HAITI HOPE FINAL DONORS REPORT SEPTEMBER 2010 – FEBRUARY 2016

Prepared by TechnoServe for The Coca-Cola Company, the Multilateral Investment Fund of the Inter-American Development Bank and USAID.

Table of Contents

Executive summary

The Haiti Hope Project was a five-year partnership between The Coca-Cola Company, the Multilateral Investment Fund (MIF) of the Inter-American Development Bank (IDB) Group, and the US Agency for International Development (USAID), implemented by TechnoServe (TNS). The Clinton Bush Haiti Fund (CBHF), Soros Economic Development Fund (SEDF) and other international and local actors provided additional support. This document is the project's fifteenth and final donor report and describes project results from launch in September 2010 to close in February 2016.

The Haiti Hope Project achieved considerable impact. The project set an ambitious goal of doubling the mango income of 25,000 producers in five years after being enrolled in the project. Fully engaged beneficiaries, comprised of 4,615 farmers, increased their mango income between 67% and 74% on average. The project expects these farmers will double their income after five years of implementing the project's methodology. Overall, the average mango income increase of all 25,125 beneficiary farmers was 44%. Additional mango income increases came from seasonal Producer Business Group (PBG) employment, and the expected future income from grafts and additional trees planted by farmers, which will likely yield fruit beginning in 2018.

Mango farmers are applying best production, harvest, post-harvest, and commercialization practices. There is evidence for greater, positive competition in the supply chain largely driven by an increase in inclusive grower associations called PBGs which increased prices to farmers. Gender equity was actively pursued; women comprised 47% of PBG membership and 38% of the PBG leadership teams. Exported Fair Trade and USDA Organic volumes have increased by 315% since 2010 (32,889 dozen in 2010 to 136,458 dozen in 2015). A credit program with over 9,000 borrowers, many of them for the first-time, exceeded targets by lending over $3.25million. For long-term productivity, 63,215 mango trees were planted in 524 micro-orchards with an average survival rate of 70%. Additionally, 65,641 Francique mango grafts were completed on lower value variety mangoes.

The mango sector enabling environment was improved through traceability initiatives, the creation of a public database of farmers, the creation of guides and toolkits, and individual exporter trainings in preparation for the implementation of the Food and Drug Administration's (FDA) Food Safety Modernization Act (FSMA).

Table 1: Summary of key project achievements

Activity	Progress
Farmer activities	• 25,125 unique farmers trained, 46% women • 262 producer business groups sold mango, 38% of group leaders and 47% of members are women
Marketing	• Average mango incomes rose by 44% with 4,615 fully engaged farmers' incomes rising between 67% and 74% (40% increase by control group) • $7.49m total value of sales from 4,642 MT from project-assisted farmers since 2011 • Fair Trade & Organic export volumes grew from 148 MT in 2010 to 614 MT in 2015 (cumulative post-season PBG premiums total $239,958 since 2011)

	• In 2015, PBGs supplied 1,312 MT of the exported volume, comprising over 11% of Haitian exports that year • 1,291 seasonal jobs created to operate PBGs (total 2,808 new and existing jobs); average seasonal mango wages of $37.46 per worker, totaling $175,705 since 2013
Farmer credit	• 9,354 farmers (52% women) received at least 1 loan (37% all participants) • More than US$3.25M disbursed with an on-time repayment of 96%
Production	• 63,214 trees planted in 524 orchards (covering 310 hectares of land) with an average survival rates of 70% • 65,641 grafts converting lower-value mango varieties to Francique
Processing	• Both Francique and Kodok varieties found appropriate for juice • Financial analysis of the investment case concluded not profitable under current market conditions

A key activity of the project was the creation of PBGs in mango farming communities. In three seasons, PBGs improved their profitability, took on more commercialization responsibility, and enhanced their value proposition to more exporters. Annual exports from Haiti were an estimated 11,094 MT in 2015 — the highest since a peak of 11,306 MT in 2006. From 2013 to 2015, 262 PBGs sold 2,523 metric tons (MT) of mango for export.

Evidence suggests that the project's prioritization of improving the fresh Francique export supply chain has been effective in increasing farmer income. However, factors such as initially only engaging with existing farmer associations, the limited project engagement with local market buyers, insufficient activities to promote crop diversification, and the reluctance of most exporters to fully engage, have likely limited impact. The project also encountered limits to scale both with Fair Trade and Organic export volumes, as only one exporter, Perry, was certified and supplied one US retailer, Whole Foods.

The project executed an exit strategy in 2015, which primarily focused on handing over key activities to private sector actors, including PBGs and exporters. Sustainability activities focused on (1) PBG function and market access, (2) mango production, (3) exporter modernization, and (3) credit. Project partners examined all stages including project design, implementation, management, evaluation, and sustainability to establish key learnings.

The Haiti Hope Project closed having systemically improved the mango sector. Recommendations for future mango projects and policy include preserving and supporting the PBG structure, continuing to increase Fair Trade and Organic exports, and continuing to transition smallholders to supply the local market with larger plot farmers, like those established with micro-orchards, to more efficiently supply the export market. By adapting grower groups to sell on the local market, encouraging greater competition among exporters, providing additional technical assistance to prepare them for the FSMA, and spurring greater US buyer diversification across regional markets to increase exports, donors and policymakers alike will be building on the successful investments made during the Haiti Hope Project. This will allow for the continued improvement of mango producers' socioeconomic conditions while also promoting the long-term development and revitalization of Haiti.

1 Background

In September 2010, TechnoServe (TNS) began implementing the Haiti Hope Project. The Project was a five-year partnership between The Coca-Cola Company, the Multilateral Investment Fund (MIF) of the Inter-American Development Bank (IDB) Group, and the US Agency for International Development (USAID), implemented by TechnoServe. Support was also provided by the Clinton Bush Haiti Fund (CBHF), Soros Economic Development Fund (SEDF) and other international and local actors. The project's primary objective was to double the income of 25,000 mango farmers.

The increase in income was promoted through activities to support farmers to increase their production (e.g., training of tree maintenance, planting of new trees), improve quality (e.g., training on harvesting techniques, farmer credit), and enhance sales practices (e.g., quality grading, group bookkeeping).

This document is the fifteenth and final project report detailing progress and achievements from September 2010 to project close in February 2016.

2 Progress against core indicators

The Project reported against core indicators defined in the project log frame on an annual basis.

The table below shows indicator results tracked for the period. Note that the project year in previous reports was from September to August. However, due to the project extension through December 2015 for project activities and through February 2016 for close out activities, dates have been adjusted to reflect achievement made through December of each year. The project's logical framework is provided in Annex 1, which includes indicator definitions.

Table 2: Progress against outcome indicators

#	Outcome Indicators	Unit	Dec 2011 Actual	Dec 2012 Actual	Dec 2013 Actual	Dec 2014 Actual	Dec 2015 Actual	Y5 Target	Y5+3 Target
1	Average Farmer Income From Mango*	US$ per year	$77	-	$108	-	**$111**	$96-129	$154
2	Average Volume Sold by Farmers	"Dozen" "Dz"	146	-	-	-	**146**	190	204
3	Average Unit Price Received by Farmers	HTG per "Dz"	25	-	33	-	**35**	32.5	37.5
5	Number of Farmers (Cumulative) Implementing Practices	Farmers	Unknown	Unknown	18,616**	-	**18,189**	25,000	25,000
6	Mango Trees Planted by Farmers (Cumulative)***	Trees	0	0	21,936	49,083	**63,214**	45,000	n/a
7	Functioning PBGs (e.g., aggregating, selling to exporters or Grower Groups)	PBGs	6†	16	129	229	**262**	250	200
8	Number of New Mango Processing Operations	Operations	0	0	0	CANCELLED	**N/A**	N/A	N/A
9	Share of Participating Farmers with Access to Credit through the project	%	25%††	8%	23%	41%	**37%**	20%	20%
10	Number of Financial Institution Providing Farmer Credit	Institutions	1	1	1	1	**1**	1	1
11	Cumulative Loan Amount	US$	$46,088	$252,357	$1,118,383	$2,328,144	**$3,258,629**	$250,000	n/a

* Based on the 2015 Annual Survey and Evaluation. All figures are nominal based on HTG 51 per US$1.

**This estimate was based on adoption rates measured in 2013 for the mid-term evaluation. This rate has been applied to the current number of enrolled farmers (Production 80% Harvest 40% Marketing 60% - weighted average of 70%) for 2013. The apparent change in 2015 is partially due to the denominator changing from enrolled farmers (~27,000) to farmers receiving at least 1 training (~25,125). See section 3.1.2 for more information.

***Includes orchards only, not including widely reported farmers planting on their own due to the project and changing perceptions of the profitability of mango in Haiti.

† Existing grower groups

†† Number is inflated due to low number of participating farmers during project pilot phase.

Table 3: Progress against output indicators

#	Output Indicators	Unit	Dec 2011 Actual	Dec 2012 Actual	Dec 2013 Actual	Dec 2014 Actual	Dec 2015 Actual	Y5 Target
13	Number of Farmers participating in the Program (cumulative)*	Farmers	2,818	11,290	18,013	21,006	**25,125**	25,000
14	Share of Participating Farmers that are Women	%	42%	47%	46%	47%	**46%**	30%
15a	Animator Training (cumulative)	Trainings	524	1,215	7,798	13,528	**18,138**	8,550
15b	Business Advisor Trainings (cumulative)	Trainings	0	37	347	760	**1,248**	504
15c	Formal Trainings (cumulative)	Trainings	0	41	52	70	**70**	78
16	Number of Collection Sites	Sites	15**	69	177	Unknown	**410**	350
17	Value of Awards or Incentive Schemes Rewarded to Well Performing Groups (cumulative)	US$	$0	$11,350	$176,218	$204,752	**$204,752**	$150,000
19	Number of Partnerships Established with Institutions to Provide Loans to Farmers	Institutions	1	1	1	1	**1**	1
20	Mango Export Volume from Haiti Hope PBGs & Grower Associations (GAs)	flats: 4.5kg	44,810	50,130	150,213	266,270	**325,147**	62,720
21	Number of farmers selling through PBGs & GAs (per season)	Farmers	-	511	2,038	3,356	**3,616**	4,000
22	Number of PBGs receiving mobile money payments	PBGs	-	-	-	100	**133**	150
23	Number of farmers participating in the traceability system	Farmers	-	-	-	-	**6,122**	8,000

*The definition was modified by Steering Committee agreement in October 2014 to better reflect the impact of the project (enrolled farmers attending at least 1 training).

**Estimate based on existing grower groups

3 Haiti Hope Results

The goal of the Haiti Hope Project was to catalyze sustainable economic growth in Haiti by creating income, employment, and economic opportunity in the agricultural sector. It aimed to take Haiti's mango value chain to potential via a comprehensive program to increase productivity and incomes for 25,000 smallholder farmers, increase fresh mango export and local sales, foster a competitive processing sector, diversify to complementary fruit products, and by so doing, significantly contribute towards food security, gender equity, and reforestation. The project's primary objective was to double the mango income of 25,000 farmers.

Specifically, the project aimed to (1) empower Producer Business Groups (PBGs) to increase production, (2) improve the supply chain to strengthen market linkages for fresh mango export markets, (3) foster competitive local processing businesses to increase local value addition, and (4) facilitate a supportive enabling environment.

By 2015, 25,125 farmers were trained and received assistance from the project. Table 4 below shows profiles of three cohorts of farmers. This includes PBG Direct Export farmers, which were farmers enrolled in the program, organized into PBGs, and who sold directly to the export market through the PBGs. PBG Indirect Export Farmers were farmers enrolled in the program, who were organized into the PBGs, but who accessed the export market through traditional intermediaries and channels. Finally, non-PBG farmers were those that enrolled in the project, but who were not members of PBGs.

Table 4: Haiti Hope farmer cohort profiles

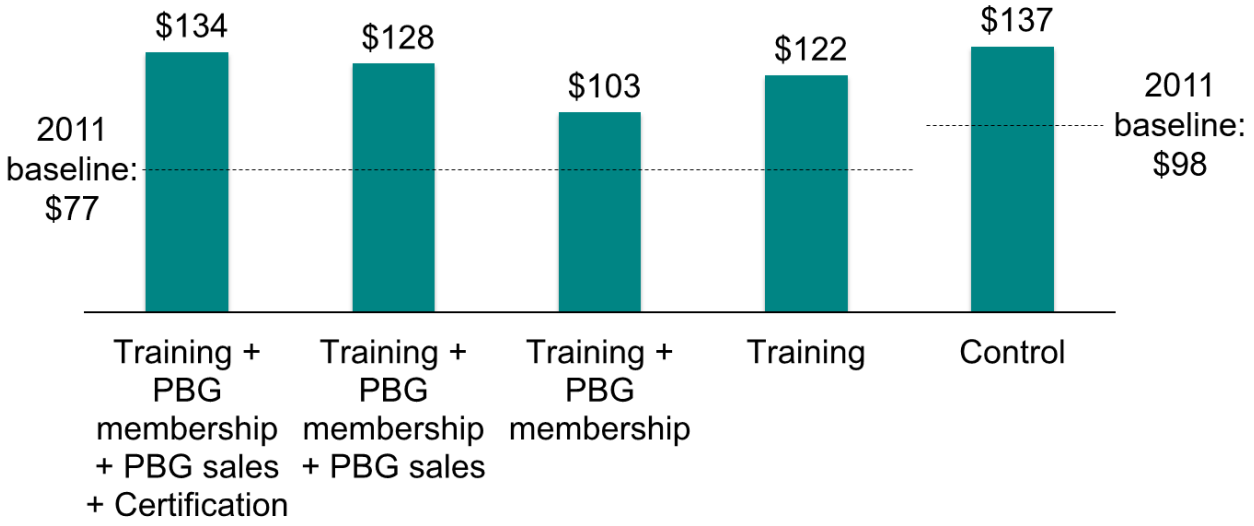
Farmer Cohorts	# Farmers	Average Trainings (%N>3)[1]	PBG Member	PBG Seasons sold	Credit, # Farmers	Median Productive trees (2013 → 2015)
PBG Direct Export	4,615	7 (85%)	Yes	1.5 seasons	3,423	4 → 7
PBG Indirect Export	16,057	5 (59%)	Yes	0	5,539	3 → 4
Non PBG	4,453	2 (13%)	No	0	390	3 → 5
All cohorts	25,125	5 (56%)	-	-	9,352	3 → 5

The project successfully increased the incomes for all cohorts of farmers. Table 5 below illustrates nominal income increases since the 2011 baseline by services received. The second row represent PBG Direct Export farmers, which as seen in Table 4 were the most active group in the

[1] Percent of the cohort population that attended more than 3 trainings.

project. These farmers increased their nominal mango incomes between 67% and 74%, with larger increases resulting from sales through the Fair Trade and Organic certification program. Row three represents PBG Indirect Export farmers, which experienced the smallest percentage increase in income. This cohort increased nominal mango income by 33% on average. Row four represents Non PBG farmers who had the lowest level of engagement, yet the third highest income increases. These farmers increased their nominal mango income on average by 58%.[2] On average, mango incomes increased by 44% for the 25,125 farmers engaged in Haiti Hope. It is important to note that a control group also increased its income on average by 40%, suggesting that externalities and other market forces outside of the project contributed to the income increases. Additionally, as seen in Table 5 below, the control groups sampled in 2011 and 2015 had the highest mango income of any group. This likely suggests that farmers in the program were among the poorest mango producers in the sector, who had productive mango trees, but who were earning inferior prices in 2011/2012.[3]

Table 5: Nominal average farmer mango income increases since baseline



Confounding factors made it difficult to assign full attribution of income increase directly to project activities; however, the project played a critical role in driving these positive changes in the market. Evidence elaborated on in sections below and in the evaluation summaries in Annex III highlight the project's critical role given:

[2]Evidence from the 2015 Annual Survey (Schwartz, 2015) shows that Non PBG farmers are the most diverse group with large variation of observable characteristics. Anecdotal evidence from the project suggests that these farmers likely had already established market access and self-selected out.

[3] Schwartz, 2015, pages v, 24, 28, and 38.

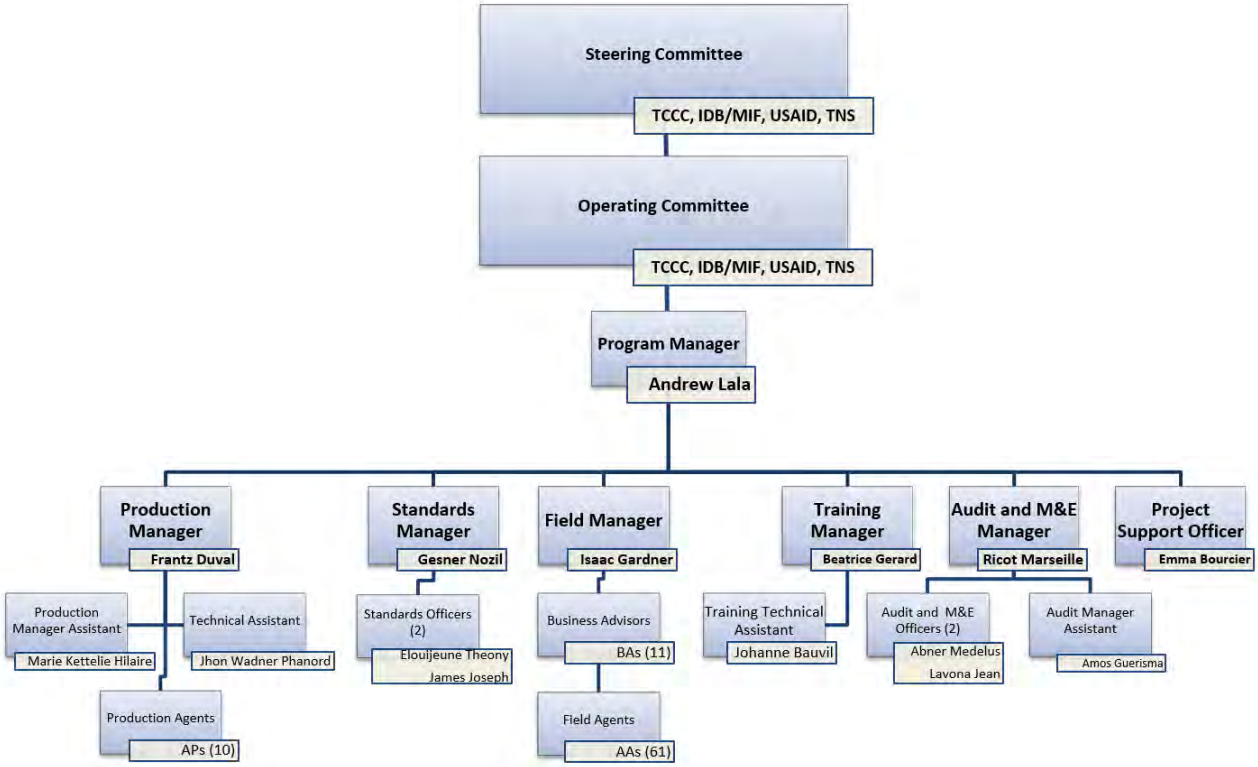
- the project trained and had direct contact with a large number of active export market producers; the final evaluation (Lea, 2016) estimated the number of producers supplying the export market is between 25,000 and 50,000;
- best practices associated with income increase have largely been adopted by farmers, such as a reduction in pre-selling mango trees at a discount to intermediaries;
- the majority of PBG Direct Export farmers (60%) were not members of the previously established farmer associations;
- there has been large sales volume growth for both conventional and certified mango sales within the new PBG channel, indicating PBGs' strong value proposition to member farmers; and
- there is an abundance of focus group evidence of market system change, such as copying, competitive pressures on intermediaries, spillover effects, and leading indicators such as high new sapling planting rates.

One major strategic pivot was from exclusively engaging with existing Grower Associations (GAs) to helping to form small, locally-controlled Producer Business Groups (PBGs) starting in 2013. PBGs competed with traditional intermediaries to purchase from farmers and were comprised of farmers themselves who took over key intermediary roles including harvest, post-harvest handling, and marketing.

The project also worked on meeting international standards (social and environmental certifications, food safety, and traceability). The project added dedicated field teams for production and standards to the existing structure. Each team was led by a senior business advisor which allowed the field manager to focus on mango commercialization. The project also increased the efficacy of the field staff team, comprised of approximately 60 technical advisors, in delivering trainings and services to farmers.

The project addressed key supply chain constraints. This included training harvesters to address a skilled labor gap and increased the management and coordination capacity of exporters. These exporters traditionally heavily rely on intermediary trader groups for all supply chain steps before mangos arrive at the packing house. Decreasing exporter reliance on traders will improve profitability of both exporters and farmers, as well as improve quality controls and traceability required to maintain and expand market access to growing retail sectors in the US.

Figure 1: Haiti Hope Organizational Chart



3.1 Empowering farmers to increase production and strengthen market linkages through farmer groups

This section provides in-depth detail on our work to support farmers to improve their production and commercialization of mangoes. This includes supporting farmers to:

1. Organize efficiently,
2. Train farmers on production, harvesting, etc.,
3. Provide access to credit,
4. Support grower groups to develop mango marketing systems, and
5. Facilitate Organic and Fair Trade certification.

3.1.1 Supporting farmer groups

From 2010 until 2012, the project engaged with existing grower associations to reach farmers and conduct extensive trainings, provide credit, support the Fair Trade and Organic certifications, and connect farmers more directly to export markets. By 2012, over 20,000 farmers had been recruited, but only 511 of them were mobilized by 17 existing grower associations (GAs) to sell mangos on the export market. After reviewing this challenge with field agents and the GAs, it

became clear that expanding the participation in these associations faced significant logistical and social obstacles, and their leadership declined to invite new farmers as voting members. Thus, in order to improve sales and farmer participation to achieve the goal of the project, it accelerated the creation of Producer Business Groups (PBGs) in the second half of 2012. Although PBGs became the key vehicle for delivering project activities to a larger audience of farmers, GAs continued to receive project assistance through 2015. GAs were assisted by business advisors and the standards team who helped to register their members in the Fair Trade and Organic program, and received traceability, harvest and post-harvest handling trainings. They were also provided improved tools to execute those best practices, and were coached to improve Fair Trade compliance particularly in the financial management and responsible use of premiums for Fair Trade community projects.

The new PBGs were formed of and by farmers enrolled in the Haiti Hope Project for the purpose of marketing agricultural products rather than the more diverse social and political goals of most existing farmer associations or GAs in Haiti. Project staff gathered extensive feedback from farmers before narrowing down the definition of a PBG to include one or two villages and approximately 60 farmers each. The size ensures that all members know one another and have extensive social collateral, minimizing the cost and risk of participation. Marketing by the PBGs is managed by a three member committee composed of an “Ajan Maketing,” “Ajan Lojistik,” and “Ajan Kontwole” who perform sales, logistics, and bookkeeping respectively. As the PBGs formed, project staff conducted trainings and supported the group to build member cohesion.

The project expanded the number of active PBGs from 82 in 2013 to 213 in 2015 to increase farmer participation and to accompany first-time sellers through pre-season visits to exporters, intensive trainings on the harvest, aggregation and marketing, and through direct coordination support during their first mango harvest. The strategy shift of engaging farmers through PBGs and GAs, accomplished its objectives of increasing farmer participation over seven fold from 511 active farmers to 3,616 per season by 2015. Correspondingly, volumes sold through the project rose from 148 MT in 2010 from GAs alone to 1,463 MT from PBGs and 203 MT from GAs in 2015. Figure 4 below illustrates this evolution.

PBGs that had sold in 2013 exercised more independence in the following seasons, evidenced by organizing collections, increasing prices paid to farmers, and keeping sales and traceability records. The project supported these more experienced groups primarily through transportation coordination to the exporter. By 2015, 94% of PBGs had reached breakeven or earned profits with a combined net profit of $68,382. It is important to note however that the primary objective of the PBGs was not to maximize profits but to return as much as possible to the farmer. The profits earned were used to cover up-front costs for future mango sales, replace equipment such as tarps, purchase other inputs such as donkeys, and address cash-flow constraints. The most successful of the PBGs sold over $27,000 worth of mangos and ended the season with a net profit over $1,700. The average PBG revenues were more modest at $1,300 with average profits of $340, which is roughly the equivalent of selling one truck load per season.

The project formed a total of 297 PBGs, of which 213 PBGs and 9 Grower Associations (GAs) sold for export during the 2015 season. Of the 297 formed, 262 PBGs sold at least once. Although the PBGs average about 65 members, or almost 20,000 members in total, a much smaller number, 4,615 farmers, actually sold directly on the export market through the PBG. Member farmers benefitted from access to trainings and market information, such as per dozen prices. Evidence from the Final Evaluation and Annual Survey suggest that farmers were also incentivized to join PBGs to access credit, with half of those farmers in the credit program never selling mangos through a PBG. This gap between PBG Direct and Indirect Export farmer sales to PBGs is likely due to strong existing relationships with traditional traders, harvest timing, and farmers' risk-averse preferences to diversify buyers and for traders who pay cash before the season or cash-and-carry during the season (PBGs to date have taken mangos from farmers on credit and paid them after delivery to the exporter). The project also concluded that the issue of payment terms (cash-and-carry versus on credit) was a key constraint to the growth of participation, and in the last year it worked with the main buyer, Perry Export, to assess the possibility of establishing a very short term credit program for well-performing PBGs (more on this in section 3.1.3).

In addition to sales support, the project heavily invested in reinforcing the management capacity and legal status of PBGs. First, as part of the Fair Trade requirements, all of the PBGs formed Fair Trade committees, who are responsible for managing Fair Trade premiums for community and social projects. Second, the project assisted 287 PBGs to legally register with the Ministry of Work and Social Affairs (MAST), the Haitian government entity with the authority to grant legal status to farmer groups as Associations. MAST, under a former minister, independently registered 15 PBGs before halting the process at the beginning of 2015. MAST expressed concern in registering a large number of small farmer groups relative to the typical association or cooperative. After several negotiations, MAST agreed to recognize PBGs ("cellules"), but for administrative purposes they were required to be structured under an umbrella group. A total of 272 PBGs were registered collectively under the name of a Central PBG called "Cellule Centrale des Producteurs pour le Developpement de la Mangue Francique" or (CECEPDEMAF) from December 2015 until December 2017. By December 2017, the PBGs will be responsible for submitting PBG activity reports and income statements to MAST under the Central Cell for continued legal recognition.

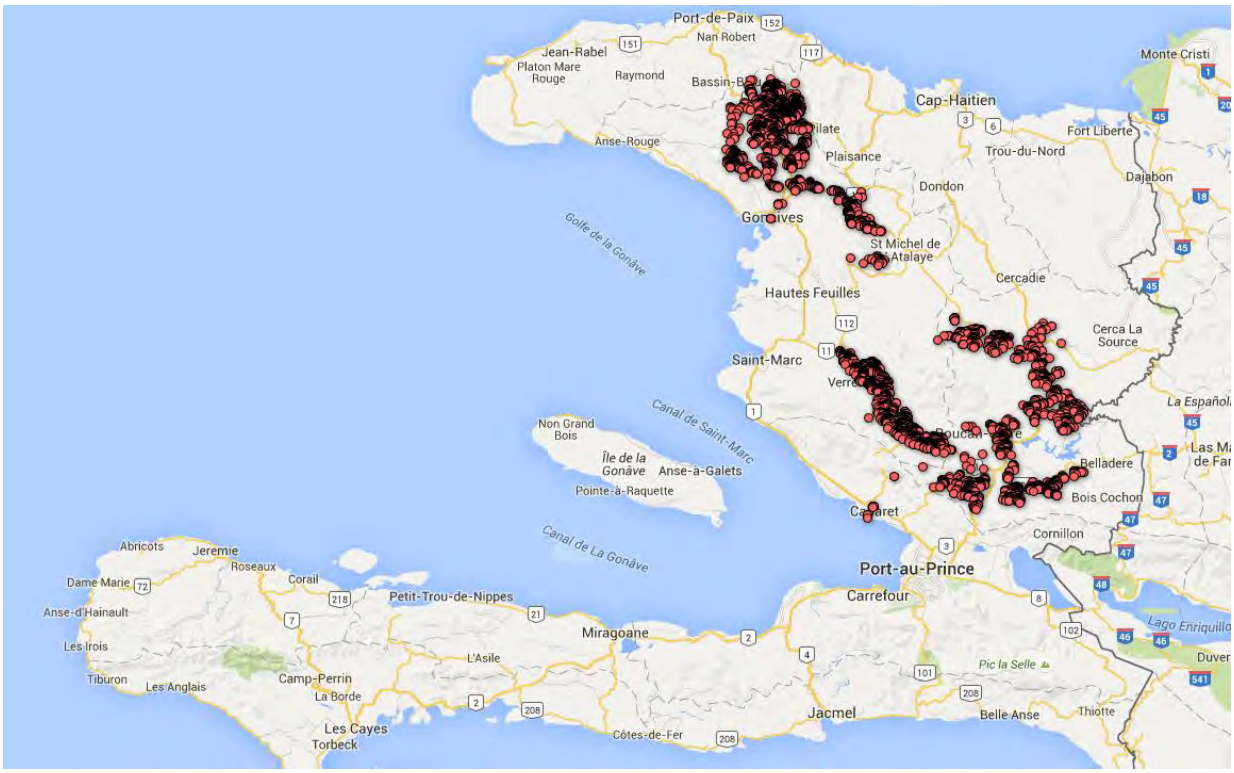
As stated in their legal documentation, each PBG is allowed to function independently. They can open their own bank account, cash checks under the PBG group's name, and sign contracts. Furthermore, the commercial committee and Fair Trade committee of each PBG combined to form the association committee. The project deliberately coordinated very closely with the Ministry of Agriculture, specifically the "Direction de la Protection des Vegetaux" (DPV) section which oversees the mango export sector, to ensure their support and recognition of the PBGs.

In addition to training, coordination and legal support, CBHF funds were used to provide improved technologies as an incentive to active PBGs and GAs, including harvest and post-harvest tools, such as crates, pack animal equipment, mobile tent structures, tarps, water drums and

drying cloth. These incentives were distributed among the growers of the most active mango selling groups and among the most adaptive and innovative growers. By 2014, the project finished distributing materials with the exception of some mobile collection point kits and tablets for yearly organic plot registration, which were distributed in 2015.

The majority of PBGs are expected to be sustainable after the project ends due to group profitability and continued access to multiple markets, which was bolstered through the creation of regional coordinators in collaboration with exporters. PBG sustainability activities are discussed in detail in section 5.1.

Figure 2: Haiti Hope Farmer Locations (2015)



3.1.2 Farmer training

The project exceeded its training objective with 25,125 farmers participating in at least one training. On average, farmers received 5 trainings. The most active members, PBG Direct Export farmers, received on average 7 trainings, PBG Indirect Export farmers received 5, and Non PBG farmers received 2 on average. In total, 23 training modules were developed over the lifetime of the project and 18,138 trainings were conducted by 60 field agents at the project's peak. These training modules included: introduction to TechnoServe and the project, nursery creation, orchard establishment, environmental management, composting, chemical input management,

natural pesticide creation, pruning, grafting, harvest and post-harvest best practices, PBG mobilization, business planning, seasonal marketing plan, farming as a business, PBG as a business, PBG collection center management, traceability, profit loss statement, negotiation, conflict resolution, credit, certification and food safety, and gender equity.

In the last two year of implementation, farmer training focused on the strengthening of the PBG structure and management as well as building farmer capacity needed to meet the potentially onerous requirements of the Food Safety Modernization Act (FSMA). Enacted by the United States government and effective on all food products sold in the US including Haitian mango, the FSMA will likely have a significant impact on small growers in Haiti as it requires verifiable preventative measures on food safety, which for fresh produce such as Francique Mango includes documenting on-farm practices, especially those related to hygiene, and having a viable traceabilty system. In addition to the administrative burden for farmers, PBGs, and exporters, it will also require Haitian farmers to have a good understanding of and apply global standards of agricultural production to maintain their market access.

Overall, farmer trainings proved effective in changing behavior. As the 2015 Annual Survey[4] measured, 72% of those surveyed across all farmer cohorts (see Table 4), representing 18,189 farmers, implemented 2 or more of the 6 best practices assessed (planting new saplings, pruning, thinning, cleaning the ground cover, using improved harvest tools, and sorting for quality). Twenty percent of those surveyed, representing 4,935 farmers, indicated they implement 4 or more best practices. The 2015 Annual Survey also documented that best practices, such as pruning, were positively spilling over to other mango varieties and fruit trees. The control group had the lowest adoption rates across all assessed best practices. One key finding was that those surveyed who had attended 6 or more trainings were 2 to 3 times more likely to have adopted 4 or more best practices.

As detailed in the exit strategy found in Annex II, junior trainers were elected in 2015 by member farmers and field staff to serve as the keeper of training materials and to conduct trainings after the project ended. In total, 420 PBG junior trainers provided 1,384 trainings in 2015 with project field staff providing coaching as needed. The trainers were provided printed, illustrative modules to encourage them to continue key trainings after the project ends. PBGs were also encouraged to include a training fee in their business plans, with most opting to provide a small honorarium to the trainer to encourage him or her. The trainings will likely take place a few weeks prior to mango harvest as PBG leadership mobilizes farmers for the harvest and prepares the mobile collection center. Best practices resulting from training, such as harvesting only quality mangoes or selecting by quality for the local or export markets, are likely to continue as there is a profit motive behind the successful implementation of those practices (see section 3.1.4 for a discussion on how traceability allows for a mango quality feedback loop from farmers to exporters).

[4] Schwartz, 2015, pages 11-16.

In February 2016, an intense radio spot and storytelling campaign targeting PBG farmers was broadcast in the Plateau Central, Haut Artibonite, and Bas Artibonite. It is estimated that at least 10,000 PBG farmers were exposed to the intensive radio campaign that described changes to the mango sector since 2010, encouraged best practice adoption (such as using dozen units and pruning), discussed results from organizing into PBGs, and highlighted future changes to the sector such as traceability and food safety regulation.

3.1.3 Farmer credit

Although there are many microfinance institutions in Haiti, few farmers have access to credit. Most microfinance institutions focus on commercial trading activities because of the high turnover and low risk. Based on reports from industry experts and farmer groups, the project set out to partner with a Haitian financial institution to provide loans to smallholder farmers enrolled in the project, and with funds from the Clinton Bush Haiti Fund (CBHF) established a small guarantee fund of $250,000 to motivate financial institutions.

Since April 2011, farmers were invited to participate in a credit program, Agripro, developed with local microcredit institution Sogesol which was co-developed with the project to keep interest rates to a minimum. Agripro loans featured a fixed four-month duration and a fixed monthly interest rate of 2.5 percent, plus a 3 percent origination fee. Farmers started out with an initial credit of $50, and each time they fully reimbursed on time, they became eligible to renew for a larger amount up to $150. In addition to the credit itself, this allowed farmers to build up a credit history with the bank. As a result, some farmers, after reimbursing the largest loan available, decided to approach Sogesol loan agents for larger loans through the bank's main agricultural loan program to finance their commercial and production activities. This credit product unlocked $3.25 million in short-term credit for 9,325 smallholder farmers, many of whom were previously excluded from the country's formal banking system. Over 68% of these farmers were repeat borrowers who continued to take two or more loans.

The partnership with Sogesol and the Agripro product reached a mature level in 2014, with many farmers having reached the maximum loan amount and seeking larger loans with Sogesol or other institutions. The Sogesol team itself had expanded, gained experience, and acquired logistical resources in order to serve these rural clients. As a result, the project and Sogesol agreed that the project would cease subsidizing new loans as of July 2014, so all first-time borrowers after that date would be the sole responsibility of Sogesol. Farmers who received their first loan prior to July 2014 were, per the existing agreement, cycled out of the guarantee after one year or June 2015.

CBHF was critical in developing and implementing the farmer credit program in collaboration with Sogesol. The fund was formally closed on December 31st, 2012, and management of the fund officially transferred to the IDB. By July 2014, the project no longer provided Sogesol with

loan guarantees to new borrowers, and existing borrowers cycled out of the guarantee after one year. As a result, IDB agreed that remaining funds were to be redirected to fund an ambitious production program through the end of the project, which is detailed in Sections 3.1.7 and 3.1.8. A total of $15,549 of the $250,000 guarantee fund was used to pay eligible defaults.[5]

In the summer of 2014, an outside consultant wrote a case study on the Agripro product, its results, and effectiveness in addressing the mango pre-selling constraint initially identified. One of the important conclusions was that although the original purpose for the project to create the loan product to smooth income and prevent farmers from pre-selling their mangos due to short-term cash needs, in fact this is not how most farmers used it. Instead nearly 80% of borrowers reinvested the loan in income generating activities. This suggests that there are other causes for pre-selling rather than short-term financial constraint such as an extreme perceived uncertainty of future revenue. Other notable findings included the average on-time repayment (within 30 days of scheduled reimbursement date) was 96% and average net returns were 15% of the value of the loan. See section 5.4 below on credit program sustainability.

3.1.4 Marketing

As identified in the project diagnostic[6] more direct commercial relationships with exporters of fresh produce were encouraged to eliminate those middlemen who were not adding value in order to directly increase farmer income. As many smallholders were dependent on traditional middlemen to get their produce to market (both for local and export markets), they had little opportunity to negotiate a fair price for their mangoes or understand true market conditions. PBGs provided this more direct market access and the project increased both volumes sold through GAs and PBGs, and the farmgate price. Creating and supporting farmer groups as detailed in section 3.1.1 above was the primary marketing activity.

Mangoes only ripen within a particular geography during a short window of time. Planning and coordination with other supply chain stakeholders prior to harvest helped to minimize spoilage. Key training topics included how to determine if a mango has reached the correct stage of ripeness, quality standards for export versus the local market, and appropriate transport techniques to minimize losses. Business Advisors and the Field Manager conducted workshops with the GAs and PBGs on their seasonal marketing plan (“Plan Konpay”). In 2015, responsibility for this activity was primarily transferred to regional coordinators as outlined in the exit strategy (see section 5.1). The marketing plan was an essential activity to organize farmers within groups to prepare them to mobilize PBGs seasonal employees including harvesters and transporters and to identify buyers on the local and export markets to negotiate prices and volumes. The seasonal business plans ensured that prices were transparent to member farmers and PBG seasonal

[5] The CBHF guarantee fund covered 75% of the loan principal for first-time borrowers, 50% for second-time borrowers, and 25% for third-time borrowers.
[6] TechnoServe, August 2010. Haiti Hope Project Diagnostic.

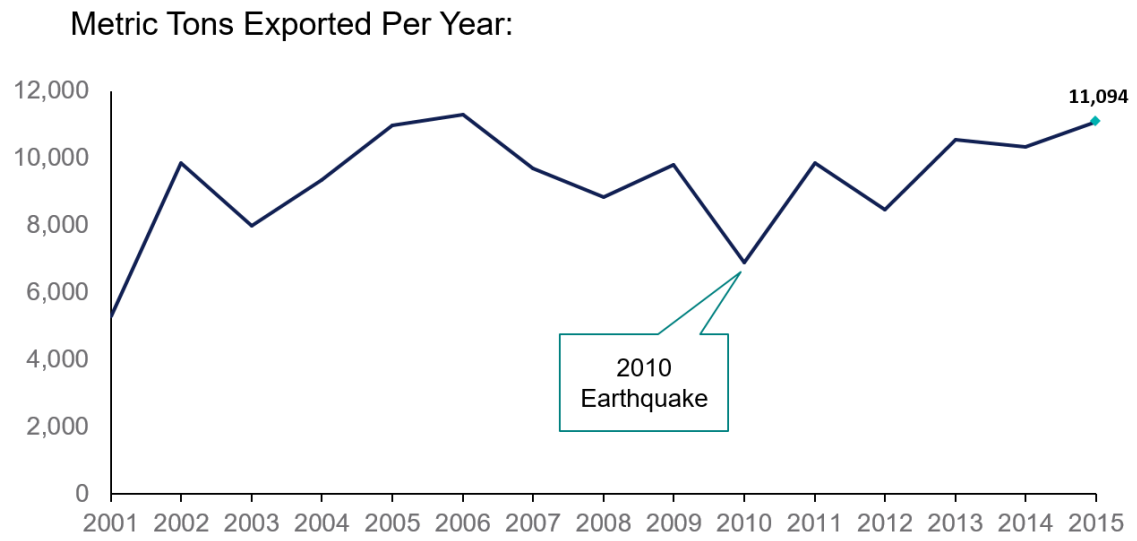
workers. This careful planning allowed for 94% of PBGs to break even or earn profits in 2015. That same year, of the 448,877 dozen sold through the project by independent aggregators ("fournisseurs"), GAs, and PBGs, over 33,000 dozen ("dz") mangoes were sold to "Madam Sara," women traders selling agricultural goods predominantly on local markets. Through the "Plan Konpay", PBGs developed a network of buyers on both the local and export markets for its members. Madam Sara in certain localities, like Mirebalais, began purchasing reject mangoes from PBG farmers at the mobile collection centers after sorting. Focus group interviews suggest this helped Madam Sara more efficiently purchase mangoes in bulk and helped PBGs add more value to farmers who could sell a larger percentage of their total mangoes on both markets.

In total, 262 PBGs sold mango at least once from 2013 until 2015. Experienced PBGs having already sold at least once, received refresher trainings. First season PBGs were supported with the full training package described in section 3.1.2. The project brought the commercial committees of first-time selling PBGs to visit an exporter in Port-au-Prince and tour the packing house with exporter staff. This introduction was essential as many of the PBG members had never been to the capital and were intimidated and distrustful of the process. Both the PBG farmers and the exporter reported that this process was very advantageous in establishing trust later during the mango season.

In 2011, the project investigated opportunities for grower groups to sell directly to supermarkets in Port au Prince. Despite a strong initial interest from both supermarkets and grower groups, no sales actually occurred as the supermarkets dropped the agreed-upon prices at the last minute, which made the deal uninteresting for the farmer groups.

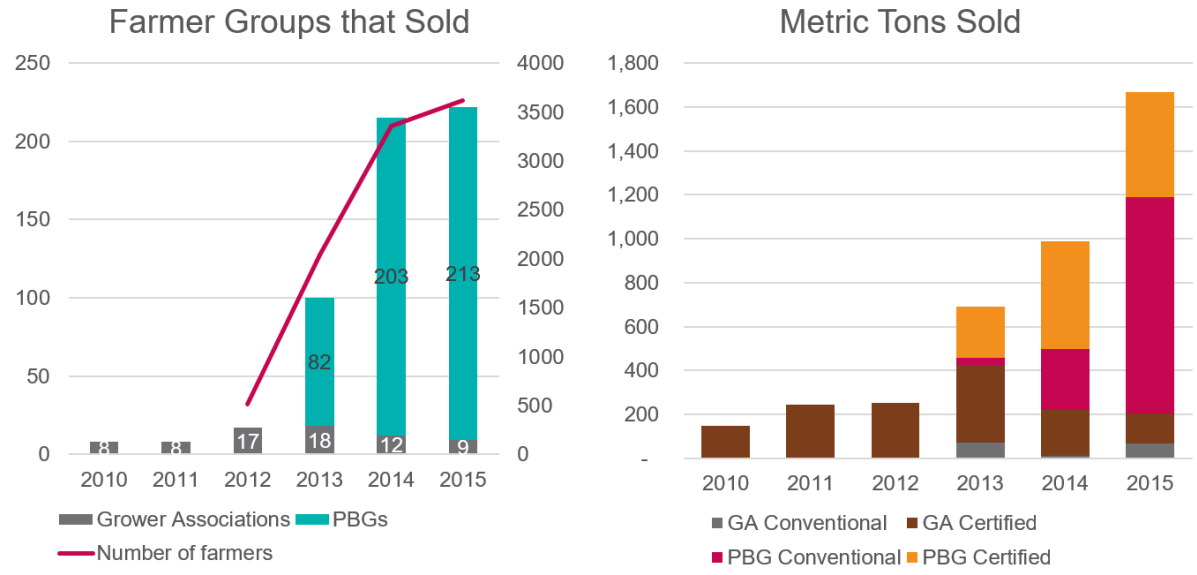
Haiti Exports: Exported volumes in 2015 were the highest they had been since 2006. Haiti exports approximately 10,000 MT of its total mango production (2.5-5%) each year. However, exports were unable to break the "2.5 million box ceiling," or 11,250 MT, and fell far short from The National Mango Forum's plan in 2010 to double exports to 5 million boxes, or 22,500 MT, by 2015. The general export volume trend since project start was positive, however seasonal factors, such as the usual 2-3 year cycle of mango tree production which likely caused a decline in 2014, make it challenging to attribute any one factor to explain overall industry volume growth or decline (see Figure 3).

Figure 3: Mango Exports from Haiti – Metric Tons per year



Project-supported aggregators, PBGs, and GAs sold 2,020 MT in 2015, which accounted for approximately 18% of export sales by volume. PBGs alone accounted for 1,312 MT of the total or over 11% of the total sales by volume. Since 2011, project-supported farmers sold 4,642 MT (see Figure 4).

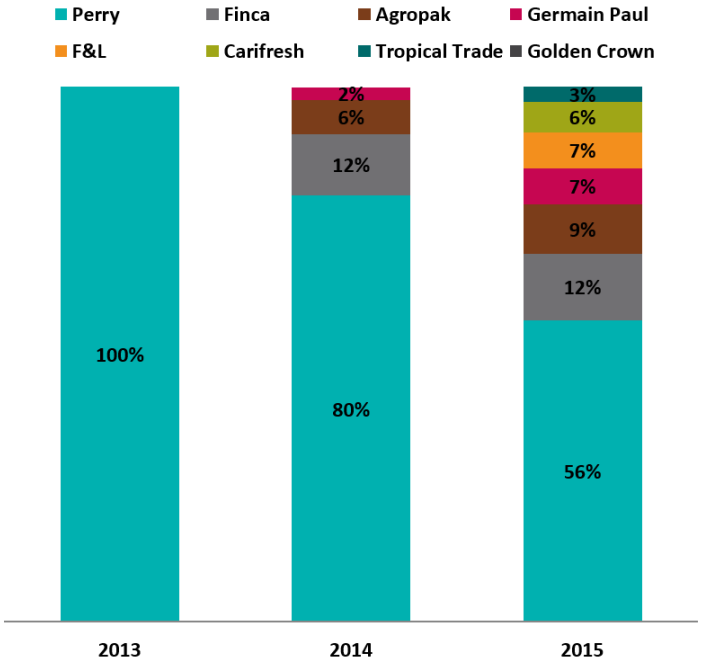
Figure 4: Farmer Group Participation and Export Sales



PBG Diversification of Sales: In 2011, 9 out of 10 exporters had committed to collaborate with the project. However, 2 exporters shut down by 2013 and only 1 out of the remaining 8 actually collaborated fully over the entire project duration. In 2015, 4 of the 8 exporters had worked directly with the project on sourcing from PBGs, using the traceability system, and receiving training on food safety regulations and the steps needed for high value certifications like organic.

Although 7 out of the 8 exporters did not have buyers for organic or fair trade mangos, they each had their own niches, and in some cases offered additional farmer benefits such as transportation from remote or difficult to access areas. While from 2011 through 2013, nearly all volumes were sold to Perry Export, this decreased to 56% of PBG volumes sold with the other 44% going to the remaining 7 exporters (See Figure 5). In some cases, PBGs made direct contact with the exporter, while in others they worked with exporters' existing traders or sourcing staff to coordinate shipments into Port-au-Prince or field based collection centers. In 2014 and 2015, the project continued to build exporter awareness of the benefits of sourcing from PBGs and MOUs were signed with Agropak and Carrifresh. The project started by gathering exporters' terms of sale (unit price, volume, delivery frequency, transport reimbursement, etc.) and analyzing their supply chain features. The project communicated prices and features, such as rural collection centers or availability of exporter-owned trucks, to PBGs. Connections were made by project staff between PBGs and packing house staff. Simultaneously, trainings were conducted with Agropak and Perry's independent "fournisseurs" on traceability and proper harvesting techniques. In 2014, training on traceability documentation was undertaken to track sales from connected PBGs to other packing houses, including Agropak, Carrifresh, and Finca. Business advisors and field staff continued to work in 2015 to develop PBG connections with the other pack houses.

Figure 5: PBG Sales by Exporter / Buyer



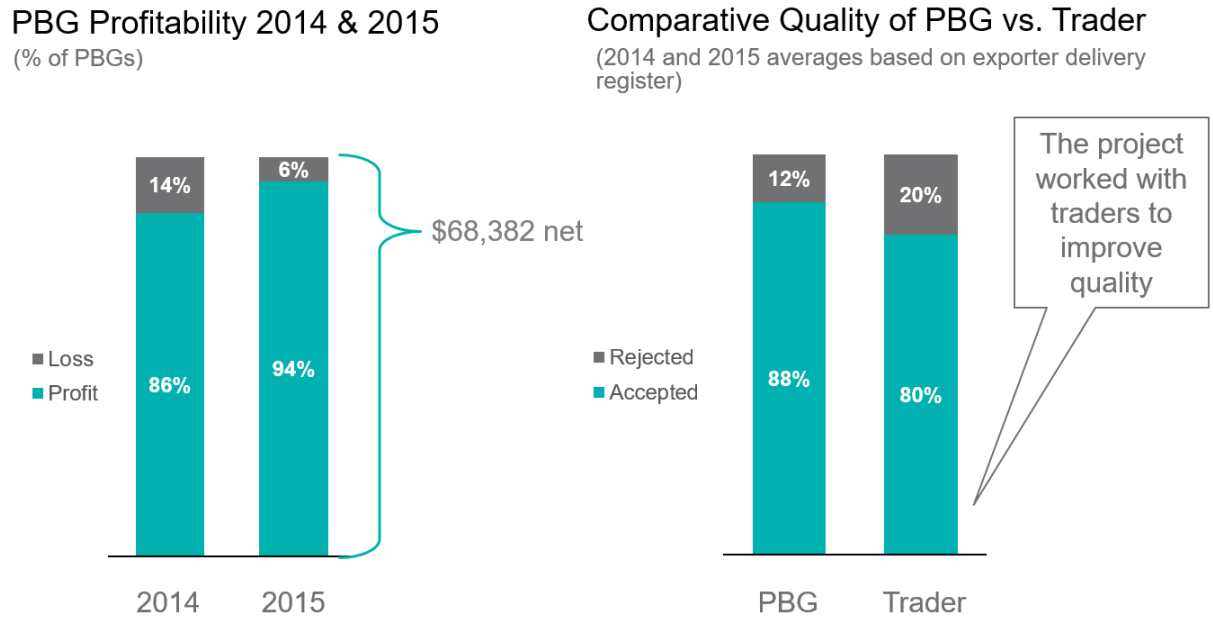
PBG Profitability and Value Add: In addition to volume, the project devoted significant resources to ensure the financial health and quality performance of PBGs and Perry Export's trader network ("fournisseurs"). Business advisors from the project worked with PBG committees to produce strong, viable business plans. Field agents ("animateurs") coordinated with them during the harvest to ensure they managed costs. As a result, PBGs maintained healthy overall Profit and Loss Statement (P&L) even with the large number of first-time sellers. By 2015, 94% of all PBGs achieved break-even or earned a net operating profit with the net profit of PBGs totaling $68,382 (see Figure 5). Even among PBGs which did not sell to the premium Organic and Fair Trade markets, 88% of PBGs selling conventional mango achieved break-even or earned a profit. The P&L calculations were completed with PBG committees during training sessions, to ensure they would be able to make these calculations on their own in the future. Per the exit strategy, this was a focus of PBG junior trainers in the last year of implementation.

For quality performance, the project continued hands-on training for harvesters and quality control agents in the PBGs. In 2014 and 2015, these trainings were managed directly by the production team, a dedicated team of ten focusing on tree maintenance, harvests, nurseries and orchard installation. Based on observed shortages of harvesters in 2013, the project determined that the average PBG needed at least five skilled harvesters in order to harvest enough mango in the 48 hour window before it must be shipped to the exporter.

In addition, with the support of Perry Export, the project worked with approximately twenty traders delivering the project-developed training on harvest, selection for quality, and

traceability. As a result, despite unfavorable weather conditions in 2014 which would increase rejects, this exporter's trader reject rate dropped from 30%[7] in 2013 to 22% in 2014 to 20% in 2015. PBGs' reject rate over the same period decreased from 15% to 12% on average (see Figure 6).

Figure 6: PBG Performance



Farmgate price: Price was the primary driver of mango income increases. Nominal[8] median prices for mangoes increased for all units of sale by the farmer (see Figure 7). In 2011, farmers pre-selling per tree were making 12 HTG per dozen. This more than doubled to 25 HTG per dozen by 2015. The 2015 Annual Survey and Evaluation offers some insight to explain this:

> "This high rate of increase for trees can be interpreted as increasing confidence in the future market manifest, on the one hand, by volitje and fournisseur paying

[7] Rejects refer to non-export quality mangoes from field collection centers to the packing house sorting tables. This information was gathered using the F10/F12 traceability forms for both PBGs and traders and the comparison was made using one exporter's quality standards to avoid making an invalid comparison. A subsequent survey conducted by TechnoServe revealed that PBGs leave more mangoes on the tree as they are determined to not be ripe enough. This follows the best practices and aligns with evidence form the 2013 Annual Survey indicating PBG member have more harvests on average than comparison groups.

[8] The Haitian Gourde (HTG) depreciated by 25% over the life of the project, with the majority taking place from 2014-2015. When accounting for inflation, real mango income increased by 11% on average. The project has found no evidence that exporters significantly increased farmer or intermediary prices during this time and instead maintained a price of approximately 60 HTG per dozen conventional delivered to the packing house. Increases in farmer prices came from an increased farmer share of the margin.

> more and on the other hand producers demanding more. However, more significant than the disposition the latter to pay higher prices is producer unwillingness to sell for low prices, a trend evident in the Table 2.12 showing a reduction in tree sales over life of the project a 2011 high of 56% of all respondents selling a tree to mere 14%. This can be interpreted as supplanting fournisseur and volitje market share—those who typically purchase trees—and encouraging competition between those intermediaries and the PBGs, something that focus groups participants mentioned often, i.e. volitje raising prices to out-bid the PBGs."[9]

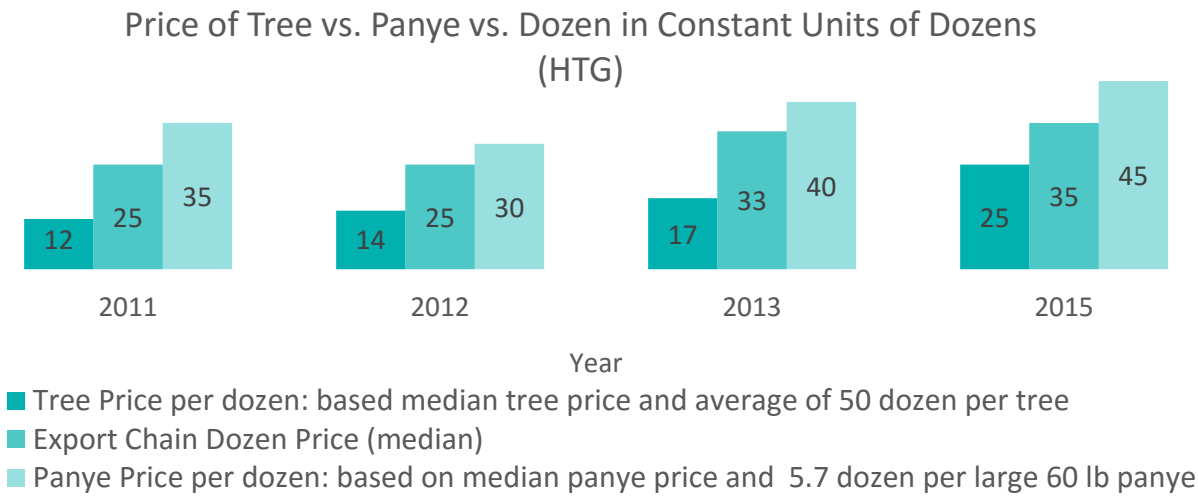
The "dozen" price was commonly used for the export market for sales through GAs and PBGs; this price increased by 40% from 25HTG per dozen to 35HTG per dozen. The project tracked prices in 2015 ranging from 30HTG minimum to 55HTG maximum per farmer. This did not include Fair Trade premiums or payments made by the PBG for performing addition handling tasks, such as harvesting or transportation. The minimum price PBGs paid to farmers rose from 25HTG per dz 2013 to 30HTG per dz 2015 to remain competitive with traders, who also raised prices to defend market share. Key behavioral changes at the farmer level were being widely adopted and farmer-to-farmer knowledge sharing was expanding in key strategic areas such as negotiation and selling, as well as tree maintenance, and tree planting.

The project also encouraged the decrease in the size of the dozen, which fell over the lifetime of the project from 15.2 mangoes per dozen to 14.3 mangoes per dozen. The project encouraged transparency and alignment between the dozen size used for purchasing from farmers and the dozen size sold to exporters. Part of the resistance to decrease the unit size further comes from exporters with at least two partner exporters, Carrifresh and Finca, purchasing by $dozen_{14}$ to account for internal pack house rejects and increase their margin as they ship boxes that hold between 9-12 mangoes (average of 10).

The panye, or basket, price per dozen was primarily used for sales on the local market. According to the 2015 Annual Survey, the local market price has consistently had higher prices than the export market units. This fits volume data that suggested a majority of farmers, even those selling through PBGs, continue to diversify sales across local market, traditional export, and PBG export channels. It is important to note however that both median and average volumes sold to PBGs doubled from 2013 to 2015 suggesting that the new channel offered clear value to member farmers.

[9] Schwartz, 2015 Annual Survey and Evaluation, page 26.

Figure 7: Farm gate price evolution since 2011



The increasing prices and growing market share of the PBGs was critical to the strategy of the project, which likely drove the general market price of mango upwards through competition. Anecdotal evidence throughout 2014 indicated that this was the case, as traders continued to raise prices and improve terms to farmers in order to remain competitive. This was further supported by the 2015 Annual Survey and Evaluation through survey data showing a decreased willingness of farmers to sell to traders by tree for low prices, and focus group data highlighting market dynamics where traditional traders have had to increase prices to those offered by the PBG to source mango from farmers.

Furthermore, with pressure on intermediaries growing, the project engaged some independent traders who sourced mangoes for two packing houses and larger commercial farmers in the areas where PBGs were operating. This was done in 2014 to encourage others to emulate the mango harvest and sourcing model designed by the project, including using improved harvest tools and techniques, using the collection center ("baz") design, and employing the F10/F12 traceability system. Evidence from the 2015 Annual Survey suggested that spillover effects and copying, both indicators of market system change, were present outside of the directly targeted mango, PBG, and the fully engaged exporter, Perry. Spillover effects included practices such as pruning being done on other mango and fruit varieties and the sharing of improved harvest tools across PBGs and traditional intermediaries. Another example includes one other exporter starting to pay post-season bonuses or "ristournes" to the farmers who supplied it in 2015 at the beginning of 2016 to increase the stickiness between the supplier and buyer.

Constraints: Based on the project's experience and discussions with farmers and PBG leaders, the main constraints for PBGs to grow independently remained working capital, coordination, and human resources.

The credit program (Section 3.1.3) was designed to smooth farmer income to reduce mango pre-selling to intermediaries at a discount. Further downstream, it was recognized that PBGs faced working capital constraints by not having cash on hand needed to pay farmers and workers, such as harvesters, at the time of mango harvest. To address working capital, the project identified two possible loan sources: a financial institution or an exporter. A PBG needed to be a legal entity to receive a loan, but this activity faced multiple delays (see section 3.1.1) and was unable to be accomplished early enough for loans to be issued to PBGs. The project also started a process to establish exporter-based short term credit, whereby PBGs planning to deliver to the exporter would receive a percentage of the value of the expected delivery up to 7 days in advance. In order to achieve the necessary speed of turnaround, and taking into account the distance between farmers and exporters, mobile money was identified as a possible solution. After evaluating the two main mobile money transfer products available in Haiti, telecom Digicel's TchoTcho, now MonCash, was selected based on its advanced stage of development and national network of agents.

A pilot to use mobile money payments was run from October to December 2014, whereby the project worked with lead farmers in the PBG committees and the exporter to make the Fair Trade Premium and sales adjustment payment using the mobile money platform MonCash offered by the telecom Digicel. The project's technical advisors first tried out agents who were closest to farmers, and then in partnership with Digicel addressed any technical, training, or liquidity needs to ensure a smooth experience for farmers. Eventually, about 300 farmers received payments through the system, and both they and the exporter were very happy with the transparency, accuracy and speed as compared to the old system of envelopes of cash or checks cashed at distant banks. The use of mobile money was scaled in 2015 to 133 PBGs supplying Perry Export totaling 1,503 farmers. Working capital from the exporter was not able to be provided as intended due to the extraordinary 2015 season, which saw a flood of mangoes ripen in a shorter than usual window of time, which primarily strained exporters' pack house throughput. Perry Export will continue to explore this option of providing working capital using mobile money. However, during that time and in spite of farmers still selling to PBGs on credit, farmers doubled median and average sales to PBGs in three seasons. This indicates that there is a high level of trust built between member farmers and PBG management and that for some farmers, selling on credit is not prohibitive to selling to a PBG.

Moreover, it is important to note that one innovation of the project was to tie farmer, seasonal worker, and PBG payments to dozens accepted by the exporter, which was permitted through the sale of mangoes on credit to PBGs. This was crucial to decreasing rejects as exporters would return rejected mangoes to PBGs which would often sell them at lower costs on the Port-au-Prince local market. This was recorded on the F10/F12 traceability system and losses were divided evenly among farmers. Social collateral ensured that farmers, harvesters, and other PBG seasonal workers were doing their best to reduce rejects to avoid losses and continue to supply profitable export markets. Traditional advances by traders separate payments received by

farmer, harvester, and trader from quality received by exporter. This is discussed in greater detail in section 7.2.

Second, the coordination constraint involves linking hundreds of PBGs to 8 exporters and other local market buyers. To solve this problem, the project prioritized one exporter, Perry, with the greatest buy-in who manages the Fair Trade and Organic program, to identify a field team to address the coordination issue. A team of the former standards manager and 5 former field agents were hired for the 2016 season. This will likely reduce problems encountered previously: minimize packing house backlog and subsequent under-utilization, increase exporter confidence of farmers, improve information flow between farmers and the exporter, and permit the exporter to effectively offer transportation to many PBGs insuring full utilization of truck capacity. See section 8.1 below for more details on the exit strategy.

Finally, the human resource challenge was one of finding sufficiently qualified committee members. This challenge varied significantly by locality; some areas and PBGs had very competent members, while others struggled to find a single literate member to complete traceability paperwork. The project identified an opportunity for PBGs to band into "clusters" of 3-5 PBGs who are already sharing transport to share some management functions as well. See section 3.1.1 above for more details on the legal status of PBGs.

3.1.5 Certification for Export Sales

Fair Trade and Organic certification was a direct means for farmers to receive higher prices for their mangoes (~20% higher with premiums than conventional), and also provided an exporter with premiums and access to niche markets in the United States and Canada. The project scaled the impact and sustainability of the certification activity with Whole Foods built by Perry Export with assistance from USAID's Hillside Agriculture Program. The project made certification more inclusive and transparent to farmers, increased volumes sold and quality, and increased farmer group compliance to promote scalability. The project grew the Fair Trade and Organic sales from 148 MT sold in 2010 to 614 MT sold in 2015 while driving participation from roughly 300 to 2,000 farmers over the same period (see Figure 3). Whole Foods remains the sole buyer of Fair Trade and Organic certified mangoes from Haiti. The project also implemented a soil testing baseline in conjunction with Whole Foods, the importer, and Perry Export. Haitian mangoes received a rating of "Best" for the Responsibly Grown program in 2016 due to efforts to decrease soil acidity through organic composting, as encouraged through PBG trainings. This rating allows customers to be better informed about their purchases and helps Whole Foods make sourcing decisions based on the environmental impact of its suppliers.

It was estimated that the total revenue added to the Haitian mango industry through the Fair Trade and Organic program is $1,466,411 since 2011.[10] This translated into value to the farmers through higher prices from the exporter. An additional $239,958 was earned by certified GAs and PBGs in the form of Fair Trade premiums.[11] Typically, a third is used to pay for farmer premiums, a third goes towards Fair Trade community projects, and the remaining third goes to cover part of the certification costs. The breakdown is voted on by farmers on a yearly basis per the General Assembly rules established in the contract between the farmers, groups, exporter, and Fair Trade USA.

The Haiti Hope Project supported these existing associations and new PBGs and farmer groups who wanted to be certified. The project also invited all exporters to express interest in receiving support to be certified. Up until 2015, no other exporter expressed an interest in pursuing certification due to the significant initial work required to meet the standard as well as an important shift in their supply and distribution chains. For example, the shift would entail moving from a typical wholesale "fournisseur" in Haiti and selling to a wholesale terminal market in the US, as is done currently, to a vertically integrated farm-to-table model selling in US national supermarkets. Despite this initial reticence, at least 3 other exporters expressed an interest in 2015 in piloting Organic or Fair Trade certification.

For the 2014 season, the project ensured that all farmers selling through the PBGs were eligible for Fair Trade sales[12], and the project worked hard to ensure that farmers who sold through PBGs in 2013 would be eligible for organic in 2014. This was intended to create an incentive to continue selling with the PBG, as well as motivate new sellers within the PBGs. In 2015, the project worked with the exporter to streamline trainings and combine Fair Trade and Organic to reduce throughput constraints. Combining Fair Trade and Organic (FTO) not only aligned what Whole Foods and the exporter prioritize in terms of purchasing, but it also helped increase farmer compliance by not having as many mixed certification truck loads.

To ensure sustainability, the project began training PBG members with the necessary capacity on how to complete a tablet-based plot registration and annual review. In total, 6,122 farmers registered their plots and received certification trainings. Perry Export staff shadowed project field staff in the last year to fully realize the registration, training, and field certification process and began independently implementing the process at the end of 2015 and beginning of 2016 in preparation for the 2016 season. Perry plans to certify those farmers who have previously sold FTO to Whole Foods (approximately 2,000 farmers) and develop a system for GAs and PBGs to add additional farmers as needed to satisfy demand. As described in section 3.1.6 below, the

[10] Assuming a $2.75 exporter FOB premium ($5.50 per conventional box versus $8.25 per FTO box).
[11] Fair Trade USA premium as of 2015: $0.45 per dozen accepted by the exporter
[12] Although a delivery of mangos may be eligible, a number of shipping, marketing, and US demand issues may cause a delivery to be sold as conventional. For this reason the price difference was paid by the exporter at the end of the season, averaged out across all "eligible" deliveries.

project included farmer exposure to FTO trainings in the public traceability database to help other exporters interested in certification to reach out to experienced and organized farmers.

In addition to these certifications and in anticipation of the FSMA law and demand from one exporter and their potential US client, the project organized a training on the Global GAP standard in October 2014. This food production and supply standard was created by retailers in 1997 as an independent system to ensure food safety, environmental and worker health. It is now recognized by retailers throughout the developed world and overlaps a great deal with the FSMA requirements. This standard is needed to reach American retailers such as Wegmans, Krogers, and Publix.

The project selected Global GAP due to the potential to open up new US markets and regions for Haitian mango, such as large supermarket chains, as well as providing a clear and verifiable path to FSMA compliance. The training was conducted by a Global GAP consultant who reviewed the standard and then led a practical training on a typical mango grower's field, in this case a female farmer in Cabaret with seven trees on a mixed production plot. Members of the Ministry of Agriculture and three exporters attended, and those who passed the final exam were issued certificates. In the second half of 2015, another Global GAP consultant assessed the feasibility and drafted an implementation plan that was shared with exporters. The consultant determined that if exporters want to become certified, they had to first implement a farm-level traceability system, train an extension team to ensure farmer food safety compliance, and begin packing house certification with HACCP. This was the focus of exporter engagement in 2015.

Additionally, the project developed toolkits, guides, and conducted food safety and traceability trainings for exporters to ensure that knowledge gained during the project would not be lost. These toolkits are step by step instructions for implementing a Fair Trade or Organic program, or in pursuing HACCP certification. These materials were shared during the mango industry workshop and directly with the Ministry of Agriculture.

3.1.6 Traceability

Traceability in Haiti was required by the USDA at least to the level of truck loading in the general areas of production, however the Food Safety and Modernization Act (FSMA), enforced by the Food and Drug Administration (FDA), will come into effect for Haitian mango exports by 2017 and is a stricter standard. This law requires traceability to the place of production (farm or garden) as well as identifying the producer (the farmer, not the trader), farm records on other crops grown, pesticides used, and water usage on the farm for all imports of fresh produce to the United States. This will require, as a condition for export to the U.S., a more robust system of traceability down to the individual farmer, which will need to be audited in the field by a third party. The project's experience in certification has led to development of a simple, low-cost system for traceability that has been in use and certified for three mango seasons, and is compliant with the new law. Many stakeholders continue to wait for full implementation of the final FSMA rule, issued in

August 2015, and hope for exemptions or a phased-in approach. It is possible that some farms may qualify for exemptions based on annual revenues while others could qualify for a compliance delay under certain circumstances. However, the private sector is outpacing regulators around the issue of food safety. Most supermarkets require some packing house certification, such as HACCP, and many other, such as Wegmans, require Global GAP certification for all suppliers.

The project identified a locally-developed traceability solution in 2010 developed by Perry Export. Over the course of the project, improvement where made to allow the system to scale and remain compliant with certifications. The first step, is registration of the suppliers and handlers. Every single farmer in the mango program had a unique code, based on a regional numbering system created by the Haitian Ministry of Agriculture (MARDNR). The farmer's name, phone number, number of plots, and number of trees in each plot was recorded. For the new FSMA FDA requirements, for each plot a sketch must be drawn or a map created which includes information on the trees, other crops produced, neighboring production activities, any agricultural inputs used, and water sources.

The estimated cost for an exporter to do this for their entire supplier network the first time is $30,000 (one-time cost – annual maintenance is $4,000-5,000). The project shared guides with exporters that detail this process. Additionally, global turnkey software solutions have existed for nearly a decade and include Farmforce, developed by the Syngenta Foundation, and mKrishi. The estimated costs for the subscriptions average $20,000 per year per exporter depending on the number of users, regional coordinators, or field agents needed to register farmers and log transactions per season. Perry Export piloted Farmforce in 2015, which is essentially a fully digitized version of the F10/F12 traceability system. Other Haiti-developed solutions, such as Agritech or Agrotracking, have yet to successfully pilot a traceability system from farmer to buyer, or be certified by a third party for compliance with international standards.

The traceability starts with the first hand off from farmer to buyer. When the farmer relinquishes his or her product, the buyer (voltigeurs or PBGs) issue a receipt to the farmer which includes the number of dozens purchased, and the price paid or owed, as well as the farmer's name and unique code and the buyer's name and trader or fournisseur code (required registration with MARDNR to sell to exporters). Farmers were highly supportive of this proof of their sale and the transparency it represented. The buyer keeps the carbon copy of this receipt for the next step.

At the collection site, the aggregator (sous-fournisseur) has his own form, which summarizes the mango purchases. Each line on the form lists the farmer name, farmer code, quantity and price, as well as a place to record the receipt number, allowing the purchase to be identified in the buyer's purchase records. The aggregator keeps a carbon copy for their records and sends the original form along with the truck (fournisseur).

The truck (fournisseur) may pick up from multiple collection sites in one trip, so the final form is a summary of the quantities, locations, and suppliers, with the aggregator forms for each

collection point attached. The delivery form is completed by the factory upon delivery, and includes the quantity accepted after quality control and sizing, lot number, and the total amount paid. A copy is returned to the seller for his records.

Registration → Receipt → Aggregator Form → Delivery Form

The project has implemented this system with Perry Export and worked with three others to adopt the same system, two of which successfully filled out the delivery forms. Instructions along with the forms and tools necessary to implement were distributed to all members of ANEM (the Haitian Mango Exporters association) as well as the Ministry of Agriculture in December 2014 and in February 2016 during the industry workshop. The project engaged with the Ministry technical staff, USAID PASA cooperation in Haiti, USDA Foreign agricultural service, and the private sector to assist exporters to implement this low-cost and proven system. To help encourage the use of the system, a public database with approximately 5,000 farmers was distributed to exporters. The list includes farmer codes, GPS locations, and relevant information for exporters to begin using the traceability system in the 2016 season for those registered farmers. They have also been provided with tools to register additional farmers.

3.1.7 Orchards

One of the objectives of the project was to increase mango production, including the goal of planting 45,000 trees over the five years of the program. The project focused on marketing during the first three years, identifying market access as an impediment for farmers to make further investments in production. With the marketing work beginning to show results in sales numbers in 2013, the project launched an orchard program with farmers.

One of the common challenges faced by previous efforts to plant mango trees was that mango saplings were simply distributed to farmers. Planted trees were usually neglected, and died off by either drought or free-ranging livestock, such as goats. Additionally, one of the challenges of the Haitian mango industry is the atomized production which increases the cost of aggregating significant volumes. In order to address these problems, the project elected to focus on establishing small- to medium-sized orchards of 0.5 to 2 hectares, assist the farmers to create fencing to protect against livestock, and ensure immediate access to water. Farmers were responsible for providing labor to prepare the field, purchasing saplings at a 50% subsidized rate, and paying for fence posts and labor for fencing. The project provided expertise, subsidized the cost of saplings, and provided barbed wire. Orchards were encouraged to be established in areas where farmers were already cultivating crops that would be suitable for companion planting. This success factor assured farmer upkeep of the newly planted trees.

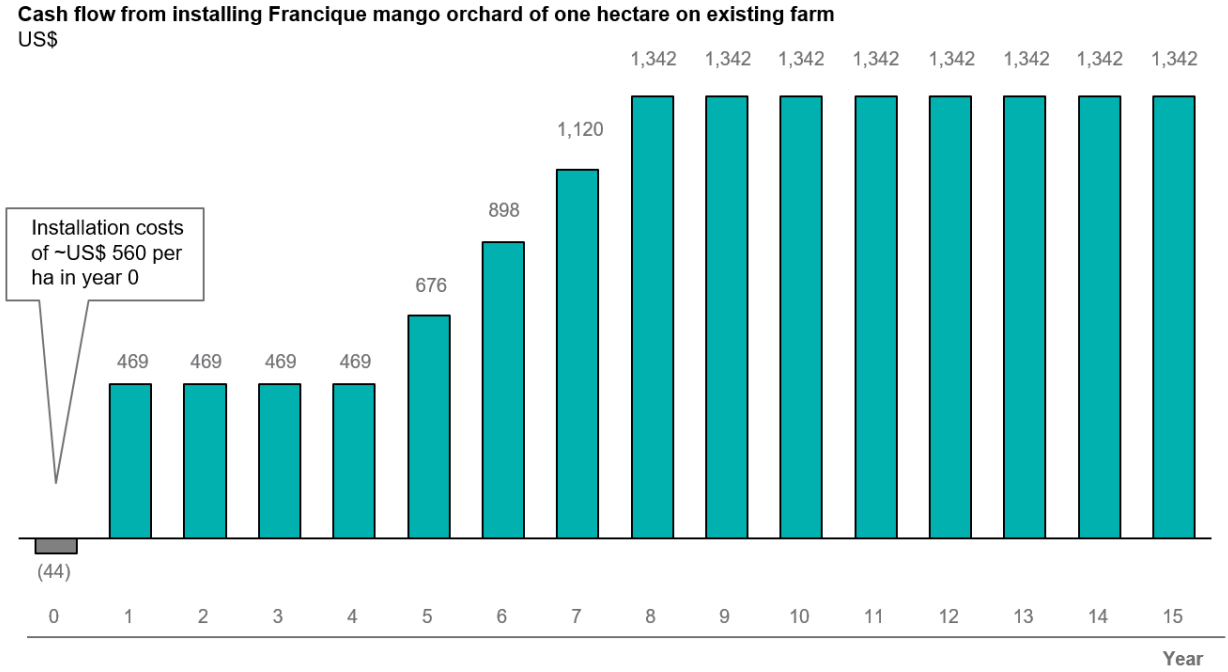
Based on the project's experience in 2013, during which over 33,000 trees were planted, the project continued the program in 2014 including medium orchards of 2-10 hectares, and several large orchards greater than 10 hectares. These orchards were planted with farmers who held

access to larger plots of land, and in the case of large orchards, a large landholding owned by an exporter or businessperson, but managed by small farmers with assigned sections and a profit sharing agreement.

In addition to planting new orchards, the project conducted follow-up with orchard owners from 2013 and 2014. During these visits the production team checked the health of the trees, whether the field was maintained, and whether the fencing was maintained. They found slightly over 80% of trees had survived the crucial first year, and worked with farmers to replant any lost trees. By 2015, the average survival rate of all orchard trees was 70%. This reduction in the survival rate is partially explained by the severe drought conditions in 2015.

Additionally, they encouraged farmers to conduct any needed field maintenance. This follow-up was essential to the success of the orchard program as, in the past, it was customary to neglect the orchards after planting. This neglect was attributable to the long delay before the first mangos are produced by the tree (5-7 years), weak and uncertain formal land rights particularly for larger land holders, and the very short investment horizon of smallholder farmers, making any investment, even maintenance, produce a negative return for the first 2-3 years. For this reason, regular follow-up and support of the farmers was essential. Once the trees reached approximately 3 years or 2.5 meters height, they were very likely to survive as they are no longer as vulnerable to animals or drought.

Figure 8: Typical Cash-Flow from establishing an orchard[13]



The cumulative result to date is 63,215 trees planted in 524 orchards, covering an estimated area of 310 hectares[14]. Of the 524 orchards, 1 was greater than 10 hectares of tree coverage (large), 8 were between 2 and 10 hectares (medium), 46 were between 1 and 2 hectares, 161 were between 0.5 and 1 hectare, with the remaining 308 less than 0.5 hectare. Approximately 50% of the saplings grown in orchards were Francique, 15% were Blan, 14% were Fil, 6% were Kodok, with the remaining 16% being other mango varieties. These trees will produce 3,800 metric tons of francique for export at maturity. Other mango varieties will be sold on the local market.

Low value varieties like Fil and Kodok were targeted by the grafting program as described in section 3.1.8, with nearly 20,000 of the total 65,641 grafts performed in orchards. Assuming the farmer was already producing a typical range of crops on the orchard land before, the net present value (with a 12% discount) of the investment in these orchards is more than **$3.5 million USD.** Current lending conditions dominated by short term micro-credit, make it unlikely that farmers could borrow to invest in orchards on their own. An opportunity exists in agricultural lending with interest rates and pay periods that mirror the long term investment needed to establish an orchard.

[13] Assumptions: 100 trees per orchard, 25% of farm available for other existing crops, yield of 22 dozen for export per tree, installation costs of $560 in year 0, exchange rate of 51 HTG per 1 USD

[14] Tree coverage is an area estimate based on a hypothetical contiguous tree area, where number of trees is multiplied by its area of 49m^2 (average spacing of 7 meters by 7 meters).

3.1.8 Grafting

In 2013, through surveys and the project's monitoring system, the project leadership identified that the majority of mango farmers in the exporter chain had just one to three Francique mango trees. However it was also noted that they typically had an equal or greater number of non-Francique mango trees. Recognizing that very small scattered production hugely increased the cost of harvest and transport, the project identified grafting as an opportunity to increase the density of production, and increase farmers' incomes in a relatively short timeframe, since grafted trees typically begin producing fruit after 3 years compared to 5 years for a newly planted sapling.

Farmers' income was expected to increase by converting a lower-value variety to the high value Francique variety. This element was very important since the farmer would also be losing 2-3 years of production from the tree, and increasing his or her risk by concentrating only on the Francique variety. The project identified Kodok, Aselwi, and Fil as targeted varieties, with Fil as the most common as both Fil and Kodok having very little market value. Blan, a very common variety, was not to be grafted because of its high local market value and farmers reported being able to sell it easily.

The project trained over two hundred grafting technicians including sixty project staff and the remainder were drawn from locals who had worked in other projects such as the IICA grafting campaign as well as PBG members. Even experienced grafting technicians were retrained as most were unable to pass a practical test of grafting fifty saplings with an 85% or higher success rate. The training was intensive, with one week of training in the classroom and a field training area in Cabaret, Haiti, followed by three weeks of intensely supervised work in the field. Once deployed, in order for their work to be approved for payment all grafts had to be checked by a project Technical Advisor or member of the production team. This ensured quality and results.

At the end of their first week of training, each grafting technician was provided with a high-quality grafting knife. These were imported from abroad, as high-quality versions were unavailable in Haiti, and even cheap versions to last only a few months were difficult to locate in quantity. This is likely due to the fact that so many grafting campaigns have been conducted by the government and NGOs, that it was viewed as a free service and not an entrepreneurial opportunity. Farmers, for their own part, do not accept to pay for grafting both because they expect it as a free service and because, using their discount rate of 60%, the investment of $6 and temporary loss of revenue from the old variety would result in a net loss (see Figure 7).

Figure 9: Change in revenue from grafting one tree to Francique variety

Assuming $4.50 per year per tree revenue from previous variety (25% of Francique)

The net present value of one tree grafted to Francique is $70.16 at a 12% discount, whereas the "business as usual" with the previous variety yields $31.38 for a net income increase of $38.77 per tree grafted to the farmer (assuming the farmer paid for grafting, however the project subsidized this cost).

The original purpose of the grafting program was to help address the very low tree density per farmer, a median of three trees each for farmers in the program. This was based on the idea that the other trees would be located on the same plots of land as existing Francique trees. Unfortunately, this turned out not to be the case for the low-market value varieties targeted, which were even more dispersed than the Francique stock. In addition, managing the subsidy took a disproportionate percentage of management time, and the cost per graft was much higher than originally anticipated. Furthermore, farmers will not pay for the service due to the negative return at farmer perceived discount rates (60%), so the program was not sustainable as a private sector initiative. Finally, and most crucially, the project found that many of the non-Francique varieties to be grafted were located on different plots of land or relatively distant from the existing Francique trees. This means that grafting will not, as had been hoped, address the critical problem of production density for most mango farmers.

In 2015, the project made an additional grafting effort under certain conditions and based on previous lessons learned. In total 65,641 grafts were completed. In an effort to control costs while ensuring the long term success of orchards, nearly 20,000 of the grafts were completed on the low value variety yet hardy rootstock orchard saplings planted from 2013 to 2014. Due to their higher density in the orchard, costs were reduced by two-thirds. These grafts in the orchard program will ensure that trees will yield fruit sooner and that the fruiting mango varieties in the orchards are those with the highest commercial value, such as Francique and Blan.

In total, 5,135 farmers benefitted from the grafting campaigns. On average, the roughly 550 farmers with orchards grafted 36 mango trees each, with the remaining farmers each completing 10 grafts on average. Per graft costs were reduced significantly by targeting only those farmers that owned 5 or more non-Francique trees. Also, roughly 20% of all grafts were completed on mature trees, while other 80% was completed on low value saplings or young trees ranging from 1-5 years old. Over 40% of all grafts were made on Fil or Kodok rootstock.

The project gave the Ministry of Agriculture the list and contact information of grafting technicians trained and equipped by the project in case they wish to engage in this activity in the future.

3.2 Fostering competitive local processing businesses

The project researched the viability to potentially support the development of viable processing operations in Haiti to create a market for “reject” (below export grade) Francique mangoes or other Haitian varieties which currently have little or no market value. Since the goal was to establish a business of sufficient scale to have a market-wide impact, the project focused on mango purée.

3.2.1 Mango Purée

The processing business objective was to draw on the expertise of Coca-Cola in fruit-based beverages and the technical expertise of their suppliers to evaluate the feasibility of processing Haitian mango into purée for juice and related products. A critical consideration was that none of the major varieties processed globally, such as Indian Totopuri and Alfonso, and Mexican Tommy Atkins, are produced in Haiti. The locally available varieties, other than Francique, are largely unknown in the global market. Coca-Cola’s labs tested the varieties for taste and chemical characteristics for appropriateness, and their partner suppliers tested for ease of processing, as well as reviewing the business case. If processing in Haiti was found to be feasible, Coca-Cola was willing to source mango puree from Haiti for its US products.

The Haiti Hope Project began researching the Haitian local varieties in 2011. Many challenges were initially encountered. At first, mango pulp was prepared by hand in small batches for testing, however this resulted in a very low quality sample. To properly test the varieties, they

needed to be processed through an existing commercial facility. In 2012, 2013, and 2014, full containers of mangos were trucked to Concorcio Citricos Dominicanos for processing at their Villa AltaGracia facility in the Dominican Republic. The facility regularly processed Dominican mango and were happy to support Haiti's development by making their facility available. Each test took a full day of operation to complete.

Concurrently, the project researched the business case. In 2012, an external consultant came to Haiti to produce a cash-flow analysis. This effort included deep consultation with the Haitian private sector to verify real input costs such as labor and electricity. The initial findings presented a difficult case, requiring pulp sales at a price point significantly above the global average and requiring the plant to operate for much of the year, despite large mango volumes only being available for a few months. This analysis was reviewed and revised several times by another management consultant, by Coca Cola's sourcing team, and by a private sector social business investment fund. All came to similar conclusions. The conclusions are summarized below.

Technical feasibility

The variety tests of 2011-2014 were able to narrow down which varieties would be appropriate based on significant volumes produced and the appropriateness of their inherent qualities for producing purée and juice. The following table summarizes the results:

Table 6: Variety Test Results Summary

Variety	Extraction	Brix	PH	Flavor and Quality
Aselwi	OK	17.6	4.63	3/5
Jean Marie	×	18.3	4.43	2/5
Madame Blanc	OK	17.6	4.66	2/5
Muscat*	×	n/a	n/a	n/a
Francique	OK	17.3	4.13	4.5/5
Kodok	OK	16.3	4.15	4.5/5

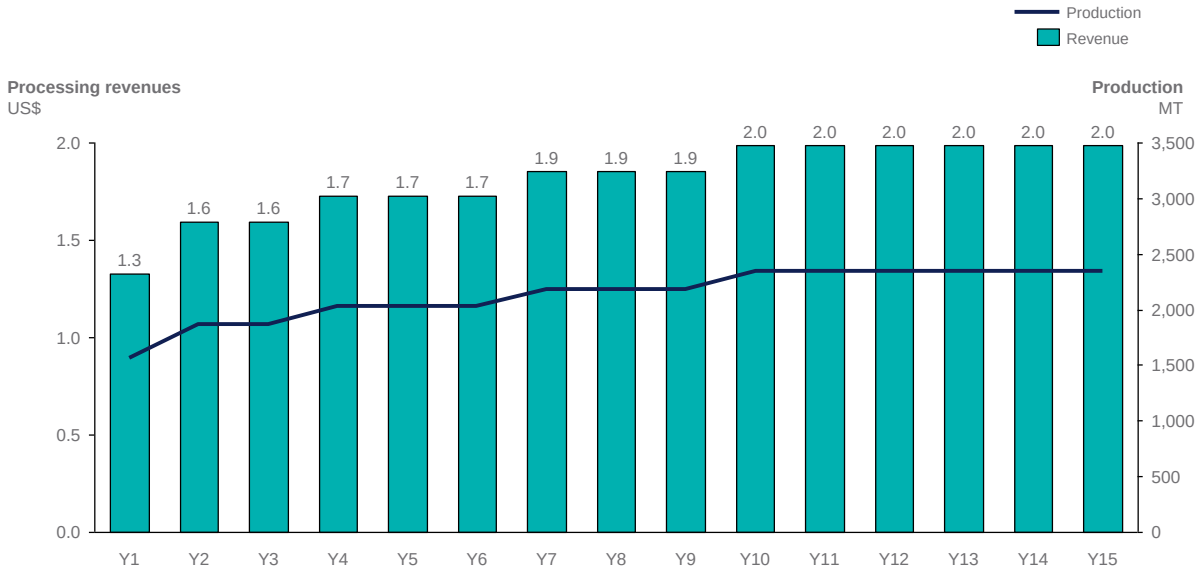
*Unable to process; variety does not allow determination of ripeness/ could not extract

The conclusions found that both Francique and Kodok, from a technical perspective, appear appropriate for processing, although the relatively low acidity of Francique could make aseptic processing a challenge and might require mixing with a more acidic variety such as Kodok to ensure shelf life. The other varieties faced critical challenges around flavor profile. Even where the flavor could be managed, they would require creating a new dedicated product for each variety, and available volumes were very small.

Financial viability[15]

Detailed evaluations of the financial viability of establishing a processing plant for mango puree in Haiti have shown that under current market conditions it was not financially viable to establish a processing plant. While the processing plant was expected to generate revenues of up to US$2 million per year, it would only start operating profitably from year 10 onwards, further earning a profit margin of a mere 8% in the steady state scenario. Overall, the net present value of future cash-flows was negative for an investment horizon of 15 years, amounting to -(US$ 745,000)[16]. The processing plant would not generate sufficient positive cash-flow to cover the initial investment costs, resulting in a negative return on investment.

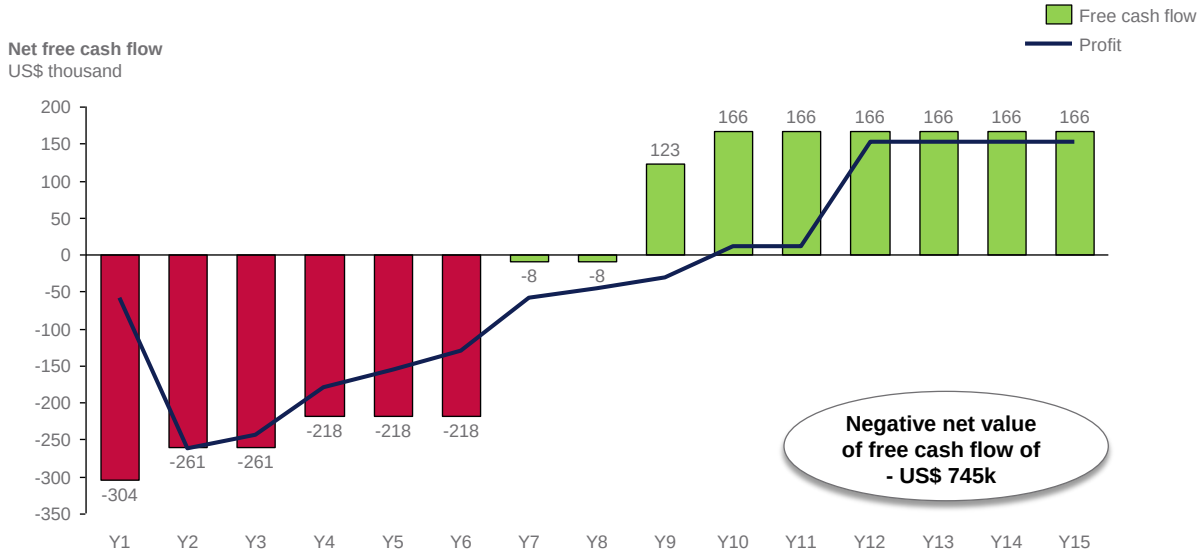
Figure 10: Projected revenue (based on sales price of US$ 850 per MT) of processing plant



[15] No consideration of inflation or external shocks in demand or supply for business case analysis

[16] Based on discount rate of 16.8%

Figure 11: Mango Pulp Processing Projected net cash-flow and profit of processing plant



The negative investment case was mainly due to the following factors:

- **High sourcing costs:** Due to the high local demand for Francique mango, sourcing costs were significantly higher than in other mango producing countries where mango rejects often can be purchased at prices close to zero. In Haiti, in order to compete with local market demand and ensure sufficient production volume, the processing business model assumes sourcing costs of US$ 0.62 per dozen for Francique mango.

There are limited opportunities to substitute Francique mangos with other varieties in order to lower sourcing costs or increase available volumes. Only the Kodok variety was approved for processing so far. While this variety did not face a high local demand and was normally not sold on the local market, this posed a challenge in terms of logistics and costs. In order to bring the variety to the market, it competed with the already scarce resources for harvesting and transport during peak mango season, resulting in higher than expected sourcing costs.

- **Short plant operation cycle:** Due to the short mango harvesting season in Haiti that normally goes only from March/April to August/September it was estimated that the plant would only operate 130 days per year, which would result in idle capacity for 6 months of the year.[17]
- **Low plant capacity utilization**: In addition to the short operating cycle, the plant could not be used up to its full capacity due to a shortage of sufficient mango volumes. As reject volumes of the export value chain currently amount to 2,500 to max 3,000 metric tons, it was estimated that the plant could achieve a capacity utilization maximum of 75%. This already assumed that 25% of required mango volumes constitute Kodok, that available

[17] Assuming that the plant operates with an 8-hour shift from Monday to Friday

Francique mango volumes increased by ~15% over the next 10 years, and that 100% of mango rejects generated by 8 different exporters, currently processed by one and sold to the local market at a profit by the other 7, would be sold to the purée business.

- **Sales price:** The business model assumed that Haitian mango puree could be sold at a price of US$ 850 per ton to the international market.[18] This sales price is significantly higher than prices charged by other puree producing countries such as India that sells NFC puree for US$ 700 per ton. However, due to the premium positioning of the Haitian Francique mango and its unique flavor profile, it was expected that Haitian mango puree could be sold at a premium price. However, this premium positioning would limit the opportunity to substitute the Francique mango with other varieties.

Other assumptions on which the business case was built include:

- Required capital expenditure of US$ 1,450,000 for processing infrastructure (including land, building, equipment, well, vehicles);
- Purchase of Italian manufactured equipment due to higher quality and thus lower maintenance expenditures in comparison with equipment manufactured in China
- Conversion rate of 2:1 from fresh to puree
- 14 full-time employees for during peak processing season; it was assumed that the facility will operate one 8 hour shift for 130 days a year
- Tax exemption of this facility (franchise first year has no import tax through commerce and 15 year tax holiday for agribusinesses)
- Financing: Owner contribution for working capital needs assumed; financing of capital expenditure through bank loan and investor contribution at a 12% interest rate

Break-even analysis:
Analyzing different scenarios of the processing business case revealed that establishing a processing plant would only be feasible if market conditions changed significantly. Establishing a mango processing plant in Haiti could constitute a positive investment case (based on positive present value of cash-flows) if:

- Haitian mango puree could be sold at sales prices of at least US$ 920 per ton[19], ~30% more expensive than Indian mango puree today.
- Sourcing costs of mango rejects dropped to less than US$ 0.47 per dozen (HTG 21), 15% less than the average local market price for Francique mango today

[18] Assumption that 100% of production is exported
[19] Keeping all other assumptions constant.

- Availability of unsold Francique mango volumes increased to at least 4,250 tons per year, 40-70% more than current reject volumes of the export value chain
- Processing plant operated outside of mango season in order to expand the operating cycle and process other fruit.

Considering the market conditions that need to be in place to make the processing plant financially viable, it was clear that in the short to medium-term establishing a processing plant in Haiti did not seem to be an attractive investment opportunity, in particular considering that investments in Haiti bear a higher risk than investments in other emerging markets due to political instability.

Based on this analysis the project concluded that under the current production and market conditions in Haiti, a mango purée plant would not be a profitable business. Furthermore, project discussions with other producers and juice buyers indicate that the world market for mango purée is well or even over-supplied, making the achievement of a price premium even less likely. Going forward, if processing is to be a national objective, then the priority must be to greatly expand the fresh mango export industry while also investing in infrastructure such as roads which could reduce sourcing costs. If supply increases significantly relative to local Haitian demand, prices may come down and the volumes needed for a profitable purée plant might be created. The recent devaluation of the Haitian gourde in addition to project interventions to increase production could make mango puree feasible in the future by driving sourcing costs down. Assuming most exporters will not increase export gate prices for rejects at 21 HTG/dozen, the USD cost for sourcing rejects has dropped from $0.47 to $0.38/dozen. Similarly, newly planted orchards at maturity could supply the market with an additional 3,800 MT. Nevertheless, it is unlikely that a future processing plant would have any significant impact on farmer revenues; nearly all the value created would likely be in profits to the processing plant owner.

3.3 Gender

The primary gender goal of Haiti Hope was to ensure that men and women have equal opportunities to participate and succeed in the program, with success defined as increase in mango revenues.

The primary gender objectives of the program were to:

1. Increase women's representation in producer cell leadership
2. Encourage women's participation in mango production
3. Ensure women's ability to maintain strong involvement in mango marketing

Recognizing that producer group development and individual farmer adoption of technologies and practices are affected by gender dynamics at the community and household levels, the program engaged local and international gender experts. They helped to design a comprehensive gender strategy, to ensure that men and women both equitably *participate in* and *benefit from*

the program. In order to maximize mutual benefits of the program, and ensure that neither men nor women lose out from the development of the sector, the program designed a suite of activities to increase women's representation in producer group leadership, encourage their participation in mango production and maintain their strong involvement in mango marketing.

In order to ensure that the project was providing equitable access to service and monitor impact, the project tracked key performance indicators disaggregated by gender. The following table summarizes the gender breakdown of participation in key project services. The relatively low number of women in PBG committees compared to enrolled farmers, also reflected in the business advisor trainees as they primarily train PBG committees, was thoroughly assessed in 2014 and 2015. Generally the project team found that women were already occupied during the mango harvest trading on the local market, and so actively managing the PBG as a committee member would have resulted in a reduction of their income. These women preferred to delegate the task to others, but are still highly active in the decision making of the PBGs. The project sought ways to ensure women are able to participate directly in PBG leadership without negatively impacting their livelihoods.

Table 7: Key Gender Statistics

Indicator	Result as of December 2015, % Women / Men
Enrolled farmers	45 / 55
Unique training participants	46 / 54
Business Advisor Trainees	38 / 62
Access to credit	52 / 48
PBG Members	47 / 53
PBG Leaders	38 / 62

Importantly, through all of these trainings, women participated in similar numbers, reflecting the project's efforts to ensure that women experience equitable benefits from the project as well as the increasing role of women in the operation and leadership of PBGs. Notably, women were disproportionately represented in mango pruning, traditionally a male activity.

Table 8: Haiti Hope Training Gender Balance

Activity	% Women Trainees
Harvest & Post-Harvest (revised)	48%
Mango Pruning	61%
Credit Management	51%
Gender Awareness Workshop	51%
PBG Business Planning	50%
PBG Organization	48%
PBG Management	50%
Orchard Installation	55%
Fair Trade Principles	50%
Farm Environmental Management	51%
Organic Growing Methods	50%
TOTAL:	**51%**

Viewed through a gender-sensitive lens, the project has been highly successful in ensuring equitable access to benefits from the project for both men and women. Compared with existing GAs, where only 9% of their leadership positions were filled by women, women held 38% of PBG leadership positions. Similarly, women comprised 52% of the credit program's borrowers. Also, 31% of PBG's seasonal employees were women and 42% of PBG Direct Export farmers were women. While some of these jobs followed traditional gender norms with 95% of mango washers being women and 94% of mango pickers being men, others roles appeared to be shifting. For example, 24% of mango quality selectors were women and 20% of those catchers and stackers were women. Those tasks are typically performed by men in traditional sales channels.

As discussed in the gender strategy as markets formalize, men tend to supplant women in the commercialization of goods. However, it is unclear to what extent this could impact total household income and whether or not women would lose control over managing these typically pooled incomes. Survey data from 2015 continued to suggest that female headed households were far more common than male headed households. And in terms of perceived gender norms, more than 50% of both men and women surveyed indicated that women were more competent at managing the household budget.

Furthermore, women were more engaged with the local market, which frequently had higher price points, albeit with greater volatility, than those offered by the export market. Evidence in the survey suggest that women decreased sales to the PBGs from 2013 to 2015, but it is likely

that this is due to women's local market connections which command a more attractive local market price point. Similarly women sold over 90% of PBG rejects. As highlighted in the 2015 Annual Survey, approximately 30% of the project's beneficiaries had a spouse as a member of the project. Spouses were encouraged to enroll together in the program per the gender strategy to ensure equal household access to information. This would also allow the household, with co-owned trees and multiple gardens, some owned separately by males or females, to sell to the most profitable markets accessible by any member of the household. This approach was intended to prevent men from exerting new commercial control over mango sales and allow both parties to make better marketing decisions by increasing market access and having access to pricing information.

4 Monitoring & Evaluation System

The project's achievements were assessed through two systems. Ongoing outputs and short-term outcomes, were captured by and reported on via the project's internal Monitoring & Evaluation (M&E) system (Section 4.1.1). The second were periodic evaluations to assess key project outcomes, including the main project indicator of farmer income from mango.

4.1 Monitoring

This included periodic reports submitted by animators and business advisors, reports and records collected from PBGs, and transaction data from exporters. This data was managed by a full-time M&E team, who audited reports and conducted field visits when necessary to verify accuracy and veracity of reported data. Technical advisors and production agents used tablets produced by the Haitian company Surtab, while business advisors and other management staff used web forms on laptops to submit activity reports and results. This allowed the M&E manager to remotely collect all data in digital form, saving enormous resources and time which were shifted to analysis and deeper investigation. The project tracked approximately 90 disaggregated indicators monthly.

4.2 Evaluation

The evaluations sought to determine whether the project was achieving the goal of increasing farmer revenue from mango, and other objectives as outlined in the log frame, and was led by outside evaluators using surveys, focus groups, and other methods. They also aimed to identify the likely causes or attribution of any observed change. The table below lists activities to date conducted to evaluate project impact:

Table 9: Evaluation activities to date

Timing	M&E Activity	Type of Information Available
2010 (Oct) – 2016 (Feb)	TNS Monitoring System	Activities, outputs, industry data
2012 (Sep)	IDB-led baseline survey	Baseline outcomes and goal vs. control group, low goal data quality
2013 (Sep)	TNS Annual Survey	All 3 cohorts, outcome & goal differences within project participants; did not measure change over time
2013 (Oct)	IDB-led Follow-up Mid-Term Evaluation	Outcome differences over 1 year vs. control group with very high variance in goal data
2015 (Nov)	Annual Survey & Evaluation	All 3 cohorts outputs and outcomes, data collected and analyzed from baseline, 2013, 2015
2016 (Feb)	IDB-led Final Evaluation	PBG direct export cohort outputs and outcomes, focus on orchards and grafting, credit, Fair Trade pricing, and project context

Challenging conditions made it difficult to assess certain indicators, in particular farmer income. This is due to a delayed baseline, different levels of farmer engagement with project treatments, and large variations between farmer incomes which required stratification. Furthermore, the project design changed significantly over the five years of implementation, it intervened in zones with previous and current mango projects, and it intervened with a very large percentage of the market actors. These factors made reliance on small surveys or those solely using quasi-experimental methods unlikely to yield definitive conclusions. An effort was made to use mixed-methods in the last year of the project to examine systemic change across the mango value chain to examine changes over time and the likely reasons for those changes.

An executive summary of the evaluation findings can be found in Annex III.

5 Exit Strategy

The exit strategy sought to increase the probability that achieved project outcomes detailed in the above sections are sustained in the medium to long term after project closure. The project has been pursuing a “phasing over” strategy since 2014. By phasing over, Haiti Hope’s priority activities around PBGs, mango production, exporter modernization, and credit will continue to generate outputs leading to outcomes by transferring responsibility to local communities, entrepreneurs, exporters and their association, and the Ministry of Agriculture. This public and private handover required actors to demonstrate a strong sense of ownership, have a clear

recognition of project intervention values, have the needed tools and capacity, and have an enabling environment to implement project interventions. The exit strategy is shown in Annex II.

The project hosted a Mango Industry Workshop for stakeholders at the end of February 2016, broadcast an intensive rural radio campaign, and ensured knowledge dissemination with the public and international development communities. The mango workshop held in Haiti included 48 participants including representatives from the Ministry of Agriculture, 4 of 8 exporters and representatives of their private traders, USDA, Digicel's Mobile Financial Services, grower associations, PBGs, IDB/MIF, USAID, and a traceability business. It provided a project impact overview, a discussion of the state of the mango sector including the FSMA, financing opportunities for the sector including mobile money and microcredit, traceability initiatives, and certification for farmers and exporters.

The project also hosted a close out event in Washington, DC. Julie Katzman, Executive VP and COO of the IDB, kicked off a panel comprised of USAID Administrator Gayle Smith, Coca-Cola CEO Muhtar Kent, TechnoServe CEO William Warshauer, and IDB President Luis Alberto Moreno who moderated the discussion. The panel shared their perspectives and lessons learned, and reflected on the power of public-private partnerships as a vehicle for development.

Below are summaries of four specific sustainability initiatives.

5.1 PBG function and market access

If PBGs continue to demonstrate value to farmers and exporters, maintain market linkages, and are profitable businesses, then they will continue to sell mangos to buyers. To ensure PBG sustainability, the project focused on PBGs' ability to maintain market access and coordinate with exporters. Having proved that PBGs can offer competitive price points to source from farmers, earn profits as small businesses, and add value to exporters by offering high quality and traceable mango sales, four out the eight exporters sourced more directly from PBGs in 2014. All eight exporters sourced mangoes from PBGs in 2015.

One exporter, Perry, heavily invested in PBG sustainability by hiring the project's former Standards Manager and 5 former field agents ("animators") to serve as seasonal regional coordinators. This was in part made possible through a cost-sharing agreement between the exporter and Fair Trade USA. This will enable approximately 100 PBGs to remain directly connected to the export market and enable the Fair Trade and USDA Organic program to at least maintain current volumes, all else equal.

The other 3 export partners required different approaches that matched their individual supply chains, which range from a vertically integrated exporter with field-based collection centers and private trucks, to an exporter who sources primarily through direct phone contact between traders and packing house floor management. Roughly 50 additional PBGs were connected to either exporter field-based staff or exporter coordinators. When low volumes per PBG remained

unattractive to exporters, PBGs were encouraged to aggregate with neighboring PBGs to share trucks.

Additionally, a public database of nearly 5,000 traceable smallholder farmers was presented during the Haiti Hope Project's Industry Workshop held at the end of February. The public database was shared with exporters and contains traceability information such as garden GPS, the number of trees, PBG membership, if the farmer has been trained on Fair Trade and Organic principles, and any potential hazard point such as waterways or chemical input use by neighbors.

5.2 Mango tree production increase

If the price of mango on local and export markets continues to rise relative to other crops and farmers can access seedlings, then farmers will plant and care for mango trees. Evidence collected from the project in 2015 suggests this market assumption is reasonable given that since 2011, prices of trees, payne (local market proxy unit of sale), and dozen (export market proxy unit of sale) have all risen. Focus group evidence also suggests that local market and export market demand and price are both increasing. Furthermore, there is little evidence from project stakeholders suggesting there was a dramatic decrease in total productive volume during this period which could have explained the farmgate price increases on both international and domestic markets.

In 2015, the project focused on farmers' ability to continue to access mango seedlings by supporting private nursery structures linked to PBGs called KEZAPs. There were 52 of these groups comprised of 148 total committee members. The groups received nursery trainings and start-up kits that included watering cans and sapling bags. These members of these groups also received small business and seasonal marketing trainings. Their planning included planting during the rainy season to give the saplings the greatest chance of success.

5.3 Exporter Modernization

If US buyers continue to pressure exporters to adopt modern practices (GMP/HACCP) and reward them for compliance, then exporters will improve their packing houses and be better prepared for the FSMA. In 2015, the project created guides and toolkits for exporters around topics of GMP/HACCP, Fair Trade, and Organic certification. These were distributed to exporters during the TechnoServe-hosted mango industry workshop. Throughout the season, the project's standards team met with 3 exporters to conduct food safety trainings with packing house staff, conduct trainings on the HACCP process, and began developing procedures necessary for compliance and certification. This also included trainings conducted by the M&E team with 2 exporters on how to use the verified F10/F12 traceability system used by PBGs to supply Whole Foods. These two exporters used the receipt chain to track sales and the project trained them on how to use cloud-based software such as Google Sheets to enter and use the data.

5.4 Credit Program

If farmers have a good credit history through Agripro, then Sogesol will consider graduating them to their consumer loan product. By the end of June 2015, Sogesol took complete responsibility over the Agripro credit product. Farmers received credit at least through November 2015, when Sogesol sent its final report to TechnoServe. Sogesol expressed a strong commitment to maintain and grow the program, integrating it with their higher end agricultural credit product and the associated management team. As of February 2016, Sogesol had paused their agricultural lending in Haiti due to severe drought conditions that directly impacted 30% of their portfolio.

5.5 Knowledge Management

To ensure that lessons learned and project successes and challenges were communicated to the public and to development professional, the project regularly published articles, case studies, and released multimedia. The following is a list of selected Haiti Hope communications pieces:

- "Unlocking Credit for Haiti's Smallholder Mango Producers", TechnoServe (September 2014)
- "Haiti Hope Mango Pulp Feasibility White Paper", TechnoServe (October 2014)
- "Haitian Mango Sector: An Industry at Crossroads", TechnoServe (December 2014)
- "Haiti Hope: Innovating the Mango Value Chain", Harvard Business School (December 2015)
- "Guide to the Use of Digital Financial Services in Agriculture", USAID featured case study for Haiti (February 2016)
- Videos:
    - "Message in a Mango": https://www.youtube.com/watch?v=RbMoCBCu6BE
    - "Haiti Hope Delivers Value to Farmers": https://www.youtube.com/watch?v=n_DUEqP9mzg
- Rural radio campaign in Haiti (February 2016)
- Haiti Hope Project Fact Sheet
- Selected Published Articles:
    - NextBillion.net, Andrew Eder, "Ripe for Change: Developing a Sustainable Mango Industry in Haiti" (April 2010): http://nextbillion.net/ripe-for-change-developing-a-sustainable-mango-industry-in-haiti/
    - Whole Foods Market Blog, Matt Rogers, "Whole Trade Haitian Mangoes" (May 2012): http://www.wholefoodsmarket.com/blog/whole-story/whole-trade-haitian-mangoes
    - Business Fights Poverty, James Obarowski, "Four Years After the Earthquake, a Road to Market for Haitian Mangoes" (January 2014): http://community.businessfightspoverty.org/profiles/blogs/james-obarowski-four-years-after-the-earthquake-a-road-to-market-
    - Coca-Cola Journey, Louis Alberto Moreno, "The Often Bumpy Road to Progress" (March 2016): http://www.coca-colacompany.com/stories/community/2016/the-often-bumpy-road-to-progress/

6 Challenges and risks

The Haiti Hope Project identified challenges and risks to mitigate or avoid their potential impact. Protests and other political issues were pervasive in Haiti, and the last year proved to be particularly challenging in fully executing the exit strategy. However, some improvements to primary infrastructure such as repairs to main roads were made. Furthermore there were no major hurricanes in 2014 or 2015, normally a significant hazard to people and property. Nonetheless, the extremely poor condition of secondary roads was still a significant constraint to increasing mango sales, reducing exports by perhaps 10-20%.[20]

Key challenges and risks of the project included:

- **Political Instability.** In February 2016 the Haitian government entered a period of great uncertainty as the President of country left office without completing the election process nominating his successor. A temporary President was voted by the parliament with the mandate of completing this process in 120 days. Given that this deadline will not be met, the country will continue to face uncertainty and political instability in the coming months. Immediate project impact resides with the Ministry of Agriculture that, along with the other arms of the government, has often seen changes in the cabinet with each new political agreement. This issue directly affects sustainability of the project as knowledge sharing and transfer of responsibility to the Ministry was interrupted. The project engaged with USDA staff cooperating with the Ministry of Agriculture as well as key technical staff at the Ministry of Agriculture to transfer knowledge. The exporter association, ANEM, and its exporter members had to take on a larger sustainability role than originally envisaged due to political instability and ministerial staff turnover.
- **New US food safety laws government imports including Haitian mango.** The FSMA law will have a sweeping global impact and more than 70% of the Haitian market remains very far from compliance. Most exporters have no involvement in and very little knowledge of their inbound supply chain, and the Ministry of Agriculture has not shown sufficient leadership in addressing the challenge. Changing this will require not only investments in personnel and other resources, but a shift in the paradigm of their businesses to a more vertically integrated structure. The certified PBGs are already compliant so this may serve as both a model and, in the case of exporter failure to act, a life-raft for the industry. In addition, the project organized trainings and a workshop for exporters and ministry staff to both educate them about the law's requirements, and provide contextually relevant tools and approaches to comply.

[20] A single road built in 2008 near Mirebalais increased exports from that area from 80k to 200k dozens.

7 Key Lessons Learned and Conclusion

Frequent feedback within the implementation team and between the Operating and Steering Committee members led to many lessons learned and a highly evolving approach to meet the needs of beneficiaries and reach the goal of increasing mango income for participating farmers.

7.1 Design

- **Certain assumptions based on the existing market understanding may have limited impact:** Ministry and industry figures cited 200,000 smallholder mango farmers. The number of active mango farmers in the export sector is only roughly 30,000. The project design targeted reaching 25,000, assuming a much larger base population of smallholder farmers. Also, volume targets were set to increase 30% by year 5, which was short considering some practices like grafting may reduce production in the short term. There was also significantly less rejects in the chain than had been originally estimated.
- **Do not assume industry actors, particularly private sector actors, will engage with the project even if there are clear financial incentives for them to do so**: Exporters expressed a commitment early on, but most did not engage meaningfully until the last year, when activities were limited. Some hesitancy can be explained by the closely-held family-run export business structure in Haiti that likely values stability over profitability and market differentiation. Only after repeated attempts to engage, clear value proposition of the project activities, and external regulatory and importer pressures, have some exporters and their representative association, ANEM, begun to show an interest in the initiatives launched by the project.
- **Iterate and finalize model before farmer scale up**: The first year roughly 10,000 farmers were enrolled and the second year another 10,000 were enrolled. Having already targeted and recruited 80% of the enrollment objective by the time the final model had been completed in 2013, there was occasionally a mismatch between those farmers that were recruited and those that were interested in fully engaging with core activities.

7.2 Implementation

- **Processing was not feasible under current market conditions:** The project determined through rigorous analysis that processing Francique mango rejects into pulp for export is not a profitable business enterprise in Haiti under current market conditions. This explains why, despite a decade of investments intended to establish such an enterprise, none have yet been successful. This is due to the market structure in Haiti, based on widely dispersed "backyard" production resulting in high costs of harvest and transport, and the high local demand and price for fresh mango regardless of visual blemishes disqualifying them for export. Subsidizing the construction of the plant is difficult to justify since farmers would not earn any additional revenue. They are already paid by most exporters for their "rejected" mangos at local market prices, which are the same or higher than processed prices. The local processing market was satisfied by the lower cost canned juice produced by Famosa, affiliated with the exporter Agropak.

- **Positive spillover effects from trainings are likely when farmers recognize clear value in adopting the practice**: The midterm evaluation of the project determined that for pruning, very high adoption rates had been achieved significantly beyond the number of farmers who received direct training, though these farmers mainly cited the TechnoServe project or their PBG as the reason for doing so, while this practice was rare prior to 2012. This suggests that, if a given practice shows sufficient benefit over the right time frame, once a critical mass of farmers adopt it, it can go "viral" in rural Haiti, resulting in widespread behavior change. Pruning was also performed on non-francique varieties, and other fruit trees.
- **PBGs were able to source mangos from farmers on credit and pay them after acceptance at the packing house:** As highlighted in the marketing section, PBGs were able to double the dozens sold for export per farmer in three seasons. This was all done on credit from the farmer, which is frequently cited by more risk-averse farmers as being a constraint for them to supply more mangoes to PBGs. Yet this system of supplying on credit allows for a positive feedback loop to increase quality from farmer to exporter. While most PBGs have the choice at the pack house to sell the rejects themselves or sell the rejects to the exporter, they often sell them at a discount (25-50%) to exporters due to convenience and transportation costs. The discounted dozens rejected are recorded on the traceability system and eventually divided evenly among farmers sharing a truck or lot. This encourages PBGs to insist that harvesters only take ripe mangoes from the tree, farmers only bring quality mangoes to the collection center, and that the PBG only selects and ships the quality of mango they believe matches the quality standards of the exporter. This has been a driving factor in reducing PBG rejects relative to a traditional intermediary comparison group that uses pre-selling and cash payments highlighted in Figure 6. Further, traceability is required for this feedback to exist. This tradeoff of a credit system based on trust versus a cash-based, volume-driven system, where harvesters and farmers finish the transaction at the tree, suggests that there are new opportunities around supplier financing, such as providing short term working capital to PBGs based on a percentage of projected sales.

7.3 Steering & Operating Committee[21]

- Success Factor #1: Engaged and Thoughtful Leadership.
  Recommendation: Ensure clear executive sponsorship of the project that is owned throughout each partner organization especially at the operational level.
- Success Factor #2: Understanding and Leveraging Partner Organizational Assets.
  Recommendation: Advance collective understanding of the partner roles and responsibilities, their competencies and how to best utilize.
- Success Factor #3: Managing for Results.

[21] Summary from "Capturing Lessons Learned of a Public-Private Partnership" (February 2012)

Recommendation: Outline clear and tangible results, establishing defined metrics, scheduling important routines, and making certain that the right subject matter experts are engaged to inform design and decision-making.

- Success Factor #4: Maintaining Trust through Open and Routine Communication. Recommendation: Establish regular routines that encourage open dialogue and build trust among the partners.
- Success Factor #5: Establishing an Environment that Allows for Flexibility to Evolve. Recommendation: Trust the project partners to do what is required to make project changes that reflect local needs and dynamics.

The Haiti Hope Project emerged after a devastating tragedy. The partners took a long term vision with the hope of growing and strengthening a key sector for both farmers and the Haitian economy. Most of the objectives set at project launch were achieved in spite of some faulty assumptions, implementation challenges, and reluctance from key mango sector stakeholders to work with the project. The project, like many in Haiti, did not operate in a vacuum, nor did it start from scratch. It was built by first taking the lessons learned from past projects and initiatives, such as the mobile collection kits that are used by all PBGs which was piloted by GAs during USAID's WINNER project. It innovated new PBG structures to give farmers access to information and markets and pioneered financial inclusion efforts to smallholders through micro-credit and mobile money payments.

The project is leaving behind an industry that is better equipped for future food safety regulation and market opportunities, such as Global GAP. The exporters and their association, will be critical to the future sustainability of PBGs and in increasing the global competitiveness of the Haitian mango industry. Troubling signs, such as Ecuador planting the prized Francique mango in large and efficient plantations, Peruvian associations making strong US marketing efforts in supermarkets, and onerous new food safety regulations, call into question the preparedness of most of the exporters. Toolkits and guides prepared by the project will be insufficient in addressing their future challenges to become competitive and effectively compete for shelf space in foreign markets.

This project's legacy will not only be the investments made in production through orchards and grafting, but also the changed mentality of farmers, intermediaries, and exporters. Farmers are more engaged with the harvest, post-harvest, and commercialization steps and they are profiting from their efforts. Intermediaries are facing increased positive competition increasing quality standards and increasing prices to suppliers. Although current market conditions did not make the case for a pulping facility, with increasing production starting in 2018 with full maturity in 2023, in addition to a depreciating currency, the future of pulping may be positive.

Nearly 5,000 smallholder farmers proved that it is possible to create an inclusive supply chain in Haiti including the supplying of Fair Trade and Organic mangoes to one of the biggest supermarket brands in the US. Over 9,000 farmers accessed much needed credit which was

invested in profitable income generating activities. Over 18,000 farmers are adhering to improved techniques and positive spillover effects, such as establishing high farmgate floor prices, are reaching farmers outside of the PBGs. Future Haitian mango projects and agribusiness policymakers now have a strong foundation of learnings, accurate market statistics, a mobilized farmer base, promising future production, and tools to grow the industry.

8 Financial summary (September 2010 to February 2016)

Table 10: Project expenses up to February 2016 (TCCC, MIF, USAID)

Cost category	Total expenses, US$
Salaries	1,806,582
Benefits	991,472
Office Expenses	605,387
Travel	384,016
Vehicles	254,114
Outside Services/Consultant	2,994,533
Equipment	230,725
Other Allowable Cost	245,403
Total Direct Costs	**7,512,232**
Indirect Costs	1,655,475
Capital equipment	234,293
Total Costs	**$9,402,001**

Table 11: Pledged funding and disbursements by donor

Donor	Pledged funding, US$	Disbursement, US$	Comment
Core budget			
The Coca-Cola Company	3,500,000	3,500,000	Closed
MIF/IDB	3,055,218	3,045,157	Closed ($2,874,453 managed by TNS)
USAID	3,000,000	2,999,951	Closed
Total	**9,555,218**	**9,545,108**	
Other contributions			
CBHF	550,600	540,747	Closed
Soros	250,000	250,000	Closed
Kellogg Foundation	65,000	65,000	Closed
Private donor	500,000	500,000	Closed

Annex I: Haiti Hope Monitoring & Evaluation Plan

1. Introduction

The goal of the Haiti Hope project is to contribute to improving income growth opportunities for smallholder farmers and other actors in the mango value chain. The purpose of the project is to develop a more competitive, sustainable and inclusive mango value chain that increases the income of smallholder mango farmers, creates employment and enhances fresh and processed mango exports.

2. Background

In September 2010, TechnoServe began implementing the Haiti Hope Project. The Project is a five-year partnership between The Coca-Cola Company, the Multilateral Investment Fund (MIF) of the Inter-American Development Bank (IDB) Group, the US Agency for International Development (USAID) and TechnoServe. Support is provided by the Clinton Bush Haiti Fund (CBHF), Soros Economic Development Fund (SEDF) and other international and local actors. The Project's primary objective is to double the income of 25,000 mango farmers.

3. Field monitoring system

The Project has set up a monitoring system to track the progress of Project activities. The field monitoring system is based on information on farmers and farmer activities collected by the animators and aggregated first by the business advisors and thereafter by the Monitoring & Evaluation (M&E) Manager.

An M&E manager was hired in November 2010 and has worked closely with the operational team to develop the field reporting system. All field staff have been trained on the reporting system consisting of procedures and forms to track farmer activities and results at farmer level in a monthly cycle. This system feeds into the donor reporting system.

The field monitoring system is based on information on farmers and farmer activities collected by the animators and aggregated first by the business advisors and thereafter by the M&E manager. Internal progress reports will be produced monthly and donor reports quarterly.

The animators collect data for the majority of our indicators through their work on the ground and through their relationships with farmers and groups. Their business advisors collect and assess the data monthly. The animator is given a receipt enumerating the reports they deliver (all reports are due no later than the third of the month). Business advisors verify the reports and provide analysis to inform the direction and any necessary amendments to the Project plan. Business advisors compile the monthly report data into one monthly report spreadsheet. The business advisor transcribes the individual animator's reports on farmer trainings and rallies onto a spreadsheet. The business advisor provides a monthly report workbook for each group. The compilation model harvests data from the workbooks based on embedded formula. An electronic filing system with a double back up will be put in place for all business advisor workbooks reports and for all the M&E files.

These reports and their embedded formulas will easily generate information to inform our work. They return Project indicators in a clear, comparable table that shows overall trends as well as findings per grower group, region, business advisors and animators. These findings inform quarterly, semi-annual and annual reports with valid, deep, ground-tested data.

4. Governance and reporting structure

The Haiti Hope Project is implemented under leadership and guidance of a Steering Committee made up of representatives from The Coca-Cola Company, MIF/IDB, USAID and TNS, and local advisors. The Steering Committee convenes in yearly in-person meetings and quarterly conference calls.

An Operating Committee consisting of representatives from The Coca-Cola Company, MIF/IDB and TNS has been tasked to carry out the day-to-day management of the Project. The Operating Committee convenes in biweekly conference calls (since before Project start) and has so far focused on contracting, external and internal communication and planning and review of Project activities.

The Project reports on a quarterly basis according to the following calendar:

- **Annual reports:** Published by February 28 for previous January – December.
- **Semiannual reports:** Published by July 31 for January – June.
- **Quarterly reports:** Published by April 30 for January – March; Published by October 31 for previous July – September.

The Project collects data on a monthly basis:

- Day 1: AA submits data for the previous month to BA.
- BA enters data into excels and submits to M&E assistant.
- M&E assistant reviews data and sends to M&E manager.
- Day 15: M&E manager develops report for field manager and program manager.

Data quality is assessed both internally by the M&E assistant and the field manager, and externally by the impact evaluator.

5. External evaluator

The Project is considering to hire an external firm to carry out impact evaluations. The impact evaluation will combine quantitative and qualitative research methods and will consist of a baseline study conducted in year one, two mid-term surveys conducted after two and three years, and an end-line conducted at year five. The evaluator will assist the Project to refine the monitoring system, review Project indicators and develop a corresponding baseline data set. The results of the impact evaluation will be used to determine the effectiveness of the business development strategy used and reinforce accountability to stakeholders.

Impact Evaluations will be carried out by an external evaluator to assess the Project's effectiveness and efficiency from a process oriented perspective as well as success in achieving results (impact) for the intended beneficiaries. The evaluation plan will achieve the following general objectives.

- Identify and measure impact among participant farmers and attribute the results to Project activities.
- Undertake a deep-dive analysis of the factors that contributed or not to Project success, including political, market, industry, or country-specific conditions.
- Assess the overall results of the Project and sustainability.
- Determine the aspects of the Project that can be easily transferred or standardized in other programs, sectors or countries.

6. Setting baselines and targets

The Projects indicators and log frame (see below) were developed in collaboration with IDB and TCCC. Targets were based on an initial diagnostic of the mango sector and an assessment of Project impact, carried out by the implementing agency. An impact evaluator will be hired in the spring of 2012 to design an impact evaluation plan and to collect baseline data. Baseline data will be gathered through quantitative surveys and qualitative interviews.

7. Log frame

Haiti Hope Logical Framework			
Narrative	**Indicators**	**Means of Verification**	**Assumptions**
Goal Increased economic opportunity and income for 25,000 mango farmers	• 100% increase in net income • 30-50% increase in incremental volumes sold by farmers • Average price received by farmers increased by 30-50% • 100% increase in farmer incremental sales revenues	• External impact evaluation (included in project budget) • Core Indicator collection and reporting system	We can collect good price information at different points in VC and selling groups keep records
Outcome Improved performance of an inclusive mango Value Chain	**1. Producers** • 25,000 farmers (cumulative) implementing practices they have been trained on • 45,000 mango trees planted by farmers **2. Aggregators (PBGs)** • 250 PBGs functioning (e.g., aggregating, selling to exporters or Grower Groups (cumulative) **3. Processors** • At least one new mango processing operation **4. Financial Service Suppliers** • 25% of enrolled farmers with access to credit • At least one of financial institution providing farmer credit • At least US$250,000 of cumulative loan amount	• Impact evaluation • TNS monitoring reporting system • PBG selling records at Cell and Buyer level	**Outcome to Goal** • Exports to US continue • Environmental conditions remain favorable • No economic shocks disrupt improvements and investments • Political and rural social environment is stable • Export demand remains stable. • Farmer cost does not increase proportionally

Haiti Hope Logical Framework			
			more than revenue.
Outputs 1. Improved production methods and commercial practices at farmer level 2. Improved processing capacity 3. Improved enabling environment 4. Learning system established and operational	• 25,000 of farmers enrolled into the program[22] • At least 30% of enrolled farmers are women • At least 225 productivity workshops conducted • At least 225 trainings on business and organization organizational governance and management carried out • Awards or incentive schemes of at least US$150,000 rewarded to well performing groups • At least one processors supported (e.g., business plans developed, financing facilitated, customers identified) • At least one partnership established with institutions to provide loans to farmers (MOU signed) • Project team established by February 2011 • Monitoring data collected, analyzed and disseminated quarterly • Steering committee participates in evidence review and contributes to project re-design where necessary	• Impact evaluation • TNS monitoring reporting system • Bank confirmation • Project quarterly reports	**Outputs to Outcomes** • Varieties suitable for purée processing Global or local market willing to buy Haitian pulp at a profitable price for the value chain • Financial institutions willing to provide farmer credit • Investor willing to set up processing plant in view of political and security issues in Haiti
Activities **1. Empower Producer Business Groups (PBG) to increase production** • Support farmers to form PBGs • Provide training on production • Support PBG grower members to plant new trees • Design and train farmers on approaches to post-harvest handling • Provide training on business practices • Train farmers to diversify into other agricultural activities • Support relations between PBGs and exporters **2. Foster competitive local processing businesses** • Support establishment of new processing business(es)			**Activities to Outputs** • Farmers interested in joining program

[22] Question to be added to impact evaluation: Is number of farmers substantially different than number of households?

Haiti Hope Logical Framework	
• Explore viability of varieties for processing **3. Facilitate supportive enabling environment** • Partner with financial institutions • Collaborate with partners to address logistics **4. Learning system established and operational** • Monthly monitoring system • Impact evaluations • Steering Committee meetings	

8. Indicator list

Outcomes:

1. Increase in net income (USAID Indicator: 4.5-4 Gross margin per unit)
2. Increase in incremental volumes sold by farmers
3. Increase in average price received by farmers
4. Increase in farmer incremental sales revenues (USAID Indicators: 4.5.2-23 Value of incremental sales; 4.5.2-36 Value of exports)
5. Number of farmers (cumulative) implementing practices (USAID Indicator: 4.5.2-5 Number of farmers and others who have applied new technologies or management practices)
6. Mango trees planted by farmers (USAID Indicator: (Custom) Number of trees planted)
7. Functioning PBGs (e.g., aggregating, selling to exporters or Grower Groups) (cumulative) (USAID Indicator: 4.5.2-11 Number of food security private enterprises (for profit), producers organizations, water users associations, women's groups, trade and business associations, and community-based organizations (CBOs) receiving USG assistance)
8. Number of new mango processing operations (USAID Indicators: 4.5.2-38 Value of new private sector investment in the agriculture sector or food chain leveraged)
9. Share of enrolled farmers with access to credit
10. Number of financial institution providing farmer credit
11. Cumulative loan amount (USAID Indicator: 4.5.2-29 Value of Agricultural and Rural Loans)

Outputs:

12. Number of farmers enrolled into the program[23] (USAID Indicators: 4.5.2-13 Number of rural households benefiting directly from USG interventions; 4.5.2-7 Number of individuals who have received USG supported short-term agricultural sector productivity or food security training)
13. Share of enrolled farmers that are women
14. Number of productivity workshops conducted
15. Number of trainings on business and organization organizational governance and management carried out
16. Value of awards or incentive schemes rewarded to well performing groups

[23] Question to be added to impact evaluation: Is number of farmers substantially different than number of households?

17. Number of processors supported (e.g., business plans developed, financing facilitated, customers identified) (USAID Indicator: 4.5.2-11 Number of food security private enterprises (for profit), producers organizations, water users associations, women's groups, trade and business associations, and community-based organizations (CBOs) receiving USG assistance)
18. Number of partnership established with institutions to provide loans to farmers (MOU signed)
19. Value of sales of processor (if applicable)

9. Performance Indicator Reference Sheets (PIRS)

Performance Indicator Reference Sheet
INDICATOR TITLE:(Ref#12) Cumulative Number of farmers enrolled (Ref#13) Share of Women enrolled (USAID Indicator: 4.5.2-7 Number of individuals who have received USG supported short-term agricultural sector productivity or food security training; 4.5.2-13 Number of rural households benefiting directly from USG interventions) **Conversion from HH to USAID:** None for 4.5.2-7; 4.5.2-13 requires determining if there are multiple farmers enrolled per household **DEFINITION:** A farmer is enrolled when he/she has participated to a rural meeting held by the animator of the locality, and the farmer has signed an engagement form accepting the terms and conditions of his participation in the project. The implementing partner needs to be able to demonstrate from the records that the farmers have effectively joined the project. All farmers should be identified by their SIN cards without exception. **RATIONALE:** Track number of farmers for trainings planned in the project, and control the total cumulative number of farmers engaged in the program toward the 25,000 farmers that the project has planned to work with over a five-year period **UNIT:** Number **DISAGGREGATE BY:** Male (M) Female (F) Continuing vs. New farmers/households **DATA SOURCE**: Implementing Partner **MEASUREMENT NOTES**: Level of Collection: Project-level Who collects Data for this indicator: Implementing Partner How should it be collected?: from Project records, attendance lists, surveys **FREQUENCY OF REPORTING:** Quarterly

Performance Indicator Reference Sheet
INDICATOR TITLE:(Ref#5) Cumulative Number of farmers that have implemented improved practices from the training package received **DEFINITION:** This indicator measures the total number of farmers that are applying new practices on production techniques, harvest post-harvest techniques, fertilizer utilization, commercial practices etc.., following the training package of the project. **RATIONALE:** Adoption of new techniques by the farmers is critical to the objective of the project to increase farmers' income. **UNIT:** Number **DISAGGREGATE:** -by Sex **TYPE:** Outcome **DATA SOURCE**: Implementing Partner **MEASUREMENT NOTES**: Level of Collection?: Project –level Who collects data for this indicator?: Implementing Partner How should it be collected?: Survey of targeted individuals **FREQUENCY OF REPORTING:** Annually

Performance Indicator Reference Sheet
INDICATOR TITLE: (Ref#14) Cumulative number of workshops on productivity measures carried out (e.g., pruning, grafting, fertilizer, harvest& post – harvest etc. **DEFINITION:** The number of trainings that have been carried out in a variety of best practices in productivity, production techniques, pruning, grafting, harvest & post-harvest **RATIONALE:** Measures the quantity of trainings in a specific subject given for effective impact on the implementation of improved practices. **UNIT:** Number **DISAGGREGATE BY:** Thematic of training **TYPE:** Output **MEASUREMENT NOTES:** Level of Collection? : Project – Level Who collects data for this indicator? : The implementing data collection mechanism How should it be collected? : Project training records **FREQUENCY OF REPORTING:** Quarterly

Performance Indicator Reference Sheet
INDICATOR TITLE: (Ref#15) Cumulative number of trainings on business and organization carried out (e.g., business practices, group management, institutional development, community organization, new groups, dismantled and reorganized groups) **DEFINITION:** Total number of trainings given to members of farmers' organizations **RATIONALE:** Tracks the number of trainings given to individuals or groups for evaluation of improved practices. **UNIT:** Number **DISAGGREGATED BY:** Groups/Thematic of training **TYPE:** Output **DATA SOURCE:** Implementing Partner **MEASUREMENT NOTES:** Level of collection ?: Project Level Who collects data for this indicator? : Implementing partner How should it be collected? : Training records. **FREQUENCY OF REPORTING:** Quarterly

Performance Indicator Reference Sheet
INDICATOR TITLE: (Ref#16) Value of awards or incentive schemes rewarded to well performing grower groups (e.g., tools, solar panels, laptops, traceability equipment) **DEFINITION:** Tracks the value of in kind incentives given to well performing groups. Reason(s) for the awards or incentives must be specifically stated on the Project records **RATIONALE:** The project promotes a meritocratic system; the awards promote a competitive atmosphere within the farmers and/or the farmers' groups **UNIT:** US Dollar **DISAGGREGATED BY:** Type of awards/incentives and farmers' groups **TYPE:** Outcome **DATA SOURCE:** Implementing Partner **MEASUREMENT NOTES:** Level of Collection? : Project level Who collects data for this indicator? : Implementing Partner How should it be collected? : Project records **FREQUENCY OF REPORTING:** Annually

Performance Indicator Reference Sheet
INDICATOR TITLE: (Ref #6) Cumulative number of new mango trees planted by farmers. **DEFINITION:** This indicator represents new mango trees planted by farmers since their engagement in the project. **RATIONALE:** The addition of new trees will increase the farmers' production and turn a smallholder farmland into a small or medium size orchard where production techniques are better implemented. **UNIT:** Number **DISAGGREGATED BY:** Farmers, localities, groups **TYPE:** Outcome **DATA SOURCE:** Implementing Partner **MEASUREMENT NOTES:** Level of Collection? : Project level Who collects data for this indicator? : Implementing Partner How should it be collected? : Collected directly from farmers, verified by project personnel **FREQUENCY OF REPORTING:** Annually

Performance Indicator Reference Sheet
INDICATOR TITLE: (Ref#18) Cumulative number of partnerships established with institutions to provide loans to farmers. **DEFINITION:** This indicator tracks the number of formal partnerships established with institutions to provide loans to farmers. A formal memorandum of understanding must be signed and actual loans are to be handed out to farmers. **RATIONALE:** Partnerships with established institutions will assure the sustainability of the loan program **UNIT:** Number **DISAGGREGATED BY:** None **TYPE:** Output **DATA SOURCE:** Implementing Partner **MEASUREMENT NOTES:** Level of Collection? : Project Level Who collects data for this indicator? : Implementing Partner How should it be collected? : Verification of MOUs **FREQUENCY OF REPORTING:** Annually

Performance Indicator Reference Sheet
INDICATOR TITLE: (Ref #8) New mango processing operations (investors and small farmers associations); (USAID Indicators: 4.5.2-38 Value of new private sector investment in the agriculture sector or food chain leveraged) **Conversion from HH to USAID:** None **DEFINITION:** This indicator represents any tangible investment made in new mango processing by private investors or small farmers associations. **RATIONALE:** Private sector investment is critical because it indicates that the investment is perceived to provide a positive financial return and therefore is likely to lead to sustainable mango production increase. **UNIT:** Number + Dollar value **DISAGGREGATED BY:** None **TYPE:** Outcome **MEASUREMENT NOTES:** Level of Collection? : Project level Who collects data for this indicator? : Implementing partner How should it be collected? : Program data, private sector financial records. **FREQUENCY OF REPORTING:** Annually

Performance Indicator Reference Sheet
INDICATOR TITLE: (Ref#4) Revenue increase of farmers who have been in program for at least 2 years. (USAID Indicators: 4.5.2-23 Value of incremental sales; 4.5.2-36 Value of exports) **Conversion from HH to USAID:** For 4.5.2-23: Percentage to dollars. For value of exports, the volume sold can simply be multiplied by the export price (received by exporter) rather than by price received by farmer. **DEFINITION:** This indicator will collect increase revenue of small holders' farmers after at least 2 years with the program, in comparison with their baseline revenue at the beginning of the project. This indicator will collect both volume (in metric tons) and value (in US dollars) of purchases from smallholders of targeted commodities for its calculation. The value of incremental sales indicates the value (in USD) of the total amount agricultural products sold by farm households relative to a base year and can be calculated based on the total quantity/volume (in metric tons) sold of a product (crop, animal, or fish) times the product price in the reporting year minus the total quantity/volume (in metric tons) sold of a product times the crop price in the base year. Except to determine the baseline, re-existing sales should not be counted; only incremental sales facilitated by the project should be counted. Note that quantity of sales is part of the calculation for gross margin under indicator #4.5—4, and in many cases this will be the same or similar to the value here. **RATIONALE:** The objective is to measure the impact of the Project on the productivity of the farmers and consequentially on their revenue. **UNIT:** Percent (USAID: dollars) **DISAGGREGATED BY:** Sex of smallholder farmer**.** **TYPE:** Outcome

DATA SOURCE: Implementing Partner
MEASUREMENT NOTES:
Level of Collection? : Project level
Who collects data for this indicator? : Implementing partner and Impact Evaluator
How should it be collected? : Collected directly from farmers, cross -checked with recorded sales to farmers' organizations.
Only count the increase in sales attributable to the project investment.
FREQUENCY OF REPORTING: Annually

Performance Indicator Reference Sheet
INDICATOR TITLE: (Ref #1) Increase in net income (USAID Indicator: 4.5-4 Gross margin per unit) **8.1.1.1.1 CONVERSIONS FROM HH TO USAID:** 8.1.1.1.2 Incremental to total; aggregate to per unit (tree or producer) **DEFINITION:** Incremental change in revenue from mango sales minus cost incurred by the mango sales. Input costs included should be those significant input costs that can be easily ascertained. These are likely to be the cash costs. Most likely items are: purchased water, fuel, electricity, seed, fertilizer, pesticides, hired labor, hired enforcement, and hired machine services. **RATIONALE:** Farmers are better off with a higher income earned from their own mango production and sales. **UNIT:** Percent (USAID: dollars/unit) **DISAGGREGATED BY:** Sex; Rain fed vs. irrigated **TYPE:** Outcome **DATA SOURCE:** Implementing Partner **MEASUREMENT NOTES:** Level of Collection? : Project Level Who Collects data for this indicator? : implementing Partner How should it be collected? : Impact evaluator. Gross margin is calculated by applying a formula against these 5 data points: 1) Unit, e.g., Area (hectares) or Kilograms (for fish) or Number of animals (for livestock), 2) Production, 3) Value of Sales (USD), 4) Quantity of Sales, and 5) purchased input costs (report only those costs that are at least 5% of total cost, i.e. do not report miniscule costs). Price = value of sales divided by quantity of sales; gross revenue = price x production; net revenue = gross revenue minus purchase input cost; gross margin (per ha, per kg of fish, or per animal) = net revenue divided by area (for crops), by animals (for livestock). **FREQUENCY OF REPORTING:** Annually

Performance Indicator Reference Sheet
INDICATOR TITLE: (Ref #2) Increase in incremental volumes sold by farmers **DEFINITION:** Incremental change in number of dozen sold by beneficiary farmers. **RATIONALE:** Core element of farmer revenue. Increased farmer revenue leads to higher quality of life. **UNIT:** Percent **DISAGGREGATED BY:** n/a **TYPE:** Outcome

DATA SOURCE: Implementing Partner
MEASUREMENT NOTES:
Level of Collection? : Project Level
Who Collects data for this indicator? : implementing Partner
How should it be collected? : Impact evaluation.
FREQUENCY OF REPORTING: Annually

Performance Indicator Reference Sheet
INDICATOR TITLE: (Ref #3) Increase in average price received by farmers **DEFINITION:** Incremental change in price per dozen (12) received y the farmer. **RATIONALE:** Core element of farmer revenue. Increased farmer revenue leads to higher quality of life. **UNIT:** Percent **DISAGGREGATED BY:** n/a **TYPE:** Outcome **DATA SOURCE:** Implementing Partner **MEASUREMENT NOTES:** Level of Collection? : Project Level Who Collects data for this indicator? : implementing Partner How should it be collected? : Impact evaluation. **FREQUENCY OF REPORTING:** Annually

Performance Indicator Reference Sheet
INDICATOR TITLE: (Ref #10) Number of financial institution providing farmer credit **DEFINITION:** Number of banks providing credit to Haiti Hope beneficiaries in collaboration with the Program. **RATIONALE:** Giving access to financial loans to smallholders' farmers, will benefit the daily lives of the farmers as a whole and strengthen the value chain by making the farmers more in control of when to sell their mangoes. **UNIT:** Number **DISAGGREGATED BY:** n/a **TYPE:** Outcome **DATA SOURCE:** Implementing Partner **MEASUREMENT NOTES:** Level of Collection? : Project Level Who Collects data for this indicator? : implementing Partner How should it be collected? : Project team. **FREQUENCY OF REPORTING:** Annually

Performance Indicator Reference Sheet
INDICATOR TITLE: (Ref #11) Cumulative loan amount (USAID Indicator: 4.5.2-29 Value of Agricultural and Rural Loans) **Conversion from HH to USAID:** None **DEFINITION:** Total number of loans times average loan size. This indicator adds loans made (i.e. disbursed during the reporting year as a result of USG assistance) to producers (farmers, fishers, etc.),

input suppliers, transporters, processors, as well as loans to MSMEs in rural areas that are in a targeted agricultural value chain as a result of USG assistance. The indicator counts loans disbursed to the recipient, not loans merely made (e.g. in process, but not yet available to the recipient). The loans can be made by any size financial institution from micro-credit through national commercial bank, and includes any type of micro-finance institution, such as an NGO.

RATIONALE:

Giving access to financial loans to smallholders' farmers, will benefit the daily lives of the farmers as a whole and strengthen the value chain by making the farmers more in control of when to sell their mangoes.

UNIT: US dollar

DISAGGREGATED BY: Sex of recipient

TYPE: Outcome

DATA SOURCE: Implementing Partner

MEASUREMENT NOTES:

Level of Collection? : Project Level

Who Collects data for this indicator? : implementing Partner

How should it be collected? : Bank records.

FREQUENCY OF REPORTING: Annually

Performance Indicator Reference Sheet
INDICATOR TITLE: (Ref #17) Number of processors supported (e.g., business plans developed, financing facilitated, customers identified) (USAID Indicator: 4.5.2-11 Number of food security private enterprises (for profit), producers organizations, water users associations, women's groups, trade and business associations, and community-based organizations (CBOs) receiving USG assistance) **Conversion from HH to USAID:** None, but note relationship to HH Indicator #7 Functioning PBGs **DEFINITION: Number of potential processing companies supported by the project.** **RATIONALE:** A profitable processor of mango purée will be a sustainable customer for the farmers- **UNIT:** Number **DISAGGREGATED BY:** new vs. continuing **TYPE:** Output **DATA SOURCE:** Implementing Partner **MEASUREMENT NOTES:** Level of Collection? : Project Level Who Collects data for this indicator? : implementing Partner

Performance Indicator Reference Sheet
INDICATOR TITLE: (Ref #9) Share of enrolled farmers with access to finance **DEFINITION:** This indicator adds the number of farmers with loans as a percentage of total enrolled farmers in the program. **RATIONALE:** Giving access to financial loans to smallholders' farmers, will benefit the daily lives of the farmers as a whole and strengthen the value chain by making the farmers more in control of when to sell their mangoes. **UNIT:** Percent **DISAGGREGATED BY:** Sex of recipient **TYPE:** Outcome **DATA SOURCE:** Implementing Partner **MEASUREMENT NOTES:** Level of Collection? : Project Level Who Collects data for this indicator? : Implementing Partner How should it be collected? : Bank/ lending institutions records, survey of all targeted beneficiaries. **FREQUENCY OF REPORTING:** Annually How should it be collected? : Project team. **FREQUENCY OF REPORTING:** Annually

Performance Indicator Reference Sheet
INDICATOR TITLE: (Ref #19) Value of ag business sales (only in the case of building of plant) **DEFINITION:** Incremental revenue of processing plant in first and second year of operations. **RATIONALE:** Will generate jobs and farmer income. **UNIT:** US dollar **DISAGGREGATED BY:** n/a **TYPE:** Outcome **DATA SOURCE:** Implementing Partner **MEASUREMENT NOTES:** Level of Collection? : Project Level Who Collects data for this indicator? : implementing Partner How should it be collected? : Impact evaluation. **FREQUENCY OF REPORTING:** Annually

Performance Indicator Reference Sheet
INDICATOR TITLE: (Ref #5) Number of farmers (cumulative) implementing practices **DEFINITION:** This indicator measures the total number of farmers that applied new technologies. **RATIONALE:** Technological change and its adoption by different actors in the in the agricultural supply change will be critical to increasing agricultural productivity. **UNIT:** Number of farmers **DISAGGREGATED BY:** n/a **TYPE:** Outcome **DATA SOURCE:** Implementing Partner **MEASUREMENT NOTES:** Level of Collection? : Project Level Who Collects data for this indicator? : Implementing Partner How should it be collected? : Impact evaluation. **FREQUENCY OF REPORTING:** Annually

Performance Indicator Reference Sheet
INDICATOR TITLE: (Ref #7) Functioning PBGs (e.g., aggregating, selling to exporters or Grower Groups (cumulative) **DEFINITION:** Total number of PBGs that received USG assistance. This assistance includes support that aims at organization functions, such as member services, storage, processing and other downstream techniques, and management, marketing and accounting. **RATIONALE:** Tracks civil society capacity building that is essential to building agricultural sector productivity. **UNIT:** Number of organizations **DISAGGREGATED BY:** n/a **TYPE:** Output **DATA SOURCE:** Implementing Partner **MEASUREMENT NOTES:** Level of Collection? : Project Level Who Collects data for this indicator? : Implementing Partner How should it be collected? : Impact evaluation. **FREQUENCY OF REPORTING:** Annually

Annex II: Exit Strategy

Haiti Hope Project
2015 Exit Strategy

Haiti Hope Project Summary of Outputs and Outcomes Assessed To Date

As of September 2015, the Haiti Hope Project has trained 25,125 mango farmers, 47% of which are women, in best production, harvest, post-harvest, and commercialization practices. The project co-created 262 functioning Producer Business Groups (PBGs) that have sold directly to exporters since 2013. In 2015, 14% of all trained farmers sold through a PBG. The PBG channel has sold 555,157 dozen mangoes to all eight exporters over three seasons. In 2015 alone this totaled 325,147 dozen sold with 33% being Fair Trade and Organic certified mangoes for Whole Foods stores across the US. Since project inception, project-trained grower associations, independent aggregators, and PBGs have sold 921,280 dozen with 46% being Fair Trade and Organic certified mangoes. PBGs in 2015 supplied to exporters the equivalent of over 10% of the total export market volumes. This is with a total average reject rate of 14.8% compared to an industry average of over 30% from collection to packing house.

Currently there are 6,122 farmers traceable to the level of the plot using the F10/F12 receipt chain system tied to a cloud-based farmer database, which prepares them for the Food Safety Modernization Act. This is based on farmer registration data tied to the USDA Organic activity. To help modernize the industry, the project has helped four exporters prepare for GMP and HACCP food safety audits and certifications.

Since 2013, PBGs have increased seasonal employment opportunities in communities with 2015 wages totaling $205,042. On average each PBG has 13 laborers who perform critical harvest and post-harvest tasks. In 2015 alone, 2,808 community members harvested, washed, dried, graded, and marketed mangoes to exporters. Over half of these seasonal jobs are new with the introduction of the PBG model and are comprised of PBG members. This totals 229 FTE jobs during the mango season with an average wage of $39.61 per worker per season.

To increase production of export quality mangoes, the project has supported the creation of 648 micro-orchards covering 763 hectares of land with a total of 71,087 mango trees. It has also helped farmers increase productivity through grafting 31,116 trees with two-thirds for 2,800 farmers with existing non-Francique trees. To help smooth farmer income the Agripro credit program has disbursed over $3.2 million to 9,352 farmers with average net returns of 15%.

As presented in the May 2015 Steering Committee meeting, there are three cohorts of farmers for which changes in behavior and income are designed to be sustained. The project is still analyzing data collected from 2011 through the 2015 season to report updated and valid findings regarding these changes. The project outcomes not covered in this strategy document will be included in the final project and final evaluation reports.

1. PBG Direct Export Farmer (6,663 total farmers)
    a. Higher farmgate price
        i. Certification: The 2015 average price per Fair Trade and Organic dozen is 43 htg per dozen (33% of total PBG volumes for 2015); the project is still assessing

comparison prices per farmer cohort, but in 2011 some new members averaged 15 htg-20 htg per conventional dozen, pre-sold to private traders

ii. Competition: The 2015 average price for conventional mangoes is 36 htg per dozen

iii. Best practices: grading mangoes, using standard units of sale, and pruning; project is assessing contribution to price and volumes sold

b. Increased production: investments in production are unlikely to increase income until trees begin to fruit (expected 2017); rates of planting and grafting per cohort currently being assessed

c. Other:

i. Credit: Over 2,483 farmers benefit from the credit program that generates roughly 15% return per loan cycle with 4 loans on average, totaling approximately $44 in profit per farmer

ii. Seasonal Employment: 2,808 seasonal employees on average earn $39.61 per worker per season

2. PBG Indirect Export Farmer (15,582 total farmers)

a. Higher farmgate price

i. Competition: This season the M&E team tracked prices outside of PBGs channels which ranged from 25 – 45 htg per dozen being offered by traditional intermediary groups. Focus group findings suggest that some private traders or voltigeurs raised prices to match those offered by PBGs to compete for farmers selling to PBGs and outside of PBGs.

ii. Best practices: grading mangoes, using standard units of sale, and pruning; project is assessing contribution to price and volumes sold

b. Increased production: investments in production are unlikely to increase income until trees begin to fruit (expected 2017); rates of planting and grafting per cohort currently being assessed

c. Other:

i. Credit: Over 4,017 farmers benefit from the credit program that generates roughly 15% return per loan cycle with 4 loans on average, totaling approximately $44 in profit per farmer

3. Non PBG Farmer (2,880 total farmers)

a. Higher farmgate price

i. Competition: Unclear if effect seen with PBG Indirect Farmers is present for Non PBG Farmers

ii. Best practices: grading mangoes, using standard units of sale, and pruning; project is assessing contribution to price and volumes sold

b. Increased production: investments in production are unlikely to increase income until trees begin to fruit (expected 2017); rates of planting and grafting per cohort currently being assessed

c. Other:

i. Credit: Over 284 farmers benefit from the credit program that generates roughly 15% return per loan cycle with 4 loans on average, totaling approximately $44 in profit per farmer

The document below discusses the motivation for the exit strategy, the model of how sustainability will be achieved, and the specific project intervention assumptions, leading indicators, and objectives to be achieved by this strategy.

Motivation for an Exit Strategy

The goal of this exit strategy is to improve the probability that achieved project outcomes are sustained over the next 3-5 years. While certain activities, such as nurseries, grafting, and micro-orchards, are designed to last beyond 3-5 years, this timeline is what will be used when calculating any return on investment given the volatility of the markets and policy environments in which the project is working. The project has been pursuing a "phasing over" strategy since 2014 and will continue in the last semester of project implementation. By phasing over, Haiti Hope's priority activities around PBGs, mango production, exporter modernization, and credit will continue to generate outputs leading to outcomes by transferring responsibility to local communities, entrepreneurs, exporters and their association, and the Ministry of Agriculture. This public and private handover requires actors to demonstrate a strong sense of ownership, have a clear recognition of project intervention values, have the needed tools and capacity, and have an enabling environment to implement project interventions.

Sustainability Model and Activity Buckets

Annex A shows the sustainability model that was presented at the May 2015 Steering Committee meeting in Washington, DC. It describes the four phasing over activity buckets undertaken to: (1) align incentives between project stakeholders, (2) lock in key learnings and best practices for farmers and PBGs, (3) share knowledge and data with the GoH and ANEM, and (4) provide tools for standards and traceability. Taken together, these activity buckets are the approach the project has been using in phasing over project interventions. Each are described in greater detail below:

1. **<u>Align incentives between project stakeholders</u>**

   Financial incentives need to be aligned between farmer, PBG, exporter, and buyer for the market system to be sustainable. PBG farmers receive at or above market prices relative to traditional channels as set in PBG business plans. If farmers are Fair Trade and Organic (FTO) certified they receive premiums from Perry, currently the only exporter selling FTO mangoes. The certification body, Fair Trade USA certifies PBGs and Grower Associations as "aggregators" and Perry as the "market access partner" on a yearly basis. The mandatory buyer-seller contract exists between Perry with Grower Associations, and with PBGs. Perry determines eligibility to the Fair Trade program based on compliance and an internal cost-benefit analysis. In 2015, 133 FTO PBGs received over 85 htg per

dozen from Perry relative to 50-65 htg per dozen for conventional mangoes at other packing houses. Fair Trade and Organic sales by farmers have premium farmgate prices between 30-50 htg per dozen as specified in individual PBG business plans. This has resulted in total certified volume growth from 21,204 dozen mangoes in 2009 to 136,458 dz in 2015. Further, PBG volumes for FTO and conventional mangoes has grown from 59,237 dozen mangoes in 2013 to 325,147 dozen mangoes in 2015. This 449% growth in three mango seasons indicates a strong preference for the PBG channel relative to traditional channels.

Evidence from focus groups also suggests that voltigeurs and traditional marketing channels have had to raise their prices to compete with PBGs over farmers even when PBGs are selling on the conventional rather than certified market. To continue selling, PBGs must also add value to exporters, which is recognized through reduced reject rates. The total average reject rate is 14.8% versus 30% industry average. This saves time and money by reducing exporter handling of low value, local market fruit. Interviews with three exporters with direct contact with PBGs shows this value recognition with another exporter, Finca, rewarding higher quality with higher prices through a post-season bonus to PBGs.

2. <u>Lock in key learnings and best practices for farmers and PBGs</u>

The project has developed 27 modules that have been used to train 25,125 farmers. Since March, the training manager has focused on modules tied to the sustainability of PBGs including PBG business management, negotiation, and certification. The PBG Management Performance Index in Annex B below is a visualization of an index score the project created for each PBG based on ratings from field staff. A high score indicates that there are sufficient and competent managers within a PBG. Those PBGs with low scores have been targeted to ensure that there are competent leaders to manage the PBG beyond the project.

Additionally, as part of the phasing-over strategy the field team started working in August with PBG members to identify a model farmer who could lead the PBG as an internal trainer. This individual is being trained as a trainer and is leading practical sessions with PBGs – focusing on key best practices; she or he will also be issued a certificate at the end of the training. The training of trainers includes the development of a plan to set aside funds from the mango season to pay for the internal trainer in the same manner that collection site laborers are paid to wash, dry, sort, etc. Each PBG is responsible for determining the amount of funds they make available for the trainer and for individual trainings.

3. <u>Share knowledge and data with the GoH and ANEM</u>

Since the May Steering Committee the project has created four toolkits to help modernize the industry: GMP, HACCP, Fair Trade, and Organic. The GMP and HACCP toolkits have been shared with

ANEM, partner exporters, and with MARNDR. The Fair Trade and Organic toolkits are being finalized and will be shared in October.

In addition to sharing lessons learned and detailing how exporters can comply with modern food safety (GMP/HACCP, Global Gap), social (Fair Trade), or environmental (Organic) certifications, the project is also sharing core farmer data. Too often NGOs develop a wealth of data that is lost when a project ends. The Haiti Hope Project will share traceability data of 5,000 PBG farmers collected since 2013 to MARNDR and ANEM to serve as a public good for traceability and improved visibility into exporters' inbound supply chain. Traceability data involves GPS coordinates and mapping hazard points, such as latrines, which was not initially collected during farmer enrollment. This traceability data for 5,000 farmers will be a new activity that is supplemented by data from certified plot registration. The Ministry is piloting a traceability system, "Agro-tracking," that could be supported by this data and ANEM members can directly use the data to begin understanding how they can invest in farmers and comply with the Food Safety Modernization Act, which requires greater visibility into suppliers. The data could also be used by USAID's Agritech traceability project.

4. <u>Provide tools for standards and traceability</u>

The toolkits are guides for exporters to modernize through certifications both at the packing house level (manufacturing and food safety – GMP, HACCP) and at the farmer level (social- fair trade; environmental- organic). The tools mentioned here are primarily about managing farmer supplier networks for traceability and shipping. These tools, while they enable the work to be done in the toolkits, are primarily targeting exporters' logistics and operations. These tools primarily consist of the F10/F12 receipt chain linked to a cloud-based farmer database. During the 2015 mango season, the project coached two additional packing houses (Carrifresh and Agropak) on how to use the F10/F12 system and record transaction data from PBGs. The project also trained staff at Perry's to coordinate shipments from PBGs through Google Forms feeding an online calendar with delivery information and how to use the cloud-based farmer database to plan the upcoming season. The Perry's will continue to use this system as they have since 2013 having recognized its value and incorporated it into internal packing house systems tracking lots all the way to Whole Foods stores. The project has advocated for MARNDR and ANEM to adopt the F10/F12 receipt system as a first step towards traceability that is compliant with the FSMA. Ralph Perry as President of ANEM has encouraged other packing houses to adopt this system and Haiti Hope has advocated this as well to packing houses by providing sample receipt books and traceability guides to packing houses. Since May 2015 the project has had 3 meetings with MARNDR including with ex-Minister Dorcin and his cabinet to present the F10/F12 receipt system and advocate for its adoption. The same has been done with the former and current APHIS attaché. During the 2015 season the project actively worked with Carrifresh and Agropak and trained their staff on how to collect, enter, and use the data from the traceability system. Agropak entered traceability data and is likely to use it as they seek to become Fair Trade certified.

Sustaining Priority Interventions Using the Approach

The key to the Haiti Hope Project's sustainability is financial incentives between supply chain actors including the profitability of the new Producer Business Group market channel. Four priority project interventions addressed in the exit strategy are: (1) PBG function and market access, (2) mango tree production increases, (3) exporter modernization, and (4) farmer credit access.

1. **PBG function and market access (Activity Buckets 1 & 2)**
   - 1.1. **IF** PBGs continue to demonstrate value to farmers and exporters, maintain market linkages, and are profitable businesses **THEN** they will continue to sell mangos to buyers.
   - 1.2. Supporting actions:
     - 1.2.1. Reinforcing trainings on PBG business management, negotiation, and certification (including plot registration)
     - 1.2.2. Perry will receive some support from FTUSA to hire 10 project community organizers (*animateurs*) after the project closes to serve as regional coordinators, which were used to coordinate sales from 140 PBGs in the 2015 season. Perry intends to hire the project's Standards Manager after the project closes. These 11 individuals are already responsible for training farmers on Fair Trade and Organic principles, registering farmer plots, ensuring accurate traceability, and have already coordinated shipments across packing houses.
     - 1.2.3. Identify and train lead farmers to continue to support PBG members on best practices encouraged by the project
     - 1.2.4. Provide conventional farmer PBG database and contact information to ANEM, MARNDR, and exporters
     - 1.2.5. Encourage contract use between farmers and packing houses through the adoption of certifications like Global GAP (La Finca) and Fair Trade (Agropak)
   - 1.3. Leading indicators
     - 1.3.1. **PBG Mango Reject Rate**: 14.8% average reject rate from PBG collection centers to all 8 exporters since 2013 compared with an industry average of 30%
     - 1.3.2. **PBGs directly connected** to exporter field staff, regional coordinators, or operations managers: 196 PBGs out of 262 PBGs or 75%.
     - 1.3.3. **Profitability**: 86% of 2015 PBGs were profitable
     - 1.3.4. **PBG Management Index**: 84% have an index score above 3, which indicates the PBG has sufficient and competent leadership teams
   - 1.4. Objective: 70% of functioning PBGs will continue to sell on local and export markets through the 2018 season (183 PBGs)
     - 1.4.1. These functioning structures allow for the Fair Trade and Organic program to continue and to increase intermediary competition to drive quality (low reject rate) and reward suppliers with higher prices. This priority intervention is key to sustaining income increases, mainly through price, both for PBG Direct Export Farmers and for PBG Indirect Export Farmers.

2. **Mango tree production increase (Activity Bucket 1 & 2)**

2.1. **IF** the price of mango on local and export markets continues to rise and farmers can access seedlings, **THEN** farmers will plant and care for mango trees. Note: This market assumption is reasonable given that since 2011, prices of trees, payne (local market proxy unit of sale), and dozen (export market proxy unit of sale) have all risen. Focus group evidence suggests that local market and export market demand and price are both increasing. There is little evidence from project stakeholders to suggest that total productive volumes have dramatically decreased during this period to solely justify the price increases on both international and domestic markets.

2.2. Supporting action:

2.2.1. Private mango tree nurseries have been supported by the project through structures called KEZAPs ("Inter-PBG Committee for Production Activities"). A KEZAP works across PBGs to meet their Francique mango production needs. They are comprised of a small network of mango farmers that are members of PBGs and are private nursery owners. They sell each mango seedling at the market price of 20 htg to farmers in the project and to local community members as an income generating activity. KEZAPs have been provided with business training and start-up kits including watering cans and plastic seedling bags to support their enterprises.

2.3. Leading indicators

2.3.1. **% farmers planting mango trees**: 82% of all respondents from 2013 Annual Survey (to be updated in October)

2.3.2. **Number of KEZAPs**: 52 committees

2.4. Objective: 80% survival rate of all trees planted in the micro-orchards (56,569 trees) through 2017 when fruit is expected to be sold

3. <u>Exporter Modernization (Activity Bucket 3 & 4)</u>

3.1. **IF** US buyers continue to pressure exporters to adopt modern practices (GMP/HACCP) and reward them for compliance **THEN** exporters will improve their packing houses and be better prepared for the FSMA.

3.2. Supporting action:

3.2.1. Food Safety Consultant will do a final review of packing houses and create exporter-specific plans to become GMP/HACCP certified (La Finca, Agropak, Carrifresh packing houses)

3.2.2. Food Safety Consultant will create an action plan for ANEM and interested exporters to pursue localgap and Global GAP to create access to new retail markets and comply with FSMA

3.3. Leading indicator

3.3.1. **Number of exporters receiving TNS assistance** (trainings and toolkits) to become GMP/HACCP "audit-ready": 3 (Agropak, Carrifresh, La Finca) out of 7 (Perry already certified)

4. <u>Credit Program (Activity Bucket 1 & 4)</u>

4.1. **IF** farmers have a good credit history through Agripro **THEN** Sogesol will consider graduating them to their consumer loan product

4.2. Supporting Action

4.2.1. Sogesol has received supporting project documentation on creditworthy farmers indicating repayment rates, loan cycles, and graduation limits up to 5000 htg

4.2.2. Support Sogesol in their hiring of TechnoServe field staff to broaden their network of loan officers by making introductions and providing all CVs (for all interested field staff)

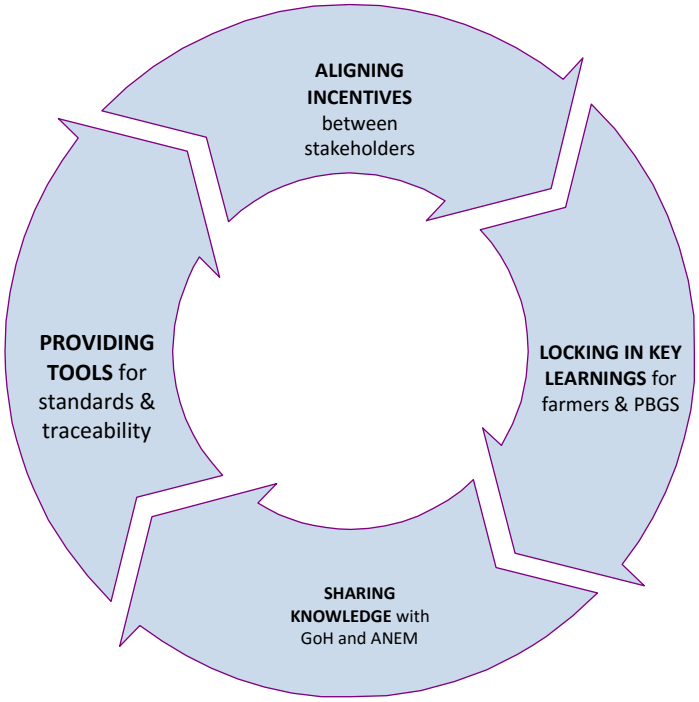
4.3. Leading indicator

4.3.1. **Loans disbursed since guarantee no longer active:** to be determined by end of November

4.4. Objective: To be defined based on information provided by Sogesol by the end of November

The project will come to a close on December 31, 2015. This approach and supporting actions for priority project interventions will improve the likelihood that outcomes are sustained in the medium to long term. The project will update indicators after the final evaluation is complete.

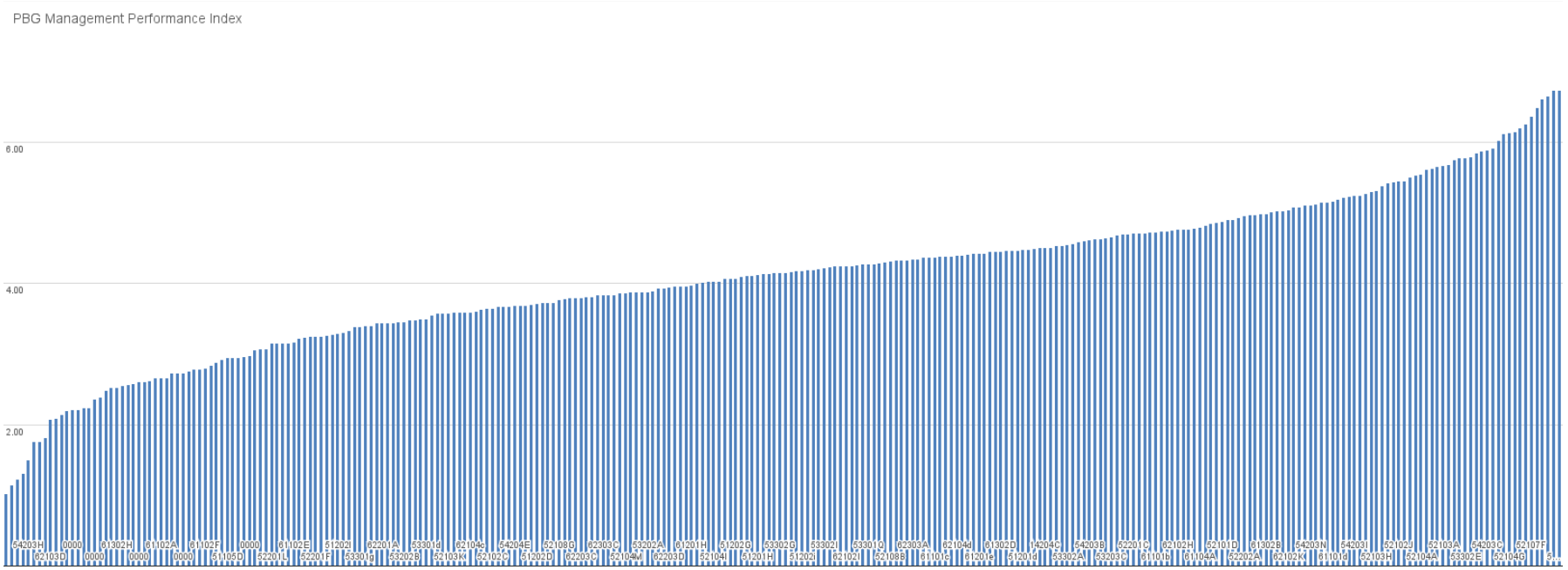
Annex A: Sustainability Model Presented May 2015 Steering Committee



1. Aligning incentives between stakeholders
    a. Exporter – Farmer
        i. Post-season bonuses to farmers
        ii. Pre-season advances to farmers
        iii. Information transparency
            1. Delivery predictability tools
    b. PBG – Exporters
        i. Regional Trader Network
        ii. Organic & Fair Trade farmers: 150 PBGs linked directly to Perry
        iii. Fair Trade Only farmers: 50 PBGs linked to Agropak
        iv. Demonstrating PBG value
    c. Exporter – Importer – Buyer
        i. Whole Foods commitment
2. Locking in key learning for farmers & PBGs
    a. Focus trainings on factors that contribute to sustainability:
    b. PBG management
    c. Fair Trade & Organic certification
    d. Traceability documentation
    e. Standard Units of Sale

    f. Specialized harvester trainings for new intermediary groups (La Finca)
3. Sharing knowledge with GoH and ANEM
    a. Traceability documentation
        i. F10/F12 Receipts linked to Supplier Database
        ii. Encourage alternative to ANEM receipt that is compliant with FSMA
    b. GMP/HACCP playbook
    c. Organic and Fair Trade playbook
    d. Agronomist contractors (grafters)
    e. Post-Season Conference
        i. Haitian Mango Industry Report
        ii. Credit Program Case Study
        iii. APHIS GMP/HAACP Conference
        iv. Workshop with GoH & IDB
4. Providing tools for standards and traceability
    a. 6,122 farmers in traceability system with 22,582 potential (est. 70% of total mango export farmers)
    b. Organic/Fair Trade Traceability
        i. Perry:
            1. Farm Force pilot
            2. 6,122 Organic & Fair Trade certified farmers
            3. Organic tree tagging
        ii. Agropak:
            1. 5,922 Fair Trade farmer plot registration
    c. Conventional Traceability
        i. F10/F12 Demonstration
        ii. ANEM form replacement
        iii. Generic database with ability to add own farmers

Annex B: PBG Management Performance Index



Field staff were asked to rate PBGs based on the number of key leadership roles filled and how confident the trainers were of PBG management competencies. Averages were taken of the ratings and an index score was created to help the training team prioritize which PBGs needed additional support to improve PBG management. This index will be measured again in December.

Annex III: Haiti Hope Final Evaluation and 2015 Annual Survey Results Executive Summary

Haiti Hope Final Evaluation and 2015 Annual Survey Results

Executive Summary

BACKROUND

The Haiti Hope Project is a five-year partnership between The Coca-Cola Company, the Multilateral Investment Fund (MIF) of the Inter-American Development Bank (IDB) Group, the US Agency for International Development (USAID) and TechnoServe (TNS). Haiti Hope's main objective is to improve the socioeconomic conditions of mango producers, and by doing so also help in the ongoing efforts to promote the long-term development and revitalization of Haiti. The program set an ambitious target of doubling the income of 25,000 mango producers from the sale of Francique mango through four components: 1) Empower Producer Business Groups (PBGs); 2) Foster competitive local processing business; 3) Facilitate a supportive enabling environment; 4) Facilitate an on-going learning process through establishing a monitoring and evaluation and knowledge management system.

The project was launched in September 2010. The project would boost producer mango incomes by increasing mango yields, shifting production to higher quality mangos which adhere to international standards for export, and better linking of producers to domestic and international value chains. The project also sought to foster local processing for value added, and facilitate an enabling environment through factors such as collaboration with other partners to prioritize infrastructure projects and develop mechanisms for market intelligence and fair competition among exporters. This combination of effects (increased productivity, improved quality and commercial linkages) was expected to generate an increase in mango sales while developing stable commercial relationships with reliable exporters. To achieve project's objectives, Haiti Hope has provided training to local mango producers and has established commercial linkages between smallholder producers to exporters. At an initial phase, the Project engaged already established farmer cooperatives (Grower Associations) then shifted its strategy towards the establishment of new producer business groups (PBGs). Within these groups, TNS provides key training on best practices in production, harvest and post-harvest techniques, business skills, commercialization, etc.

EVALUATION STRATEGY

In 2013, the IDB completed an **impact evaluation**[1] providing early results of Haiti Hope. These results were based on the analysis of both program and non-program mango growers (treatment and control groups), before and during early project implementation. The impact evaluation was able to confirm widespread adoption of production and commercialization practices but was not able to detect that a measurable change in income had occurred during the period measured. Given the relatively early stage of implementation and the fact that most of the newly planted and grafted trees had not begun to produce fruit, it was reasonable finding at the time.

In 2014, a **mid-term qualitative evaluation** prepared by AGRITECH was completed over the course of the mango season. The mid-term evaluation, using qualitative methods, found indications that important changes had occurred in farmer income, specifically through higher prices and a changing

[1] https://publications.iadb.org/bitstream/handle/11319/7184/ImpactEvaluationMangoProducersHaiti.pdf

The views expressed in these report are from John Dale "Zach" Lea and Timothy Schwartz and do not necessarily reflect the views of IDB/MIF, USAID, the Coca Cola Company, and TechnoServe.

dynamic in the industry, but was not able to quantify this change. The analysis also came to the following conclusions:

a. The mango business model is effective and is creating a new dynamic in the sales and marketing of mango in the geographic areas of intervention. Mango producers through their Producers Business Groups (PBGs) gradually are assuming greater control of their mango business. It is anticipated that these results will eventually contribute to an increase in farmers' income.

b. The functioning of PBGs creates some frustration among some service providers (local fournisseurs, traditional mango organizations) but at the same time creates more competition in the value chain, benefiting the small producers. However, TNS has not yet engaged fully with key stakeholders in the value chain, resulting in delays in initiating the replication of lessons learned and knowledge management.

c. Lack of support from stakeholders to address tertiary road rehabilitations was also found to be a problem.

d. Delays in project disbursements had no impact on project delivery of services.

FINDINGS FROM THE FINAL EVALUATION AND 2015 ANNUAL SURVEY

A **final evaluation** was commissioned to provide a summative assessment of the project and sought to estimate how it had affected farmer and supply chain actor revenue, as well as the mango industry as a market system. In addition to the final evaluation, TNS commissioned a **2015 Annual Survey and Evaluation** to determine how well attuned the Haiti Hope strategy was in promoting an increase in present and future revenues for mango farmers and other mango supply chain actors. Both studies assessed increases in producer incomes for different sub segments of beneficiaries, as producers participated in the PBGs and established GAs at varying levels.

a. **Increases in Income from Mango Sales.** Both reports find an increase in mango income from project participants. By looking at the premium paid to mango producers who participated in the sale of Fair Trade and Organic (FTO) mangos, the *Final Evaluation* suggests that there was a **22% increase in income for the ~1,800 active GA and PBG members who sold FTO** mangos to the Fair Trade Exporter, Ralph Perry Export Import, S.A. as well as for the **~2,200 mango producers who sold conventional mango** (i.e. non-FTO) through PBG or GAs to other non FT exporters. Thus approximately 4,000 mango producers (approximately 19% of all Haiti Hope PBG/GA members) saw a 22% increase.

   While the Final Evaluation was not able to report on the increases in income of the producers who did not sell to the export market, the *2015 Annual Survey* -which was able to use data from the baseline data of the impact evaluation to assess increases over time- was able to conclude that overall mango income increased 45% for all mango producers. The report also estimates a **81% increase for PBGs/GAs members who sold FTO mangos,** a **67% increase for conventional**

mangos sellers (i.e. members who sold actively through PBG/GAs) and a **33% increase for Non-Sellers** (i.e. PBG/GA members who did not sell mangos). It is important to note that the **control group** also saw an estimated **40%** increase over the life of the project.

All the evaluations (Impact, Mid-term, Final, and 2015 Annual Survey) confirm widespread adoption of best practices in productions and sorting.

b. **Income from Credit Program.** Using information from the TNS credit report, *Case Study: Unlocking Credit for Haiti's Smallholder Mango Producers*, (November 2014), it is estimated that each dollar lent generated $1.28 in new income after accounting for non-repayment and assuming 18% was used for consumption and did not generate new income. Over the life of the HHP, the credit program lent $3,258,628 and produced $3,283,445 in new revenue for 9,352 mango farmers. As reported by the case study, most of the participants used the loans for non-mango-related enterprises. In a calculation of the HHP benefit/cost ratio, it is assumed that 15% of the credit program increased income was mango-related.

c. **Producer Business Groups.** The important increases in income for the producers selling to the export market are intrinsically linked to the organization and support provided to the PBGs and GAs. The commercialization practices and the coordination with exports have been fundamental element of the Project's strategy. The HHP empowered Producer Business Groups by arranging for their use of the Fair Trade Marketing channel, by providing business management consultation and training through on-site management consultants, by providing training on improved mango cultural practices, by providing consultation and subsidies for establishing new mango orchards, and by providing GA and PBG members exclusive access to the HHP/SOGESOL credit program. However, the sustainability of the PBG activities –although TNS has been diligently working to establish linkages between exporters and PBG that would no longer require the support of Project advisors- is uncertain. This is due to the fact that the costs of managing a PBG when compared to the revenue stream are often higher.

Recommendations. Both studies provide a series of recommendations for building upon the success to date of the project. They include preserving the PBG structures along with increasing the number of exporters certified to export FT mangos as this would establish a more competitive market for mango producers in which to sell. Sustaining the traceability system established to be able to sell FTO certified mangos is another priority given the impending USDA requirements for the sale of mango. In relation to this last recommendation, it was suggested that the partners explore investing in irradiation systems to treat mangos prior to export as the efficiency of irradiation at destroying fruit fly larvae is considered unquestioned. In practice, this will mean that no fruit will be rejected from the export stream because there is a question about its contamination with fruit fly larvae.

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