Technologies Transfer to Small Farmers Project (PTTA)

(HA-L1059; 2562/GR-HA)

Project Completion Report (PCR)

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Acronyms and Abbreviations

BAC	Bureau Agricole Communal
EMBRAPA	Empresa Brasileira de Pesquisa Agropecuária
FAO	Food and Agriculture Organization
GAFSP	Global Agriculture and Food Security Program
IADB	Inter-American Development Bank
IRAM	Institut de Recherches et d'Applications des Méthodes de développement
MARNDR	Ministry of Agriculture, Natural Resources and Rural Development
M&E	Monitoring and Evaluation
PITAG	Programme d'Innovation Technologique en Agriculture et Agroforesterie
PNIA	Plan National d'Investissement Agricole
PSM	Propensity Score Matching
PTTA	Projet de Transfert de Technologies aux Agriculteurs
RCT	Randomized Controlled Trials
RESEPAG	Renforcement des Services Publics Agricoles
SNS	Service National Semencier
UIS	Update to the Institutional Strategy
USAID	United States Agency for International Development
USD	United States Dollars

BASIC INFORMATION (US$ AMOUNT)

PROJECT NUMBER (S): HA-L1059
TITLE: TECHNOLOGIES TRANSFER TO SMALL FARMERS PROJECT (PTTA)
LENDING INSTRUMENT: GRANT
COUNTRY: HAITI
BORROWER: GOVERNMENT OF HAITI
GRANT (S): 2562/GR-HA
SECTOR/SUBSECTOR: AGRICULTURE AND RURAL DEVELOPMENT/AGRICULTURAL TECHNOLOGY ADOPTION

DATE OF BOARD APPROVAL: AUGUST 31, 2011
DATE OF LOAN CONTRACT EFFECTIVENESS: SEPTEMBER 27, 2011
DATE OF ELIGIBILITY FOR FIRST DISBURSEMENT: APRIL 18, 2012 AND OCTOBER 04, 2013 (HA-G1025)

LOAN AMOUNT (S)
ORIGINAL AMOUNT: $40,000,000
CURRENT AMOUNT: $40,000,000
PARI PASSU: NO
TOTAL PROJECT COST: $40,000,000

MONTHS IN EXECUTION
FROM APPROVAL: 76
FROM CONTRACT EFFECTIVENESS:75

DISBURSEMENTS PERIODS
ORIGINAL DATE OF FINAL DISBURSEMENT: SEPTEMBER 27, 2016
CURRENT DATE OF FINAL DISBURSEMENT: DECEMBER 31, 2017
CUMULATIVE EXTENSION (MONTHS): 14 MONTHS
SPECIAL EXTENSIONS (MONTHS):
DISBURSEMENTS
TOTAL AMOUNT OF DISBURSEMENTS TO DATE: $40,000,000

REDIRECTIONING. HAS THIS PROJECT?
RECEIVED FUNDS FROM ANOTHER PROJECT YES WHICH? HA-G1025
SENT FUNDS TO ANOTHER PROJECT [NO]

EX POST ECONOMIC ANALYSIS METHODOLOGY: COST-BENEFIT ANALYSIS
EX POST EVALUATION METHODOLOGY: EXPERIMENTAL AND SEMI-EXPERIMENTAL IMPACT EVALUATIONS

DEVELOPMENT EFFECTIVENESS CLASSIFICATION: SATISFACTORY

STATEMENT OF THE DEVELOPMENT OBJECTIVES OF THE PROJECT/PROGRAM:

The goal of HA-L1059 operation is to contribute to sustainably improve small farmers' agriculture income and food security in the North and Northeast departments of Haiti. A total of 30,000 farmers will be given access to improved agricultural services and investment.

The program comprises the following two components:

Component 1: Promoting improved and sustainable agriculture technology adoption. Includes non-reimbursable financial support for eligible farmers who agree to adopt technological packages from a menu set by the executing agency.

Component 2: Strengthening the National Seeds Service. This component includes assistance to the MARNDR to build capacity for control and regulation of seeds.

EXECUTIVE SUMMARY

Agriculture plays a crucial role in the Haitian economy. The sector represents 25% of Haitian GDP and accounts for about 50% of overall employment. Despite the dominant position of agriculture in the economy, 88% of individuals in rural areas live below the poverty level (MARNDR-PNIA, 2010). The Haitian agriculture has a high potential for growth and income generation, with a potential demand for agricultural products in the local market and clear opportunities for export. However, the lack of competitiveness limits this growth potential. Poor access to modern technologies and sustainable agriculture practices, and the consequent low level of productivity explain this lack of competitiveness.

In this framework, between 2011 and 2018, the Ministry of Agriculture, Natural Resources and Rural Development (MARNDR) implemented the Technologies Transfer to Small Farmers Project (PTTA), with the financial support of the Inter-American Development Bank (IADB) for USD 15,000.000 on the project number 2562/GR-HA and the Global Agriculture and Food Security Program (GAFSP) for USD 25,000,000 known as GRT/GA-12884-HA.

The project objective was to contribute to a sustainable improvement of small farmers' agricultural income and food security in the North and Northeast departments. A total of 30,000 farmers would be given access to improved agricultural services, contributing to the outputs of the “Protecting the environment, responding to climate change, promoting renewable energy and enhancing food security” strategic priority of the Bank for 2012-2015. Two components were designed to achieve this global objective: (i) Promoting improved and sustainable agriculture technology adoption and (ii) Strengthening the National Seeds Service. The first component provided 11 different technological packages and concentrated more than 94% of the funds (excluding administrative costs). The second component included actions to strengthen the national and local institutional framework.

Even though the project suffered some operational delays, the expected disbursements and investments have been carried out. Through the component 1, the project has delivered incentives to 35,553 farmers (more than initially planned) to improve their cropping systems. The program also invested in strengthening and building local and national institutional capacities for the National Seeds Service, through training, infrastructure, policy design and technical assistance.

In addition to the final evaluation, to assess the impacts at project’s end, the Bank and the Government agreed to carry out the following analyses:

- Two Randomized Controlled Trials (2014-2015), testing the effectiveness of smart subsidies for rice and for horticulture (Northeast department) and in Saint Raphaël (North department).

- Two Propensity Score Matching evaluations (2016), testing the effectiveness of smart subsidies on peanut production and on agroforestry systems in the North and Northeast departments.

These evaluations observed that impacts varied significantly between the technology packages: The annual crop packages did not allow any real improvement since farmers were already using the practices proposed through these packages. However, the agroforestry packages led to a significant income increase (+63%) for famers. Since most of the packages (more than 70%) were focused on agroforestry, the project has achieved the expected technology packages adoption and income generation. The third outcome (% of seeds providers tested by the new dedicated laboratory), related to component 2, wasn't achieved because of an important delay in the laboratory building.

The most important lessons learned are the following: i) The dedicated research unit of the Ministry should be strengthened to generate and test relevant technologies. The package selection should be done through iterative and participative field test. This approach could prevent the fact that proposed practices are already used in some beneficiary locations; ii) Some technological packages (e.g. rice) need a productive natural environment and some investments (such as irrigation systems) are crucial preconditions to increase the likelihood of additional income generation; iii) Technical assistance needs to be strengthened to support farmers effectively and continuously. The tasks of the operators should thus be separated into a service dedicated to the technical assistance (agronomists) and a service dedicated to the management of vouchers; iv) The design, implementation and monitoring of the voucher delivery should ensure that the value of the vouchers is not eroded by delays, inflation or supply chain distortions; v) The procurement unit has to be assessed and then reinforced in a substantial way with a more effective organization and capacity strengthening. These lessons learned were taken into consideration in the design of the Technology Innovation Program for Agriculture and Agroforestry (in French: Programme d'Innovation Technologique en Agriculture et Agroforesterie - PITAG), which is considered as a de facto second phase of the PTTA.

I. INTRODUCTION

1.1. In 2010, the agriculture sector was playing a key role in the Haitian economy, representing about 25% of GDP, 50% of overall employment (66% in rural areas), and 75% of employment among low income households. Over one million families owned mainly small-scale subsistence farms, with an average farm size of less than one hectare. Despite these statistics, Haiti imported more than 50% of its caloric requirements[1].

1.2. Because of an increasing local population and food demand, agriculture has a high potential for growth and income generation. One of the challenges farmers are facing, though, is the poor access to modern technologies (due to lack of information, equipment, seeds and financial support) and to sustainable practices.

1.3. In 2009, the Ministry of Agriculture, Natural Resources, and Rural Development (MARNDR), decided to implement a new strategy based on smart subsidies. In August 2011, the Inter-American Development Bank (IADB) approved a grant proposal (HA-L1059) and then on September 27th, 2011 it signed with the Haitian Government a contract (2562/GR-HA) for a 5 years operation named Technologies Transfer to Small Farmers Project (PTTA), co-financed by the Global Agriculture and Food Security Program (GAFSP).

[1] MARNDR ; Plan National d'Investissement Agricole – PNIA, 2010

1.4. The objective of the PTTA was to improve small farmers' agricultural income and food security in the northern region of Haiti. Two components were developed and implemented to reach this objective.

1.5. Component 1 focused on the promotion and adoption of improved and sustainable agricultural technologies. This adoption was supposed to generate better agricultural productivity in specific value chains: coffee, cocoa, citrus, cashew nut, pineapple, rice, corn, yam, plantain, carrot, onion, tomato, chili, beet, and pastures. These value chains were selected through the experience of previous agricultural projects funded by the Bank and other institutions such as the United States Agency for International Development (USAID), the Brazilian EMBRAPA, the World Bank (WB), and the Food and Agriculture Organization (FAO). The menu of technologies was supposed to be reviewed annually by the Executing Agency and the Bank, based on the result of another program: The Rural Supply Chain Development Program (2393/GR-HA).

1.6. Component 2 focused on strengthening the National Seeds Service (SNS). The institutional strengthening of this service, through the inclusion of a seed control laboratory, the provision of trainings, and the implementation of dedicated policies and procedures, was supposed to improve the national supply of seeds and seedlings.

Table 1: The PTTA general information

TECHNOLOGY TRANSFER TO SMALL FARMERS PROJECT (Financial Terms and Conditions)			
Beneficiary (grant):	Republic of Haiti		
Executing Agency:	MARNDR		
Amortization Period:	NA		
Grace Period:	NA		
Disbursement Period:	5 years		
Supervision and Inspection Fee:	NA		
Interest Rate:	NA		
Credit Fee:	NA		
Currency:	US Dollars		
Investment categories	**IADB**	**GAFSP**	**Cost (Millions USD)**
I. Direct costs	**10.0**	**25.0**	**35.0**
Component I: Promoting improved and sustainable agriculture technology adoption	*8.0*	*25.0*	*33.0*
Component II: Strengthening the National Seeds Service	*2.0*	*0*	*2.0*
II. Administrative costs	**1.65**	**0**	**1.65**
III. Monitoring and Evaluation	**1.0**	**0**	**1.0**
IV. Audit	**0.75**	**0**	**0.75**
V. Unexpected costs	**1.6**	**0**	**1.6**
TOTAL	**15.0**	**25.0**	**40.0**

II. CORE CRITERIA. PROJECT PERFORMANCE

2.1 Relevance

a. Alignment with country development needs

2.2. In 2011, Haiti developed an Agriculture Policy Document for the period 2010-2025. This document mentions several constraints and weaknesses for the Haitian agriculture, including:

- The degradation of natural resources (water, soils, forests), leading to the progressive reduction of the land productive capacity;
- The limited access to agricultural inputs;
- A rare and ill-adapted financial system in rural areas;
- The inadequate standards and quality control system.

The same document mentions the objectives targeted by the Haitian government:

- A better national offer to meet the local nutritional demand;
- A decent income generation for 500,000 farms;

Moreover, this document states the priority axes including the development of the various value chains (rice, bananas, congo peas, vegetables, tubers, coffee, cocoa).

2.3. The PTTA design was fully consistent with the Haitian agricultural policy. The program targeted two of the government objectives, i.e. the generation of decent incomes for farmers and a better food security for the Haitian population, targeting specific value chains with high potential: coffee, cocoa, citrus, cashew nut, pineapple, rice, corn, yam, plantain, carrot, onion, tomato, chili, beet, and pastures. To reach these two objectives, the program identified the same barriers as the Government did: degradation of natural resources, limited access to agricultural inputs, lack of financial services for farmers and inadequate control for quality standards. Components 1 et 2 were supposed to tackle these challenges.

2.4. Moreover, the project was financed by the GAFSP, which aimed to improve food production and food security for Haitian rural households in the northern region of the country. The proposed program focused on the North and Northeast departments, where agriculture was diversified and had a high potential for intensification.

2.5. PTTA took place in the framework of a wider program implemented by the MARNDR, which included another project named “Renforcement des Services Publics Agricoles” (RESEPAG), financed by the World Bank. These two projects adopted the same smart subsidies approach and were managed by the same coordination unit team.

2.6. At the design phase, the program was fully aligned with the Country Strategy Update approved in July 2010 (GN-2465-2), in which agriculture is one of the pillars of economic growth for the reconstruction of the country.

2.7. Moreover, the promotion of improved and sustainable agriculture technologies was supposed to contribute to the expected output under the “Protecting the environment, responding to climate change, promoting renewable energy and enhancing food security” strategic priority of the Bank for 2012-2015, established by the IDB-9.

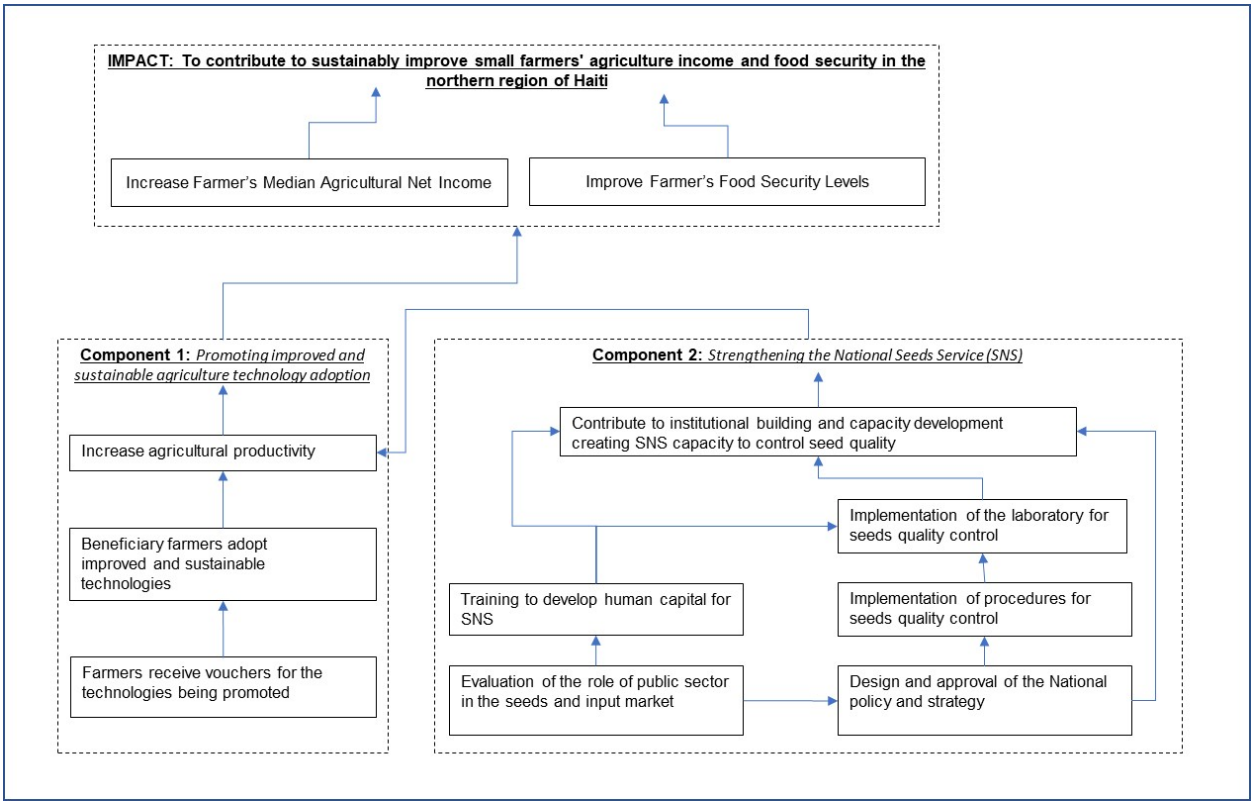
2.8. During its implementation, the project was also aligned with the evolution of the national strategies and the evolution of the Country Strategy of the IADB. Moreover, the project was also aligned with the new Country Strategy (2011-2015), in which agriculture continued to be a strategic sector. Finally, in 2013, the government published a three-year agricultural recovery program document (2013-2016). In this document, the MARNDR outlined the limited access to relevant agricultural practices (technological packages). The impacts expected by the program matched with two of the four objectives of this document, namely:

- Modernize the Ministry of Agriculture to ensure the governance of the sector;
- Improve agricultural productivity to increase food security and increase income from family farms.

2.9. In conclusion, the project objectives and design were completely aligned with the country development needs and priorities, at the time of approval, at the time of closure, and during the whole implementation of the project.

b. Vertical logic

2.10. The program was designed to improve the income of 30,000 small farmers in the North and Northeast departments. The target for the income increase was, at minimum, 25%. Among these 30,000 small farmers, the program aimed also at a reduction of the malnutrition rate (from 29.2% to 22% in the North and Northeast departments). In order to achieve these results, the program identified several barriers (as mentioned above in § 2.2.), and so, different strategic answers. Because of a weak access to improved technologies, small farmers have difficulties to adapt their agricultural practices and therefore improve their productivity. This bottleneck is compounded by inadequate financial services. Without these services, small farmers cannot invest in new practices. Component 1 aimed at overcoming these barriers through the provision and financing of relevant technological packages. Another barrier concerned the weakness of the government to assure quality standards for the different inputs used by small farmers, especially the seeds. Component 2 was supposed to mitigate this weakness through the strengthening of the National Seed Service.



2.11. **Component 1: Promoting improved and sustainable agriculture technology adoption.** The component obeyed to the following logic: 30,000 famers would receive a voucher to implement a new technological package (output). The program assumed the technological packages allowed for a higher productivity. Thanks to a better productivity, at least 18,000 (out of the total 30,000) farmers were supposed to adopt and maintain the improved technological package (intermediate output). The difference was justified as the project assumed that some farmers who received a voucher might not be able or willing to adopt and maintain the technology. Then, these beneficiary farmers were supposed to generate a better revenue from crops and, finally, despite some potential higher input cost, an at least 30% higher gross margin (outcome). Small farmers could be reluctant about new technologies, in particularly if they generate an extra cost. Finally, the agroforestry packages were supposed to mitigate erosion and then reduce fertility reductions, increasing de facto the land productivity. These two aspects (productivity and fertility preservation) were supposed to contribute to the food security improvement. The program financed 80% of the total cost of the technological packages (financing additional inputs) to address farmers' financial constraints and their risk aversion and uncertainty about the profitability of the new packages.

2.12. The crop selection was relevant for the farmers, according to the final evaluation. Several former experiences (the Bank, USAID, EMBRAPA, FAO, or World Bank) offered an effective decision-making benchmark for the selection of the technological packages. According to the final evaluation, all the key players (operators, famers, suppliers) agreed that the crop selection was relevant, as it was demand-orientated and adapted to the environment. Moreover, the variety adjustment was particularly appreciated by the farmers (e.g. the "Typica" coffee variety was substituted by the "Blue Mountain" variety, which was rust tolerant).

2.13. However, rice, vegetables and peanuts technological packages did not really lead to the introduction of new practices. Moreover, some recommended technical practices were not adapted to the natural context: water deficiencies did not allow for more productive practices (for rice crops, for example) in the absence of the needed mitigation measures (such as irrigation systems).

2.14. **Component 2: Strengthening the National Seeds Service.** The ex-ante analysis had shown that most agricultural producers did not use improved planting materials but simply the better seeds saved from the previous crop; there was no quality control on agricultural inputs, especially seeds, which were provided by a very limited number of providers in a non-competitive market; this lack of norms and quality control on seeds undermined the farmers' interest to invest in improved technologies. To mitigate these ex ante limitations, the Component aimed to build a strong institutional capacity to control the seeds' quality (outcome). This component was based on a national diagnosis (evaluation of the role of the public sector in the seeds and input market). Based on this evaluation, a national seed policy, with a related action plan and procedures, had to be designed, and a national laboratory to test and certify the seeds had to be created, including the implementation of capacity building initiatives to develop the human capital of the Seed National System (outputs).

2.15. In conclusion, the vertical logic of the intervention demonstrated the excellent relevance of the project. The causal chain of the intervention was aligned with the objectives and the country needs (and its context, such as the identified barriers).

2.2 Effectiveness

a. Statement of project development objectives.

2.16. As originally stated in the grant proposal approved by the Bank, the objective of the project was to contribute to a sustainable improvement of agricultural income (+25%) for beneficiary farmers and an improvement of the food security (a decrease of the malnutrition rate from 29.2% to 22%) in the North region. To reach these objectives, the project aimed to increase agriculture productivity (1st outcome). The first indicator for this outcome was agricultural gross margins. The project expected an increase of at least 30% of the gross margin. The baseline for this indicator was based on a dedicated economic evaluation document (Budry Bayard, 2011). Technology adoption itself is an important outcome (2sd outcome) for the project, because famers who receive a voucher to implement a new package might not able, or willing, to adopt and keep it. The number of beneficiary farmers who have adopted the improved and sustainable technologies was the second indicator (18,000 small farmers were expected, out of a total of 30,000). In order to reinforce the agricultural inputs quality (and so, the sustainability of the improved technological packages), the project was supposed to contribute to the institutional building and capacity strengthening of the SNS to control seed quality (3rd outcome). 100% of the registered seed providers were supposed to have been inspected by the SNS at least once a year, following an approved protocol.

b. Results Achieved

The result assessment is based on the project's Results Matrix. However, because of different implementation challenges (issues related to the organization of the procurement unit, field implementation and cost), the different evaluations did not assess the exact original matrix indicators, although they focused on strictly related ones. Three

reformulations and two simplifications have been proposed. These five minor adjustments do not distort the logic of the intervention as the indicators remain similar and follow the same logic as the original ones did. The mentioned minor adjustments are reflected in Convergence.

Table 2: Changes to the Results' Matrix

Section of the Results Matrix where change took place	Name of the change	Type of change	Reasons for change	Date of change
Impact	Indicator now refers to a relative increase.	Definition of Indicator	The indicator was only slightly changed. From a comparison with the baseline in absolute terms, to a percentage difference. The end of project target value is therefore no longer valid.	na
Impact	The income definition will be reduced to the "crop value-input costs" (excluding livestock systems).	Reformulation	The livestock systems are not considered because the project is supposed to focus on agriculture production system and not on livestock system. The target remained +25% difference between beneficiaries and non-beneficiaries agricultural net income.	na
Outcomes (Component 1)	Agricultural productivity increase was supposed to be measured for the following crops (15): coffee, cocoa, citrus, cashew nut, pineapple, rice, corn, yam, plantain, carrot, onion, tomato, chili, beet, pastures. It has been simplified including the following crop systems (4): rice, peanuts, horticulture, and agroforestry.	Baseline type simplification	In order to save resources, the project team decided to assess less crops systems grouping them within more comprehensive crop systems: agroforestry (coffee, cocoa, citrus, cashew nut, pineapple, plantain, corn), horticulture (carrot, onion, tomato, chili, beet, yam), rice, and peanuts.	na
Outcomes (Component 1)	The indicator will refer to the percentage difference in crops' value between beneficiaries and control group and not the percentage difference in agricultural gross margins value between beneficiaries and control group	Reformulation	The indicator "percentage difference in crops' value between beneficiaries and control group" was "smart" enough to illustrate the outcome "Increase agricultural productivity" and easier to measure.	na
Outputs (Component 1)	The indicator "number of hectares covered with the technologies" is not assessed	Simplification	The Output "Farmers received vouchers for the technologies being promoted" cannot have two different indicators. The number of farmers who received a voucher is sufficient.	na

Outputs

2.17. For Component 1, following the vertical logic of the intervention, the project was initially expecting to provide vouchers to 30,000 small farmers in the North and Northeast departments (Output 1 of Component 1). This initial quantitative objective was calculated based on the estimated cost of each technological package and the average areas farmers use. Based on the real prices and areas, the project exceeded the target, reaching 35,553 farmers (39% of them were women), who received a technological package, according to the final evaluation and the project monitoring system. Nevertheless, some delays have been reported because of problematic information flows, technical problems with the financial institution and/or the limited capacity of suppliers.

Table 3: details on Output 1 of Component 1

Package	Superficies (Ha)	beneficiaries
Agroforestry	3 192	9 904
Citrus	946	2 205
Cocoa	1 019	2 219
Coffee	1 390	2 646
Creole garden	4 969	9 434
Vegetables	713	1 751
Rice	2 599	5 922
Irrigation (Caracol)	9	12
Sweet potatoes	251	599
Peanuts	591	761
Sisal	100	100
Total	15 779	35 553

2.18. An evaluation (Output 1 of Component 2) of the role of the public sector in the seeds and input market has been performed in 2013[2]. The delay for this first deliverable, one year, was due to the initial technical and fiduciary capacity limits of the program management unit.

2.19. Following this evaluation, The Food and Agriculture Organization of the United Nations (FAO) has been recruited to develop a National Policy and Strategy for the Seed Sector (Output 5 of Component 2) and a Procedures Manual for Seed Quality Control (Output 4 of Component 2). As above, the delay (completed in year 5 instead of year 2) was due to the initial fiduciary limitations of the program management unit. Moreover, 4 people have completed a Master's degree and another one is currently enrolled in one (the target was 4 for Output 3 of Component 2).

2.20. The Laboratory for Seed Quality Control (Output 2 of Component 2) was inaugurated on June 12th, 2018. The delay is explained by initial technical and fiduciary capacity limits.

[2] Evaluation du rôle du secteur public sur le marché des intrants agricoles en Haïti. Jefferson Germain, Olivier Jenn-Treyer - IRAM, 2013.

Outcomes

2.21. The MARNDR and the IDB carried out several evaluations in order to assess Outcome 1 and 2 and Impact 1 (See section “Analysis of the Results Attribution”).

2.22. In order to assess the outcomes and impacts of Component 1, the Final Evaluation considered four different impact evaluations that have been conducted for the project:

- Two Randomized Controlled Trials (2014-2015) testing the effectiveness of smart subsidies for rice and horticulture in the Northeast department and in Saint Raphaël (North department).

- Two Propensity Score Matching evaluations (2016) testing the effectiveness of smart subsidies on peanut production and agroforestry in the Northeast and Limbé (North department).

2.23. Randomized Controlled Trials (RCTs) allow for the identification of the causal impact of a program on the variables of interest. The two RCTs conducted on the PTTA (Gignoux et al., 2017) focused on annual crops that were covered early in the project (rice and horticulture). They were designed to measure three main indicators: (a) agricultural yields, production values and profits, (b) technology adoption, and (c) food security. The Propensity Score Matching (PSM) evaluations focused on similar variables: (a) agricultural yields, production values and profits, (b) technology adoption, and (c) food security. Unlike the RCTs, however, the PSMs allowed for the estimation of the impacts of the Program on perennial crops (agroforestry packages).

2.24. According to the final evaluation and based on the impact evaluations, only the agroforestry packages led to a significant increase of the value of production (+38%). The other packages did not. Since 74% of the packages were focused on agroforestry, the weight of these packages was significant enough to allow the project to have a positive impact. Considering that the 74% of packages led to a 38% increase whereas the remaining 26% led to no increase, the average increase in the value of production was about 28% (outcome 1). The adjusted target was a 30% increase; thanks to the agroforestry packages only, the project achieved 93.33% of its adjusted target.

2.25. Different reasons can explain the disappointing results for the annual crops packages (rice, horticulture, and peanuts). The annual crops packages did not transfer any innovation: the farmers were already applying the annual crops packages provided. There was not any significant innovation and therefore no significant production increase. Moreover, the project based its expected results on improved seeds which were supposed to be controlled by a laboratory (outcome 3) which was not launched on time (see below). This might have allowed poor quality seeds reaching the fields, limiting the potential production increase. Moreover, the irrigation issues in different areas might have also impacted the yield for the annual crops. Finally, the delays for many vouchers distribution might also have impacted appropriate agricultural practices (seedling date) and therefore the yields.

2.26. The number of beneficiary farmers that have adopted new selected technologies (19,375 farmers - Outcome 2) exceeded the expectation (18,000). This good result is only due to the agroforestry packages (table 1). Considering that the beneficiaries who have received agroforestry packages (26,408 farmers) adopted them with a rate of 73.3% (according to

the Final Evaluation), it is calculated that 19,357 farmers have adopted the provided package. The annual crops packages have not been considered for this Outcome 2 because they did not lead to any value of production increase. The final evaluation did not consider any package adoption for these annual crop packages.

2.27. For Component 2, despite the completion of the five outputs, Outcome 3 (percentage of seed providers controlled) was not achieved because of the important delays experienced for Output 2 (laboratory), which was completed at the very end of the project. There was therefore not enough remaining time to start any seeds' providers inspection. It has to be said, though, that the laboratory is now functional and will offer support to the MARNDR and to the agricultural sector in the future. This represents a positive inheritance of the PTTA.

Impacts

2.28. Only Impact 1 has been measured by the impact evaluations. The farmers who have received an agroforestry package have increased their income by 63%. The others (annual crops packages) did not have any income increase. Since 74% of the beneficiaries received agroforestry packaged and since only 73,3% of them have adopted the package, the average income increase for the beneficiaries was 34.3%, higher than the original target, which was a 25% increase.

2.29. In conclusion, the project achieved the majority of its 3 outcomes and all of its outputs were delivered. For Outcome 1 (Increase agricultural productivity) the result has been higher than the expectations, Outcome 2 (adoption of the packages) has been achieved at 94% and, finally, because of the laboratory construction delays, Outcomes 3 has not been achieved. The indicators related to those results are shown in Table 2.

Table 4: Results Achieved Matrix

Impact/Indicator	Unit of Measure	Baseline value	Baseline year	Targets and Actual Achievement		% achieved	Means of verification
Impact #1: Increase Farmer's Median Agricultural Net Income							
Increase in Income = (Crop Value + Livestock Value) - Input Costs	Index	100	2001	P	125	137%	Ex-post survey on treated and control groups
				P(a)	125		
				A	134		
Impact #2: Improve Farmer's Food Security Levels							
Proportion of target population (30,000 families) below the minimum level of dietary consumption	Index	29.2%	2000	P	29.2%	N/A	Survey of households
				P(a)	Not measured		
				A	Not measured		
Outcome #1: Increase agricultural productivity							
Percentage difference in agricultural production between beneficiaries (who adopted the technology) and control group	Index	100	2011	P	130	93.33%	Ex-post survey on treated and control groups
				P(a)	130		
				A	128		
Outcome #2: Beneficiary farmers have adopted improved and sustainable technologies							
Beneficiary farmers that have adopted new selected technologies	Producers	0	2011	P	18,000	107%	Monitoring and evaluation reports
				P(a)	18,000		
				A	19.357[3]		
Outcome #3: Contribute to institutional building and capacity development creating SNS capacity to control seed quality							
Proportion of registered seed providers who have been inspected by SNS at least once a year and following the approved protocol	%	0	2011	P	100	0%	Monitoring report
				P(a)	100		
				A	0		

[3] According to the Final Evaluation (Roosevelt SAINT-DIC, January 2018), 73,3% of beneficiary farmers who have planted trees (agroforestry, citrus, coffee, cocoa) have adopted the package and so kept them, i.e. 73.3% of 26,408 farmers.

Output/Indicator	Unit of Measure	Baseline value	Baseline year	Targets and Actual Achievement		% achieved	Means of verification
Component #1: Extension of direct payment system							
Farmers received vouchers for the technologies being promoted	Producers	0	2011	P	30,000	118%	Monitoring report
				P(a)	36,263		
				A	35,530		
Component #2: Technical Support to SNS (National Seed Service)							
Evaluation of the role of public sector in the seeds and input market completed	Document shared with stakeholders	0	2011	P	2	100%	Evaluation report
				P(a)	2		
				A	2		
Laboratory for seeds quality control established and functioning	A laboratory is operational	0	2011	P	1	100%	Photographs
				P(a)	1		
				A	1		
Training to develop human capital for SNS	Number of person trained with a master degree financed by the program	0	2011	P	4	100%	Copy of Master diploma
				P(a)	4		
				A	4		
Procedures for seeds quality control are implemented	Manual of seed quality control procedures approved by MARNDR	0	2011	P	1	100%	Procedures manual
				P(a)	2		
				A	2		
National policy and strategy for the seed sector approved	Document approved by MARNDR and shared with stakeholders	0	2011	P	1	100%	Policies proposal
				P(a)	1		
				A	1		

Where: P = Start-Up Plan; P (a) = Revised Annual Target; A = Actual.

c. Analysis of the Results Attribution

2.30. The analysis of the results attribution is meant to underline the links between the project interventions and the impacts of the project. The monitoring and evaluation plan were properly designed to rigorously assess outcomes, impacts and attributions. Nevertheless, since the project mainly provided agroforestry packages – whose main production only starts after a few years – and since, as the impact evaluations show, annual crops packages did not trigger any production increase, it was not easy to identify any immediate gains in terms of production values, technology adoption and food security.

2.31. In order to attribute the results to project's interventions (including the potential gains of agroforestry packages which will materialize after the project completion), the project carried out four impact evaluations[4] and two mixed-method evaluations[5]. These evaluations have assessed Outcome 1 (Increase agricultural productivity), Outcome 2 (Beneficiary farmers have adopted improved and sustainable technologies) and Impact 1 (Increase Farmer's Agricultural Net Income).

2.32. Each impact evaluation focused on specific packages in specific areas:

- The two Randomized Control Trials (RCT) tested the effectiveness of smart subsidies for rice and horticulture in the Northeast Department and in Saint Raphaël (North Department),

- The two Propensity Score Matching (PSM) studies tested the effectiveness of smart subsidies on peanut production and agroforestry in the Northeast and Limbé (North Department).

2.33. These evaluations are summarized in the following table.

Table 5: Impact evaluations summary

Target crop (Eval. Method)	Yield	Value of production	Profits[6]	Imputs use	Food security
Rice (RCT)	The Program resulted in a significant decrease in annual[7] rice yields among treatment farmers compared to the control group	The Program resulted in a significant decrease in the treatment farmers' production values compared to the control group	No difference	The Program resulted in a significant decrease in the use of inputs among treated households	No difference

[4] Cf. § 2.26.
[5] The mixed-method evaluations were (i) An agroeconomic diagnostic study (2014-2015) focusing on a small-scale, in-depth case study of a farmers' dwelling in the Saint Raphaël irrigated area and (ii) A qualitative evaluation (2014-2015) investigating the sustainability of PTTA's effects on supply chain actors.
[6] To calculate profits, the cost of inputs paid for with vouchers was included in total input cost.
[7] As opposed to the seasonal analysis, for which the difference was not significant.

Target crop (Eval. Method)	Yield	Value of production	Profits[8]	Imputs use	Food security
Horticulture (RCT)	No difference	Overall, no difference. A significant decrease in the production value for Buenabite	Overall, no difference. Significantly negative impact for Buenabite	Increase in fertilizer use was only significant in Buenabite, while treatment and control farmers in Merlene used similar amounts of fertilizer. Significant decrease in pesticide use	No difference
Peanut (PSM)	No difference	No difference	No difference	Inputs use was significantly higher among treated households	No difference
Agroforestry (PSM)	N/A	Positive and significant impact. The total value of crop production (including actual and expected crop production) was 38% higher in the treatment group	Positive and significant impact. Treatment farmers' profits (including actual and expected profits) from crops were 63% higher than the control farmers'	No difference	N/A

2.34. For **Component 1**, the impact can be attributed only to the agroforestry packages. The dedicated study for agroforestry packages has demonstrated the link between outputs of Component 1 and Impact 1. The analysis of the data collected highlights positive impacts of the Project on the number of cultivated plots, total value of production, agricultural income and profits, labour use and investment in perennial crops. The crop production has increased (38%) leading to an income growth (63%).

2.35. Unfortunately, for the rice, horticulture and peanuts packages, the Project did not determine significant impacts in the areas analysed. The packages had no significant effects on the total value of production nor on the value of production per hectare.

2.36. For the peanuts packages, the only difference with the control group was the number of households dedicated to agricultural work: 97% of the treatment households engaged in agricultural work, while only 86% of the control households did.

2.37. For the rice packages, a negative impact was observed, as the production values decreased for the treatment group, if compared with the control group. According to experts' observations, these negative productivity effects were likely due to a significant decline in input use (about 1/3), particularly urea and sulphate. An analysis of the spending

[8] To calculate profits, the cost of inputs paid for with vouchers was included in total input cost.

of the farmers suggests that they used the vouchers as substitutes rather than as complements to their own spending.

2.38. For horticulture, the impact evaluation shows that, while the intervention led to some reallocation of crops, it did not induce farmers to expand their horticulture cultivation. Considering the total production value for the horticulture crops, there were no significant impacts when considering all crops together, nor for any of the PTTA crops taken separately.

2.39. The attribution for **Impact 2** (food security) was not analyzed because it was not possible to assess it with agroforestry packages. Nevertheless, the impact evaluation for rice, peanuts and horticulture did not show any difference between treatment groups and control groups for food security.

2.40. Finally, for **Component 2**, it is not possible to establish any link between the project interventions and the targeted impacts. This is due to the fact the Outcome 3 (a functioning laboratory) was achieved at the very end of the Project implementation.

d. Unanticipated outcomes

2.41. According to the final evaluation, for the areas close to the Dominican Republic, imports of some agricultural products (vegetables and banana especially) decreased. The local production is now better able to provide supplies to the local market (Limbe, Marmelade). According to the observations of the experts, the charcoal production of the targeted farmers has decreased but it was no possible to demonstrate the role played by the Project for this unanticipated outcome.

2.42. Moreover, according to the impact evaluations, income from livestock sales decreased in the targeted areas. It is possible that the subsidies allowed beneficiaries to hold on to their livestock because they consider it as a source of capital.

2.43. Regarding annual crops, the Program had a negative impact on the number of annual crops cultivated, reducing crop diversification.

2.3 Efficiency

2.44. The following table shows the forecasted and final expenses of the project.

Table 6: The global project expenses

Categories	Expenses (USD)			
	Forcast		Final	
	Amount	%	Amount	%
I. Direct costs	**34.659.507**	87	34.506.744	87
Component 1: Smart subsidies	32.846.856	(82)	32.693.287	(82)
Component 2: regulation of seed supply	1.812.651	(5)	1.813.457	(5)
II. Others costs	**5.340.493**	13	5.168.866	13
Total	40.000.000	100	39.675.610	100

2.45. The smart subsidies represented 26.220.029 USD i.e. 82% of the budget of the project. Even though the PTTA was a first experience in Haiti, this percentage is aligned with other similar projects (80-85% in Kenya, Tanzania, Malawi).

Component 1

2.46. The ex-ante economic evaluation (2011) of the project expected an Economic Rate on Return rate of 33% over 15 years. This rate was based on the expected extra income for farmers, generated by the packages. The main findings of the impact evaluations show that agroforestry led to gains in terms of additional income (+63%). Nevertheless, for the others packages (rice, peanuts and horticulture), the project did not generate immediate first-order gains in terms of production values, technology adoption and food security.

2.47. The final evaluation of the Project used these impact evaluations to estimate an ex-post Economic Rate of Return of 17% over 10 years (and 20.4% over 15 years) with a discount rate of 12%. This rate is lower than the expected one (33% over 15 years) but greater than the 12% discount rate used during the ex-ante economic evaluation. Even with a hypothetic 15% reduction of the generated added value, the Economic Rate of Return falls only to 13.2% over 10 years (and 16.8% over 15 years) and is still higher than the discount rate. This means the component was economically justified.

Component 2

2.48. Since Outcome 3 (laboratory implementation) has been completed only at the very end of the project, no data could feed an ex-post cost-benefit analysis. The efficiency of this component has therefore not been analyzed.

2.49. According to the final evaluation, the Economic Rate of Return (ERR) is higher than the discount rate used in the ex-ante evaluation. The Project efficiency can be considered excellent. Nevertheless, the ex post ERR is lower than the ex-ante ERR and the contribution of the different technological packages is highly asymmetric (the added value being generated only by agroforestry packages).

Table 7: Costs of the Project

1 Component: Extension of direct payment system

	Output Definition		2012	2013	2014	2015	2016	2017	Cost
		P	0,00	2 722 563,00	6 508 487,00	10 674 250,00	13 094 700,00		33 000 000,00
1.1	Farmers who received vouchers for the technologies being promoted	P(a)	0,00	500 000,00	7 000 000,00	8 000 000,00	16 479 468,00	2 561 574,00	32 846 856,00
		A	16 565,00	1 018 776,00	3 921 926,00	11 563 265,00	13 764 750,00	2 408 005,00	32 693 287,00

2 Component: Technical support to Seed National Service

	Output Definition		2012	2013	2014	2015	2016	2017	Cost
		P	0,00	30 000,00			20 000,00		50 000,00
2.1	Evaluation of the role of public sector in the seeds and input market completed	P(a)	0,00	30 000,00	10 000,00		0,00		49 707,00
		A	0,00	22 601,00	27 106,00	0,00	0,00	64 359,00	114 066,00
		P	0,00	537 600,00	592 200,00	192 600,00	137 600,00		1 460 000,00
2.2	Laboratory for seeds quality contro established and funcioning	P(a)	0,00	150 000,00	250 000,00	250 000,00	820 351,00	504 167,00	833 166,00
		A	0,00	0,00	120,00	264 529,00	64 350,00	440 210,00	769 209,00
		P	0,00	100 000,00	200 000,00	100 000,00	0,00		400 000,00
2.3	Seed National Service's human capital strengthened	P(a)	0,00	40 000,00	20 000,00	60 000,00	251 031,00		400 000,00
		A	0,00	2 500,00	48 973,00	97 496,00	123 132,00	159 290,00	431 391,00
		P	0,00	40 000,00					40 000,00
2.4	Procedures manual for seeds quality control elaborated	P(a)	0,00	40 000,00	13 750,00	13 750,00	13 750,00	13 750,00	40 000,00
		A	0,00	26 250,00	0,00	0,00	0,00	89 640,00	115 890,00
		P		25 000,00			25 000,00		50 000,00
2.5	National policy and strategy for the seed sector approved	P(a)		40 000,00	40 000,00	200 000,00	247 152,00	150 855,00	489 778,00
		A	0,00	0,00	0,00	178 141,00	160 782,00	43 978,00	382 901,00

Other Cost		2012	2013	2014	2015	2016	2017	Cost
	P	100 000,00	903 300,00	768 900,00	568 900,00	2 533 900,00		4 875 000,00
Total Cost Administration, audit, evaluation	P(a)	100 000,00	450 000,00	684 000,00	930 000,00	1 680 537,00	828 715,00	5 340 493,00
	A	185 595,00	1 224 460,00	843 088,00	1 066 320,00	1 192 315,00	657 088,00	5 168 866,00

Total		2012	2013	2014	2015	2016	2017	Cost
Total Cost	P	100 000,00	4 358 463,00	8 069 587,00	11 535 750,00	15 811 200,00		39 875 000,00
	P(a)	100 000,00	1 250 000,00	8 017 750,00	9 453 750,00	19 492 289,00	4 059 061,00	40 000 000,00
	A	202 160,00	2 294 587,00	4 841 213,00	13 169 751,00	15 305 329,00	3 862 570,00	39 675 610,00

2.4 Sustainability

2.50. The timeframe for this sustainability assessment is the long-term, as the production increase associated to agroforestry packages is supposed to start after a few years and continue for many more. Considering that the agroforestry packages are associated to significant improvements in income generation, we can suppose that farmers will keep the technologies provided by the Project.

2.51. According to the final evaluation, the agroforestry packages are more likely to be maintained by farmers (73.3% of interviewed farmers said they would) than the rice packages (only 21% of farmers said they would). The income generation (higher for agroforestry) can explain these differences and confirm the impact assessment conclusion.

2.52. For the annual crops packages (rice, horticulture and peanuts), the various evaluations and impact assessments show that they did not generate any additional income as they did not represent any innovation for farmers. Moreover, according to different field studies (Jerry Rambao, 2014, for example), the lack of irrigation systems can also partly explain the lack of impact of the annual crop packages.

2.53. According to the project's final evaluation, the answer to the question "do the farmers will keep the packages?" depends not only on the technological package itself but also on the gender. 64% of women who stated that they will not keep the package justified their answer with the cost of inputs (only 44% of men gave the same answer). Women are usually more limited in their possibility to access finance than men and therefore their financial capacities are lower. This specific segment of the population is also particularly exposed to yield variation due to natural hazard. These factors can explain the different justification given by men and women.

2.54. The above percentages do not reflect the whole Project but just a sample. Indeed, since more than 74% of beneficiaries have used agroforestry packages, the global economic sustainability of the Project is considered high given the high technology adoption for agroforestry packages (cf. Outcome 2). Some challenge might remain for vulnerable groups, especially women with poor access to finance. These vulnerable groups might still find it difficult to find the capital for renewed investment, even though the additional income that is and will be generated by the adoption of agroforestry packages mitigates the problem.

2.55. Finally, the environmental sustainability can be considered high since the technological packages (particularly the agroforestry ones) were designed to be aligned with their natural environment. According to experts' opinion, agroforestry packages mitigate erosion, contribute to carbon capture and increase soil fertility and water retention.

2.56. In conclusion, Project sustainability is partly satisfactory because the economic sustainability is achieved only for agroforestry packages (74% of beneficiaries). For annual crop packages, the sustainability is low since they did not provide any innovation. Moreover, the sustainability for vulnerable famers with poor financial access (particularly women) remains problematic.

III. Non-Core Criteria

3.1 Strategic Alignment

3.1. The project design was consistent with the Update to the Institutional Strategy (UIS). The project was aligned with the challenges of Social Exclusion and Inequality as it was working with small holder famers, one of the most vulnerable population in Haiti. Moreover, through the distribution of technological packages', the project was also associated to the low productivity and lack of innovation. The program was aligned with the cross-cutting theme "climate change and environmental sustainability", as it provided adapted technologies (in particular the agroforestry packages) for sustainable farming activities.

3.2. The project contributed to the Regional Development Goals "Protecting the environment, responding to climate change, promoting renewable energy, and enhancing food security", and particularly to the indicators "Annual growth rate of agricultural GDP". The project contributed to the product "Farmers given access to improved agricultural services and investments," as defined in the Results Framework.

3.3. Targeting small farmers in Haiti through the distribution of environmentally adapted technologies, the project contributed also to the following lending program priorities of the GCI-9 (AB-2764): (i) support to small and vulnerable countries; (ii) poverty reduction and equity enhancement, as beneficiaries were low income rural households; and (iii) lending to support climate change initiatives, sustainable energy, and environmental sustainability. Moreover, the project also aligned with the Country Strategy Results Matrix (GN-2465) providing technical assistance and improving access to rural finance.

3.4. Finally, working with local suppliers, the project was involved in the strengthening of the inputs' supply chain and so is aligned with the 2007-2011 country strategy which following the objective of "strengthening of conditions for economic growth". Agriculture was considered as a priority sector for investment. The project was also consistent with the Bank's 2011-2015 Country Strategy for Haiti (GN-2646), which established agriculture as a priority sector of intervention. Following the alignment, the project took the opportunity to develop synergies with two other Bank interventions in Haiti: The Natural Disaster Mitigation Program in Priority Watersheds (HA-L1041 / 2187/GR-HA), as well as the Land Tenure Security Program in Rural Areas (2720/GR-HA).

3.2 Monitoring and Evaluation

a. M&E Design

3.5. The Monitoring and Evaluation system was based on the Monitoring and Evaluation Plan and the Operational Manual of the Project. The implementors were supposed to monitor the outputs according to the following elements:

- Administrative data on subsidy application (approved, rejected, package, amount, location) and administrative data on beneficiaries (gender, age);
- Monitoring of the technical packages (quality, climate impact, challenges).

The national project coordination was supposed to compile the implementors data, monitor the price fluctuation and the potential stakeholders' complaints. Moreover, the coordination was supposed to assess Project's outcomes and impacts.

3.6. However, for the outcomes, even if a baseline had been scheduled since the beginning, the initial results matrix and monitoring and evaluation plan did not clearly define the methods to monitor the outcomes of Component 1. The plan did not take into account any corrective measure to mitigate external aspects impacting outcomes. Taking into account these challenges, the M&E design has been adjusted. The result matrix has been partially reviewed during the Project in order to better define the outcomes of Component 1. This review has allowed the implementation of the four impact evaluations during the project. The adjustments used the control group approach and avoided the ex-ante project baseline which was not assessed at the beginning.

b. M&E Implementation

3.7. The M&E system was implemented using several tools. To monitor the outputs of the project, the Monitoring and Information System (SIGI) was designed. Unfortunately, the SIGI experimented several technical and conceptual issues which forced stakeholders to use Microsoft Excel as a complement.

3.8. For the outcomes and impacts assessments, the project finally adapted the Monitoring and Evaluation plan, implementing four different impact evaluations:

- Two Randomized Controlled Trials (2014-2015) testing the effectiveness of smart subsidies for rice and horticulture in the Northeast department and in Saint Raphaël (North department).

- Two Propensity Score Matching evaluations (2016) testing the effectiveness of smart subsidies on peanut production and agroforestry in the Northeast department and Limbé (North department).

c. M&E Utilization

3.9. The SIGI issues generated delays in the data transfer between the different institutions (e.g. the Bank and the Project coordination). In addition, the project coordination was able to collect the different outputs data but it was not able to assess outcomes and impacts. To face this weakness, the four impact evaluations were crucial for project evaluation. These four evaluations collected enough data, using different methodological approach, to provide relevant results and recommendations.

3.3 Use of Country Systems

3.10. The national fiduciary systems for procurement and financial management are not yet aligned with the standards required by the Bank's policies related to the use of country systems. Programming and budget planning, execution and monitoring at the project level relied on IDB's project financial management formats and procedures.

3.11. However, the project contributed to the implementation of a central procurement unit within the Ministry of Agriculture.

3.4 Environmental and Social Safeguards

3.12. The grant proposal document states that the project was classified as Category B and that Bank guidelines for this category were duly respected. The project provided environmental benefits through its Component 1 and specifically through the provision of environmentally sustainable technological packages. Experts' observations during the impact evaluations

suggested that agroforestry packages (74% of the total) mitigate erosion, increase soil fertility and water retention and contribute to capture carbon.

IV. FINDINGS AND RECOMMENDATIONS

Table 8: Findings and Recommendations

Findings	Recommendations
Dimension 1: **Technical-sectorial dimension**	
Some technological packages did not generate extra income (because not adapted and/or not a real innovation for beneficiaries).	A dedicated unit research has to be created in order to generate and test technologies. The package selection should be done through iterative and participative field test. This approach could limit the fact that practices were already used in some locations.
	Some technological packages (e.g. rice) need a productive natural environment and some investments might be a crucial precondition (such as irrigation system) to increase the likelihood of an extra income generation. Moreover, subsidies diversification could ensure better packages' adoption by farmers, meeting their needs more closely.
The adoption of the technological packages is crucial for sustainability. Some farmers did not keep the packages because of a lack of technical assistance and/or because of financial risk.	Technical assistance needs to be strengthened to support farmers effectively and continuously. The operators could thus be divided in two, with a service dedicated to technical assistance (agronomists) and a service dedicated to the administrative management of the subsidies. In addition, demonstration plots should be created and co-managed by the BAC in order to strengthen the exit strategy of the operation. These technical support units should work closely with a dedicated public research unit of the Ministry.
	A weather index microinsurance can be tested here in order to mitigate the financial risk. Rural microfinance can also be an exit strategy for the intervention, by providing a financial opportunity for the beneficiaries. The matching grant can progressively decrease along with the gradual increase to microcredit access.
	Farmers need to participate in the financing of the packages in order to ensure higher adoption rates.
Dimension 2: **Organizational and managerial dimensions**	
The implementation design had occurred significant delays in the vouchers distribution leading to agricultural practices delays and, therefore, production issues.	Information is crucial within value chains. Farmers should be clearly informed about the benefits they are entitled to and for how long, so that they can hold suppliers accountable, and plan well ahead of time for a breakdown of personal and subsidized investment. The information system needs to be improved in order to make the information transfer faster, to make easier results synthesis and to allow for some automatic updates of the different modules. This should limit delays, improve problem identification and reduce the reaction times.
	The design, implementation and monitoring of the voucher delivery should ensure that the value of the vouchers is not eroded by delays, inflation or supply chain distortions. Particularly, the financial institutions, with their internal procedures, can be responsible for delays. Mobile banking should be promoted and penalties for delays should be added to the service contract agreement.
	The agricultural inputs suppliers might also be responsible for delays. A full control has to be implemented with potential penalties in order to limit unproductive suppliers.

	External and independent evaluations have to be conducted on a regularly basis in order to identify challenges and propose adjustments.
	The complaints system has to be improved in order to make faster the treatment and so identify potential challenges and then design efficient answers.
Dimension 3: **Dimensions related to public processes and actors**	
The most vulnerable beneficiaries (e.g. women) might not keep the technological packages without any financial support.	An exit strategy via rural microfinance can be designed. The microfinance institutions (MFI) can be involved in the vouchers' distribution in order to create a first business link between vulnerable farmers and MFI.
Dimension 4: **Fiduciary dimensions**	
An efficient Procurement Unit is key for project execution (particularly for component 2)	The procurement unit has to be assessed and then reinforced in a relevant way with a more effective organization and capacity strengthening.
Dimension 5: **Risk management**	
Climatic risk is usual in agriculture and can cause significant income losses for farmers. The most vulnerable might hesitate to invest in new practices.	As explained before, a weather index microinsurance can be tested.