PROJECT NAME: Reducing environmental impacts and improving efficiency in coffee processing.
PROJECT NUMBER: HO-M1036

PROJECT TEAM: Lorena Mejicanos Rios (FOMIN/A2BS), Team Leader, Fausto Castillo (CHO/FOMIN), Ruben Doboin (FOMIN/DEU), Georg Neumann (FOMIN/KSC), Isabel Auge (FOMIN/A2BS), Betsy Murray (FOMIN/ CCR), Alejandro Escobar (FOMIN/A2M), Dora Moscoso (FOMIN/DEU), Carlos Jacome (ENE/CHO) and Enrique Alvarado (CID/CHO).

I. PROJECT SUMMARY

During the *wet milling process*[1] for coffee, cooperatives generate large volumes of pulp and water waste that pollute the environment and local bodies of water. Additionally, the process of de-pulping and drying coffee demands high energy inputs[2], including fossil-fuel-based electricity and heat. The coffee industry lacks the knowledge and technology to adopt best practices in waste management to improve energy consumption, reduce the use of agrochemicals in the production chain, and reduce greenhouse gases (GHGs) emissions in the coffee supply chain. Waste management systems can recycle waste into a source of energy and bio-fertilizer, which can be used to improve production and soil quality. The project will pilot a business model with a group of small coffee producers in the western-central region of Honduras to promote a culture of responsible and sustainable production, demonstrate technological alternatives that avoid or reduce GHGs, measure reductions in operating costs and increases in profitability.

II. PROJECT CONTRIBUTION TO THE ACCESS FRAMEWORK

Private sector development: The coffee sector is the most important sector in terms of job creation in Honduras, with approximately 1 million jobs across the coffee supply chain. Currently, 95% of production comes from small producers (up 2.4 ha). In 2011, Honduras became the largest coffee exporter in Central America. It's the third largest in Latin America, and sixth worldwide. According to the Central Bank of Honduras (2010), coffee contributes 6% of national GDP and 28% of agricultural GDP, ranking first as an agricultural product generator of foreign exchange, which means U.S. $ 1.240 billion in revenue for the country during harvest 2010/2011.

Poverty Reduction: 95% of coffee production in Honduras comes from small producers in the central-western region, which is characterized by high rates of poverty and low human development index (lower than the HDI of .625), lack of basic services and employment opportunities.

Agendas. The project is aligned with 2 Agendas: (i) **Clean energy and efficient energy**, as it will develop a model to support small farmers to generate renewable energy (biogas) from liquid waste and reuse it in their own production process to generate emissions reductions in production

[1] Wet milling of coffee includes depulping, fermenting, washing and drying the grain. The cherries are depulped to remove the fleshy fruit from them quickly after the harvest.

[2] In 2010, Honduras the cost per kWh varies by industry, but for the first 1,000 kWhs the unit cost is around US$ 0.20. The country struggles with an inefficient transmission and distribution system controlled by a state-owned vertically integrated utility (Climatescope 2012).

Número de palabras:

processes; and eventually market the waste byproducts for household or community use (e.g. biofertilizers), generating additional sources of revenue[3]; and (ii) **Natural Capital**, since it will reduce / avoid GHG emissions and will conserve water.

III. INFORMATION

COUNTRY:	Honduras	**MIF TECHNICAL COOPERATION:**	$ 770,000	70%
LOCATION:	Central-West Honduras	**COUNTERPART:**	$ 330,000[4]	30%
EXECUTING AGENCY:	SNV Honduras			
ACCESS AREA:	Basic Services	**TOTAL PROJECT:**	$1,100,000	100%
AGENDA:	1. Clean & Efficient Energy; 2. Natural Capital; and	**NUMBER OF DIRECT BENEFICIARIES:**	(i) 3 coffee cooperatives (COMSA, COCAFELOL and ARUCO); (ii) 1,485 small coffee producers (cooperative members), and (iii) the environment	
COMPLEMENTARY BANK OPERATIONS:		**NUMBER OF INDIRECT BENEFICIARIES:**	IHCAFE[5], AHPROCAFE, 110,000 coffee producers, 3 Municipalities and Local communities	
		QED SCORE:		

IV. PROBLEM DIAGNOSIS

The coffee sector is very important for the Honduran economy but it also negatively impacts the environment through polluting water sources and releasing GHG emissions. According to an SNV study, the carbon footprint a 46 kg bag of coffee in two coffee cooperatives in western Honduras, ARUCO and COCAFELOL, averaged 140 Kg of CO2 (the equivalent of about 15.7 gallons of gas consumed, or roughly the tank of a mid-sized car). The main emission sources were chemical fertilizers during the production process, wet milling, and the use of energy (mainly from fuel sources) during the wet and dry milling. Extrapolating the finding of these studies to the total amount of Honduran coffee exported in 2011-2012 (3.2 million coffee bags per 140 kg per green coffee bag) the total emissions are about 500,000 MT of CO_2e (equivalent to 1,162,791 million barrels of oil consumed)[6].

The majority of coffee producers apply chemical fertilizer without conducting a soil analysis, which would determine which minerals and quantity the plants precisely need. As a result, many producers increase both their cost and environmental pollution unnecessarily. The SNV analysis showed that when a producer develops a fertilization plan based on soil analysis they can reduce the use of

[3] This project differs from the SNV project in Nicaragua (NI-M1025) in the following aspects: (i) the use of biogas in that project is primarily for household use rather than productive purposes, (ii) wastes to be used in that project are primarily animal rather than vegetable, (iii) and the the biodigestion technology used is intended for medium to large producers rather than small, due to larger volumes of waste to be processed

[4] This figure is approximate and will be refined during the analysis mission.

[5] Honduran Coffee Institute, a nonprofit national regulator of coffee (http://www.ihcafe.hn/)

[6] http://www.epa.gov/cleanenergy/energy-resources/calculator.html

Número de palabras:

chemical fertilizers between 40-60%, resulting in a significant impact in cost and pollution reduction, as well as, increase in the yield. Improving yields in the current context of crop destruction from the roya is vital to preserving competitiveness and mitigating the negative income impacts of the plague.

In coffee wet milling only 20% of the coffee bean is dried for sale. The remaining 80% becomes waste in the form of pulp and acidic waste water. However, these discards that are currently detrimental to the environment can serve as raw materials for bioenergy and bio-fertilizer if captured and treated. Pollution in the coffee regions of Honduras mainly comes from cooperatives using wet milling processing methods, which result in waste coffee pulp decomposing in the open air and generating methane, and conversion of high amounts of fresh water to wastewater[7], contaminating both surface and groundwater supplies. These environmental problems generate odors, proliferate diseases, and negatively impact natural resources, as well as the lives and health of the communities living in coffee production centers. Although there is a legal framework that gives municipalities the legal instruments to ensure that coffee processing reduces pollution, there is a lack of technical capacities in the municipalities to make sure the law is enforced. About 40% of wet coffee processing is done in decentralized wet mills that do not meet basic environmental standards.

During the coffee wet and dry milling processing, many cooperatives require large amounts of water and energy due to the use of old and inadequate equipment. The use of energy includes electricity and heat, which normally is sourced from fossil fuels.[8] The parts of the process using the most energy are electric motors and water pumps for depulping, classification mechanical dryers, boilers and furnaces for drying. Typically, 11.95 kWh of electricity and 111.46 Kwh of thermal energy are required to produce one quintal of green coffee.[9] Additionally, coffee producers and cooperatives have limited power supply options. This can jeopardize the timely processing of wet and dry grains and affect the production quality and quantity, with the consequent reduction of their coffee's price in the markets.

Causes.

Limited specialized technical assistance to the coffee cooperatives and producers is causing: (i) inappropriate and inefficient use of chemical fertilizers in the production process, which negatively impacts production and costs; (ii) inadequate management of solid and liquid waste in the wet and dry milling processing; (iii) inefficient use of energy during the wet and dry processing due to use of faulty equipment and / or poor electrical installations: and (iv) irrational use of water.

Limited knowledge on efficient and cleaner technology by the cooperatives is causing them to operate inefficiently, losing strategic opportunities in generating renewables for their own productive purposes.

The limited technical capacity of local governments to ensure the compliance of the coffee sector with environmental standards is causing the pollution of the natural capital of the communities (air, soil and watersheds). Coffee is grown in 15 out of 18 states and in 213 out of 298 municipalities in Honduras.

Classify the problem in one or more of the following categories that most apply:

Market failure	■	**Skill deficit**	■
Institutional weakness	■	**Collective action problem**	□
Policy weakness/failure	□	**Lack of appropriate technology**	■
OTHER (Explain as needed)_____	□		

[7] On average, 3 – 4 L of water is used to process 1 kg of coffee, but it can reach as high as 21.7 L / kg if washing is done by hand (Hagler, 2000).

8 During the preparation of this abstract (late 2011 and early 2012), the price of oil increased significantly and the price of coffee reduced due to financial crisis the European market.

[9] Fundación Para la Innovación Tecnológica Agropecuaria - **FIAGRO** http://www.fiagro.org/

Número de palabras:

Project beneficiaries: The direct beneficiaries will be: (i) three coffee cooperatives / business associations located in rural west-central Honduras, the largest coffee-producing region in the country; (ii) 1,485 small producers who are members of the cooperatives (19% women): and (ii) the environment, making better use of water and ensuring its quality, and reducing / avoiding GHG emissions. The selected cooperatives have at least one certification (organic, Fair Trade, designation of origin, or socially and environmentally responsible agricultural production), and have launched at least one cleaner production initiative. Some of the cooperatives already have biogas production facilities in their headquarters but have several micro-mills that still need to adopt cleaner technology and improve production practices. The total production of the cooperatives is 143,000 bags of green coffee.

It is estimated that women participate in 60% of the work in the coffee chain, but their salary represents only 67.6% of the average wage earned by men under the same conditions. Many women-owned or managed farms do not have their *"Producer code*" or coffee sales records in their names, which are required to access IHCAFE assistance programs.[10] The project will explore the barriers, interest and opportunities from women to improve their access to the producer code.

The West-Central region of Honduras is composed of 7 departments: Santa Barbara, Copan, Ocotepeque, Lempira, Intibucá, La Paz and Comayagua. About 68% of total national coffee production comes from this region.

V. PROJECT DESCRIPTION

The intended impact of the project is for producers in three coffee cooperatives in Honduras to reduce their production costs and increase productivity while reducing their negative environmental impacts. This will be achieved by optimizing the use of fertilizers, energy and water resources; providing better management and use of waste (solid and liquid) for bioenergy and organic by-products for reuse in the coffee production cycle.

The project will pilot a business model for improving environmental efficiency and operational capacity in three coffee cooperatives in Honduras.

At the end of the project it is expected that the Honduran Coffee Institute (IHCAFE) and the Honduran Association of Coffee Producers (AHPROCAFE) will have the knowledge to promote the adoption of greener practices and technologies in the coffee sector nationwide. The project also aims to create and strengthen the capacity of biogas technology providers (supply) and improve the environmental enforcement capacity in the municipalities.

This will be accomplished through the following project components and activities:

Component I. Measuring carbon footprint and resource efficiency consumption. The objective of this component is to measure GHG emissions, the efficiency of energy and water consumption, and help the coffee cooperatives develop an action plan to reduce the emissions and resources. The following activities will be carried out: (i) measurement of the coffee carbon footprint (scope from growth to port of delivery); (ii) conduct energy and water consumption audits (mills and offices); (iii) design an operational plan to reduce GHG emissions and increase energy and water consumption efficiency; and (iv) training to at least three UMA (Environmental Municipal Units) to understand challenges and benefits on climate mitigation initiatives. Results: (i) three audits on energy and water consumption and a plan to improve efficiency has been implemented; (ii) coffee carbon footprint has been measured and certified in three coffee cooperatives at the beginning and at the end of the project; (iii) at least 90 technical staff from cooperatives, AHPROCAFE, and IHCAFE have been trained to facilitate technical assistance; and (iv) three UMAs trained.

10 The status of women in coffee in Honduras. Solidarity and Green Development Foundation, 2008.

Número de palabras:

Component II. Improving Resource Efficiency and Piloting Biogas. The objective of this component is to support the cooperatives in the adoption of cleaner technology and practices, to improve their consumption of resources (fertilizers, energy, fossil fuel, water and waste). The following activities will be carried out; (i) specific actions for energy and water efficiency defined based on the results of the energy and water efficiency consumption audits carried out in Component I; (ii) mapping the coffee producers´ farms to design and implement a collection strategy to optimize the mill processing; (iii) based on the operation of the existing biogas plants in the cooperatives, the project will validate and refine the biogas plants´ operation in terms of technical, operational and financial issues; (iv) design and construction of at least 3 new biogas plants in community[11] (micro central) wet milling coffee processing centers (with counterpart resources); and (v) training on the construction and maintenance of biogas plants for coffee cooperatives, IHCAFE, AHPROCAFE, and local service providers. Results: (i) guideline for the technical, operational and financial management of the biogas plant has been developed; (ii) at least 3 additional biogas plants, (one per cooperative), have been built and are operational (with counterpart funds); (iii) at least 20 technicians from cooperatives, IHCAFE, AHPROCAFE, local service providers and universities are trained.

Component III. Development of organic by-products. The objective of this component is to produce organic fertilizer using the by-products generated by the wet milling processing, which is expected to generate GHG emissions. The purpose is to create a virtual circle within the coffee producers, who will buy these organic products and reduce the use of chemical fertilizers. Activities: i) systematization of COCAFELOL´s experience in the production and commercialization of organic fertilizer (foliar fertilizer, compost and multi minerals); ii) design of a business plan for each cooperative for the production and commercialization of organic fertilizer; and iii) implementation of the business plans.

Component IV. Development of technical assistance model. This component seeks to ensure that farmers have specialized technical support to ensure good agricultural practices to increase productivity, reduce production costs and reduce environmental impact beyond the life of the MIF intervention. Activities: (i) assessment of needs for training and technical assistance at the producer and technician level; (ii) design of a technological package for the implementation of good agricultural practices, certification and cleaner production in the coffee sector. This package will include manuals and tools adapted for small coffee producers; (iii) training of trainers for technical staff from cooperatives, AHPROCAFE and IHCAFE, including the development of technical and pedagogical skills, use of technology to improve knowledge transfer, such as videos, cell phones and internet; (iv) development and implementation of a technical assistance plan for each cooperative.

Component V. Knowledge Promotion and dissemination of project results. The knowledge gap this project seeks to fill is how to apply green technology to the coffee production process to improve business and environmental performance. This component will build learning and best practices, and involve participating cooperatives and their members, AHPROCAFE, and IHCAFE. It seeks to ensure that the project activities and lessons serve as a basis for future implementation of the model by other Honduran coffee cooperatives. Activities: (i) implementation of a campaign to promote the benefits (economic and environmental) on adopting green production technologies; (ii) exchange of experiences among participating cooperatives; (iii) promote the project among other local cooperatives; (iv) systematize the results of the business model in the three cooperatives; and (vii) organize and participate in national and international events to disseminate the project results (Promecafe, IICA, and ICO). Results: (i) three “How to guides” developed and published at IHCAFE and AHPROCAFE websites: 1- for a GHG assessment, 2- for adopting greener production methods, and 3- organic by-products.

[11] Specific criteria needs to be developed to choose these community wet milling coffee processing centers. At least one per cooperative.

Número de palabras:

MIF or other organizations' experience. SNV has designed and implemented a prototype system for bioethanol, biogas and biofertilizer production from coffee processing waste in a cooperative of small producers in Marcala, Honduras. Afterward, with some adjustments to the original model, SNV adapted it to ARUCO and COCAFELOL. Additionally, with funding from the Energy and Climate Partnership of the Americas (ECPA), SNV is supporting ARUCO and COCAFELOL to generate electricity from the biogas plants. These small initiatives indicate that there is great potential for scalability of the model, but it still needs to be improved to achieve financial sustainability. In preparation for this project, MIF requested an evaluation of SNV projects[12] and a case study of COOPEDOTA (Feb 2013)[13], the first coffee organization certified carbon neutral worldwide. These two studies were developed by MIF to better understand the challenges and opportunities in producing a cleaner coffee. The studies showed that before achieving a new costly certification (C-Neutral), several best practices should be adopted during the growth and processing phases of the coffee, to make its production more environmentally efficient, sustainable and profitable. These practices have been successful in reducing their environmental impact while reducing operational costs, but no metrics have been collected yet to demonstrate with facts these cost – benefits of C-neutral certification. The use of the biogas technology has showed better acceptance and results for the coffee producers in comparison to the bioethanol, which has presented higher complexity, production and maintenance cost, besides no market has been identified. The team concluded that it was better to focus the efforts of this project in the efficiency of the coffee production and to leave the C-Neutral certification for the long term, but leaving the cooperatives prepared for this process. These lessons were incorporated in this abstract.

Lessons learned and/or best practices

1. From the beginning when the plants are constructed, it is important that the cooperatives train their teams to develop skills to understand how the equipment works, so that they can operate it safely and ensure its proper maintenance.
2. It is recommended to research, test, and validate other raw material inputs for the bio digesters, to identify alternatives that keep the plants in operation throughout the year, including in the off-season of the coffee harvest.
3. No local companies currently specialize in technical service delivery for biogas, making it necessary to build their own capacity to assist from the design phase to post-installation. To consolidate local technical capacity and ensure quality, there is need to promote knowledge sharing generated by developing appropriate information and knowledge management tools.
5. There should be continuous improvement and adaptation of technologies that produce renewable energy, since these are very incipient technologies in the country.
6. Conduct a GHG footprint measurement before any climate mitigation initiative is developed, to measure its impact.

VI. MIF ADDITIONALITY

MIF Non-Financial Additionally: The MIF provides credibility, expertise and potential to leverage other resources to expand the initiative once the model is fully validated. In addition, the operation will generate knowledge that may be of strategic value for other countries and sectors in the region, in which, these sectors, like coffee also play a dominant role in employment and the economy. With coffee, MIF has strengthened regional organizations in different certifications in order to ensure better access to higher value markets. This, in addition, with MIF participation in the project, additional funds will be leverage from NDF, UNDP, CAMBIO and others.

[12] IDBDOCS 37931711

[13] http://www5.iadb.org/mif/HOME/FOMINblog/Blogs/tabid/628/entryid/608/Sostenibilidad-en-el-negocio-del-cafe-COOPEDOTA-y-el-camino-hacia-la-carbono-neutralidad.aspx

Número de palabras:

***MIF Financial Additionally*:**

The technical and financial viability of certain technologies to mitigate climate change in the coffee sector has not yet been demonstrated. This project will begin to explore this area with small scale industry. To date, there has been an absence of reliable and credible technological models to demonstrate good performance, technical and financial effectiveness, and to promote replication and expansion in the sector. Hence, the MIF´s financial contribution is crucial.

VII. RESULTS INDICATORS

1. At least 189,000 m3 of biogas produced by cooperatives per year ($ tbd)
2. At least 46,320 kwh of energy saving per coffee harvest / year has been achieved by the cooperatives ($ tbd).
3. At least 30,000 kgs of organic fertilizers has been produced and commercialized by the cooperatives ($ tbd).
4. Average % increase in cooperatives productivity (tbd)
5. 3 cooperatives have improved sustainable use of natural capital within their businesses
6. 3 UMA (Environmental Municipal Units) have adopted procedures to enforce environmental legal framework in their municipalities.
7. At least 80% of the coffee producers are receiving technical assistance from the cooperatives
8. 3 How to Guide developed

VIII. IMPACT INDICATORS

Provide preliminary estimates of quantitative and qualitative metrics.

1. At least 10,000 tons of CO2-equivalent emissions reduced or avoided per year (target: 10,000);
2. Average % increase in cooperatives profit (target: estimated by USD 64,800.00 per year) (tbd in %).
3. Monthly energy cost savings in the cooperatives ($)

IX. SYSTEMIC IMPACT

The intention of this project is first to learn from the model, and if it is successful and cost-effective, try to replicate it among other cooperatives with which IHCAFE and AHPROCAFE have close ties and would be best suited. The project aims to influence local governments to improve environmental enforcement.

x. BASE LINE, MONITORING MECHANISM AND EVALUATIONS

At the beginning of the project a monitoring and evaluation system will be developed. This will include the development of a base line with relevant indicators. The base line will be done using different sources of information including but not limited to; producers survey, energy and water consumption audits, carbon footprint measurement, interviews with key informants to understand the situation before the intervention, including participatory rapid appraisal techniques. Special emphasis will be given to the challenges of women coffee producers to provide tailored technical assistance to these producers. Secondary data will also be collected from national household surveys, censuses and similar studies.

Monitoring mechanisms: A monitoring and evaluation plan will be developed. SNV has a monitoring tool called “PME tool” for recording changes in impact and result indicators. A midterm and final evaluation will be done.

Describe how the project will be evaluated.

Número de palabras:

A mid-term and a final evaluation will be carried out during the project execution period. A final evaluation will be carried out in the third year of the project using qualitative and quantitative data from the project's monitoring systems and through field visits. The evaluation will follow a non-experimental methodology. The final evaluation will be centered on the relevance, efficiency, governance arrangements, impact, and sustainability of the new model and of the project's other activities. Some of the strategic questions to pose include: (i) to what extent did the new green technologies expand production, improve quality, and reduce costs?; (ii) what are the costs and benefits?; (iii) to what extent has the new model increased incomes and created economic opportunities in the pilot cooperatives?; (iv) how did communities use or reinvest their profits from the productive enterprises?; (v) to what extent has the new model improved environmental sustainability and natural resource management? The findings, recommendations, learned lessons and potential for replication will be disseminated to interested audiences.

XI. EXECUTING AGENCY

SNV is an international nonprofit headquartered in The Hague, Netherlands. SNV has operated in Honduras since 1987 as a development NGO. In 2007, SNV obtained its legal status. SNV offers more than 20 years of experience providing technical assistance in the country, environmental sustainability, institutional development and organizational strengthening, in sectors such as agriculture (specifically coffee and horticulture), energy, among others. In Honduras, SNV has a technical team of eight advisers and a team of financial, administrative and support staff of eight people. For the implementation of this project, only SNV complied with the expected require technical experience in renewables and energy efficiency. The SNV budget in Honduras is 1.25 million euros. SNV implemented a regional program in partnership with the MIF, "Economic Inclusion of the Base of the Pyramid" that was successful. Currently, SNV is implementing a Program to develop the biogas market in Nicaragua which is co-financed by MIF, NDF, HIVOS and SNV. It is currently in implementation and is meeting its objectives.

SNV core business. SNV has defined a corporate strategy for 2007 to 2015 focused on two main areas: (i) increased production, income and employment, and (ii) access to basic services to alleviate poverty in developing countries. Under this approach, they have decided to focus and prioritize their efforts and resources to develop three main areas: a) Renewable Energy; b) Water, Sanitation and Hygiene; and c) Agriculture, with an axis of environmental sustainability and climate change. In the renewable energy sector, SNV's strategy is aimed at encouraging the production and use of biomass energy to improve the living conditions of poor families by generating new income and employment opportunities and reducing environmental pollution and negative effects of climate change.

Other partners. The Honduran Association of Coffee Producers (AHPROCAFE) will finance staff for the coordination of activities with its members, such as the promotion and awareness of the cooperatives selected for the project. The Honduran Coffee Institute (IHCAFE) will support promotion and awareness of the coffee sector. The selected cooperatives will finance with their own funds or by external financing (e.g. COMRURAL, CAMBIO, FLO, Root Capital, BANCAHFE, or others) the purchase of the biogas and bio-fertilizers plants, and any other infrastructure needed.

XII. PROJECT RISKS

(i) **Rust risk:** The occurrence of high destructive pest and disease will reduce coffee production by almost 50% for next years. This event can reduce the interest of producers and cooperatives to

Número de palabras:

implement the project activities. **Mitigation**: (i) the 3 cooperatives that will participate in the project have already confirmed their interest and commitment; (ii) these cooperatives will be able to have access to the Root Capital Facility that is currently being restructured to reactivate the sector after the damages caused by the rust.
(ii) **Lower prices in the international market**: Instability in the international coffee market may cause prices to decrease, affecting small producers.
(iii) **Sustainability risk**: The dependence on external biogas technology provider.

XIII. ENVIRONMENTAL AND SOCIAL ASPECTS

The project will help to develop a collective environmental awareness among the coffee industry. This project also plans to reach local governments, as a strategy to promote better environmental behavior in the coffee industry and to promote systemic changes in the long run. Moreover, the western region has a population of Chorti Maya that could be directly benefiting from this initiative. In addition to addressing cleaner production, the project will result in a healthier environment; will safeguard natural resources through reducing the environmental pollution.

XIV. COUNTRY OFFICE COMMENTS

As part of the strategic guidelines of MIF in Honduras, we have prioritized an increase in the number of interventions in the West and South regions of the country. These regions were selected as models in the National Plan, and specific actions are currently being developed to establish a local production model with emphasis on competitiveness, so this initiative would be responding to that element of increased focus. Coffee is the second best developed productive chain in the country and its production is located in the central and west regions, so that the intervention is strategically located.

Número de palabras: