

# CONILON

## Coffee

**3<sup>rd</sup> Edition**

Updated and expanded

*The Coffea canephora produced in Brazil*

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# Institutional Arrangement of Conilon Coffee Cultivation in the State of Espírito Santo

Antonio Elias Souza da Silva, Enio Bergoli da Costa, Romário Gava Ferrão  
and Luiz Antonio Bassani

## 1 INTRODUCTION

The chapter describes the institutional arrangement of cooperation, a conilon coffee production chain component, which has made available its skills and *expertise* using its differentiated and peculiar ways of acting in the direction of the activity technological and sustainable progress. It is notorious in it a kind of informal alliance, particular and specific by the acting nature that characterizes the participating institutions.

The institutional arrangement of cooperation is understood as the set of actions, mechanisms and processes that define the particular way of how actors are related and how institutional interests are developed in the implementation of a policy directed at a given productive activity, that is, refers to agglomerates of institutions that are interdependent in their ways of acting but, that in one way or another, complement each other, strengthening productive links and providing the State with the capacity to perform targeted public policies.

The construction of the conilon coffee institutional arrangement had its origin from the crisis of the arabica coffee crops eradication, which took place in the 1960s. As an agricultural alternative to this devastating action, the local government of the municipality of São Gabriel da Palha, located in the northwestern region of the State of Espírito Santo, in a visionary attitude, decided in the early 1970s, to produce and promote the production of coffee conilon seedlings, with technical assistance.

Along the conilon coffee development trajectory in the State, which has shaped and organized its productive chain, several institutions of various segments have been adding to this arrangement, lending their knowledge, skills and *expertise*, with a good level of commitment towards the consolidation.

In this chapter, in addition to some considerations about the institutional environment around conilon coffee, a space has been reserved where there are records, missions, efforts, programs and contributions of the institutions in the advancement of coffee, especially of this variety.

The institutional dimension of the productive arrangement reveals an enormous diversity of organizations, with their different ways of dealing with services for conilon coffee growers. There are several areas of institutional performance listed. In the eagerness to contemplate some of them, it is possible that others may not be properly highlighted, but it is recognized that the development of this product in the State is due to many more institutions than those that had space in this chapter. It is expected to unveil some of these organizations roles and how effectively each one operates or operated and participates or participated, in its own way, in the process of developing this activity in Espírito Santo.

## 2 THE INSTITUTIONAL ARRANGEMENT

Historically, there are many facts that mark the conilon coffee implantation trajectory in Espírito Santo. The first is attributed to the Governor Jerônimo Monteiro's decision to acquire seedlings and seeds of the species in 1912 and distribute them, according to what is found in his Final Government Report, in 1913.

However, there was a significant expansion of conilon coffee crops after the eradication period of the arabica coffee crops, when the warmer regions of Espírito Santo, below 400 m altitude, were not included in the crop renewal financing.

Thus, the beginning of the 1970s is considered the start of the conilon coffee institutional arrangement in the State of Espírito Santo. In this embryonic stage, the municipal government of São Gabriel da Palha, the Associação de Crédito e Assistência Rural no Espírito Santo-Acares (Association of Credit and Rural Assistance in Espírito Santo), the Cooperativa Agrária dos Cafeicultores de São Gabriel da Palha - Coabriel (Agrarian Cooperative of the Coffee Growers of São Gabriel da Palha) and the company Real Café Solúvel. With this, the actions of seedling development, technical assistance and market guarantee began.

Soon after, in 1972, Verdebras, a private company located in the aforementioned municipality, installed a nursery for the conilon seedlings production by seeds, with capacity for 300 thousand plants, which later became the pioneer also in commercial scale production of this culture clonal seedlings, essential to the expansion of plantations at that time (VERDEBRAS, 1995).

The commercial-scale production of conilon coffee, led by the local public power, was started then, supported by the supply of seedlings from the private initiative. Soon the production had the industrial segment support sustaining the manufacture of soluble coffee in the State. This was the beginning of the conilon coffee institutional arrangement that Espírito Santo currently lives in an expanded way.

Another moment of support for the institutional arrangement development came from the creation of the State Coffee Coordination in 1983 at the Secretaria da Agricultura, Abastecimento, Aquicultura e Pesca - Seag (Department of Agriculture, Supply, Aquaculture and Fisheries). From this fact, an agenda of interventions and actions follow-up that were already more than necessary for this product was established (SILVA et al., 2007).

In 1985, the State Government stops being an organizer to become an implementer

of important policies for the development of this coffee cultivation, placing the Empresa Capixaba de Pesquisa Agropecuária - Emcapa (Capixaba Agricultural Research Company) on the agenda of science and technology for the cultivation, especially in the selection of superior plants for the clonal varieties development. The official technical support services also included specific technology transfer actions in its technical agenda, through the Empresa de Assistência Técnica e Extensão Rural - Emater (Technical Assistance and Rural Extension Company).

It is important to remember that the Instituto Brasileiro Café - IBC (Brazilian Coffee Institute) already developed research actions for the species, whose results were essential to support the research work continuity over all these years.

The conilon coffee advancement in Espírito Santo is the result of an articulation and institutional involvement work that has been practiced throughout the last 45 years by several pioneer institutions, but has been intensified by the State in a more organized way and with concrete results from 1993, with the launch by the Instituto Capixaba de Pesquisa, Assistência Técnica e Extensão Rural - Incaper (Capixaba Institute of Research, Technical Assistance and Extension Rural), of the first clonal varieties.

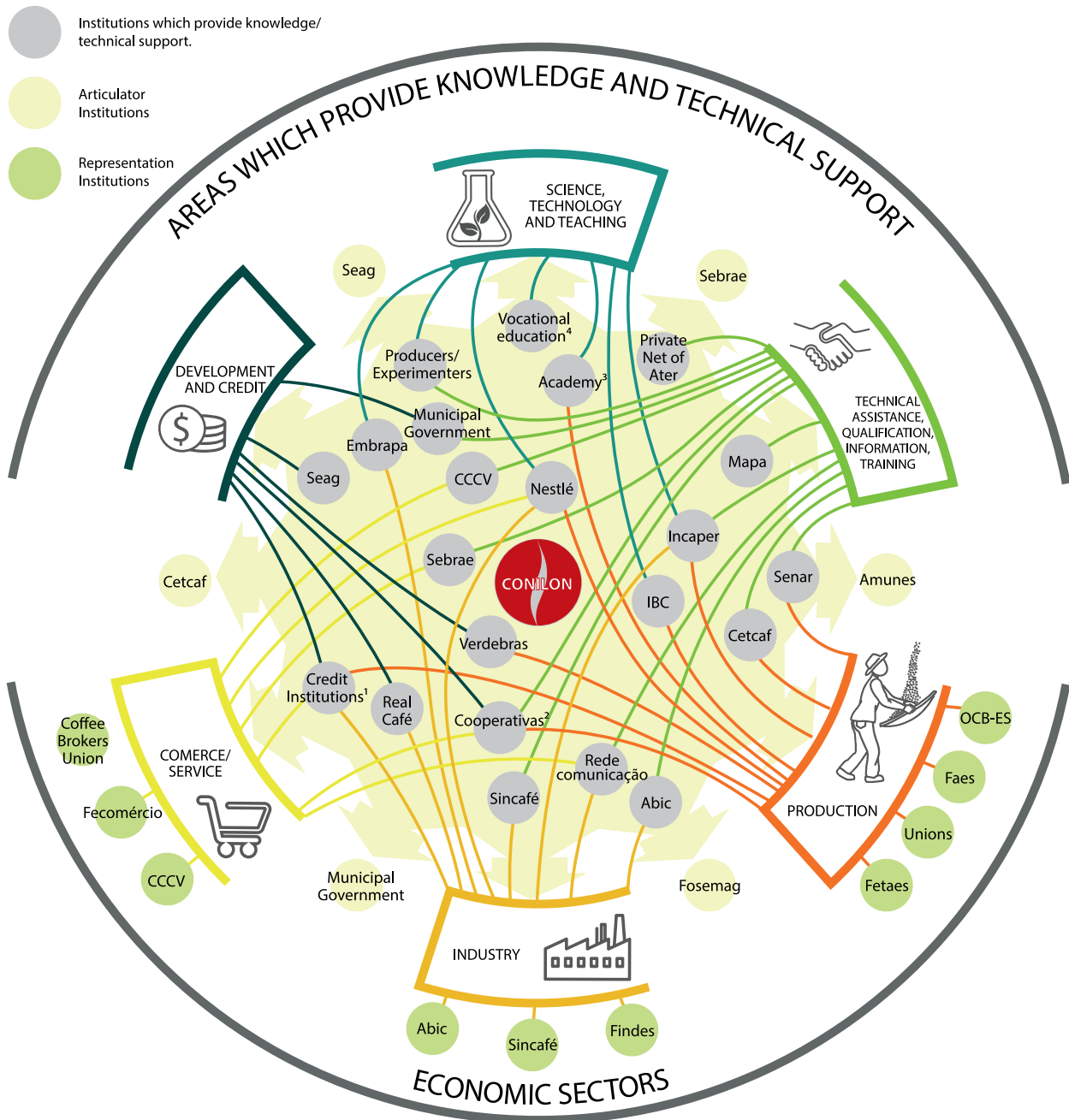
The installation of these varieties of clonal gardens at that time, in partnership with some municipal governments and Coaabriel, not only made it possible to accelerate the process of transferring these technologies, but also consisted of an important densification strategy of the institutional arrangement that dealt with this important productive chain which, over this period, has widened and diversified.

Because of this logic, a large institutional network was formed due to the need for access to technology that would later transform the technological profile of conilon coffee cultivation. Later, besides Incaper, other institutions started producing knowledge, such as Embrapa Café, an agency of the Empresa Brasileira de Pesquisa Agropecuária - Embrapa (Brazilian Agricultural Research Corporation), the Universidade Federal do Espírito Santo - Ufes (Federal University of Espírito Santo) and the Instituto Federal de Educação, Ciência e Tecnologia do Espírito Santo - Ifes (Federal Institute of Education, Science and Technology of Espírito Santo).

The participation of the institutions in this network, as illustrated in Figure 1, has brought, mainly, positive changes in the institutional environment, which started realizing that rural society and specifically the various segments must be guided towards knowledge and technological innovation, developing and building alliances to improve competitiveness.

In this sense, Villaschi Filho and Felipe (2010) observe that each one of these institutions operates with considerable effort of cooperation and interactivity, having as common goal the constant improvement of productive processes, mainly focused on the construction of new technological and productive competences.

This institutional base of technology generation and transfer allowed the construction of a new approach to the development policy of the conilon coffee cultivation of the State, established new relations between the public and private sectors and redirected the public power roles towards the creation of a suitable environment to rural development.



<sup>1</sup> Credit Institutions

- Banco do Brasil
- Banco do Nordeste do Brasil
- Banestes
- Bandes
- Sicoob
- Cresol
- Caixa

<sup>2</sup> Coffee Unions

- Cafesul
- Cafeicruz
- Coobriol
- Coocafé
- Coopeavi
- and others

<sup>3</sup> Academies

- Ufes (CCA, CEUNES)
- Ifes (Stª Teresa, Itapina, Alegre)

<sup>4</sup> Vocational Education

- Mepes
- Ceier
- Ifes
- Ufes

**Figure 1.** Institutional arrangement of conilon coffee based on organizations, providing knowledge, technological support and articulation and representation mechanisms in the State of Espírito Santo.

**Credit:** Illustration by Cristiane Silveira/Incaper.

This new vision made possible the development of shared responsibilities in the events organization, in the coffee growers permanent qualification and institutional agents, in supporting the process of technology transfer and in the construction of an integrated and cooperative environment between the institutions, necessary for the creation of synergies aiming at the execution of actions directed to this species productive chain.

The creation of an articulation and information, knowledge and technologies sharing environment by all the institutions working in the various segments of the production arrangement brought coffee growers closer to an innovative production, infrastructure and post-harvesting apparatus, management concepts and agroindustrial and market information. This was a great differential in the acceleration of the capacity process for appropriation and incorporation of the way of dealing with the activity.

This sharing has been strategic for the information exchange of all the agents and professionals that are distributed and participating of the diverse segments. In this regard, Villaschi Filho and Felipe (2010) highlight the local productive arrangement of conilon coffee as one of the most dynamic, successful and with better institutional deepening, focused on the centrality of knowledge, besides presenting significant institutional densification in all links.

It is important to emphasize that some organizations have multiple functions within the institutional arrangement, either by developing action in the field of knowledge generation and technology transfer, or in the articulation and representation functions of the production, industry and commerce segments.

The result of all this committed and shared institutional environment was and has been responsible for the construction of a technological base that has given support to the advance and the recent transformation of the conilon coffee cultivation, due mainly to two important generating factors: the speed of the process of generated technology transfer and the consequent increase in the level of its adoption. They have forged the proper profile of the conilon coffee cultivation that Espírito Santo is experiencing and that is recognized by other producing states of Brazil and admired in the world.

All the institutions that make up this great institutional arrangement have some kind of resource, *expertise* and knowledge that were and still are fundamental to the technology generation and transfer process. And so even these partnerships need to be continually stimulated, definitely strengthened and permanently valued.

### 3 THE INSTITUTIONS

In order to have a more adequate understanding of the institutional conilon coffee arrangement and to know a little of this network dynamics, responsible for the current stage of coffee production, the component institutions and their forms of action will be presented.

It is evident that this report, prepared by the institution itself, is not intended to deepen analyzes and discussions on how the interactions between them occur. The texts referring to



the institutions were written individually and succinctly, representing the action focus of the main partner entities of the productive arrangement.

These activities, each with its own characteristics, have revolutionized the services of development, supervision, teaching, researching, technical assistance, rural extension, rural credit, industry and commerce, including training and producers organization. It is they who, under the aegis of knowledge generation and their socialization, have given speed to the generation, diffusion and technologies transfer process at all levels.

### 3.1 SECRETARIA DE ESTADO DA AGRICULTURA, ABASTECIMENTO, AQUICULTURA E PESCA - SEAG (AGRICULTURE, SUPPLY, AQUICULTURE AND FISHERIES STATE DEPARTMENT)

Seag, as coordinator and organizer of the state agricultural public system, has as official institutions linked to it, for the implementation of the agricultural policies for coffee cultivation, Incaper and the Instituto de Defesa Agropecuária e Florestal do Espírito Santo - Idaf (Agricultural and Forestry Defense of Espírito Santo).

However, the actions directed to this activity, are based on the set of institutions active in the productive arrangement of this product, which have historically been proactive and partners.

The main actions organized for the coffee cultivation in the State of Espírito Santo are contemplated in the Renovar Café Arábica (Renew Arabica Coffee), Qualidade Conilon (Conilon Quality), Renova Sul Conilon (Renew South Conilon) and Calcário Correto (Correct Limestone) programs, coordinated by Seag and executed by Incaper.

These programs always aim to increase productivity and improve the final quality of products (arabica and conilon), with focus on economic, social and environmental aspects, necessary to ensure the Capixaba coffee business sustainability. Of these programs, two are directed specifically to the south of the State, since this region needs to advance further in the increase of the average productivity, that figures comparatively very inferior to the north of the State.

The anchored guidelines of these actions have been the Plano Estratégico da Agricultura Capixaba - Pedagog (Capixaba Agriculture Strategic Plan), built in partnership with the representations of the production chain in 2003, reviewed and expanded in 2007, with a horizon up to 2025.

Seag has a historical participation in the conilon coffee trajectory in the State in several important moments, whose highlight falls on 1983 with the creation of the Coffee State Coordination, assuming a research program and official technical assistance, from 1985, under the execution of the institutions responsible for these services at the time.

There were numerous actions carried out under its coordination throughout the history, trajectory and evolution of conilon coffee in the State until the present day, however, it will be emphasized some lines currently practiced and that are contemplated in the programs directed to the activity.

### **Renewal and recovery of coffee plantations**

The renewal of conilon coffee plantations is done through new plantings to replace old or decrepit crops.

The availability of genetic material for the renewal of the conilon coffee planting area has as its source 220 clonal gardens implemented in the State by Seag/Incaper, through the transfer of superior genetic material cuttings provided to private nurseries, cooperatives and municipal governments.

The coffee grower has direct access to this technology through various state and municipal programs and projects, or can purchase directly from registered nurseries at the Ministério da Agricultura, Pecuária e Abastecimento - Mapa (Ministry of Agriculture, Livestock and Supply), encouraged by the sequential productivity and quality breeding campaigns developed, every year, by the Government/Seag and by the demand market.

It is estimated that between 2011 and 2014, from 50 to 70 million conilon coffee seedlings, mostly varieties researched and recommended by Incaper, were made available from 2011 to 2014 from clonal gardens implanted by the State Government and other bases. This amount was sufficient to renew more than 20 thousand ha of the conilon coffee cultivated area per year, which is equivalent to an average of 7% per year of renewal.

### **Actions with regional focus**

Under the general coordination of Seag and technical execution of the Incaper, the Renova Sul Conilon Program was launched at the Fazenda Experimental de Bananal do Norte (Experimental Farm of Bananal do Norte)/Incaper - Pacotuba, Cachoeiro de Itapemirim, in 2012, which brings in its core the strategy of stimulate this species production in the region, given that the technical indicators of the north of the State are much higher.

The program contemplates 28 municipalities in the South of the ES, involving 7 thousand properties, 20 thousand families and 60 thousand people. The region encompassing the program has an average productivity 30% lower than the State conilon average.

The main goals of the program until 2025 for coffee cultivation, according to Pedeaq, is to renew and reinvigorate 5% of the coffee conilon area per year (6 thousand ha); to reach the average productivity of Espírito Santo (43 bags/ha); increase production from 1.6 to 3.0 million bags (87%) and produce at least 20% of premium conilon coffee (600 thousand bags).

The main actions undertaken in 2014 in the program were: provision of technical assistance and rural extension services to farmers in the region covered by the program; training of coffee growers and technicians; 500 kg of seeds of the variety 'Emcapa 8151-Robusta Tropical' for the renewal of crops; availability of 500 thousand cuttings of the superior varieties recommended by Incaper; about 50 thousand cuttings of the 27 clones of the new clonal varieties 'Diamante ES8112', 'ES8122 - Jequitibá' and 'Centenária ES8132' for nursery registered on Mapa, association of producers, municipalities and educational institutions aiming at the implantation of clonal gardens.

A course was also held involving theoretical contents and also the practical part for 72 professionals from Incaper, Senar, Ifes, CCA/Ufes, municipal governments and cooperatives

working in the area of the program, aiming at updates on technologies associated with renewal and reinvigoration of crops (seedlings, varieties, pruning, fertilization, pests and diseases).

40 new clonal gardens of the cultivars Diamante, Jequitibá and Centenária were implanted in the area covered by the program. This network of clonal gardens has the potential for producing in 2016 about 15 million seedlings per year that will be used to renew the crops in the south of the state.

### **Coffee Quality Improvement Campaigns**

Improving the coffee quality is a path to be followed because it is required by the market and especially by consumers. The main objective is to advance even further towards the conilon and arabica coffees quality in the State of Espírito Santo.

Therefore, since 2008, every year, the State Government, through Seag and Incaper, launches editions of campaigns to promote the quality of the Capixaba coffees. The action consists in the accomplishment of a set of activities in order to enable and make the coffee grower aware about the importance of producing quality and the ways to achieve it. This event always happens on May 14, the official date that marks the beginning of the conilon coffee harvesting, whose theme of the last editions was "It's the Espírito Santo producing quality coffees". Normally, there are 500 to 1,000 coffee grower, as well as representatives of cooperatives, unions, private organizations and authorities.

### **Calcário Correto (Correct Limestone) Program**

In order to promote productivity growth, improve coffee quality through the strengthening of technology transfer actions, following the sustainability concept the Government/Seag/Incaper implemented the Programa de Incentivo à Utilização de Calcário - Calcário Correto (Incentive Program of Limestone Use - Correct Limestone) in the southern region of the state, supported by research results that affirm that this input, when properly applied, is capable of increasing the coffee plantations productivity by up to 30%.

The reasons for this program are based on the fact that the soils of the state of Espírito Santo have high acidity and low levels of some nutrients, mainly calcium (Ca) and magnesium (Mg), essential for the development of plants and obtaining satisfactory productivity. Therefore, the correct use of limestone as demonstrative effects to farmers is a great strategy to promote low-cost productivity.

The Calcário Correto Program was launched and implemented throughout 2014, with the general objective of encouraging the use of dolomitic limestone in selected family farms in municipalities in the southern region of the State of Espírito Santo, to renovate or invigorate coffee areas.

The program also had strong support from the technical assistance service and the rural credit mechanism, which benefited 2 thousand family farmers in 29 municipalities with the development of 4 thousand tons of limestone.

It is understood that the Calcário Correto Program, rather than benefiting family farmers, through a public selection instrument, leaves a very important legacy, considering that the

beneficiary areas are used by the state rural extension network as demonstration units to other farmers, showing that it is possible to improve crop productivity levels, at a time of crisis, using limestone as the input of greater response with low cost.

#### **Support to coffee farmers' organizations with facilities, machinery and equipment**

Over the last few years, Seag has made available various types of machines and equipment for the collective use of associations and coffee farms' cooperatives, with the predominance of family farmers in their social settings.

In four years from 2011 to 2014, the State Government granted through Seag 182 dryers, 79 processing machines and 13 pulping machines, in addition to 60 trucks to aid in the production transportation, both in the crop and to trade the product.

In order to certify the quality of coffee production, guide the action of the technical assistance network, ensure fair prices and give transparency to the marketing process, Seag provided enough equipment for the implementation of 25 coffee-tasting rooms. They are located regionally in strategic points of the State and are operated by producer organizations or municipal governments.

#### **Support for technical and scientific events**

Seag sponsors and supports events held by partners that stimulate the coffee cultivation development in Espírito Santo. They are congresses, conferences, symposiums, courses, meetings, quality competitions, among other special events that take place every year.

### **3.2 INSTITUTO CAPIXABA DE PESQUISA, ASSISTÊNCIA TÉCNICA E EXTENSÃO RURAL - INCAPER (CAPIXABA INSTITUTE OF RESEARCH, TECHNICAL ASSISTANCE AND RURAL EXTENSION)**

Incaper is a local authority with legal personality of internal public law, with its own equity, technical, financial and administrative autonomy, linked to Seag.

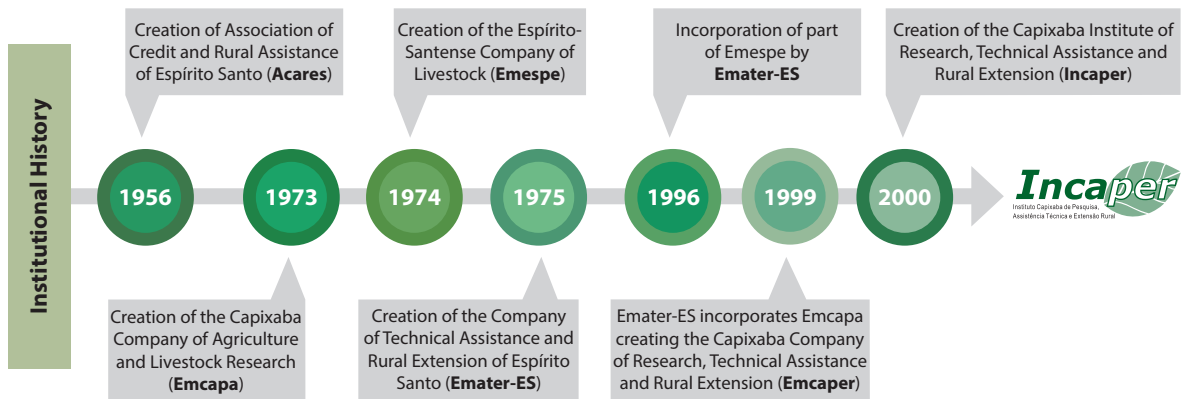
The Institute develops an important work in the rural area of the State of Espírito Santo that reflects on the society as a whole, since it has great experience in the integration between research and extension, especially for family farmers, the actors in the coffee chain that are the in rural areas and hold the largest national and state participation in food production.

It is the main institution generating and socializing knowledge, technology and information for the productive arrangement of conilon coffee in the State of Espírito Santo. Together with dozens of partner organizations, public or private, it has led throughout the last decades a continuous innovation process, with the main result being the improvement of the conilon coffee growers competitiveness, which increases productivity, improves quality and reduces unit production costs in a technological revolution that impresses the world coffee industry of the Robusta group.

Naturally, it leads the productive arrangement of Conilon in view that it technically coordinates the main programs, projects and guiding actions for the coffee industry development in Espírito Santo.

### Institutional path

In 2016 it is Incaper's 60 years anniversary. It began its activities on November 16, 1956, based on credit support services and technical and social assistance. During this period, many institutional transformations took place in order to better meet the rural demands, integrate actions, reduce administrative and operational costs, potentiate synergies aimed at speeding up the process of generation and socialization of technologies and knowledge that contribute to the rural development. Figure 2 shows the timeline of institutional changes experienced by Incaper.



**Figure 2.** Incaper's institutional path.

**Source:** Incaper (2016).

Overall, it has already been 60 years of technical assistance and rural extension and 43 years of agricultural research. Since 1999, Incaper has integrated these services, whose results have made the body known and recognized nationally and internationally in this shared model of generation, diffusion, transfer, socialization and access to knowledge and technologies. For this purpose, it has about 750 effective active servers, including researchers, extension agents, administrative staff and support staff. As a result of technical and financial cooperation, there are another 50 collaborators, including scholars and trainees.

### Physical and Organizational Structure

Based in Vitória/ES, Incaper presents its functional physical structure settled on the concept of administrative or operational regions defined based on the social economic dynamics, also taking into account relevant aspects of State transportation and communication logistics.

In its headquarter, the managerial function is performed by the coordinator of the finalist programs defined by the State Government guidelines for the sector under the general coordination of Seag.

In each administrative region, the operational function is exercised by the Centros Regionais de Desenvolvimento Rural - CRDR (Regional Rural Development Center), which are responsible for implementing the Pesquisa, Assistência Técnica e Extensão Rural - Ater (Research, Technical Assistance and Rural Extension Programs).

Present in all Capixaba municipalities, Incaper currently has 84 Ater offices, of which 77

are Escritórios Locais de Desenvolvimento Rural - ELDR (Local Rural Development Offices), in the municipalities' head offices and seven other District Offices for Rural Development. There are 4 CRDRs 12 Experimental Farms, 3 Training Centers and 13 research labs.

This structure gives the Incaper a unique capillarity compared to the other institutions that work in the rural area of Espírito Santo and also, proportionally, to those that operate in the national scope.

In support of the planning and execution of its services, Incaper maintains the spatial data infrastructure, the Sistema Integrado de Bases Geoespaciais do Estado do Espírito Santo - Geobases (Geospatial Base Integrated System of the Estate of Espírito Santo) and the Sistema de Informações Meteorológicas (Meteorological Information System). Figure 3 shows the distribution and location of the operational units and coverage area of the regional ones.

### **Laboratories chain**

Incaper has a chain of laboratories in the CRDRs, located in its research bases in Linhares and Domingos Martins.

The primary function of these units is to support research programs; but also provides services to producers and other segments of the sector.

Currently, several laboratory actions are carried out, of which 12.8 thousand samples were processed in 2014 and 113.7 thousand analyzes and diagnoses were performed, the great majority of which is demanded by farmers.

### **Experimental Farms**

These are public properties located in representative areas of the State, equipped and prepared for the development of research actions and technology transfer, for a total of 12 units. Of these, especially three contemplate a defined programmed base for conilon coffee.

There are numerous research projects, with their respective experiments (more than 2 thousand genetic materials), germplasm banks with 500 accessions, clonal gardens, seed production field, observation and demonstration units that are fundamental to the training process of the extension network technicians and coffee growers.

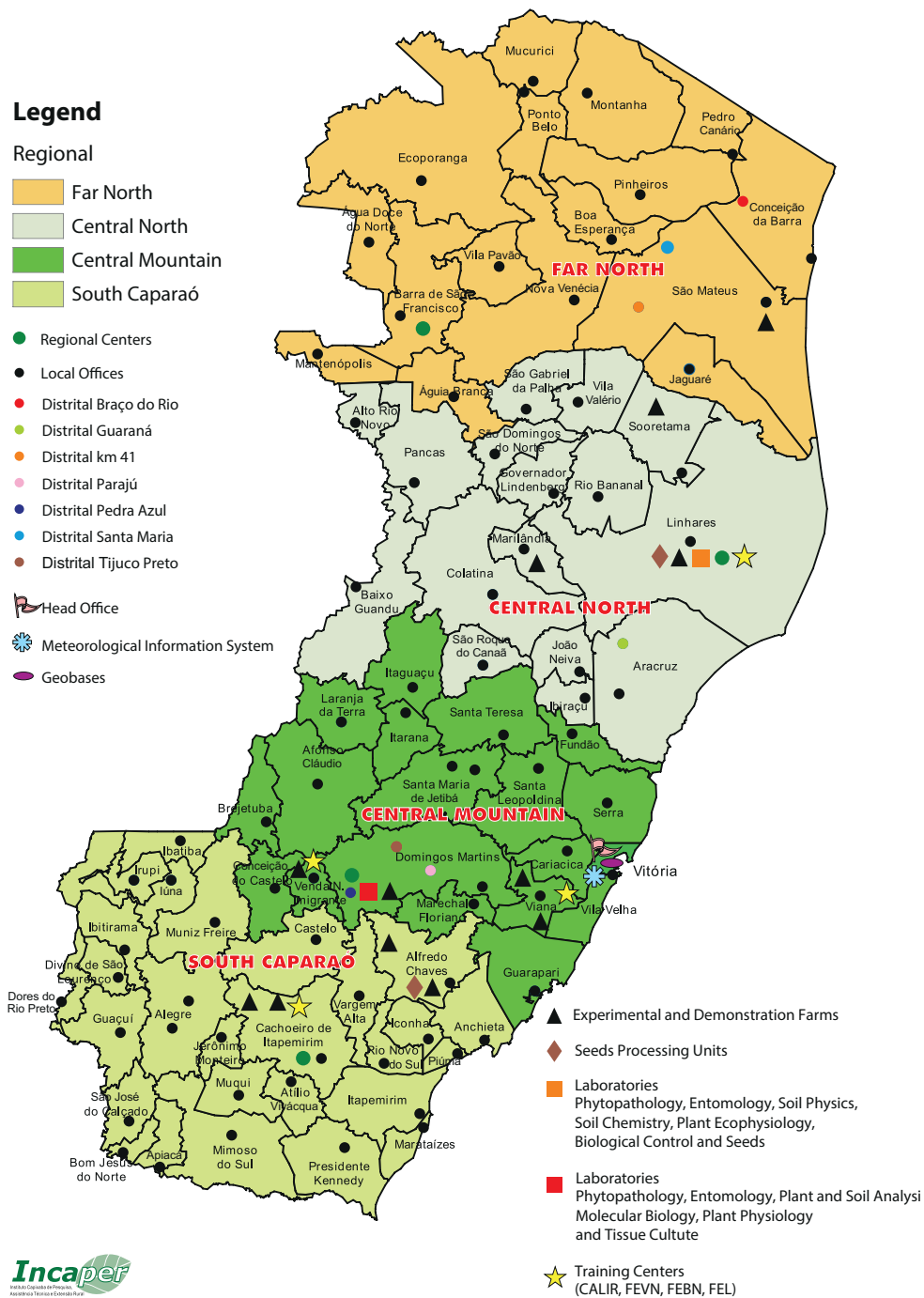
Experimental Farms, with their field facilities installed, have exerted demonstrative effects necessary to the technology transfer process, since they are seen as "technological showcase", and the actions carried out in those areas contemplate all the technologies that, if adopted by the coffee growers, can promote important productivity and quality differentials.

These structures have played an important role in the technologies generation and dissemination, necessary for the conilon coffee advancement. It is, therefore, appropriate to make a brief reference to them.

### **Fazenda Experimental de Marilândia - FEM (Experimental Farm of Marilândia)**

This property has a total area of 83.88 ha. It is currently the main research and technology transfer base for conilon coffee in the State of Espírito Santo and one of the most important in Brazil.

In 1978, it was transferred to Emcapa Incaper, through a lending contract by Embrapa.



**Figure 3.** Incaper regional map with its facilities.

**Source:** Incaper (2015).

The research actions developed by the IBC, even before that date, did not suffer a continuity solution, considering the agreement established between that state company and this institute, whose term was closed in 1984.

Since 1985, with the State incorporating research actions in conilon coffee in its official schedule, the state research institution started running the FEM.

Located in the municipality of Marilândia, at an altitude of 140 m in relation to the

sea level and with representative edaphoclimatic and topographical conditions of the northwest region of the State, the Experimental Farm, in those 30 years, has executed a broad research, diffusion and technology transfer program, which generated a series of important technological innovations for agribusiness, including inbred varieties, including the launch of the first three in 1993.

In addition to housing 15 projects and more than 60 research actions developed by the Institute from the technology transfer point of view, it has demonstration units, seed production fields, clonal gardens, nursery seedlings, Banco Ativo de Germoplasma - BAG (Germplasm Active Bank), seed processing and production unit and coffee tasting room. This structure allows producers, technicians to be trained and has potential to provide more than 3 thousand kg of seeds per year, with also the potential for producing more than 500 thousand cuttings and 100 thousand seedlings of the inbred cultivars launched by Incaper.

It owns an important conilon coffee BAG the world scenario, currently constituted by 500 accesses. This bank is made up of genetic materials that present interest characteristics, such as: clones, clonal varieties, varieties and hybrids propagated by seeds.

With this technological apparatus, the FEM has been constantly visited by producers, researchers, technicians, political authorities, representations of all coffee segments, registering an average annual visitation of 2 thousand visitors and can reach up to 4 thousand.

This unit has been presented as the referential base of advances in research, transfer and promotion of conilon coffee in the State, in Brazil and in the world.

#### **Fazenda Experimental de Sooretama - FES (Experimental Farm of Sooretama)**

Located in the municipality of Sooretama, north of Espírito Santo, at 75 m altitude, on the left bank of the BR 101, km 117- N, this facility has housed since 1987, the main research projects responsible for technological conilon coffee arrangements.

Totaling 193.60 ha, FES hosts seven projects and 25 research actions, in addition to four clonal gardens with potential for production of 500 thousand cuttings per year, demonstration units that have supported the technology transfer work in the State.

It hosted the launch of the clonal varieties 'Emcapa 8141- Robustão Capixaba' in 1999 and 'Vitória - Incaper 8142' in 2004, receiving, on occasions, a large contingent of coffee growers.

It has basic structure for coffee post-harvesting and agroclimatological monitoring station, important for research support.

With this technological apparatus and all that it has represented for the research work and transfer of conilon technologies, FES is a strategic enterprise for the coffee industry of the State of Espírito Santo.

#### **Fazenda Experimental de Bananal do Norte - FEBN (Experimental Farm of Bananal do Norte)**

Located on Highway 482, between the communities of Pacotuba and Burarama, km 2.5, in Cachoeiro de Itapemirim the FEBN, at an altitude of 146 m, has been under the administration of Incaper since February 1980, thanks to the loan agreement signed in the occasion, between the Empresa Brasileira de Assistência de Técnica e Extensão Rural -



Embrater (Brazilian Company for Technical Assistance and Rural Extension), already extinct, and Emcapa. Currently, it is run by Incaper through a loan agreement with Embrapa.

With 200 ha, it has 12 projects and a further 50 research actions, as well as clonal gardens, demonstration units, beans processing and drying unit and coffee tasting room, which has supported technology transfer research in the State.

In this unit, several actions are developed in the fruit growing, forestry and conilon coffee-growing areas in the sense of also forming “technological showcases” in order to boost agribusiness in the south of the State, considering that this sector is not very dynamic.

The Experimental Farm also has a training center, agroclimatological station and greenhouse, fundamental structures for the training of producers and support to research.

Especially for conilon coffee, from 2004, an extensive schedule was conceived and implemented to reproduce the model successfully executed in the northern units. In this farm, more than 700 conilon and robusta coffee genetic materials involving clones and progenies are evaluated. Five clonal gardens with potential for production and availability of more than one million cuttings per year of varieties generated by Incaper for the producers of southern Espírito Santo are also conducted.

It has demonstration units and clonal gardens of inbred varieties aimed at facilitating the technology transfer work, either by the demonstrative effect of the research results or by the availability of superior genetic material for nurseries and producers in the region. Other plant nutrition and management work is also being conducted.

The strategy of building an important base of technology generation and transfer for conilon coffee in the south positions FEBN as a reference for producers who wish to transform their crops profile and, consequently, to make this attitude in that region more dynamic.

From this operational base, several clones were selected, which were grouped with others, for the development of the last three clonal varieties generated by Incaper, where the event of launching of Centenária, Jequitibá and Diamante cultivars was also held in 2013.

### **Fazenda Experimental de Venda Nova do Imigrante - FEVN (Experimental Farm of Venda do Imigrante)**

In recent years, Incaper has opened a new research front with conilon coffee in regions of high altitude and milder climate, typical for the cultivation of arabica coffee. Thus, FEVN, located in the municipality of Venda Nova do Imigrante, mountainous region of Espírito Santo averaging 760 m altitude, and main base in arabica coffee research, currently counts with two projects and four research activities, a coffee-testing room, and a laboratory for post-harvesting evaluations of all conilon coffee experiments.

### **Some performance indicators**

Incaper operates in the research, development and innovation field in various cultures and areas of knowledge, with relevance in coffee cultivation, fruit growing, forestry, olericulture, fishing, aquaculture, livestock farming, organic agriculture, family farming and non-agricultural activities such as agrotourism, handicrafts and agroindustry by artisanal process.

However, most of the workforce focuses on coffee production, which leads the agenda of the institute's projects, with 28% of the total conducted by the agency. There are about 50 projects and 180 experiments and actions of research and development in coffee, mainly for the productive arrangement of conilon coffee. 70% of the species projects are ongoing and 75% of the experiments were performed by the Institute, in coffee production as a whole.

This agenda prioritization, over the decades, generated an accumulation of technologies and knowledge that gave support, technical safety and efficiency to the productive sector of the coffee industry of Espírito Santo, especially for the conilon cultivation. Superior varieties, nutrition and irrigation methods, plant management, pruning, among others can be highlighted.

From the point of view of technical assistance and rural extension, Incaper reaches a total audience, without repetition, of almost 70 thousand people over each year. About 40% of the total assisted group, that is, the 29 thousand beneficiaries with these services are arabica coffee (10.3 thousand) and conilon (18.7 thousand) farmers.

For the knowledge socialization, Incaper adopts individual methodologies, in which technical and group visits such as courses, field days, meetings, symposia, demonstration units, workshops and others stand out. And it is precisely the group methodologies that ensure a greater range of services for coffee growers.

On average, throughout each year, between 1.2 and 1.3 thousand group-specific methodologies are carried out for coffee growing, which gives an average of six events per each working day. Again, there is a greater effort in conilon coffee-growing, with almost 900 annual events, which is justified because it is the most important agricultural activity in Espírito Santo.

### 3.3 INSTITUTO DE DEFESA AGROPECUÁRIA E FLORESTAL DO ESPÍRITO SANTO - IDAF (INSTITUTE OF AGRICULTURAL AND FOREST DEFENSE OF ESPÍRITO SANTO)

Idaf is the entity responsible for the implementation of the State's agrarian policy regarding public lands, for the execution of the cartographic policy and for the execution of the sanitary defense policy for agricultural and forestry activities. Regarding the coffee production chain, the agency stands out in the inherent issues of environmental licensing of the beans drying and processing activities, as well as controlling the consumption of forest products and/or by-products.

With the evolution of the technologies used in the coffee crop, productivity and production reached very high levels, which made the beans drying in farmyards deficient. Currently, mechanical drying of beans is widely used and as there is smoke and solid waste production in the drying and plowing process of coffee, the activity is classified as potentially polluting, requiring, therefore, environmental licensing, that is authorized by the Institute that disciplined the matter with the edition of Normative Instruction N° 11 of October 23, 2014 and Normative Instruction N° 3 of February 3, 2014.

The institute also performs, along with the environmental licensing, registration of individuals and companies that exploit and/or consume products and/or forestry products, as provided for the State Decree N° 608-R of March 9, 2001. Coffee dryers mostly use firewood from exotic and native origin, the latter to a lesser extent, as fuel in furnaces for the production of heat.

Acting on these lines, Idaf ensures that the coffee beans drying and processing are carried out within the environmental standards, ensuring the production chain sustainability.

### 3.4 EMBRAPA CAFÉ - CONSÓRCIO BRASILEIRO DE PESQUISA E DESENVOLVIMENTO DO CAFÉ - CBP&D/CAFÉ (BRAZILIAN COFFEE RESEARCH AND DEVELOPMENT CONSORTIUM)

In the last decades, coffee production in Brazil has been responsible for about one third of the world market (ICO, 2015). In addition, the country is also the largest exporter of green coffee and has remained the second largest consumer. This Brazilian role is mostly a result of the institutions and partners of the Consórcio Brasileiro de Pesquisa e Desenvolvimento do Café - CBP&D/Café (Brazilian Coffee Research and Development Consortium) actions, created in 1997, which was coordinated by Embrapa Café from 1999 onwards.

Thus, to coordinate CBP&D/Café, Embrapa Café was created as part of Embrapa's structure with the primary purpose of promoting, promoting and supporting coffee research and development activities in the company and in the CBP&D/Café institutions. In this sense, Embrapa Café's mission is to "coordinate the performance of the coffee research program and enable innovative technological solutions for the sustainable development of Brazilian coffee agribusiness" (EMBRAPA CAFÉ, 2012).

CBP&D/Café is a congregation of research and development institutions that aim to provide technological support to the coffee agribusiness in Brazil. It was created in March 1997 by ten Brazilian coffee research and development institutions (EBDA, Embrapa, Incaper, Epamig, IAC, lapar, Pesagro-RIO, MA/SARC, UFLA and UFV), with Embrapa as the coordinator institution (Figure 4).



**Figure 4.** Founding institutions of the Consórcio Brasileiro de Pesquisa e Desenvolvimento do Café - CBP&D/Café (Brazilian Coffee Research and Development Consortium).

**Source:** Coffee Research Consortium (2015).

### 3.5 INSTITUTO BRASILEIRO DO CAFÉ - IBC (BRAZILIAN COFFEE INSTITUTE)

Founded in 1952, the IBC defined Brazil's coffee policy, coordinated and controlled its strategy from production to internal and external trading, developed research and studies, and provided technical and economic assistance to coffee cultivation until 1989. It was extinguished in 1990.

It developed a series of important works for conilon coffee cultivation, mainly in the introduction of the vegetative multiplication studied in the Ivory Coast, from 1962. It has contributed to other researches and studies in the field of seedlings multiplication and production and selection of parent plants of the species (PAULINO; PAULINI; BRAGANÇA, 1994).

### 3.6 SUPERINTENDÊNCIA FEDERAL DA AGRICULTURA NO ESPÍRITO SANTO-SFA-ES (FEDERAL SUPERINTENDENCY OF AGRICULTURE IN ESPÍRITO SANTO)

SFA-ES, is a decentralized Mapa unit that has the mission of promoting the sustainable agribusiness development and competitiveness for the benefit of Brazilian society. Within the coffee production chain (*Coffea canephora* Pierre ex A. Froehner), the actions carried out in the area of seeds and seedlings control and in agricultural policy and development stand out.

The inspection of seeds and seedlings by SFA-ES aims to ensure the identity and quality of the coffee seeds and seedlings produced and marketed in the State of Espírito Santo, currently covering a universe of 278 coffee seedlings producers and 81 million seedlings of the species.

The obligation to carry out coffee root analysis in order to verify the presence of *Meloydogyne* sp., before trading the seedlings, was an advance achieved with the edition of Normative Instruction N° 35, of November 29, 2012, which established the rules for the production and marketing of coffee propagation material and its patterns.

With validity throughout the national territory, this Regulation, based on the researchers and technicians of the State of Espírito Santo knowledge about the robusta coffee cultivation, which had the task of drafting the legal rule regarding this species, was constituted in a regulatory framework of culture for the whole Country.

The edition of IN 35/2012 allowed an improvement in Mapa's inspection and identity and quality assurance actions culminating with the accreditation in the Registro Nacional de Sementes e Mudas - Renasem (National Register of Seeds and Seedlings), of Ufes laboratory-*Campus* São Mateus, for the accomplishment of the analyzes of roots sent by the coffee seedlings producers of the State and of other Federation units and of Mapa fiscal samples itself.

Another important aspect of SFA-ES's work in the robusta coffee segment is the product value through public policies, such as the Agricultural and Livestock Plan.

### 3.7 COMPANHIA NACIONAL DE ABASTECIMENTO - CONAB (NATIONAL SUPPLY COMPANY)

Linked to Mapa, Conab is represented in the State by the Regional Superintendence of Espírito Santo, which performs several activities related to conilon coffee.

#### **Coffee Harvesting Survey**

This work is carried out in partnership with Incaper and, for this purpose, the body has developed, together with the Instituto Nacional de Pesquisa Econômica - INPE (National Institute of Economic Research), a scientific statistical methodology to be applied in coffee producing states, with the use of geotechnology by Conab and the Geobases of Incaper.

#### **Production Costs Survey**

Conab holds periodic meetings with producers, Incaper technicians, financial agents, cooperatives, unions to define technical coefficients for the conilon coffee cultivation in order to elaborate its production cost. Based on this survey and in other factors, the Federal Government sets the minimum price.

Through technical work developed by the Espírito Santo Regional Superintendence, in 2010, conilon coffee was included in the Política de Garantia de Preço Mínimo - PGPM (Guaranteed Minimum Price Policy), benefiting thousands of coffee producers in Brazil, since the Federal Government only bought the arabica coffee the mentioned policy.

#### **Market follow up**

Conab weekly researches the conilon coffee wholesale prices and received by the producer, which are published in the Sistema de Informação Agropecuária e de Abastecimento - Siagro (Agricultural and Food Information System). This research is intended to serve the Programa de Garantia de Preços para Agricultura Familiar - PGPAF (Family Farm Guaranteed Price Program), whose objective is to provide assistance to the Programa Nacional de Fortalecimento da Agricultura Familiar - Pronaf (National Program for Strengthening Family Agriculture), with the release of bonuses, when the settlement of agricultural market price is below the guaranteed minimum price in sales time.

#### **Market regulation**

Market regulation operations are executed when the prices received by producers are below the guaranteed minimum price.

The Federal Government via Conab uses several instruments to intervene in the market:

- Aquisição do Governo Federal - AGF (Federal Acquisition Regulation): when the Government intends to acquire the coffee;
- Contrato de Opção de Compra (Purchase Option Agreement): In this modality the Federal Government uses the Bolsas de Mercadoria e o do Sistema Eletrônico de Comercialização - SEC (Commodities Exchanges and the Electronic Trading System) of Conab.

#### **Storage**

The agency has a chain of Storage Units in Espírito Santo, located in the municipalities of

Vitória, Colatina and Itapemirim, with capacity of 140 thousand tons.

### **Coffee Classification and Tasting Station**

For this item, the institution has in the Storage Unit of Camburi, located in Vitória, a Grains and Coffee Beans Classification Station, being the only State accredited by Mapa in issuing the Coffee Classification Certificate.

## **3.8 VERDEBRAS**

Verdebras, in its time, was the most traditional private enterprise in the conilon coffee seedlings production of the State. It had its origin in 1972, producing seedlings initially originating from seeds. From 1984, it adopted the vegetative propagation technique, being considered a pioneer in the clonal seedlings production in commercial scale in the State of Espírito Santo.

Its production base was based on a selection process of plants considered superior from its farm located in Córrego Bom Futuro in the municipality of Vila Valério, set in 1975. Of the 105 thousand coffee plants, 290 parent plants were selected for eight agronomic characteristics considered desirable. Of these, through a more strict selection process, it was reduced to 130 and finally to 23 clones, which constitute the genetic base, arranged in a clonal garden of 30 thousand plants (VERDEBRAS, [1994?]). This company was essential in supporting seedling development at the beginning of coffee commercial production. Their clones are still present in the plantations of Espírito Santo.

## **3.9 CENTRO DE CIÊNCIAS AGRÁRIAS DA UNIVERSIDADE FEDERAL DO ESPÍRITO SANTO - CCA/UFES (CENTER OF AGRICULTURAL SCIENCES OF THE FEDERAL UNIVERSITY OF ESPÍRITO SANTO)**

The CCA/Ufes came from the incorporation of the former Escola Superior de Agronomia do Espírito Santo- Esaes (Agronomy Higher School of Espírito Santo), an organization subordinated to the State Education Department, created on August 6, 1969 by then Governor Christiano Dias Lopes Filho. Since 1976, Esaes has been renamed Centro Agropecuário da Universidade Federal do Espírito Santo - Caufes (Agricultural Center of the Federal University of Espírito Santo) and in 2001, Caufes became known as the Centro de Ciências Agrárias da Ufes- CCA/Ufes (Agricultural Sciences Center of Ufes).

The CCA/Ufes is an academic-administrative unit located in Alegre, in the southern State of Espírito Santo, which operates based on teaching, research and extension producing and socializing knowledge to form citizens with the ability to implement solutions that promote sustainable development. This center offers 17 graduation courses, six master's and three doctoral courses, exercising scientific and cultural leadership in the south of the State of Espírito Santo, accounting for the great majority of the training segments of professionals of higher level, master's and doctorate and playing a very important role in the knowledge production and diffusion.

The CCA/Ufes has three experimental areas that are located in Rive, Alegre district, São José do Calçado and Jerônimo Monteiro, and has the following objectives: a) to support and collaborate, as a priority, with courses in the area of Agrarian Sciences in teaching, research and extension; b) support other CEC courses in its didactic-scientific activities and institutional development; c) serve as a basis for the knowledge production and conservation and technology transfer activity.

Due to the CCA/Ufes activities in the regional development, seeking to solve, among others, problems in the agriculture area, the Post-Graduation Programs in Plant Production and Genetics and Breeding have contributed to the strengthening of regional socioeconomic development, generating qualified and specialized human resources, employing and creating technologies appropriate to the conilon coffee cultivation.

The CCA participates actively in an integrated manner for the sake of the development of conilon coffee-grown in the state of Espírito Santo enabling administrative support and formal and qualified institutional involvement. In this respect, many undergraduate and postgraduate studies have been carried out in partnership with other institutions, such as Incaper, Embrapa Café, Consórcio Pesquisa Café (Coffee Research Consortium), Empresa de Pesquisa Agropecuária de Minas Gerais - Epamig (Agriculture and Livestock Research Company of Minas Gerais), Instituto Federal de Educação, Ciência e Tecnologia do Espírito Santo - Ifes (Federal Institute of Education, Science and Technology of Espírito Santo), Coordenação de Aperfeiçoamento de Pessoal de Nível Superior - Capes (Coordination of Graduated Professionals' Improvement), Fundação de Amparo à Pesquisa e Inovação do Espírito Santo - Fapes (Research and Innovation Support Foundation of Espírito Santo), CNPq and others.

This initiative allows the generation of new information for the sustainable development of conilon coffee, including requirements for the rational use of natural and technological resources, social, based on respect for people involved in the production chain, and environmental, which advocate the use of technologies that do not harm the environment making coffee cultivation more competitive and sustainable.

### 3.10 CENTRO UNIVERSITÁRIO NORTE DO ESPÍRITO SANTO DA UNIVERSIDADE FEDERAL DO ESPÍRITO SANTO - CEUNES/UFES (NORTH CENTER OF THE FEDERAL UNIVERSITY OF ESPÍRITO SANTO)

Ceunes started its activities on August 6, 2006, initially in a structure provided by the Municipal Government of São Mateus. With the donation/acquisition of an area in Bairro Litorâneo in the municipality of São Mateus, the buildings construction and all activities began in February 2010.

Ceunes has been developing teaching, research and extension activities, assisting in regional development. The Center offers 16 graduation courses and 4 master's degrees, with a leadership in teaching and research in the north of Espírito Santo.

Among the various courses offered to the society, Agronomy has been considered by

MEC/ENADE one of the best in Brazil. Focused on regional agriculture, with applied research and training of human resources, Ceunes also offers the master's degree course in Tropical Agriculture since April 2010, which has over 60 completed dissertations.

The Ceunes, even with a small team in the agricultural area (13 teachers in the agronomy course) and even smaller acting in the coffee industry, has been outstanding with the accomplishment of several activities. It stands out in the conilon area from 2012, with an increasing performance, which has as example the conclusion of more than 20 dissertations on the cultivation of this coffee.

From 2013 to 2015, more than 30 scientific papers in periodicals, approximately 100 abstracts in scientific events and more than 15 book chapters on the culture were published (in conilon coffee). He has also been holding the Conilon Producer Symposium for years, with an audience of over 600 participants from Espírito Santo, Bahia and Minas Gerais.

In works with conilon coffee, it has been developing activities with several institutions (undergraduate and graduate), among which are the partnerships with Incaper, Embrapa, Universidade Estadual do Norte Fluminense Darcy Ribeiro - Uenf (Darcy Ribeiro State University of North Fluminense), Ifes, Capes, Fapes, CNPq, K-State University, Universidade de Lisboa - Ulisboa (University of Lisbon), Instituto de Tecnologia Química e Biológica - ITQB (Chemical and Biological Technology Institute), Instituto Nacional de Investigação Agrária e Veterinária - IniaV (National Institute of Agricultural and Veterinarian Investigation), CCA/Ufes, UFV, Fundação Universidade Federal de Rondônia - Unir (Federal University of Rondônia Foundation), UFLA, Coabriel, Coopeavi, Caliman Agrícola, several coffee growers, among others.

Therefore, in an active way, Ceunes has been contributing to regional and national development, in favor of conilon coffee and coffee grower.

### 3.11 INSTITUTO FEDERAL DE EDUCAÇÃO, CIÊNCIA E TECNOLOGIA DO ESPÍRITO SANTO - IFES (FEDERAL INSTITUTE OF EDUCATION, SCIENCE AND TECHNOLOGY OF ESPÍRITO SANTO)

Ifes has three *campuses* focused on teaching, research and extension in the agricultural area. These units are strategically located in the north (Colatina), central (Santa Teresa) and south (Alegre) regions. In its physical bases, there are cadres of qualified professionals, experimental farms and a set of laboratories and didactic units that have been used historically for the development of several activities, including those focused on the conilon coffee development.

These educational institutions are traditional trainers of high school level and graduated professionals, especially agricultural technicians, technologists and agronomists, many of them children of farmers who have played an important role as multipliers of information and knowledge, fundamental to the technology transfer process. Together, they have already made available in the labor market about 15 thousand professionals qualified for the State and for Brazil.



These educational structures have lent their skills to the research and technology transfer network for conilon coffee, since they coordinate research and extension projects or participate in the state science and technology network teams, in addition to housing in their experimental areas clonal gardens of the varieties developed by Incaper, seedlings nurseries and didactic units that are used for the practical classes development.

### **Ifes - Campus Alegre**

The current Ifes - *Campus Alegre* has its origin in the national desire to legally establish agricultural education, which occurred in the years 1946 and 1947. Thus, in 1953, as a continuous action, has started construction of *Campus Alegre*, whose educational services begin in the same year as a training center. Regular education began in 1962, with elementary education, added by the technical high school in 1966. Throughout these 62 years, several denominations have been started, having started as Escola Agrícola de Alegre - EAA (Alegre Agricultural School), passed by Colégio Agrícola de Alegre - CAA (Alegre Agricultural College) and Escola Agrotécnica Federal de Alegre - EAFA (Alegre Federal Agrotechnical School), which lasted until 2008, when it occurred the most recent change, the creation of Ifes.

The coffee agribusiness, as the main agricultural product of the campus region, was always present in institutional life, with the systemic offer of initial and continuous training of workers, in an incalculable number of graduates, and the qualification of 4.198 Agricultural Technicians.

Increasingly aware of its importance as a partner institution of regional and state development and the relevance of coffee cultivation, in 2000, the *Campus* launches the first course in the world of Coffee Technician in the post-secondary modality that formed classes until 2009, with a total of 193 graduates.

In 2010, in a continuity of work and institutional maturation, based on the new tripod (teaching, research and extension), the Superior Course on Coffee Technology began, opening new doors for the *campus* insertion in the coffee production chain, 33 professionals.

Together with the Technologist in Coffee, the research is developed and extension work is extended. Thus, the base of applied academic work involving the coffee cultivation, in its most varied aspects, is growing, totaling 20 in the form of Final Paper and hundreds of publications in different periodicals and events.

In academic terms, from the extension point of view, the *campus* holds the Coffee Industry Seminar that is already in its third edition and the Encontro de Cafeicultores (Coffee Growers' Meeting), which has accumulated five editions. Both in close partnership with Incaper.

Still about the extension, in a special way, it is possible to highlight the creation of the junior company "Caparaó Júnior", the first of Ifes and the campus, which was born with the Technologist Course and has a focus on coffee agribusiness. The company involves 43 academics of this course that attend 1,503 properties and 2,400 crops of regions of Espírito Santo and Minas Gerais, totaling 25 municipalities. In addition to direct work, Caparaó Júnior functions as an incubator of companies and as a participant in research projects.

In order to carry out its educational activities, the *campus* has countless partners, notably

Incaper, which facilitates the constant knowledge improvement, especially in conilon coffee, whose interchange includes the maintenance of clonal gardens of its genetic material, as well as the publications assignment for the *Campus Alegre* collection.

### **Ifes - Campus Santa Teresa**

The current *Campus Santa Teresa* has its origin in the year 1940, with Decree-Law Nº 12.147, of September 6, of the Federal Comptroller in the State of Espírito Santo, João Punaro Bley. It was inaugurated on September 6, 1941, under the denomination of the Escola Prática de Agricultura- EPA (Agricultural Practical School), with the purpose of providing two practical and intensive courses, Rural Technician and Rural Manager, one year long, to rural workers.

The name Escola Agrotécnica de Santa Teresa-ES (Ago-Technical School of Santa Teresa-ES) was established by Decree nº 83.935, of September 4, 1979, published in DOU, September 5, 1979. It was transformed into an organization through Law nº 8.731, dated November 16, 1993, published in DOU, on November, 17th, 1993, being linked to the then Secretaria de Educação Média e Tecnológica - Semtec (Department of High School Education and Technology).

By Law Nº 11.892, published in the DOU, December 30, 2008, the Federal Agro-Technical School of Santa Teresa has become part of IFES, with a mission to provide training for young people and adults through offering short, medium and long-term courses seeking to equip them with general and specific knowledge and skills to carry out productive activities, contributing to the technological development and improvement of the quality of life.

Among the courses offered by the *campus* are the Agricultural Technician and the Agronomy, where students have the opportunity to learn about conilon coffee and participate in research.

In the biennium of 2013/2014, two important researches related to conilon were carried out. They are:

- Maturation and productivity of coffee conilon submitted to different irrigation seasons, aiming to standardize the coffee fruits ripening. The experiment was conducted from August, 2013 to July, 2014, in a conilon coffee plantation of approximately two years old. These plants were irrigated by a drip system and grown at 3.0×1.2 m spacing.
- Flowering and growth of the conilon coffee plant submitted to different irrigation seasons, in order to standardize the emission of coffee flowers, without compromising its vegetative development. The experiment was conducted from August, 2013 to July, 2014, in a conilon coffee plantation of approximately two years old. These plants were irrigated by a drip system and grown at 3.0×1.2 m spacing.

The junior company of Agronomy, Agrifes Jr., composed of 29 students of the Agronomy course, was created in the *campus*. This company provides advice to producers in the region, mainly in the conilon coffee planting, maintenance and research.

The *campus* also has the Incaper partnership, which is a very important ally in the students training, who learn in practice, through internships, everything they are taught in the classroom.

It is noteworthy that in the history and trajectory of conilon coffee in the State of Espírito Santo, since its entry in 1911/1912, there are references about the Escola Agrotécnica de Santa Teresa (Ago-Technical School of Santa Teresa) importance, which had a genetic collection of countless species of coffee, including the conilon and that this collection was fundamental in the multiplication and distribution process of this species to the north of the State, especially São Gabriel da Palha, a municipality that began its planting on a commercial scale.

### **Ifes - *Campus* Itapina**

The Itapina *Campus* is a member of Ifes and, in its history, has been consolidated as an institution called the Escola Agrotécnica Federal de Colatina - EAF-Colatina (Federal Agro-Technical School of Colatina). In January 2009, the former EAF-Colatina, became Ifes-*Campus* Itapina. Since its founding, 59 years have passed and in this period, the *campus* has contributed significantly to the Brazilian agricultural professional education and agricultural development.

*Campus* Itapina is located on the north bank of the Doce River, 17 km from the center of Colatina. It currently serves around 1.000 students, mainly from the northwestern and northern regions of Espírito Santo, eastern Minas Gerais and southern Bahia, offering technical courses at Agriculture e Zootechny and the graduation courses of Agricultural Engineering, Agricultural Sciences and Pedagogy.

As part of the agricultural production chain of the Itapina *Campus* region, there is a large participation of coffee farming, mainly conilon coffee. The *campus* has been developing teaching, research and extension work focused on coffee cultivation. The *campus* holds, every year, the Conilon Coffee Quality Seminar. In it, producers researchers and students update and exchange experiences on the subject.

*Campus* students, especially agricultural science students, mainly coffee growers' children, show a particular interest in this culture. The *campus* has been working with projects aimed at improving the conilon coffee quality, in order to get better market values for production, and concentrated efforts to demonstrate the importance of programmed pruning to raise and ensure high productive yields, as well as the aspects related to the coffee production chain environmental conservation.

In this latter context, and through the new institutional pillars of education, research and extension, it is worth mentioning the efforts that have been made to use industrial waste to create new substrates or alternative sources of fertilization for conilon coffee production, what has been adding researchers and attracting business partnerships, with interesting results such as publications and patents in the area.

## 3.12 NESTLÉ

This company has as a global platform the Creation of Shared Value, since it knows that for the business success in the long term, as important as to generate value for the shareholders is to generate value for the society in which it is inserted.

For this company, the concern with the people's nutrition, health and well-being and with

the environment is essential to improve the quality of everybody's life, from the provision of good food and beverages. The institution is committed to providing tasty and reliable products and, for this, respect for the environment and people involved in the production and consumption cycle is extremely important, including: producers, employees, consumers and communities where it operates.

There are many economic, social and environmental challenges to face, such as the developing economies diversification, the aging of producers around the world and competition for land and water use. Half the world's population currently lives in urban areas, and this proportion will increase by two thirds up to 2050 (NESTLÉ, 2014). Regarding the raw material quality that the institution uses to manufacture its products, the supply continuity and the quality of life of its suppliers, Nestlé works with the objective of contributing to the improvement of all of these conditions.

Nescafé is the world's leading coffee brand and one of Nestlé's best-known ones. For the company, the coffee quality goes beyond the product itself. Together with its partners, a value cycle is created in the process of producing and processing coffee- from producers to consumers, based on the pillars of Nutrition, Water and Rural Development.

The creation of Nescafé dates from 1930, when the market had a huge coffee surplus. The harvests were accumulating, but with the development of the soluble coffee, carried out by Nestlé, another interesting application for the raw material appeared. If on the one hand, the Nescafé supported the coffee chain at the time of excess supply on the other, it has become one of the country's leading coffee brands, which shows that, from its inception, the principle of shared value had already been established between the company, producers and society.

### **Nescafé Plan**

The Nescafé Plan activities administered by Nestlé Brazil began in 2011, in the municipality of Águia Branca/ES. As there were no previous experiences of direct relationship between Nestlé and the Brazilian coffee growers, the company decided to bet on the good relationship with the coffee merchants to make this approach. The independent standard of sustainability developed by the 4C Association was the reference chosen to guide the development work of coffee growers. In January 2012, the first 4C license was issued on behalf of Nestlé Brazil. Initially, there were 91 business partners, a nomenclature proposed by the 4C Association and names all the participants in the chain through which coffee passes, including producers and their associations, transporters and merchants.

During the year 2012, some training were performed, focusing on the safe use of pesticides, a subject that has always been treated with special attention. At the same time, other producers were accessed and invited to join the Nestlé 4C Unit. In January 2013, the unit won another 254 coffee growers, totaling 345 business partners. In the same year, the agricultural team, dedicated exclusively to coffee, was formed. At that moment, the Nescafé Plan project already had a range beyond the municipal limits of Águia Branca and allowed the company to know the other models of the coffee industry of Espírito Santo including coffee growing in medium and large properties.

In 2014, the second 4C Unit was formed, bringing an increase of 212 business partners. At the end of the year, Nestlé Brazil's Nescafé Plan brought together 557 business partners.

Currently, the institution maintains two 4C Units, which together total 742 business partners in 18 municipalities in the northern region of Espírito Santo. The challenges ahead include developing some principles of the 4C Code of Conduct that still need to be improved on farms, especially with regard to the handling, application and storage of agrochemicals on farms, as well as irrigation systems management for the rational water use and accounting and operating records of the property.

### **Partnership with Incaper**

Nestlé has been participating in the last years of several activities of scientific cooperation with the entity, considering the researches of coffee genetic breeding developed by Incaper. Among this cooperation results, is the sensory evaluation of the coffees produced by the cultivars that later comprised the three conilon coffee clonal varieties launched in 2013: Centenária, Jequitibá and Diamante.

With the constant development of Nescafé Plan, the expectation is that the partnership with Incaper in the scientific field can be extended to the Ater area. The capillarity of Incaper's offices, coupled with the quality and experience of its technical team, will facilitate the development of these sustainability principles that need to be followed in parallel with agronomic development. In this way, it will be Espírito Santo's responsibility to continue illuminating the path to coffee cultivation in the 21st century.

## **3.13 MOVIMENTO DE EDUCAÇÃO PROMOCIONAL DO ESPÍRITO SANTO - MOPES (MOVEMENT OF PROMOTIONAL EDUCATION OF ESPÍRITO SANTO)**

A non-governmental philanthropic institution founded in 1968, which maintains the Escolas Família Agrícola - EFAs (Agricultural Family Schools), that operates with the Alternation Pedagogy System in the education of rural youths present in 18 municipalities of the State, as well as a Community Health Center- Hospital and Maternity in Anchieta, a children's education program with four kindergartens and a Training Center for School Teachers with the Pedagogy of Alternation system.

This system adopted by the EFAs and the Mepes allows young people to alternate teaching and learning moments at school environment and moments of research, experimentation in the socio-professional environment, articulating the integral formation of the young and family farmers with the territorial development, and so contributing for the technical knowledge internalization and, consequently, for the rural development of Espírito Santo.

In this way, Mepes has been making an important contribution in the training of young people and family farmers regarding the use of technologies suitable for the development of their farming activities, in particular the conilon coffee cultivation, which is part of the programmatic contents of the technical courses in agriculture, assisted by experiments in EFA's and in student's properties.

With its form of performance, credibility and respect that it has achieved throughout its 67 years of work in rural areas, the Mapes plays an important role as facilitator of the technological advancement of conilon coffee-growing, favoring the family farming strengthening with income generation and the quality of life improvement for the rural man.

For Mepes, it is a great pleasure to have contributed with Incaper, Embrapa and other research institutions for the development of conilon coffee in the State and to be part of this success story, now recognized worldwide.

### 3.14 CENTRO ESTADUAL INTEGRADO DE EDUCAÇÃO RURAL- CEIER (INTEGRATED STATE CENTER FOR RURAL EDUCATION)

Created in 1982 in the municipality of Boa Esperança and in 1983, the municipalities of Águia Branca e Vila Pavão, the Secretaria de Educação - Sedu (Department of Education), the Ceiers are rural schools that aim to meet the farmers' children in the municipalities.

The schools have, in their facilities, Unidades de Demonstração, Experimentação e Produção - UDEPs (Demonstration, Experimentation and Production Units) of conilon coffee clonal varieties propagated by seeds, which serve as the base for the agroecological teaching and research carried out in those centers.

All the farming techniques are agroecological and practiced by young people, which reinforces the entity's commitment to technical training and the diffusion of technologies of this culture. Acting directly in the rural communities, Ceier has contributed to the technological diffusion of conilon coffee based on the environmental sustainability precepts.

### 3.15 SINDICATO E ORGANIZAÇÃO DAS COOPERATIVAS BRASILEIRAS DO ESTADO DO ESPÍRITO SANTO - OCB/ES (UNION AND ORGANIZATION OF BRAZILIAN COOPERATIVES OF THE STATE OF ESPÍRITO SANTO)

The OCB/ES System, as representative and partner institution in several actions of the cooperatives of the state of Espírito Santo, supports the initiatives for the improvement of the largest productive sector of Espírito Santo, the coffee industry. Initiatives such as quality competitions, training and qualification, technical assistance program and technological advice for the members are supported and encouraged by OCB/ES. In recent years, more than R\$450 thousand have been contributed in specific projects.

In 2014, as a representative of the State in the Conselho Nacional do Café - CNC (National Coffee Council), the current administration fought at the Conselho Monetário Nacional - CMN (National Monetary Council) to achieve the increase in the minimum price of conilon coffee after years stabilized from R\$156,57 to the bag with 60 kg for R\$ 180,80. This is achieved after a period without an official CNC representation.

It is worth pointing out that OCB/ES does not only support the technical part of its cooperatives, but also articulates and outlines important strategies for the defense of State coffee producers.

Thus, the OCB/ES System is becoming more and more consolidated as a promoter and the responsible of disseminating programs and projects for the improvement of the Capixaba coffee quality, the life of the cooperative producer and its cooperatives.

### 3.16 COOPERATIVA AGRÁRIA DOS CAFEICULTORES DE SÃO GABRIEL DA PALHA - COOABRIEL (AGRARIAN COOPERATIVE OF THE COFFEE GROWERS OF SÃO GABRIEL DA PALHA)

Cooabriel, located in the northwestern region of the state of Espírito Santo, based in municipality of São Gabriel da Palha, completed 52 years in 2015. It was created on September 13th, 1963, with the participation of 38 associates. Currently, with about 4 thousand active members, it is the largest conilon coffee cooperative in the world.

In order to know its performance, its business evolution and its support pillars throughout this period, it becomes necessary to understand the trajectory of the entity and its main actions.

It is worth mentioning not only the technical, managerial and cooperative support to its members, but also its strong presence as a coordinator and important component of the coffee production chain, especially the conilon.

One of the foundations of its creation was the coffee growers of the time need to obtain better trade conditions of the product. It is noteworthy that Arabica coffee (Bourbon) constituted the economic base of São Gabriel da Palha at the time of Cooabriel foundation.

From the first services, which consisted in providing a consumer sector with the objective of transferring agricultural inputs and foodstuffs to the partners, the acquisition of an area for the installation of a processing machine and a storage structure, until a portfolio of services currently performed, the cooperative knew how to overcome difficulties and break in the historic crisis of coffee eradication, thanks to its members and leaders determination. This commitment and dedication have made Cooabriel become one of the best models of cooperative organization in the conilon coffee area of Brazil, if not the world.

#### **Provision of Services**

In addition to storage and trading services, which are its two main activities, the entity has added many other benefits in providing services to its members.

It is structured to guide and follow its associates from the choice of area for planting the crop, offering laboratory services for soil and plant analysis, producing and supplying seedlings of a high genetic standard and guiding the whole process, going through all phases, to trading and legal assistance, as well as other supporting services.

This set of services has allowed us to advance in terms of productivity and product quality by adding greater value and increasing the profitability of the associates.

#### **Seedlings production and commercialization**

With the use of seedlings, until then the producers could not go further in productivity and product uniformity, given the genetic diversity and cross-pollination, characteristics of

conilon coffee plants.

With the results of research that generated clonal varieties of greater agronomic performance, the price of seedlings greatly increased. This fact led the cooperative to decide producing its own seedlings, based on a clonal garden composed of registered parent plants.

Since 1993, the cooperative has been implementing and expanding its clonal garden using the developed varieties clones and launched by Incaper: 'Emcapa 8111', 'Emcapa 8121', 'Emcapa 8131', 'Emcapa 8141- Robustão Capixaba' and 'Vitória - Incaper 8142'. And the new varieties: 'Diamante ES8112', 'ES8122 - Jequitibá', 'Centenária ES8132' and 'Marilândia ES8143'.

Currently, with a clonal garden of approximately 28 thousand parent plants of the varieties mentioned above, Coabriel has a field and nursery facility for potential production of more than 4 million seedlings per year, which is made available to the coffee growers through confirmation in contract with a minimum period of six months, depending on the period of the orders.

To facilitate this technology access to the associate, the cooperative maintains a policy of lower prices than the market and a financing system with conversion of seedlings into coffee (product) to be paid in the harvesting. This mechanism is another facility that the cooperative makes available to encourage cooperatives to purchase better quality seedlings.

For all this well-conducted work, the Coabriel nursery is a reference in the production of quality seedlings, which are available throughout the State of Espírito Santo and southern Bahia.

### **Technical consultancy**

This service was initially carried out in partnership with the former Emater, Incaper, for several years. However, in 2000, it was identified the need to expand this action by hiring three professionals with the objective of attending to the associates as a group.

From 2002 on, the work of attending the producer in the headquarters office and the scheduled visits in the branches located in the neighboring municipalities were expanded. In 2005, the cooperative diversified its service and implemented technical and managerial consulting programs, with a programmed schedule to train the partner with management tools and technology jobs in a structured model.

The technical consulting system was created, which has already completed 10 years of operation, with 17 professionals in Espírito Santo and in the south of Bahia, assisting 794 partners with conventional schedules, and 971 members for conventional service in technical departments. Agricultural technical consulting aims to motivate the beneficiary to know and use properly the technologies of production, to understand its applicability in the activity and the results that can be achieved in productivity and quality.

Another program is Conilon Eficiente Coabriel (Efficient Conilon Coabriel), which focuses on improving the technical and managerial efficiency of the producer. Previously, it was called Educampo Project, conducted until 2011 through a partnership Coabriel/Sebrae/Producer. The project counts on three professionals who currently assist 80 cooperative producers within management bases.



With these programs in the field, to date, Coabriel has an area of 14,262.9 ha of conilon coffee.

### **Laboratory of soils and plants analysis**

The cooperative's laboratory services began in 1996. It currently serves coffee growers in the northern region of the State of Espírito Santo, southern Bahia and northeast of Minas Gerais, reaching almost 16 thousand annual samples. The laboratory performs soil chemical analysis (macro and micro nutrients), plant analysis (macro and micro nutrients), chemical analysis of water for irrigation, analysis of organic fertilizers, agricultural corrective analysis and soil physical analysis.

Coabriel participates in the following quality control programs: (Profert-MG) and the Interlaboratory Program of Plant Tissue Analysis (PIATV - ESALQ/USP), which validate the work effectiveness.

### **Coffee trading**

Among the many services provided by the cooperative, the coffee trading has been characterized as one of the main ones. This joint marketing has designed the cooperative as a market-regulating thermometer.

There is a premise that is always passed on to the associate: the cooperative is not a buyer of their coffee. On the contrary, it plays the role of a seller by commercializing the associate's coffee along with the coffees of the other members.

In the last ten years, it has sold almost 6 million bags of conilon coffee, increasing from 274,687 bags per year to 1.1 million bags.

### **Storage**

Storage is an important factor in the production process. Coabriel's warehouse complex has the capacity of around 900 thousand bags and is located in the northwest region of the state of Espírito Santo through the branches of Águia Branca, Alto Rio Novo, Nova Venécia, Vila Valério, Boa Esperança and São Gabriel da Palha. In the south of Bahia through the subsidiaries Teixeira de Freitas and Itabela.

The warehouses offer associates automatic precision scale, fast unloading, modern and high quality machines, standardized coffee grading and stored product insurance. The storage is for an indefinite period, with the lending of the bags to deposit the pounded coffee, without weight breaking or additional cost for the member. Also, the coffee is transported from the member's property to the cooperative's warehouses, at no charge to the associate producer.

The structure is modern and well equipped and built under advanced technological standards, which ensure quality to the product during the storage time. In the cooperative's warehouses, coffee, at its reception, goes through technical analysis for its classification and standardization aiming at the best market quotations.

### **Financial Services**

In another support service for its members' activities, Coabriel develops the input

program, which finances fertilizers, limestone, pesticides, implements, conilon coffee clonal seedlings and “coffee equivalence” harvesting costs, in which the associate does the payment in the next harvest. Undoubtedly, an innovative initiative that allows the associate, especially the under-capitalized, to maintain a programmed investment as a way to guarantee productive farming and, thus, seek to achieve high productivity.

### **Stores**

Another service that Coabriel has been implementing is the opening of supply stores, called “Cooabricampo”. There are six stores that act as direct products distributors, which are evaluated in cost and benefit to better serve the members and also to the regions of comprehensiveness. The stores have a relevant role to help the partner to develop their activities with better efficiency, less aggressive to the environment and fairer prices products.

### **Product quality**

The support mechanisms for the associates’ coffee activity, both in the area of guidance in the field and in the available subsidies, are part of the strategy of four pillars of work promoted by Coabriel to its partners, which are: increase of crop productivity, sustainable activity, product quality and producer profitability.

Among the motivation strategies for quality, Coabriel conducts the quality competition to establish the “Cooabriel Excellence Conilon”, which awards the best coffees produced by its members.

The “Cooabriel Excellence Conilon” competition is a pioneering initiative of Coabriel in the area of conilon coffee quality contests by analyzing the special physical and sensory characteristics of the variety. It has been organized by the cooperative since 2003, being the motivating base for several other initiatives in the market.

In addition to encouraging and rewarding producers who demonstrate care during the coffee preparation phase, the action seeks to identify potential quality producers among the members in the Coabriel area of action.

### **Legal Advise**

Concerned about correctly guiding its members regarding legal aspects related to their needs, the cooperative has a preventive law office for differentiated attendance. The services range from the preparation of agrarian contracts, legal-social security-tax information, the filing of lawsuits to obtain social security benefits and tax justice, and other types of information that interest the cooperated rural producers.

## **3.17 COOPERATIVA AGROPECUÁRIA CENTRO SERRANA - COOPEAVI (CENTER-MOUNTAIN REGION AGRICULTURAL COOPERATIVE)**

In 1964, Coopeavi was created as a cooperative formed by 20 poultry farmers with the purpose of solving the bottlenecks of the sector in the municipality of Santa Maria de Jetibá. At the end of the 1990s, the decision was made to diversify the activities of the cooperative

by expanding its business to the branches of agricultural products- retail stores and animal nutrition-, feed mill and coffee commercialization.

Currently, Coopeavi has a membership list of around 10,000 associates in the regions of Espírito Santo and Minas Gerais, with the following service structure: two feed mill factories, 18 retail agricultural stores, ten coffee purchase points, four coffee warehouses with capacity for about 700 thousand bags, an egg warehouse with processing capacity for 500 boxes/hour, an automatic poultry farm of 100 thousand poultry for the eggs production and a farm for 600 thousand poultry fattening. In addition, it has about 600 employees, of which 70 are professionals focused on technical assistance to the rural producer.

The Coopeavi ranks among the 200 largest companies in Espírito Santo, according to the Euvaldo Lodi Institute (IEL) *ranking*, and between 400 largest agribusiness of the country, according to Exame annual magazine.

Driven by its mission to provide solutions to the cooperative, contributing to its sustainability, the society quality of life and the strengthening of cooperative doctrine, Coopeavi continues to increasingly invest in promoting quality coffee and promoting the production of differentiated coffees that add value to the product of its members.

Since 2011, it has been conducting a search for markets for the peeled cherry conilon, coffee that has been gaining more and more space among roasters *blends* in various parts of the world.

At Coopeavi, principles such as innovation, transparency and commitment are based on values such as ethics, honesty and respect.

### 3.18 COOPERATIVA AGRÁRIA DOS CAFEICULTORES DA REGIÃO DE ARACRUZ - CAFEICRUZ (AGRICULTURAL COOPERATIVE OF COFFEE GROWERS FROM THE REGION OF ARACRUZ)

When it was created on February 15, 1964, in the presence of 38 members/cooperates, the Cooperativa Agrária Mista de Guaraná - Camig (Mixed Agricultural Cooperative of Guaraná) was created, working on the distribution of food and domestic products to its members.

In a second moment, it entered the manioc processing, transforming it into flour. In 1987, the coffee trading, veterinary products and animal food began, opening a small store that facilitated the coffee marketing process.

The cooperatives acquired a property to store the coffee produced by them directly in the cooperative. Through partnerships with the Municipal Executive, it improved the warehouse facilities.

New partnerships emerged through the agreements signed with Seag, when the road balance was implemented and two trucks were acquired, extremely useful for the production flow.

The entity also provides agricultural technicians to technically assist, at no cost, the cooperative.

In 2010, Cafeicruz was invited to participate in a partnership with Banco do Brasil (Bank

of Brazil) and the Banco Nacional de Desenvolvimento Econômico e Social - BNDES (National Bank for Economic and Social Development), through Banco do Brasil's Sustainable Regional Development (DRS) of a project to expand production infrastructure, processing, storage and marketing of coffee; extension of technical assistance to the cooperative members; and use of the reception and shelter structure of the plastic packaging of pesticides and similar for disposal of this type of material.

Through this project, the structure of the storage area was expanded by building a new warehouse, as well as the acquisition of machinery for the coffee preparation and grading and the implementation of the electric power substation. The technical assistance has been extended to the cooperative members, so that 100% of the active ones can be served.

It also contemplated the structuring of the reception and shelter of the plastic packaging of pesticides and similar, located in Rio do Norte, in the municipality of Linhares/ES. Proper disposal of this type of material prevents water sources contamination.

### 3.19 COOPERATIVA DOS CAFEICULTORES DO SUL DO ESTADO DO ESPÍRITO SANTO - CAFESUL (COOPERATIVE OF GROWERS FROM THE SOUTH OF THE STATE OF ESPÍRITO SANTO)

Cafesul is a cooperative formed predominantly by family farmers, whose headquarters is located in the municipality of Muqui, but also has operations in the neighboring municipalities of Mimoso do Sul, Cachoeiro de Itapemirim, Jerônimo Monteiro, Atilio Vivacqua and Anchieta

It was founded in 1998 and since 2008 has developed a project called Sustainable Regional Development (DRS) for the coffee chain in partnership with Banco do Brasil and the Banco do Brasil Foundation.

In the course of these years, this project has developed several activities to improve the coffee quality and productivity with training, field days, in partnership with bodies such as Incaper, Senar-ES, OCB/Sescoop-ES, Sebrae-ES, opening new markets and facilities improvements of the cooperative.

In 2008, the cooperative achieved a *Fairtrade* International Certification. When several environmental and social constraints are met, a better coffee price has resulted, as well as a social prize to be reinvested in the cooperative and in the communities where it operates.

It is currently beginning a project with Nespresso, a subsidiary of Nestlé, to certify in the TRIPLE AAA for the supplying of premium quality coffees to the company's single-dose capsules.

The cooperative annually holds a conilon coffee quality contest, which is already in the fourth edition and has obtained excellent results with coffees with a score above 80. These coffees are being taken to international fairs where they have been tasted and praised by renowned tasters. Batches have already been sold for small and medium coffee shops and roasters in Brazil, which are *blends* with special Arabic coffees.

Currently, it is executing a project in partnership with the Banco do Brasil Foundation for the Recovery of Springs and Soil Conservation. The project is being carried out by technicians

from Cafesul itself, in partnership with local Incaper technicians.

In this project, there are investments for the construction of a seedlings nursery, distribution of *kits* composed of stakes and wire for fencing of the areas, supply of seedlings for the producers, producers and technicians training in preservation techniques of water and soil, besides hours of machine for the construction of dry boxes on the roads of the cooperative members' plantations.

To date, 154 dry boxes have been built with a storage capacity of up to 1,164,000 L of water on 3.9 km of roads prepared to prevent erosion and preserve the soil. Fifteen producers were attended, and the goal is to meet another 50 until the end of the project.

### 3.20 SERVIÇO DE APOIO ÀS MICRO E PEQUENAS EMPRESAS DO ESPÍRITO SANTO - SEBRAE-ES (ESPÍRITO SANTO MICRO AND SMALL BUSINESS SUPPORT SERVICE)

Since the 90s, Sebrae has been creating a favorable environment for the development and improvement of Brazil's economic activities in the areas of management, innovation, entrepreneurship and market.

Within this scenario, there is the Brazilian farming industry, which began receiving actions to improve the activity, showing its strength and capacity to innovate and access new market niches for the differentiated products.

At the same time, conilon coffee appears gaining high productivity and more and more quality, lacking actions that can promote this product even more, besides structuring management and marketing systems for its production.

It was with this scenario that Sebrae-ES, together with the partners in the sector, constituted, at the end of 2013, the Encouragement Program for the Production of Specialty Coffees of Espírito Santo, which won the approval of Capixaba and national experts to show Brazil and the world the ability of the State to produce specialty coffees.

The Espírito Santo coffees have attributes that differentiate them from those marketed in stock exchanges in standardized large volumes. Such properties may be related to their physical, chemical and sensory characteristics. However, they also involve social, environmental and economic criteria related to the sustainability with which the activity is conducted.

As a result, Sebrae-ES intends to support the initiatives for the production of specialty conilon coffees so that the main consumer markets of this product can meet this new Capixaba specialty, which is also being a major producer of micro batches of specialty coffees.

### 3.21 MUNICIPAL GOVERNMENTS OF THE CONILON COFFEE PRODUCTION AREA

The municipal governments as a whole have become one of the main partners in the diffusion of technologies in general and in the promotion of the inbred varieties of conilon coffee. Currently, there is a significant portion of coffee clonal gardens and nurseries in

Espírito Santo.

Represented by their Municipal Agriculture Department or similar, they develop with Incaper and other entities and local representatives large Municipal Rural Development Plans, most of the time discussed and approved by the Municipal Councils, which have contemplated important programs for the development of conilon coffee in the major conilon producing municipalities.

Lately, municipal governs have expanded their technical structure by hiring professionals, acquiring computer equipment and intensifying their activities in the field of technical assistance and rural extension through agreements with Incaper, with the specific objective of promoting an integrated, articulated work and shared that service.

This partnership with Incaper has provided a more suitable qualification of these municipal government professionals from a technological, methodological and credit project design point of view. The results of this joint action are essential to expand and qualify technical assistance and rural extension to producers.

The municipal governments have promoted and participated in partnerships in the organization of events, forums for public policy debate and producers meetings, with the purpose of creating a communication channel with the farmers and accelerate the adoption of transformative technologies.

### 3.22 BANCO DO BRASIL - BB (BANK OF BRAZIL)

Since the 1970s, Banco do Brasil has financed conilon coffee production in Espírito Santo. In the beginning, financing for the crops implantation, under the assistance of the extinct IBC. Later other lines of credit came, in which coffee growers leaned to introduce new technologies and overcome some price crises.

Currently, BB has several financing modalities to meet the needs of coffee production.

The costing lines finance the day-to-day expenses during the coffee production, allowing resources to be used in any period of the activity. In the 2013/2014 harvest, only in Espírito Santo, more than 14,000 costing contracts were signed, totaling R\$ 427 million (Table 1).

**Table 1.** Resources applied by Banco do Brasil in the coffee sector of Espírito Santo, per harvesting year

Year/ Harvest	Costing		Investment		Trading		CPR		Total	
	Contracts (number)	Value (R\$)	Contracts (number)	Value (R\$)	Contracts (number)	Value (R\$)	CPR number	Value (R\$)	Contracts (number)	Value (R\$)
2008/2009	21.089	222.816.450	611	15.814.637	183	33.560.126	-	-	21.883	272.191.213
2009/2010	21.025	255.810.238	1.187	48.154.162	143	22.801.999	11	23.350.000	22.366	350.116.399
2010/2011	19.350	278.365.989	1.211	47.350.942	87	11.229.688	22	19.775.000	20.670	356.721.619
2011/2012	16.630	299.182.454	1.523	74.524.327	99	60.710.762	6	11.950.000	18.258	446.367.543
2012/2013	16.946	371.538.166	2.356	80.086.815	122	87.253.669	-	-	19.424	538.878.650
2013/2014	14.702	427.166.767	4.211	124.213.025	138	89.652.491	2	17.170.000	19.053	658.202.283

**Source:** Banco do Brasil (2014).

**Notes:** 1. Values based on total financing for coffee cultivation, contracted in the period from July 1st of a year to June 30th of the following year. 2. The amounts of financing for investments do not consider those directed to machines, equipment, tractors and implements. 3. There is no separation between conilon and arabica. However, the conilon represents about 75% of the total volume.

Over the same period, through the investment lines, more than R\$124 million were released for the implantation and renovation of coffee plantations, which increased production and brought more quality of life to coffee growers (BANCO DO BRASIL, 2014).

For the production commercialization, available credit lines allowed better cash flow control. With money in their pocket, the Espírito Santo coffee producers were able to wait for the best time to trade the harvest, and in these regards, Banco do Brasil lent more than R\$ 89 million.

Coffee farming has fundamental importance for the development of Espírito Santo. For this reason, the bank is proud to be the main partner of the local agribusiness, offering a wide portfolio of products and services adapted to the needs of the whole segment, from the micro and small producer to the large agribusiness companies.

With this partnership, the entrepreneurship in the field is stimulated, the incorporation of new technologies and the increase of productivity are possible. And the result of this joint work decisively contributes to the expansion of employment and income opportunities, increased exports and the promotion of sustainable regional development.

### 3.23 BANCO DO NORDESTE DO BRASIL-BNB (NORTHEAST BANK OF BRAZIL)

Since March 1999, Banco do Nordeste operates in the State of Espírito Santo. It serves 28 municipalities in the north of the state and seven in the Greater Vitória metropolitan region. It currently has five branches, of which four are named Plenas in the municipalities of Colatina, Linhares, Nova Venécia and São Mateus, as well as a Specialized in Vitória. In 2015, another two of the Plenas type were installed in the municipalities of Barra de São Francisco and Pinheiros. The capillarity expansion in the State is increasingly contributing to leverage the profile of various businesses in the region.

Within the aforementioned area of activity for the countryside of the state, there are the municipalities of: Água Doce do Norte, Água Branca, Alto Rio Novo, Baixo Guandu, Barra de São Francisco, Boa Esperança, Colatina, Conceição da Barra, Ecoporanga, Governador Lindenberg, Jaguaré, Linhares, Mantenópolis, Marilândia, Montanha, Mucurici, Nova Venécia, Pancas, Pedro Canário, Pinheiros, Ponto Belo, Rio Bananal, São Domingos do Norte, São Gabriel da Palha, São Mateus, Sooretama, Vila Pavão and Vila Valério. In the metropolitan area, it attends the municipalities of: Cariacica, Guarapari, Fundão, Serra, Viana, Vila Velha and Vitória.

The BNB has supported the most diverse production chains of the State through the Northeast Constitutional Financing Fund (FNE), with priority seating for family agriculture and micro, mini and small urban enterprises.

Accomplishing the role of development bank, it is constantly seeking to strengthen institutional partnerships, such as the cooperation agreement it has with Sebrae for joint actions aimed at spreading credit in its area of activity. Thus, it is worth noting that in these 15 years of experience in the State of Espírito Santo, it was invested R\$ 1.83 billion, over 20,888 loans.

Coffee cultivation stands out in Espírito Santo as one of the main income generating activities in rural areas. So, BNB supports the region's producers and has invested a total of R\$131.942 million in 2,169 operations in this period (BNB, 2014).

### 3.24 BANCO DE DESENVOLVIMENTO DO ESPÍRITO SANTO - BANDES (BANK OF DEVELOPMENT OF ESPÍRITO SANTO)

Bandes was created in the late 1960s with the purpose of contributing to the Espírito Santo economy recovery, which was experiencing its most serious social crisis- the effects of the coffee crisis and the coffee eradication policy.

Since then, it participates effectively in the articulation and development of agricultural policy of the State. It participated of several programs in these last decades that culminated with the good results currently obtained by Capixaba coffee farming.

Since the beginning of its activities, it encouraged the quality and coffee productivity improvement programs. In the 1970s, its activities were already focused on growing production without promoting the increase in planted area. Another good example of its performance was the implementation of Realcafé, so that it would become an anchor company of the conilon chain buying coffee, stimulating the planting and promoting the improvement of this product quality.

In the 1990s, Bandes participated in the Coffee Sector Chamber and Recafé (Capixaba Coffee Farming Revitalization Program). In this period, the understanding that the technological model practiced in the state coffee growing had imperfections from the implantation of the crops to the treatment of the product after harvesting it, with negative reflection on the productivity and the quality of the product advanced.

The bank understood that it could contribute to this process of changing the technological standard. Thus, it returned its financing to investments that promoted the productivity increase and the coffee quality improvement, reinforcing its commitment with the aggregation of value and with the activities diversification in the rural environment, under conditions of sustainability.

In this regard, family farming is one of the main focuses of Bandes action, which reinforces the relationship with Seag, Incaper, municipal departments of agriculture and other partners.

In volume of resources invested in the rural sector, since 2005, the bank financed approximately R\$1.4 billion in investments (adjusted by the IPCA), and more than R\$850 million were invested in coffee-growing, of which R\$550 million to conilon coffee. In the number of operations, 35,650 were in the rural sector, 25,200 for coffee-growing, of which 16,400 were in support to conilon (BANDES, 2014).

### 3.25 SISTEMA DE COOPERATIVA DE CRÉDITO DO BRASIL - SICOOB/ES (SYSTEM OF CREDIT UNIONS OF BRAZIL)

Sicoob, major in lending resources of the Fundo de Defesa da Economia Cafeeira - Funcafé



(Fund for the Defense of the Coffee Economy) in Espírito Santo, works in the state since 1989 and is the only financial institution of which the client is the owner. Therefore, the associate finds ease of access to the products and services in very advantageous conditions and at competitive costs comparing with the traditional market.

Until the beginning of 2006, Sicoob's activity in Espírito Santo was focused mainly on agribusiness. In 2007, it began to function as a cooperative of free admission, starting having individuals and legal entities from all segments of the economy as associates.

In Espírito Santo, coffee represents 60% of Sicoob's rural credit portfolio, which provides lines directed to the small, medium and large producer. The cooperatives linked to Sicoob provide funds from Funcafé to pay planting costs for all stages related to the harvesting and storage of coffee. Investments are also made with the objective of financing the costs of implementing the crop, such as seedlings, labor and irrigation.

In 2014, R\$434 million were invested in coffee cultivation, R\$246 million more than in 2011 (Table 2). During this period, turnover reached R\$1.2 billion (SICOOB/ES, 2014).

**Table 2.** Values financed for coffee cultivation by Sicoob/ES, from 2011 to 2014

Year	Costing*		Investment		Total (R\$ thousand)
	Operations (number)	Value (R\$ thousand)	Operations (number)	Value (R\$ thousand)	
2011	8.381	183.221,00	144	4.332,00	187.553,00
2012	8.528	235.969,00	269	9.518,00	245.487,00
2013	9.832	331.779,00	279	13.023,00	344.802,00
2014	10.467	422.698,00	183	11.330,00	434.028,00
Total	37.208	1.173.667,00	875	38.203,00	1.211.870,00

**Source:** Sicoob/ES (2014).

**\*Note:** The trading values are considered with those of costing.

The actions directed to the agribusiness development are not restricted to the concession of credit. Espírito Santo's largest private banking network encourages initiatives aimed at improving the quality of coffee. One of the actions in this regard is the sponsorship of events like the Symposium Brazil Café Conilon held periodically by Coabriel in the municipality of São Gabriel da Palha.

Brazil's largest cooperative financial institution, with more than 2.9 million associates, Sicoob attends companies and individuals and works with the same products and services as banks.

### 3.26 BANCO DO ESTADO DO ESPÍRITO SANTO - BANESTES (BANK OF THE STATE OF ESPÍRITO SANTO)

Under the denomination of Bank of Agricultural Credit of Espírito Santo, began in 1937, the base of a whole success story always consolidating the Banestes brand, which began with the rural man fomenting its farming activities via Educational Rural Credit, through credits

with technical assistance to assisted enterprises.

Counting 78 years of proximity to the farmers and the state, always seeking an offer of credit, suitable and appropriate to the rural environment.

The current Banestes is undoubtedly a strong enhancer of rural credit, with sprayed applications in all categories of producers, notably small and medium-sized producers.

Besides strongly financing the agricultural investments, that is, the inputs and services acquisition, the bank also actively participates in financing for agricultural investments, including the formation of various crops, fruit growing, coffee cultivation, construction and facilities improvements, acquisition of tractors, bovine animals, machines, implements, among others.

In June 1962, the bank's agricultural portfolio was expanded, including the industrial part of the sector, making Banestes a valuable support in the dissemination of agricultural and agroindustrial activities in the State.

The financing of the rural sector took a new breath starting in 2003, with the reactivation of Banestes Rural Credit Management. The measure was fundamental to the growth of this line of financing, which now has a specific area in the administration of this type of resource.

The Banestes Rural Credit, thanks to the capillarity of its service network, is within the reach of rural producers throughout the State. The institution is present all over the state of Espírito Santo territory, through which 132 branches are currently distributed.

In the Banestes Rural Credit portfolio, the coffee has a representative slice. It is enough to say that, of the resources destined to the field in 2014, which reached R\$181 million, R\$116 million (or 64%) were invested in coffee cultivation (arabica and conilon). Conilon coffee, in turn, absorbed R\$ 59 million (or 51%) of the total applied in the activity. From the beginning of 2003 until the end of 2014, Banestes allocated a total of R\$712.8 million to conilon coffee, which covers 27.352 sign-ups, averaging R\$26 thousand per operation, consolidating itself as a major user of rural credit resources in coffee production (BANESTES, 2014).

The importance of Banestes Rural Credit portfolio, which works with almost all of its own resources (more than 90%) goes beyond the commercial character, since it has the rural producer as a partner, which ensures support to increase its productivity and diversify their agricultural holdings, always with the main objective of contributing to the improvement of rural families' quality of life.

As a state public bank, it is engaged with the real needs of the rural sector, always following the planned policies, coordinated and executed by the State Government. The Banestes Rural Credit is an instrument that has been fulfilling an important social role, enabling rural man to generate wealth and income with sustainability.

### 3.27 FEDERAÇÃO DOS TRABALHADORES NA AGRICULTURA NO ESTADO DO ESPÍRITO SANTO - FETAES (FEDERATION OF AGRICULTURE WORKERS IN THE STATE OF ESPÍRITO SANTO)

Second degree union entity, affiliated with the National Confederation of Agricultural

Workers (Contag) and the Central Única dos Trabalhadores - CUT (Unified Workers' Central). It represents about 400.000 rural workers (family farmers, people from land reform programs, wage earners and rural retirees), covering 98% of the municipalities of the state of Espírito Santo, through 60 rural workers' unions and their base extensions.

One of these representative entities of agricultural workers is the Movimento Sindical de Trabalhadores e Trabalhadoras Rurais - MSTTR (Union Movement of Rural Workers), which has built operational strategies to focus on the main productive chains of the State, especially conilon coffee, for its importance in job creation and in the income composition of family farmers.

The actions of these entities have been guided by technical assistance by the affiliated unions, in the production organization through the associative approach (associations and credit cooperatives, production and commercialization), in the training of farmers and technicians in qualifying the product, in the opening of new marketing channels and in policies to strengthen credit and production.

Also present in the labor union movement is the search for the conquest and guarantee of the labor rights of the rural wage earners who work in the coffee production chain, as well as in others. These guidelines have generated training/qualification on labor rights, updating the diagnosis of labor relations, advancement in the collective bargaining process, meeting the workers demands, especially in the conilon coffee production chain.

### 3.28 SINDICATO DA INDÚSTRIA DE TORREFAÇÃO E MOAGEM DE CAFÉ DO ESTADO DO ESPÍRITO SANTO - SINCAFÉ (UNION OF COFFEE ROASTING AND MILLING INDUSTRY OF THE STATE OF ESPÍRITO SANTO)

The Sincafé activities, which represents the coffee companies in the State of Espírito Santo, began on February 12th, 1958. The entity is affiliated to the Associação Brasileira da Indústria de Café - Abic (Brazilian Coffee Industry Association), acts as a member of the Advisory Board and Management Council of the Institution and participates in the State Coffee Council.

The union consists of the Sectorial Chamber of Food and Beverage Industries, responsible for actions aimed at eliminating bottlenecks inhibiting the competitiveness of Local Productive Arrangements (APLs). It acts firmly in the actions taken by regulatory bodies, mainly in the fiscal actions directed to industrial sectors, that require the political and technical action to minimize the impacts.

Sincafé, currently with 22 associated roasters, has played an important role in the development of coffee agribusiness by carrying out actions and programs, in view of the growth of domestic consumption, the quality value increase, the strengthening of industries and the union of coffee agribusiness entities.

Recent technological advances related to the conilon coffee crop, whose productive predominance is located in the state of Espírito Santo, were very expressive, especially with the increasing production of conilon coffee.

The demand for specialty conilon coffee has been increasing in the Brazilian market, and

the greater demand for the product is due to the industries of roasted and ground coffee, that use it in *blends* with arabica. With the increasing consumption of coffee in capsules, the expectation is that the production of the specialty conilon will increase.

Specialty conilon coffee has attributes ranging from physical characteristics such as origins, varieties, color and size to environmental and social concerns, such as the production system and the working conditions of the coffee labor force.

It was within this framework that Sincafé, in partnership with the Federação das Indústrias do Espírito Santo - Findes (Federation of Industries of Espírito Santo), Sebrae-ES, Bandes, Seag, Cetcaf, Incaper, Faes, Centro do Comércio de Café de Vitória - CCCV (Vitória Coffee Trade Center) and OCB-ES, established the Program of Encouragement to the Trading Production of Specialty Coffees of Espírito Santo, whose target audience is the coffee producers based in the coffee regions of Espírito Santo (Mountain, Caparaó, South, Northwest and North Coast) and micro and small enterprises of roasted and ground coffee.

The main objectives of the program are: certifying 2,500 coffee farms; produce 500 thousand bags of quality and/or sustainable, certified coffee; promote the production of specialty coffees (premium, *gourmet* and sustainable) in the roasted and ground coffee industries; and to enhance the use of quality conilon coffee by increasing its share in the specialty coffee *blends*.

With this program, Sincafé will increasingly support the producers of specialty conilon coffee and its associated roasters in order to solidify the product as a differential of Espírito Santo in Brazil and abroad.

### 3.29 FEDERAÇÃO DA AGRICULTURA E PECUÁRIA DO ESTADO DO ESPÍRITO SANTO - FAES (FEDERATION OF AGRICULTURE AND LIVESTOCK OF THE STATE OF ESPÍRITO SANTO)

Faes is a private entity affiliated with the Confederation of Agriculture and Livestock of Brazil (CNA). It was created in 1951, and currently congregates 54 active rural employers' unions in Espírito Santo.

It is present in all municipalities of the State by base extension of the union's municipality headquarter. It represents about 35 thousand Capixaba producers, most of whom work with conilon coffee.

Legitimate representative of the rural production class in several public and private organizations, Faes has a seat in 83 governmental and non-governmental entities, with special emphasis on the steering committee of the Coffee Policy Deliberative Council (CDPC) and the CNC.

Its power of articulation with the constituent entities of the conilon coffee agribusiness, associated with its ability to mobilize producers through its unions, has been a preponderant factor in the process of technology transfer to coffee growers.

Therefore, its representation and performance on coffee growers, over the years, position and accredit the entity as one of the responsible for the advancement of conilon cultivation in the State.

### 3.30 NATIONAL SERVICE OF RURAL LEARNING (SENAR/ES)

Institution of private and parastatal right, it is maintained by the rural employers' class and linked to Faes.

Its main goal is to carry out professional education and social promotion of rural people, contributing to increase income, integration and social mobility of people, based on sustainability, productivity and citizenship principles, collaborating for socioeconomic development of the state.

In the last five years, the organization has carried out 460 training on coffee cultivation, benefiting 8,316 people, especially workers and rural producers (SENAR, 2014). Thus, it has contributed strongly to the advance of the State's coffee industry.

In 2015, Senar initiated a program of Technical and Managerial Assistance in the State of Espírito Santo, serving 425 rural properties that have their main economic activity in coffee production and are not continuously assisted by any other technical assistance program.

The rural producers included in the program are assisted by technicians who offer technical guidance, assist in the construction of a strategic plan with the definition of economic and social indicators for each property, identify the capacities that will be carried out by Senar with actions of professional qualification, measuring the evolution of indicators, all with the final objective of increasing production, productivity and profitability, seeking sustainability, efficiency, effectiveness and improvement of the quality of life of the people involved in the activity.

### 3.31 CENTRO DO COMÉRCIO DE CAFÉ DE VITÓRIA - CCCV (COFFEE TRADE CENTER OF VICTORIA)

The CCCV's mission is to strengthen the coffee sector in the State, representing the companies that trade the product in domestic and foreign markets.

As a statewide and nonprofit class association, it brings together and represents the merchants, exporters, as well as general warehouses and coffee brokers in the State of Espírito Santo.

Always seeking a representation of excellence for the sector, CCCV works to defend free initiative, the union of the coffee market development, technological standardization to improve the coffee quality and production in the State, in addition to market research and coffee market publicity.

Currently, it functions as the certifying agency of coffee exports origin by Espírito Santo, granted by the Federal Government, under the International Coffee Agreement, ruled by the International Coffee Organization (ICO).

The entity is also responsible for preparing and periodically publishing statistics on exports by Espírito Santo and coffee prices in Vitória. The daily quotation of the coffee and the offer of coffee grading and tasting courses are other services provided.

Rural producers from different municipalities have the opportunity to participate in the

Coffee Grading and Tasting Course, held by the CCCV in partnership with Abic, the Centro de Desenvolvimento Tecnológico do Café - Cetcaf (Center for the Technological Development of Coffee) and Incaper.

The partnership with Cetcaf also provides meetings with farmers from all municipalities that produce coffee in the state, with cooperatives and with segment leaders, as well as participation in seminars, events and forums to discuss different issues related to the coffee production chain.

From its foundation until October 2014, the CCCV has qualified several professionals in the areas of coffee grading and tasting. Between 2011 and October 2014, 13 classes were contemplated with the qualification.

Another initiative supported by the CCCV is the Criança do Café na Escola (Child of Coffee at School). In Espírito Santo, in the last four years, 15 computer rooms were installed in schools located in coffee producing municipalities.

Created in 2004 by the Conselho dos Exportadores de Café - Cecafé (Council of Coffee Exporters), with the support of exporting companies, the project is focused on computer education and provides for the donation, delivery and assembly of classrooms with ten computers each. In the State, since the project creation, there are already 30 rooms, which serve 8,264 students.

The Coffee Trade Center of Vitória (Centro do Comércio de Café de Vitória) has actively participated in partnership with other entities to ensure the opportunity of extracurricular learning and to provide new knowledge and contact with technology, increasing the knowledge possibilities of rural school students.

### 3.32 CENTRO DE DESENVOLVIMENTO TECNOLÓGICO DO CAFÉ - CETCAF (TECHNOLOGICAL DEVELOPMENT CENTER OF COFFEE)

Cetcaf is a non-governmental, non-profit and economic entity created in December 1993, with the primary function of being the liaison body between the various sectors of the coffee agribusiness.

It has been one of the great organizer in the process of the coffee productive chain union, in special of the conilon. An outstanding example of this work is the approach that has been promoting, since 1994, the production sector with the industry and exports sectors represented by the CCCV.

Interactions between segments associated with coffee have been effected in a variety of ways and opportunities, especially in technological and scientific exchanges, through events, or even in the coffee policy forums, such as the Câmara Setorial do Café (Sector Chamber of Coffee).

Its actions have also been based on technological modernization aimed at changing the profile of state coffee farming, focusing on the professionalization of the coffee grower, through courses, meetings and symposia in the various producing regions of the State.

It already achieved the mark of more than 300 professional courses held, in addition to

having coordinated and executed nine editions of the Simpósio Estadual do Café (Coffee State Symposium) reaching the historic level of more than 20 thousand coffee growers participating in their actions (CETCAF, 2014). It also includes in its portfolio of achievements, participation in studies and diagnostics, being a prominent presence in all forums, discussions and interesting debates on the coffee agribusiness. In 2006, it pioneered a beverage standard that ended up determining the organoleptic qualities of conilon coffee.

His work has gained a prominent position in the process of technology transfer to coffee growers in the State, both conilon and arabica.

### 3.33 TRISTÃO COMPANIES - REALCAFÉ

In 1935, the world was under the impact of the great economic depression, whose consequences deeply affected coffee, the driving force behind the then Brazilian economy. It is in this scenario that José Ribeiro Tristão arrives in the city of Afonso Cláudio, in Espírito Santo, to open a variety store that would have the name of his father: Casa Misael, beginning the Tristão companies.

Betting on coffee as currency, Tristão expanded his business activities. Soon, the coffee became its main business, happening to be exported in 1960. At that time, Jônice Tristão was already in charge of the business, continuing the important work received from his father.

In 1971, Realcafé Solúvel do Brasil was inaugurated, a modern enterprise that has consolidated itself as the great encourager for the conilon coffee production in Espírito Santo.

Tristão companies are very proud to have participated actively in the successful story of the Capixaba producers who, with great enthusiasm and pioneering, managed to overcome the most diverse prejudices to implant a new coffee cultivation in the northern regions of the State.

In the 1970s, the apprehension was generalized among the suffering coffee growers. It was when the local pioneers, leaders and authorities promoted an awareness campaign among producers encouraging the robusta planting. It was concluded that a possible solution was the introduction of a new plant variety, the conilon, more resistant to pests and diseases that could be grown in lower and warm climates.

But there was no financing or support for conilon. The great uncertainty was how and for whom to sell the robusta if the market was small and the prices were very irregular. The best argument in favor was that the soluble industry, whose consumption grew in the United States and Europe, used this product as a raw material and could be the appropriate channel for the production flow.

At the same time, Tristão disrupted the tendency of the federal authorities to approve the installation of soluble coffee industries in São Paulo, Paraná and Minas Gerais, and began the implementation of Realcafé, while the conilon grown relied on the entrepreneurship of many pioneers, who took the risk, contrary to official policies.

Resistance to conilon came from both the Government and the regions that cultivated arabica. It was feared that sturdy crops would replace fine coffees, given the lower production costs and high productivity. In this scenario, the daring and pioneering producers started their

plantations at their own risk, without any financial assistance from the Government.

Tristão supported and encouraged the producers to follow that endeavor, when Mr. Jônice Tristão, receiving our late Dr. Eduardo Glazar, then mayor of São Gabriel da Palha and leader of the conilon movement, said: "You can plant and I guarantee the purchase of all the coffee you produce." Realcafé, at the time, was designed to process 100,000 bags of coffee a year, which would absorb all the production of the conilon.

That moment, according to Dr. Eduardo, became a milestone in the glorious conilon path, a source of pride for the Capixaba people. Currently, more than four decades later, Realcafé, now under the command of Sérgio Tristão, industrializes about 400 thousand bags of coffee each year. Espírito Santo, in turn, became the world's second largest producer of robusta, with harvests approaching 10 million bags.

### 3.34 COMMUNICATION NETWORKS

The interest of the Capixaba media over coffee activity dates back almost three decades. This fact is fully justified by the economic and social importance that the sector represents. In Espírito Santo, coffee is news. A striking example of this interaction is the pioneering nature of *Jornal do Campo - TV Gazeta/Globo*, which has been on the air for 36 years. It is a television show specialized in the rural area.

Throughout these years, technical materials, daily bulletins, reports, special newspaper sections and other subjects were extensively used by the mass media (television, radio, newspaper, magazine and internet), with the objective of disseminating information, knowledge and technologies.

For being a productive chain in which the State is placed as a leader in technological advances and by the contingent of people involved with the activity, conilon coffee receives special attention. Important initiatives are essential to broaden the actions spectrum in the professional work of disseminating information.

Like *Jornal do Campo*, other shows, such as *ES Rural*, *TVE* and *Agribusiness Capixaba*, from *TV Capixaba*, are also weekly broadcast, bringing news from the rural world to the public. But in the Capixabas' daily life, the news of agriculture is always present. On a daily basis, the several news of TV stations, as well as local TVs (countryside), bring the Capixaba families homes a series of qualified content, fundamental to the socializing information process.

In this same direction and purpose, radios contribute to the process of information diffusion in an informal language of everyday life, establishing a faithful and lasting bond with the coffee-grower listener. Conilon coffee in the State is always an excellent topic for discussion and debate.

In addition to the audiovisual universe, the print media records the evolution of conilon coffee in Espírito Santo. Spread throughout the 78 municipalities of the state of Espírito Santo, newspapers such as *A Gazeta*, *A Tribuna*, *Tribuna do Cricaré*, *Hoje Notícias*, *A Notícia*, *O Diário do Noroeste*, *O Correio do Estado*, *Aqui Notícias*, *ES de Fato*, *Parada Viva*, *Folha do Caparaó*, *o Ponto*, *Extra Noroeste* give special attention to agricultural activity. There are also other weekly,



biweekly and monthly newspapers.

In recent years, specialized agribusiness magazines, such as Campo Vivo, Procampo and Mundo Rural, reserve a large space for the presentation of material on all links in the conilon coffee production chain. Also worthy of note is ES Brasil, the economy magazine with the largest circulation in the State, which brings articles and information about the conilon, in its almost all editions.

No other state in the Federation has such a strong relationship with coffee. Espírito Santo “breathes coffee,” and the conilon is primarily responsible for this connection. This situation is known and multiplied by the media. In the countryside or in the big urban centers, when there are references about coffee in a conversation among neighbors, producers, students, professionals of the area, businessmen, investors, among others, it will not be new that some manifestations arise, such as: “I’ve seen, I’ve read, I’ve heard”.

### 3.35 PRIVATE TECHNICAL ASSISTANCE COMPANIES AND AUTONOMOUS

There are countless and important private technical assistance actions, protagonists of the work of technology transfer, together with public institutions, and that have helped and greatly help the evolution of conilon coffee agribusiness.

There are also numerous institutions, the field of updating and the nature of its services. Only to emphasize this importance, but without the purpose of exhausting this theme, some works are cited that, together, have been fundamental to promote changes in the technological base of this product: companies and professionals of irrigation equipment, fertilizers, agrochemicals, seedlings, soil preparation machinery and equipment, pruning, harvesting and post-harvesting.

Another field of activity of private companies and autonomous professionals that deserves attention is the planning, especially in the elaboration of technical projects, consulting and technical assistance.

The effort and dedication of the group of companies and private professionals in the technical progress of the State of Espírito Santo coffee industry, especially conilon coffee-growing, is therefore acknowledged.

### 3.36 TESTER PRODUCERS

In the middle of a great generation effort, technologies diffusion and transfer, the importance of the so-called “tester producers” must be recorded. It is a differentiated category of farmers who present attributes and vision of the activity that distinguish them from the others.

In this case, they have characteristics and aptitude that are relevant and interesting to the field of research. They have observation and interpretation of natural facts abilities and attitudes. They present creative, disciplined imagination and relate ideas well. They hold accurate perception, are interested, and generally like what they do. Most of the time, their stories as tasters have origins in initial direct or indirect relationships with researchers or research entities.

In Espírito Santo, the performance of these producers is remarkable in conilon coffee cultivation, especially in the identification and selection of clones with interesting and superior agricultural characteristics, plant and weed management, different spacing arrangements, coffee association with others species, alternative pest and disease methods control, green manure and organic composting, harvesting and drying.

Bastos, Bizi, Fiorese and Partelli families, as well as autonomous professionals, such as José Sebastião Machado Silveira, Francisco Luis da Silva Felner and José Francisco Tauffner, are mentioned for registration purposes only.

However, in order for these results to be extrapolated and socialized for the group of farmers, it is recommended that, at least in its final phase, they be evaluated by scientific method, and specifically in the case of variety, it should only be available after registered in the Mapa Cultivation Protection Service.

#### **4 RESULTS SYNTHESIS OF THE INSTITUTIONAL ARRANGEMENT EVOLUTION**

Throughout the 45 years of formation and consolidation of the conilon coffee production chain, it is verified that the scientific knowledge about the species and its genetic diversity was the main factor of support and densification of the installed institutional arrangement. This arrangement is articulated and strengthened more and more by using the knowledge generated in all those years.

This apparatus was fundamental to extract from the plant the best agricultural and industrial characteristics never before unveiled. It is recalled that in the initial formation of the conilon coffee area the first crops were implanted with technologies adapted from arabica coffee.

Departing from virtually no information or knowledge, coffee growers were gradually provided with scientific support, and institutions learned to cope with the activity, so that currently there is the greatest knowledge accumulation ever recorded for any crop in such a short time.

The main indicators of evolution in the Institutional Arrangement of Conilon Coffee in Espírito Santo (AICC), presented on Table 3, were grouped into four pillars: scientific production, technological impact, socioeconomic impact and institutional dimension.

**Table 3.** Balance of the results indicators of the Arranjo Institucional do Café Conilon - AICC (Institutional Arrangement of Conilon Coffee) evolution in Espírito Santo, 1970/71 and 2014/2015

Indicators	AICC start (1970/1971)	AICC Current Phase (2014/2015)
<b>1. Scientific production</b>		
Scientific Background	Adapted from arabica coffee	Specific to conilon coffee
	There were no clones evaluated	About 2.000 clones evaluated
	Planting only by “seeds” from crops	More than 200 clonal gardens implanted, with clones of premium varieties, as well as registered seed fields
	Absence of germplasm bank	Active germplasm bank with 500 accesses
Varieties generated in ES	There were not	15
Technologies generated	Incipient	> 50
Knowledge generated	Incipient	> 4000
<b>2. Technological Impact</b>		
Area under production	28.5 thousand ha	283.1 thousand ha
Production	<200 thousand processed bags	9.95 million processed bags
Average ES productivity	<7 bags/ha	> 35 bags/ha
Productivity potential	<25 bags/ha	> 200 bags/ha
<b>3. Socio economic Impact</b>		
Scope	15 municipalities	64 municipalities
Families involved (production)	4 thousand	78 thousand
People involved (production)	12 thousand	> 200 thousand
Rural Properties	2 thousand properties	> 40 thousand properties
Participation in total credit applied in ES agriculture	0% of total	31.5% of total
VBP-CC (at 2014 average prices)	R\$ 47.4 million	R \$ 2.36 billion
<b>4. Institutional Dimension</b>		
Institutions in AICC	6 Municipal Government of São Gabriel da Palha, Coaabriel, Acares, Realcafé and Catholic and Lutheran Churches	> 40 Most cited in section 3 of this chapter

**Source:** Data estimated by the authors from publications generated by Incaper, Conab, IBGE, technical articles, scientific, among others.

The scientific base, a pillar of the entire evolution of the AICC, showed a significant advance, starting from practically the incipience and insufficiency to a forefront level in the generation of knowledge for the conilon coffee species. In the last decades, about 2 thousand clones have been studied, of which a good part is in the active germplasm bank, available to science, and many others, already tested and incorporated in clonal varieties released, are available and in use by the productive sector, in more than 200 clonal gardens, distributed in the main producing regions.

Still in the field of scientific production indicators, more than 50 technologies generated and in use by coffee growers are already registered, based on more than 4 thousand knowledge

developed during the formation of the AICC. In this scientific portfolio, we highlight the availability of 15 premium varieties/cultivars, widely used by the agricultural production sector.

Scientific production, coupled with an exemplary joint work in the area of technology transfer, developed by the various institutions that make up AICC, positively impacted the main indicators of the production sector. In just over four decades, production has increased 50-fold, from less than 200 thousand to almost 10 million bags, while in this period the area in production has grown only 10-fold, from 28.5 thousand to 283.1 thousand ha.

Thus, there is a true technological revolution in conilon coffee in Espírito Santo, because productivity, which measures the efficiency in the appropriation of the generated knowledge, increased, on average, five times, jumping from less than seven to more than 35 bags produced per hectare.

This technological advance has a direct positive impact on the indicators of socioeconomic impacts, which are distributed in most of the Espírito Santo territory. Of the 15 producing municipalities at the beginning of the AICC, there is currently the record of a conilon coffee crop in 64 of the 78 municipalities of Espírito Santo. In 50 of these, it is the main agricultural activity that generates income and employment in the rural area.

There are currently more than 40 thousand rural properties producing conilon coffee, at least 20 times superior than in the early 1970s. In this expansion, there was a proportional increase in the number of people in the production sector, from 4 thousand to 78 thousand families and 12 thousand to more than 200 thousand people involved in the activity.

In the first five years of the AICC, conilon coffee farming was not covered by the rural credit policy. And, from this absence of credit, currently, conilon coffee growers have become the main borrowers for the crops renewal in the new technological bases. Only in 2014, R\$ 850 million of contracted credit was invested, representing 31.5% of the total amount in Espírito Santo.

The Valor Bruto da Produção de Café Conilon - VBP-CC (Gross Value of Conilon Coffee Production), a kind of coffee growers' turnover, since it measures the agricultural production value at market prices, was R\$2.36 billion in 2014, putting this kind of coffee leading this indicator, among all the agricultural activities. This amount corresponded to approximately 29% of the Valor Bruto da Produção Agropecuária - VBPA (Gross Value of Agricultural Production) of all Espírito Santo.

However, it can be inferred that this scientific, technological and socioeconomic evolution was accelerated and optimized through the interaction and integration of institutions that worked in partnership, with shared focus and planning, in which spontaneous joins emerged over time, passing from six pioneer organizations for more than 40 AICC stakeholders.

## 5 FINAL CONSIDERATIONS

Committed and articulated institutions interacting with each other are fundamental to the process of development of any productive arrangement.

Among the many factors that explain the success of conilon coffee in the State of Espírito Santo, some are attributed to the organization, commitment and union between the institutions that make up this arrangement, which are fully noticeable and give global product robustness and visibility.

In the State, these institutions can be grouped together into three main pillars or supporting areas: 1) those that deal with the generation, diffusion and transfer of technologies, information and knowledge, including in this item those that act in the teaching, training and agents qualification; and 2) those that operate in the important field of producers representation and 3) those that play a fundamental role of inter-institutional articulation.

It should be emphasized that this grouping does not limit the field of institutional performance in only one area of activity. There are many traversal nature actions, especially when the action is related to qualification and training, because it is a common theme to several institutions. This classification is only a didactic exercise to better understand and value more properly these roles.

In the area of generation and technology transfer, Brazil and the world of coffee recognize that the State of Espírito Santo, through its genre institutions, is the main protagonist, leading the actions in this field. This prominent position is evident in several opportunities, such as: numerous entitlements in the accumulation of research results developed over the last 30 years; partnerships with national and international research and technological innovation institutions; visits to state missions of several conilon producing countries; prizes of science and technology won; and the collection of edited scientific technical publications, which support the reference base and the technological level on which the development of the state coffee area is based. At the International Conference of *C. canephora*, held in Vitória in 2013, this hegemony of the State of the Espírito Santo was evident.

In the area of articulation and institutional representation, it can be affirmed that, currently, there is in the productive arrangement of conilon coffee, a set of organizations that act as facilitators in promoting and practicing the culture of cooperation and partnership for its development. The current sense is the construction of a very favorable environment to its growth and protection through dissemination and incorporation of information and knowledge.

In this area of activity, many institutions have, over the years, endeavored to facilitate, cooperate and establish partnerships and even share resources and materials or just make their mark available, demonstrating a concerted attitude in the quest to build consensus, manage conflicts and integrate actions.

This posture brought capacity for the institutional development, behavior change, and management modernization so that they could well represent their roles as organizers, extracting a number of positive compensations for the arrangement.

It is also observed, in the evolution of the institutional arrangement, the construction of new institutions, in and out, creating the desire to contribute, proactively participating in forums, committees and sector councils or other space for discussion and genre proposition, besides participation in promotional events regarding conilon coffee. The purpose is to contribute more and more to the expansion of the productive chain. In fact, the strategic importance of

institutional articulation in the conilon arrangement is observed.

As a result of the group of organizations performance, there is an impressive evolution when confronting the main scientific, technological, economic and social indicators of the present time in relation to the ones existing in the year 1970, which marks the beginning of the institutional arrangement of conilon coffee in Espírito Santo.

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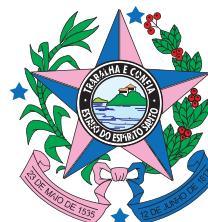


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