both local and international.

Issues/Concerns across the Supply Chain

Sustainability is the concern that echoes across the supply chain. This should not be wholly PCCP’s concern anymore but some steps in the exit plan can be included to ensure that the gains will be sustained through the local public and private players. There is also the issue of peace and order that stunts the growth of the industry from production to marketing with “RT” being demanded at up to P150/tree.

Table 1. Summary of findings and recommendations, Mango supply chain

Items	Input	Production	Trading	PH/Processing	Marketing
PROBLEMS	High cost	Low Productivity and low quality	Inefficient trading, high post-harvest losses due to handling	High losses, low capacity of processing	Limited market options re; tied up with Contractors, Prenda
PCCP INTERVENTION	Bulk buying	Technology (pruning), trainings, financial assistance access to micro credit	Training on post-harvest	Trainings, IKGs (Cold Storage, and Packing Area-CARMEN)	Market linkage-Davao buyers brought to CARAGA
OUTPUTS/ OUTCOMES	Lower cost	Increase yield- 5 to 9% Improve appearance- 20% Eating quality- 10%	Reduction in losses	Operational (used by a Korean Client)	Price received by farmers increased by 10 to 25PhP per kilo
PROBLEMS/ ISSUES	Failure to capacitate	Low adoption	Low adoption rate	High cost of power; no BFAD	Passive nature of linkage

	the Producer Groups			certification; perceived over capacity of cold storage; might not be used for mango; might not be sustained	
RECOMMENDATIONS	Collective procurement of the Producer groups	Increase adoption, technology promotion	Increase adoption, technology promotion	To be operated by cooperative and LGUs with seed capital and trucking	Develop more active linkages

B. Banana Value Chain

1. Caraga Regional Integrated Marketing Center

Caraga is a major supplier of saba (Cardaba) banana in the country. About 26.7% of households in Caraga are banana producers (saba, lakatan, latundan, etc). Nasipit port is a major outbound port for banana with more than 100 container vans weekly going to Cebu and Manila.

Figure 3. The façade of CARAGA Regional Integrated Marketing Center (CRIMC) RGMaghirang. Endline Evaluation of the Winrock International/USDA Philippines Cold Chain Project (PCCP): Crops

Loading of banana (stuffing) was being done inside the port previously but it has been banned because of various risks on safety of workers as well as on food safety. Loading/stuffing is now being done elsewhere to the disadvantage of the traders leading to increased cost and higher post harvest losses.

The CARAGA Regional Integrated Marketing Center (CRIMC) was established supposedly to serve as the loading area for bananas. Construction started on September 17, 2015 and still unfinished as of February 2019. The total amount spent is already P10.5 M. The approved amount is P11.27 M (USD 254,447.65). It was also envisioned as a reefer van bay in the near future. The packing area has a storage capacity of 3,616 m³.

The findings and recommendations on Banana across the supply Chain are detailed below by node and summarized in **Table 2**.

Saba banana has a sustained high demand being a cooking banana. Prices can be as high as P3/pc for class A and P2/pc for Class B. Cooked as banana cue it comes out as P5/pc.



Wholesale prices ranged from 8-12/kg. Wet market price can be as high as P15/kg. Harvest from 1 hectare even in an intercropping system is up to 1ton every 15 days. Labor is the major expense at P300/day needing 3pax for 2 days to harvest 1 ha including hauling.

Inputs

Problems - Very minimal use of any inputs resulting to low yields, high disease incidence and low quality of banana.

PCCP Interventions - A total of 17 banana producer groups were organized in Agusan del Norte (13) and Agusan del Sur (4). Training on composting for cheap and good source of organic fertilizer, supply of plastic bags for bagging to improve quality of banana and prevent bugtok, supply of bolo (and its proper use: disinfect regularly) and supply of plastic crates for harvesting and hauling. PCCP also provided financial assistance to the growers through loans. Linkage of growers to input suppliers.

Output/Outcome - The adoptors were able to increase yield by up to 20% and quality and minimize the incidence of bugtok to up to 100%.

Problem/Issues - Not all members of the association were trained and not all of the trained adopted the technologies/strategies. High rate of non-payment of loans.

Recommendations - Continue the technology promotion within the Association and with the assistance of LGU and DA.

Production

Problems - Low yields and quality because of lack of fertilization, Bugtok, Alcoheres (a generic term of the growers for any malady on their crop) and damage by stray animals. Pilferage is also a significant problem.

PCCP Interventions - training on mat management, pest management (mat cleaning, bagging, disinfecting bolos, early male bud removal)



Figure 4. Caraga Regional Integrated Marketing Center (CRIMC): View from inside toward proposed Reefer Van Bay area

Output/Outcome - increase yield of up to 20% and almost total control of Bugtok. Before the intervention up to 50% of the fruits are infected with Bugtok. This translates to about P40,000/ha/yr increase in income.

Problem/Issues - not all of the trained members applied the strategies mainly because of the high labor cost (P300/day plus snacks and lunch), and the high physical risk in bagging tall Cardava plants.

Recommendations - Continue the technology promotion specially on Latundan.

Postharvest/Trading

Problems - Lack of proper space for stuffing and loading of banana which was previously permitted within the Nasipit Port. This leads to higher post harvest losses and increase in trading cost.

PCCP Interventions - The CRIMC is envisioned to be the stuffing and loading center for banana and other produce (**Figure 4**). Trainings were also conducted on post harvest handling and storage.

Output/Outcome - There is no outcome yet but based on interviews with the potential users of the facility this can reduce post harvest losses, serve as storage when there is no ship and help facilitate trading.

Problem/Issues - There are current and potential problems including security, drainage, lack of peripheral facilities such as roads, parking, public toilets, power sources, water and waste management, rest area, dining area, internet access, which should all be compliant to relevant existing standards, local ordinances and laws.

Recommendations - Establish Standard Operating procedures (SOPs), install proper sinages and make CRIMC Nasipit the Hub Center both for its hardware and software facilities.

Processing/Packing House

Problems - No available central packing house leading to high post harvest losses, increase operation cost and lost opportunities

PCCP Intervention - The CRIMC will serve as the packing area for banana. It can also be used for other fruits and vegetables.

Output/Outcome - None yet operational but it can potentially help substantially reduce post harvest losses, facilitate trade and reduce trading cost.

Problem/Issues - The facility is already in a bad state, having been vandalized and not adequately maintained.

Recommendations- Immediate LGU resolution on action plan to secure, maintain the facility and operate the facility through a private sector partner such as ADFIL Corporation.

Marketing

Problems - No problems were cited since there is always a high demand for banana (Saba, Lakatan, Latundan)

PCCP Interventions- None was mentioned

Output/Outcome - N/a

Problem/Issues - N/a

Recommendations - N/a

Issues/Concerns across the Banana Supply Chain

Apparent core problems in banana in CARAGA are low yields and Bugtok (Saba and Latundan). These were properly addressed by PCCP. But across the supply chain the dominant issue is Food Safety for the part of the consumers given the way banana is handled from harvest to the selling arena. This was also addressed by PCCP in the trainings conducted but is finding difficulty to sink in to the stakeholders. Proper observance of food safety steps will also improve produce quality and reduce post harvest losses.

Overall recommendation

The project was able to improve productivity and expand trade at different levels. However, many facilities still need equipment and other things to comply with industry standards. ASPSI recommends developing sustainability plans for future post-harvest facilities and sharing those plans with each facility's stakeholders early in the planning process.

With a more integrated plan for cold-chain investment, CRIMC could have served as a central connection point for the other facilities, providing a consolidated channel for trade. If the center opens successfully, it could still play that role. (See figure below.)

Figure. CRIMC as central hub of trading interconnecting the facilities established by PCCP

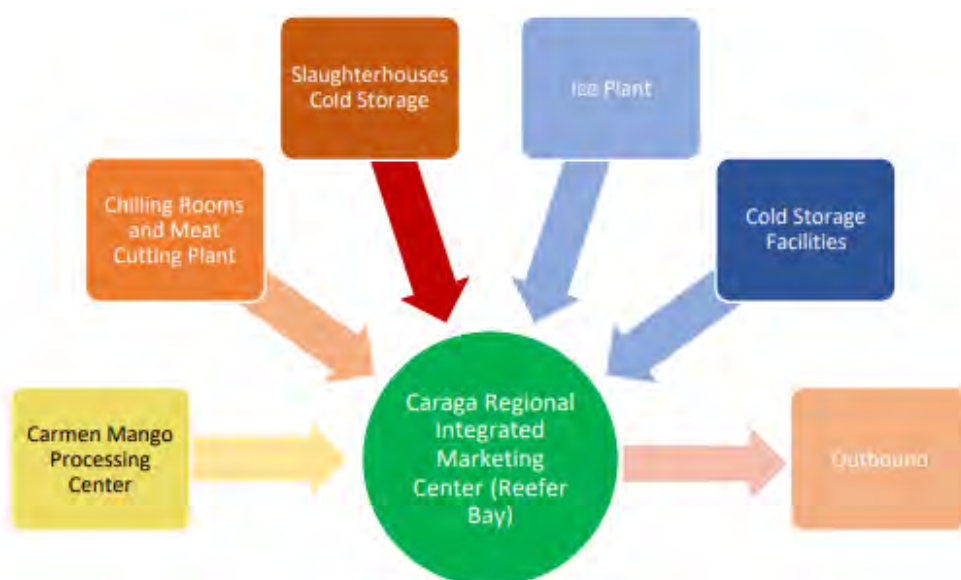


Table. Summary of findings and recommendations on Banana across the supply Chain

	Input	Production	Trading	PH/Processing
PROBLEMS	Virtually no inputs being used	Low yield, Bugtok, Alcoheres (generic)	Stuffing Loading area Irregular Supply, losses when not loaded/no ship	Losses for Over ripe specially when there is no ship arrival
PCCP INTERVENTION	Training on composting, supply bolo, plastic bag, crates	Training on soil analysis, banana production, pest management (bagging, mat cleaning, early male bud removal)	CRIMC, Nasipit Packing/ Storage	-
OUTPUTS/ OUTCOMES	available organic fertilizer and other inputs	Increase yield- 20% Up to 100% reduction in Bugtok	Potential Reduction in losses esp when no ship arrival	
PROBLEMS/ ISSUES	Not all trained applied the technologies	Low adoption of bagging practices in cardava (tall)	The facility is not yet operational and still needs some improvement	
RECOMMENDATIONS	Continue promotion	Increase adoption, Technology promotion	Finish and improve the facility, with container van bay, stuffing area, and cold storage	

C. Swine Value Chain Mapping Summary

Project Interventions

In livestock sector, the PCCP focused on swine. Winrock partnered with Pilmico in addressing mid-level objectives 1 and 3. Pilmico is one of the big animal feed manufacturing company in the country and has also ventures in commercial swine breeding and finishing operations. Pilmico provided its logistical support to PCCP on delivering improved inputs such quality feeds and genetic resources. Winrock in partnership with Pilmico funded the establishment of Genetic Resource Processing Center (GMPC). GMPC is being managed by Pilmico. Pilmico also received In-Kind Grant (IKG) from PCCP in the form of Feed Warehouse in Butuan City. These two facilities aimed to support distribution of inputs for swine production such as feeds and genetic resources. Swine repopulation project in Caraga Region was carried out through animal dispersal system and artificial insemination.

The second mid-level objective of increasing use of financial services was addressed by partnership of Winrock and First Community Cooperative (FICCO). FICCO provided loan services to farmer beneficiaries.

Input interventions

Production interventions

Through Pilimico, the PCCP provided trainings on improved swine production management, swine nutrition, animal handling, meat quality evaluation, and waste management. The project also supported producer groups with trainings, seminars, financial assistance, grants, and financial literacy education.

Postharvest and marketing interventions

Through its in-kind grant program, PCCP funded slaughterhouses, carcass chilling facilities, and meat-cutting plants. These facilities aimed to achieve mid-level objectives 1 to 7 of the second strategic objective. HERI Meat Cutting Plant is one of the visible and operational facilities established through the support of PCCP.

HERI serves as a livestock consolidator, collecting marketable animals from PGs. Pilimico linked the PGs to HERI by forecasting and providing market information services. HERI distributes its meat produce to its own meat shops and other institutions such as hotels, restaurant and supermarkets.

Key Results/Outcomes

Inputs

The distribution of improved genetics and quality feeds have led to:

Improved productivity as indicated by increased litter size

Improved meat quality as indicated by decreased backfat thickness; and

Increased carcass yield from 72% to 75-78%.

Production

The trainings and inputs provided to farmers led to:

Increased farmers productivity

Increased hog population in Caraga Region

Postharvest

Postharvest interventions led to:

Higher farm gate price. HERI buys pigs at PhP 100 to PhP 105/kg liveweight versus PhP 95/kg liveweight of other traders.

Improved meat quality. Customers of HERI Meat-Cutting Plant testify that they are now getting better quality meat than before, particularly on product uniformity.

Improved market access. Meats produced by HERI MCP are now distributed not only in Butuan City but also to other provinces. Because of "AA" classification of the HERI MCP, meat can even be brought to Luzon areas.

Issues Encountered and Recommendations

Inputs

The reach of the Genetic Material Processing Center (GMPC) is limited. Transporting semen over long distances degrades its quality. Off-site artificial insemination results in a low conception rate.

Pilimico feeds are more expensive than other options. Some farmers opted to use other brands or formulate their own feeds.

Recommendation: Establish two to three more GMPCs in Caraga.

Production

Adoption of improved farming techniques by farmers remains low may be due to some personal reservations in the utilization of financial services that can be used to upgrade their operations. Recommendation: Strengthen further the technology dissemination and offer them viable financial services.

Postharvest

Farm gate price of pigs has tremendously decreased from ₱120 of last year to ₱100-₱105 this year, which they attributed to the decrease in the demand for primal cuts, which according to the respondents is due to pork importation.

Recommendation: Government shall strengthen the policy on utilization of imported meats. Limit the use of imported meats to meat processing operation only.

Chilling facilities established in slaughterhouse are underutilized. Meat traders who use the slaughterhouse facilities opt not to use the carcass chilling facility because their consumers do not purchase cold meat. Consumers consider chilled meat not as fresh.

Recommendation: Conduct consumer awareness campaigns to promote chilled meat as fresher, safer, and of better quality.

Improve health and safety conditions in public markets to enable vendors to market fresh chilled meat.

Value Chain Interventions

The second mid-level objective of increasing use of financial services was addressed by partnership of Winrock and First Community Cooperative (FICCO). FICCO provided loan services to farmer beneficiaries.

Production interventions

PCCP provided trainings, seminars, financial assistance, grants, and financial literacy education to producer groups (PGs). Through Pilimico, PCCP provided trainings on improved swine production management, swine nutrition, animal handling, meat quality evaluation, and waste management.

Postharvest and marketing interventions

2. HERI Meat-Cutting Plant

PCCP funded slaughterhouses, carcass chilling facilities, and meat-cutting plants. These facilities aimed to achieve mid-level objectives 1 to 7 of the second strategic objective. HERI Meat Cutting Plant is one of the visible and operational facilities established through the support of PCCP.

HERI serves as a livestock consolidator, collecting marketable animals from PGs. Pilimico linked the PGs to HERI by forecasting and providing market information services. HERI distributes its meat produce to its own meat shops and other institutions such as hotels, restaurant and supermarkets.

3. Key Results/Outcomes

Inputs

The distribution of improved genetics and quality feeds have led to:

Improved productivity as indicated by increased litter size

Improved meat quality as indicated by decreased backfat thickness; and

Increased carcass yield from 72% to 75-78% .

Production

The trainings and inputs provided to farmers led to:

Increased farmers productivity

Increased hog population in Caraga Region

Postharvest

Postharvest interventions led to:

Higher farm gate price. HERI buys pigs at ₱100 to ₱105/kg liveweight versus ₱95/kg liveweight of other traders.

Improved meat quality. Costomers of HERI MCP testify that they are now getting better quality meat than before, particularly on product uniformity.

Improved market access. Meats produced by HERI MCP are now distributed not only in Butuan City but also to other provinces. Because of “AA” classification of the HERI MCP, meat can even be brought to Luzon areas.

4. Issues Encountered and Recommendations

Inputs

The area of operation of GMPC is limited. Low conception rate is achieved when semen materials are brought to distant areas.

Establish two to three more GMPC in Caraga

High cost of Pilmico feeds. Some farmers opted to use other brands or formulate their own feeds.

Production

Adoption of improved farming techniques by farmers remains low may be due to some personal reservations in the utilization of financial services that can be used to upgrade their operations. Strengthen further the technology dissemination and offer them viable financial services.

Postharvest

Farm gate price of pigs has tremendously decreased from ₱120 of last year to ₱100-₱105 this year, which they attributed to the decrease in the demand for primal cuts, which according to the respondents is due to pork importation.

Government shall strengthen the policy on utilization of imported meats. Limit the use of imported meats to meat processing operation only.

Chilling facilities established in the slaughterhouse are underutilized. Meat traders who are using the slaughterhouse facilities opt not to use the carcass chilling facility because the consumers are not yet ready or not attuned to purchase cold/chilled meat for they considered it as not fresh.

Consumer awareness campaign must be done slowly direct consumers to patronize fresh chilled meat.

Public market condition must be improved to address sanitation and make it conducive for marketing fresh chilled meat.

Commercial swine raiser may be encouraged to go into integrated production and postproduction (farm to market) operation and utilize the services of slaughterhouses with carcass chilling facilities.

D. Fisheries Value Chains: Lobster and Milkfish

The document summarizes results of several survey and interview activities carried out in a few municipalities of Dinagat Islands. It also validates previous data gathered from previous months’

survey conducted by several research assistants.

Respondents were primarily stakeholders of both the lobster and milkfish industry as these aquatic commodities make up the major sources of income and livelihood, especially of household families bordering the sea areas. Selected interviewees were earlier profiled by the Project's research assistants.

Stakeholders of the San Jose Ice Plant and Cold Storage Facility were also visited and interviewed to obtain additional information on the history of its establishment, present state of the facility and actions being undertaken to bring it to full operation

Despite the limited time and available records from government agencies, the survey team was able to capture important and critical issues affecting the Winrock-PCCP activities for the fisheries sector.

The survey resulted to a better understanding of the factors that has led to the delay in the operation of the San Jose Ice Plant, a facility financed and supported by the Provincial Government, San Jose Municipality and Winrock International through its PCCP undertaking.

1. Lobster

High market demand and pricing are among the two major factors that qualify lobsters as one high-value commodity that needs further R & D efforts as well as refinement of existing culture practices so as to bring it to commercial levels of production. The Philippines is blessed with critical areas where abundance of seed stocks have been identified. The Caraga Region is one and Winrock International through its PCCP activities has been working with various stakeholders to develop this very promising emerging industry.

Stakeholders in this industry include juvenile/adult collectors, producers (cage farmers), buyers/agents, traders. Collectors come from various municipalities within Dinagat Islands while biggest producers are those from Cagdiano and Basilisa areas.

Table 1 shows available production data gathered by BFAR Region XIII.

The Lobster Industry Situation in Dinagat Islands

YEARLY PRODUCTION OF LOBSTERS IN DINAGAT ISLANDS (MT)								
Year	Municipality							Total
	Basilisa	Cagdianao	Dinagat	Libjo	Loreto	San Jose	Tubajon	
2014	2.390	3.560	0.322				0.040	6.312
2015	2.500	4.500	0.542					7.542
2016	2.000	2.160		0.030		2.160		6.350
2017	4.000	35.800		8.000				47.800
2018	3.500	40.200		5.000		2.400		51.100

Source: BFAR San Jose

Lobster farming in the Philippines, as in many parts of the world, is still dependent on natural supply of wild pueruli. (the only fishery so far known), where catch methods have been developed by traditional collectors as these young stages migrate toward inshore areas. Basically, all stocks from juveniles to adult sizes are wild caught. In recent years, juvenile collection dramatically increased due to high demand brought about by entry of Vietnamese

buyers (some declare that about 70% of wild-caught juveniles are traded to Vietnam). This resulted also to increase in the prices of juveniles which greatly affected affordability of local growers.

Nursery rearing has been a challenge to producers/farmers as mortalities normally occurs especially during rainy days and typhoon season where salinity drops below optimum levels. Some farmers have their rearing cages located in shallow areas, limiting them from lowering their net cages when surface water salinity is low.

Stocking densities of juveniles range from 100-150 pieces/compartment and one cage net (measuring 3m x 4m x 4m) can hold about 8-10 compartments. Feeds come in the form of small fishes, sea urchins, snails, molluscs and other invertebrates that are available. Whatever is caught will be the feed (or feed mixture) for the day. Culture period is from 9-10 (at most 12) months, depending on the size of the juveniles stocked. Some farmers group themselves to manage one cage module.

Traditional cage farming methods have improved significantly with the introduction of improved technology/farming practices by Winrock's PCCP endeavour. Series of trainings/demonstration activities equipped stakeholders with new knowledge and skills bringing forth better production in this emerging industry.

Buyers normally consolidate purchased stocks and bring them to traders in Surigao where holding facilities for live trade (aquaria) are in place. A mark-up of P100/kg was declared by buyers covered in this survey.

The biggest trader in Surigao buys both wild-caught and cultured stocks to supply exporters in Manila. A tie-up arrangement with exporters has been forged where trader makes a regular mark-up of P300/kg and exporter shoulders all other costs (lobsters, packing materials, permits and freight and handling). This "win-win" situation has encouraged traders to expand and improve facilities (and continue to refine/improve handling and transport procedures).

Problems and Constraints:

Collectors

- lack of capital
- seasonality of juvenile occurrence in identified collecting grounds

Producers

- lack of knowledge and skills on proper nursery rearing practices
- limited supply/seasonality of food items for lobster culture (reliance on available catch of fishes, sea urchins, mollusks); there is a need for cheap commercial diets (formulated to meet lobsters' nutritional requirements)
- limited suitable farm areas (where cages can be lowered during rainy/typhoon seasons where salinity "drops" result to heavy mortalities)

Buyers

- increasing cost of juveniles/other stocks (battery size now cost P700-800/piece)
- lack of capital (financing interest rates are too high)
- good transport facilities (ref vans) – purchased stocks are brought to traders using live boats or in boxes half-filled with seawater (sometimes aerated while in transit to Surigao); there is a need to educate buyers to apply dry transport methods to ensure better quality of stocks and higher survival
- limited culture areas where stocks can be purchased (need for more producers to enter the arena of farming)

Traders

- limited supply to support exporters' demand (sometimes volume orders are not met)
- fluctuating prices (usually dictated by exporters; producers oftentimes delay harvest hoping for higher prices although in the end, this does not always work to their advantage (now down to P2,500/kg against P3,200/kg price in 2018))

Winrock-PCCP provided training programs on the following culture aspects: cage operations, feeding rates, dry transport methods, handling, packing procedures. Material inputs provided were crates, weighing scales, thermometers. It also made possible for stakeholders to avail of loans from financing groups/cooperatives.



Trader's conditioning tank for lobster



Milkfish

Milkfish remains to be one of the most important food fish in the Philippines. Although its production has considerably increased over the decades, the industry is still primarily confronted with problems of inadequate fry supply

The Bureau of Fisheries and Aquatic Resources continues to encourage establishment of more private hatcheries to address seed stock supply requirements of the entire country.

Milkfish culture practices in Dinagat Islands are still basically traditional although with the Winrock-PCCP initiatives, some farmers have learned to use formulated diets and apply suggested stocking and feeding rates/regime.

Some stakeholders are organized like the Samahan ng Maliit na Mangingisda, where inputs and profits are shared.

Cage sizes range from 6m x 6m x 7m to 10m x 10m x 10m. Stoking densities may go from 3,000pcs to 10,000pcs/cage. Some make use of 2-3" fingerings while others prefer 4-5" sizes. Assistance from the PCCP came in the form of materials (tubs, thermometers, weighing scales and feeds), trainings/demos and seminars of various aspects of culture operations to post-harvest handling and transport. Most of the produce are sold locally.

2. The San Jose Ice Plant and Cold Storage Facility

Areas bordering the Dinagat Islands have long relied on Surigao and Butuan supply of ice for storage and preservation mainly of fishery products (both from catch and culture) and other highly perishable produce like meat and vegetables. Farmers were often forced to sell these commodities to middlemen at low prices, less their products lose its freshness and lead to post-harvest losses. Hence the need for an ice plant and cold storage facility.

Its operation will entail sale of ice and provide cold storage areas to fish, meat and vegetable vendors, traders and other stakeholders.

The establishment of the facility was made possible through joint efforts of the Winrock-PCCP (USDA), San Jose LGU and the A&M Multipurpose Cooperative. The agreement was for Winrock-PCCP's Grants to provide funds for the ice plant and cold storage equipment and installation, the San Jose LGU was to provide the land (about 200 sq.m. lot) and the Provincial Government to provide funds for the building structure. Construction was initiated in March 2016 and was completed (per plan) by the 3rd quarter of 2016.

The agreement was for the A&M Multipurpose Cooperative to operate the facility. There are two (2) cold storage sections, each with a 30 cu.m. capacity and two (2) ice makers, with 54 canisters capable of holding 18kg. The ice makers are capable of solidifying water in 8 hours. The ice makers can run 3 cycles a day, giving forth a total production of 6 tons/day (@ 1 cycle producing 1 ton of ice x 2 ice maker units).

Major setback which delayed the operation of the plant was the failure to include in the original budget lines the cost of 3 units of transformers, capacity of which will require a 3-phase electrical system. The San Jose LGU then requested support from the Provincial Government which eventually committed funds amounting to about P640,000. Delay in the purchase of the transformers was that no supplier bided for the said equipment, despite three bidding invitations posted.

Months have passed with no eminent progress. Facility seem to have been abandoned as evidenced by presence of debris (bat droppings, dust and some amount of rust degrading the quality of the purchased equipment). Some portions of the facility now

requires cleaning and repairs (in addition to re-cementing of entry doors which had to be partially torn down to bring in the ice-making equipment).

Dry-runs to test the ice making equipment and cold storage areas were carried out through the local electric company, DIELCO (where 3 transformers were rented out). The A&M Cooperative paid for the cost of the said tests (as this was prerequisite for Winrock to pay for the equipment/machinery).

Status (as of February 14, 2019)

- Rate of completion ~94%
- Signing of MOA between LGU San Jose and A&M Cooperative for the transfer of Php 640,000 for the purchase of transformers. The amount was earlier released by the provincial LGU to San Jose LGU. The MOA also specifies the 50:50 sharing between San Jose LGU and A&M Cooperative of the ice plant's net income
- Purchase of 3 units transformers for 3-phase electrical power (pre-requisite for the operation of the ice plant)
- Installation of transformers/other electrical system (through DIELCO)
- Minor repairs and cleaning of existing facility
- Installation/provision of water supply (c/o San Jose Water District)
- Turnover of facility
- Formal launching: Targeted mid-March
-

Once in full operation, the Cooperative will strategize to keep prices of ice competitive (Surigao ice cost over P3/kg) and storage fee affordable. At 75% capacity, A& M Multipurpose Cooperative looks at a 3.2 return of investment (ROI). The following tables summarize market plans and strategies.

Operation of the San Jose Ice Plant and Cold Storage Facility will directly benefit the following:

- 1) Lobster industry - requiring ice for conditioning, packing and transport
- 2) Finfish (milkfish, grouper, others marine fishes)
- 3) Shrimps and other crustaceans
- 4) Horticulture commodities - to utilize cold storage area with higher temperature
- 5) Other perishable goods

Note: (2) and (3) require ice for packing and transport; may also require storage facility when there is an over supply of produced commodities)

Ancillary industries likely to be established with the operation of ice plant include the following:

- Fishing equipment/materials (gears) as fish effort may likely increase
- Aquaculture supplies
- Processing outfits
- Transport facilities (refrigerated van that can move around and go to farms to buy/consolidate marine products)
- Seafood restaurants
- Service providers

Benefits from WINROCK-PCCP efforts

- Training programs (hands-on)/demos/seminars
 - PCCP Courses
 - Sanitation
 - HACCP
 - Food Safety
 - Handling/Transport

- Financial assistance (equipment, materials and supplies)

Through Winrock-PCCP initiatives through conduct of trainings, monitoring, seminars, demos (hands-on), stakeholders were made aware of the benefits of food handling and preservation, proper transport facilities and methods.

RECOMMENDATIONS

Once the San Jose Ice Plant becomes fully operational, the facility will be able to provide ice and/or storage areas required by the reported volume of marine commodities from capture and culture activities.

The LGUs bordering San Jose which rely partially or solely on such commodities for income, job generation and trade should be encouraged to increase fishing effort (capture fisheries) and involve more players in culture activities (for lobster, milkfish, shrimps, groupers) so the use of the ice plant facility can be maximized.

Overall Feedback

Stakeholders' appreciation on Winrock's initiatives on establishing linkages for all stakeholders has been highlighted during interviews/surveys so far conducted.

ANNEX 13. PHOTO DOCUMENTATION