
Bayetta Bellachew, Director of Research & Development,
African Coffee Research Network (ACRN) coordinator
Inter-African Coffee Organization (IACO)
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I. Introduction

For many years, Cote d’Ivoire was the leading coffee producer and exporter in Africa and ranked third in the world after Brazil and Colombia. According to various reports, up to 2002, its annual production and export was over 300,000 tons standing first in Africa. The Civil unrest and decline in world coffee prices took its toll on coffee production in 2002 and beyond, dramatically dropping production and export volume down to 82,324 tons and 89,590 tons in 2005/2006 and 2006/2007 crop seasons, respectively. The production appeared to continue to decline even after the restoration of peace and stability and this was reportedly attributed to persistently low coffee prices which brought about continued neglect of coffee farms and conversion to other crops.

One of the major mandates of IACO is to assist its member countries through addressing challenges facing the African coffee industry and instituting measures to ensure increased production, productivity and quality. To this end, IACO has been doing its level best and is currently in the process of coordinating the development of a comprehensive project on Revitalization of African coffee production, quality and trade through the consultancy services of CABI – Africa and financial support from the Common Fund for Commodities (CFC). Cote d’Ivoire is one of the beneficiaries of this project. To address the realistic and immediate problem of coffee production in the country, it is mandatory to understand the current status of coffee production, major constraints other than low coffee price and opportunities available. As part of this effort, a short visit was made in January 2009 to three major coffee producing areas viz., Abboisso, Abengourou and Divo to obtain an overview of the current status of coffee production, assess prevailing constraints and opportunities available, discuss with the
concerned bodies on the possible ways of revitalizing and promoting coffee production in the country.

II. Coffee Production status

The current status of Robusta coffee production and existing problems were assessed through short field visits to three major coffee growing regions of Cote d’Ivoire (Abboisso, Abengourou and Divo) and having discussions with the relevant authorities such as regional extension coordination office of the Ministry of Agriculture, coffee and cocoa cooperatives, and farmers of the respective regions as well as Divo research Station staff.

1. Abboisso

Aboisso which is one of the major coffee producing regions is located about 100 km north east of the capital, Abidjan. The coffee production area is, however, some 40km East of Aboisso town. In this region the major agricultural crops are Cassava, palm oil, rubber tree, banana, pineapple, and coconut. Coffee accounts for smaller proportion, while the production of Cocoa is nearly negligible presumably due to low suitability of the area for the crop. The expansion of palm oil and rubber tree in the region is very high.

Coffee production: Robusta coffee is commonly planted at 1333 trees per hectare and the quality of coffee in this region is claimed to be better compared to other regions. The coffee producers are organized in cooperatives, coffee and cocoa farmer’s cooperative. One of the cooperatives we visited is known as ‘Coopamas’ Cooperatives which comprises 300 members and owns 500 hectares of coffee farm. As noted from one of the coffee farm that is owned by an individual farmer named Mr Motle Yao who is also member of the cooperative, the weed management was so good and the farm was clean. However, proper control of suckers arising from the main stem and number of verticals was lacking. The coffee trees are old enough and stumping and fertilization are not common practices. The yield per hectare is reported very low, 300 kg per hectare, most probably, because of the low management practices and old age of the trees. The low coffee yield allied with low prices has considerably affected the promotion of coffee production and the named farmer has already converted ten (10) hectares of his coffee farm to rubber plantation and currently maintaining five hectares. The major reasons were that coffee is labor intensive, the price is low and harvested only once per year, while palm oil and rubber trees once established are easy to manage, harvested all the year round and the price is stable and higher than coffee.

The coffee processing practice was rather good. Coffee after picking is dried on a well constructed raised bed (Fig1). The harvested cherries are fairly free from any foreign materials
like leaves, soils granules and other dirt materials. The dried coffee is maintained in clean fiber sacks distributed by the cooperative. The cooperative owns tracks for coffee transportation from the field to haling factory and then to the store or main destination for sale.

Fig 1 – sun drying process on raised bed by a farmer in his home yard

**Coffee Nursery and supply of planting material:** There are 52 nurseries across the country, which are responsible to produce and distribute planting materials from improved varieties of Robusta. It is obviously a perfect system to have so much nursery sites which could be sufficient for adequate supply planting materials to the growers. One of these nurseries was visited in Aboisso. During the visit, there was no much nursery activities and the seedlings raised for harvesting of cuttings was largely yellowish, the phenomenon of nitrogen deficiency (Fig 2). To promote coffee production in the country, it is of paramount importance to keep up the existing nursery structure and further strength the nursery activities and improved planting material distribution.

2. Abengourou

Abengourou is one of the coffee growing regions of Cote d’Ivoire located about 200 km North East of Abidjan. Its agro-ecology appeared to be quite different from Abboisso particularly when we look at the soil type and vegetation cover. In this region the primary forest has
already gone and only escaping trees are observed here and there as indicators of original forest area. Very huge wood trees lying down in the farms are also other typical indicators that the plantations were established replacing primary forests. The common crops grown in the region includes cassava, yam, taro, banana, plantain, rice, maize, and pine apple as food crops and

![Image](image.jpg)

**Fig 2** – One of the coffee nurseries in Abboisso used as sources of cuttings for clonal propagation

cocoa, coffee, coconut, palm oil, rubber trees and Jatropha as cash crops, the latter two crops being a recent introduction to the region.

**Coffee production:** The abundance of coffee farm in Abengourou region generally appeared to be higher than the coffee farms in Aboisso, suggesting the relative importance of the region for coffee production. The coffee farms visited all the way to Abengourou town were, however, observed to be neglected and too old (Fig 3).

The current status of coffee production in the region was discussed in depth with the head of Abengourou regional Coffee and Cocoa Board (BCC) and Coffee and Cocoa Cooperative staff. The cooperative visited embraces 1300 producers and the annual production of coffee was reportedly oscillating between 4 and 300 tones, even though the exact figure for coffee areal coverage was not available. The extreme irregularity of production was probably due to
biennial bearing habit of coffee, old age of the trees and poor management. It was pointed out that coffee production is not prospective and economically viable. At present the coffee farms in the region are largely neglected and coffee production may continue to decline. In the coffee and cocoa cooperatives department store, there was no a kilo of coffee and solely filled with quintals of cocoa seeds which was ready for sale.

3. Divo

Divo is the other major coffee growing region of Côte d’Ivoire located in South West forest zone of the country. Divo town is located 200 km North East of Abidjan. Similar to other regions cassava, yam, taro, banana, plantain, rice, maize, and pine apple are grown as food crops and cocoa, palm oil, rubber tree coffee, coconut, are the cash crops grown in the region. Cocoa is an old age dominant cash crop while rubber is a recent introduction which is intensively expanding. Currently, the expansion of both cocoa and rubber is enormous as demonstrated by numerous numbers of nurseries and new plantations everywhere.

![Fig 3 – An example of coffee farm under neglected condition (taken from Abengourou).](image-url)

**Coffee production:** Contrary to cocoa, palm oil and rubber, coffee production in the region is very discouraging similar to the other two regions. All the way from Abidjan to Divo town, there
were a number of coffee farms of garden coffee types observed and none of these were properly managed. A relatively larger coffee farm of about 5 ha owned by individual farmer was visited at Datta village, some 20 km away from Divo town. The farm was well managed relative to others and was weed free, but all other management practices were very traditional indicating lack or inadequate extension services particularly in training the farmers on appropriate coffee management practices. The farmer has no any awareness about pruning (multiple or single stem), handling (sucker control, removal of dense, intermingled and dead branches, etc.) and control of number of verticals or main stems per individual tree. Tree management is generally free growth and an individual tree can have as many verticals (main stems) as it can naturally bear, a typical traditional practice (Fig 4). In the farm visited, 16 verticals (main stems) were counted on a randomly taken tree from the old farm, while on a stumped farm, individual trees containing as many as 23 suckers or verticals were noted. Lack of proper pruning affect bean size and quality, reduce yield, increase proportion of floater beans, encourage pest (diseases and insect pests) development and consequently reduce the final income of the farmers from coffee. Under normal condition, 2 – 4 suckers preferably distributed on all directions (east, west, north and south) are recommended.

Fig 4 - a. Number of verticals maintained in one of the old coffee farms
Divo Research Station:

It is one of the major research stations of CNRA (National Agricultural Research Center) that serves as the main research station for coffee and cocoa. It is located 13 km away from the town and occupies 3500 ha of land, probably the largest station in the country. The station has recorded significant contributions in developing improved coffee varieties, agronomic practices and post harvest processing. The objective of the visit to the station was to discuss over the current status of coffee production and possibilities of assisting the growers through dissemination of available technologies specifically improved varieties and agronomic practices.

Discussion has been made with the director of the research center and concerned staff on possible collaborative project development and promotion of Arabusta hybrid and organic coffee production practice developed by the research station. It was agreed to develop a joint project proposal aimed at addressing some of the production constraints of coffee, specifically supply of improved planting material and quality improvement through organic coffee production and coffee terroir classification in which the research center (CNRA), IACO (Inter-African coffee organization) and UNOPS (United nations office for project support) will be project partners. In addition, the Arabusta hybrid development scheme and its agronomic performance under field condition were further discussed with Mr. Yapo Abi Antoine, breeder, to examine the feasibility of promoting the hybrid as an improved variety.
**Genetic Improvement:** Coffee variety development and collection of coffee germplasm are the major components of the coffee genetic improvement program of Divo research Station. Under this program, the development of variety ‘Arabusta’ is the major achievement to be mentioned.

**Arabusta variety** – The Arabusta hybrid variety now ready for dissemination is F4 lines of the inter-cross between Arabica x Robusta that possess high yielding ability, the good quality trait of Arabica, and disease resistance and low altitude adaptation attributes of Robusta. One of the problems of Arabusta reported and also manifested under field condition was its flexible stem nature inherited from one of its complementary parent, Arabica. The performance of the variety for other major desirable characters is given in Table 1.

Based on the available information particularly concerning yield and quality, the promotion of Arabusta appeared feasible. However, since the proportion of pea berries are too high compared to normal green beans commonly supplied to international market, while the promotion of its production is underway, it is important to conduct marketing assessment and identify the best form of the product (roast, ground, green or instant) that is more preferred by the buyers or consumers.

**Table 1. Some of the major agronomic characteristics of arabusta hybrid developed at Divo Research station (CNRA)**

<table>
<thead>
<tr>
<th>Character</th>
<th>Performance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yield</td>
<td>1000 – 1300 kg/ha clean coffee (research)</td>
</tr>
<tr>
<td></td>
<td>800 – 1000 kg/ha clean coffee (on-farm)</td>
</tr>
<tr>
<td>Quality</td>
<td>Grade 1 (80%) and good aroma</td>
</tr>
<tr>
<td>Pea berry (PB) and floaters</td>
<td>50 % and 25%, respectively</td>
</tr>
<tr>
<td>Caffeine content</td>
<td>1.98% dmb</td>
</tr>
<tr>
<td>Adaptability</td>
<td>Suited to all Robusta growing areas</td>
</tr>
<tr>
<td>Stem nature</td>
<td>Flexible and drooping, not stiff</td>
</tr>
<tr>
<td>Disease resistance</td>
<td>Resistant to coffee leaf rust</td>
</tr>
</tbody>
</table>
Coffee germplam collection and conservation – This activity is the other most important component of the breeding program of the research station. All together, there are 8000 accessions that were collected between 1966 and 1987 from eight countries of Africa. These collections have been established and maintained at two locations. The highland group which comprises 3000 accessions of *C. arabica* and other diploid species of high altitude origin were planted at Man Station on two hectares of land, while the lowland groups comprising 5000 accessions of *C. canephora* and other diploid species of low altitude origin were maintained at Divo station on 8 hectare of land. The diploid species are altogether about 25, and the bulk of the collection is generally Robusta and Arabica agro-types. Among the diploid species, *C. anthonyi*, commonly named as ‘Species Molonda’, which originated from the two Congos, Congo Brazaville and D.R.Congo, was said to be self-pollinated as opposed to all the rest diploid species which are cross-pollinated. Generally, the station maintains the largest collections of Robusta in the world and can serve as one of the major coffee gene bank to complement the main Robusta conservation center of excellence to be established soon in Uganda.

Agronomic Research – The improvement of management practices is the other important area of research at Divo Research Station. Among the various agronomic trials conducted, the study on the mineralization capacity of Gliricidia when planted with coffee was the most important to mention. The study clearly demonstrated that intercropping of Gliricidia with coffee at equal proportion (1:1 ratio) and periodically chopping down of the braches for use as mulching was as effective as the recommended rate of inorganic fertilizer. The yield and growth performance of the intercropped field was strikingly different from the non fertilized field (Fig 5). *Gliricidia sepium* commonly known as Gliricidia is a medium size leguminous tree plant of the Fabaceae family that fixes nitrogen. In addition, it has the highest coppicing capacity that facilitate periodical cutting down and chopping of the braches for using as mulch in order to add organic matter to soil and their by improve soil fertility, structure and porosity (aeration). Therefore, this finding is very useful to promote organic coffee production using improved varieties such as Arabusta. Since Gliricidia is propagated by cutting, planting material could be the only limitation in its popularization in shorter time if well established large Gliricidia garden is not available from which adequate amount of cutting materials can be annually supplied.
III. Constraints of coffee production

There are several factors that contributed to the current low level of coffee production and that impeded future revitalization and promotion of coffee production and marketing in Cote d’Ivoire. Because of my short visit, it may not be possible to provide exhaustive and long list of these problems, but from the field observations and discussion with the farmers, the extension experts and the cooperatives in all the areas visited, the following are the major constraints which may even jeopardize coffee production in the country if remained to continue and appropriate measures are not timely taken:

1. Competition by other crops – Rubber, cocoa and palm oil are becoming a serious threat to coffee production in Cote d’Ivoire for various reasons: (a) cocoa, rubber and palm oil are easy to manage and are not labor intensive compared to coffee, (b) the income from palm oil, rubber tree, and cocoa is said to be much higher than coffee, (c) there is a continuous harvest and income throughout the year from rubber and palm oil, while the yield from coffee is only once a year and highly irregular, and (d) coffee management, picking and processing is said to be relatively capital- and labor-intensive. As a result of these comparative advantages, considerable area of forest land and coffee farms are currently being replaced by rubber tree, palm oil and cocoa (Fig 6). The coffee farms are either neglected or replaced by these crops.
2. Low coffee price – The price of coffee is too low to cover the cost of production (cost incurred for labor and input supply) and assist the resource poor smallholder coffee growers. The minimum floor price or indicative price (about 550 cfa/kg of green bean) set by the government to minimize the problem has not been materialized by the traders and no follow up has been made to enact this regulation. This has considerably discouraged the coffee farmers and forced them to shift to other cash crops like rubber, cocoa and palm oil.

3. High cost of coffee management – Compared to other cash crops such as cocoa, rubber and palm oil, coffee management was reported to be rather expensive. It requires frequent weeding, constant supervision and pruning, and input supply such as fertilizer and pesticides which is expensive to bear by the farmer. Harvesting and processing of coffee is another labor intensive operation. Consequently, many growers have neglected coffee management while some are trying to manage the problem through contract agreement with individuals who are contracted to weed, harvest and dry the coffee and finally share half of the total yield produced, which is also in fact another disappointing feature.

As pointed out by Abengourou coffee and cocoa cooperative team, out of 100 farmers sampled, 70% were rubber growers and 30% were cocoa growers and there was no one farmer growing coffee. This clearly suggests that coffee production is at great risk and it may be difficult to
maintain coffee production in areas where more competitive crops like cocoa, palm oil and rubber are grown unless some incentive mechanisms are devised for the coffee growers.

4. Lack of improved planting material – Most of the coffee plantations are old and were earlier established using traditional cultivars which could be low yielding, poor in quality and susceptible to some pests. There is no adequate supply of improved planting materials for reestablishment of such old farms or for new planting program. There are 52 nursery sites reported to exist across the country, which could be extremely useful and adequate enough to supply sufficient planting materials to the farmers if actively engaged.

5. Shortage of budget and inadequate infrastructure – The cooperatives do not have adequate budget to pay cash at hand to the growers who need their money immediately. Collection of coffee from different farm gates and collection points and transporting to the main store is also constrained by road inaccessibility in some areas.

6. Quality – The quality of coffee collected from different farmers is low and lacks uniformity. Probably, this is due mainly to the discouraging low price, financial problem with the farmers to hire enough labor for harvesting and processing or construct raised drying tables or cemented floor, and lack of adequate training on proper coffee harvesting, processing and storage.

7. Lack of Incentives – coffee farmers are disappointed with the low price, and high management cost of coffee compared to cocoa, palm oil and rubber. On the other hand, unlike cocoa, which is subsidized for agricultural inputs, there is no any incentive mechanism for coffee growers. In areas where cocoa, rubber and palm oil are growing, it would be difficult to promote coffee production unless incentive mechanisms are devised.

8. Inadequate or lack of Extension services - There is no intensive extension program to carry our regular training and advisory services on proper coffee management and processing, facilitate input supply and credit system, providing planting materials, etc to the farmers. As a result, farmers’ knowledge about proper coffee management, harvesting, processing and storage is highly limited. Particularly, the farmers has no any awareness about pruning (multiple or single stem), handling (sucker control, removal of dense, intermingled and dead branches, etc.) and control of number of verticals or main stems per individual tree. Tree management is generally free growth and an individual tree can have as many verticals (main stems) as it can naturally bear, a typical traditional practice (see Fig 4 above)
IV. Measures to be taken

1. Price setting and control – It is very necessary to set the floor price for coffee and inspect its proper implementation to safeguard the resource poor smallholder coffee growers from price crises and ensure their sustainable income from coffee. It is one way of providing incentives to the farmers and promoting coffee production and trade.

2. Establishment of a viable Extension System – strong extension system must be established to provide at least the following basic services to the farmers:

2.1 Intensive sensitization and training of the farmers – Because of the low return from coffee and higher management cost compared to rubber, palm oil or cocoa, the farmers have developed hatred and lost interest. Therefore, intensive sensitization on the economic importance of coffee, its significance as a means of diversification of income sources, possible maximization of coffee prices through different ways of value addition, etc., is very important to reverse the negative image and develop interest in the minds of the farmers. In addition, farmer’s technical knowledge about coffee management, harvesting, processing, and storage and quality maintenance is limited. Intensive training program on all aspects of coffee production practices (nursery management, field planting and management, proper harvesting and processing) is vital on a regular basis.

2.2 Training of Subject Matter specialists and extension agents – Most farmers lack adequate knowledge and badly need training on proper coffee management and processing practices. To carry out effective and fully fledged extension services to the farmers, it is necessary to produce sufficient number of skilled human power with adequate knowledge on coffee production, processing and storage. Therefore, training of subject matter specialists and development agents is very important and these trainees could later on serve as trainers of the farmers and other development agents.

2.3 Multiplication and distribution of improved planting materials - The neglected coffee farms were planted with traditional low yielding cultivars. It is necessary to multiply and distribute improved planting materials that are high yielding and good in quality to replace these traditional cultivars and maximize coffee production and the income of the farmers. There are already 52 nursery sites across the country established with improved varieties that can be easily reactivated to launch intensive multiplication and distribution program in the shortest time possible.
2.4 Facilitating input supply and credit facilities – The resource poor smallholders coffee growers cannot easily access to credit services or afford to buy the necessary agricultural inputs and farm tools on their own. These services should be facilitated by the extension agent and this is one of the most important means of encouraging the farmers.

3. Incentives – at present, farmers are very much disappointed in producing coffee for obvious reasons: (a) farmers are cost sensitive and the return from coffee is not attractive to the resource poor smallholder coffee producers because of its low price, (b) coffee maintenance, harvesting and processing is said to be labor intensive compared to rubber, cocoa and palm oil, (c) there is shortage of family labor and farmers do not afford to hire daily laborers for proper management and harvesting, and (d) the return from coffee is lower and its management is costly compared to other cash crops such as rubber, cocoa and palm oil. In addition, harvesting and income generation from rubber and palm oil is throughout the year which is useful for such farmers who are not well aware of saving and proper planning of their income and expenses. Therefore, incentives in the form of (a) credit services with reasonable grace period, (b) subsidies and reduced income tax on agricultural inputs and farm tools or machineries and (c) guarantee for stable and fair price, and similar other incentive mechanisms are very important to salvage the coffee production scenario and withstand the severe competition from other cash crops.

4. Government Support – Coffee production in Côte d’Ivoire appeared at risk mainly because of low coffee price, high management cost, competition by other crops such as rubber, cocoa and palm oil, luck of incentive and inadequate extension services as indicated under section (III) above. At present many coffee farms in the areas visited have lost proper attention and farmers are quite reluctant to produce coffee and are shifting to other cash crops. Therefore, to reverse the current image of the farmers and revitalize coffee production in the country, government intervention and fully fledged support is vital. Government support is mainly needed in:

a. Implementation of the recommendations given above under section IV (No 1–3) – the recommendations given above requires strong policy support and budget for implementation by the relevant body.

b. Allocation of adequate annual budget for regular coffee development activities
c. Putting in place the National coffee development plan and articulated vision that would assist as government directive to aggressively campaign on coffee development activities on a sustainable basis

d. Infrastructure development specifically feeder-roads and transport facility to facilitate ease of access and collection of harvested coffee from farm gates

e. Diversification - Diversification program should be part of the National agricultural development strategy in which coffee is one of the major components. Income diversification is one of the most viable strategies to ensure sustainability of national exchange revenue and revamping the economy of a country. It is the major means of avoiding unforeseen market failure and the danger of mono-cropping. No one forgets the lesson learnt from the recent world coffee crisis and its consequences on the economy of those countries whose foreign exchange earnings largely depend on coffee. Various reports indicate that cocoa alone represents 90 percent of the foreign exchange earnings of Cote d’Ivoire. Today cocoa is still expanding with equal or more pace compared to rubber and palm oil while coffee is not at all expanding and the existing farms largely lack proper management. If the current practice continues, the production of coffee may face more serious challenge. Therefore, there must be strong government support to maintain coffee as one of the most components of agricultural diversification program to ensure its sustainable production and income generation.

5. Other observation: Rubber and palm oil are planted at a spacing of 3 x 5m and 7 x 10m, respectively, and this leaves wide open spaces when the trees are grown up. Considering the environmental condition of the area, it may be possible to introduce shade loving spices such as cardamom (*Ellateria cardamomum*), the third most expensive spices in the world (after saffron and Vanilla), as an under storey in order to maximize the income from the unit area of land and at the same time suppress weed growth which is currently the most labor consuming specially in palm oil plantations. Therefore, it could be a good idea to look at this possibility and see if it works or not.

V. Conclusion:

Cote d’Ivoire is in a butter position compared other war torn West African countries to revitalize coffee production and trade and regain its lost leading position in coffee production
and export in Africa. All the relevant structures including coffee research centers with required facilities and expertise, extension system at regional and national system, 52 nursery sites across the country for planting material multiplication and distribution, coffee and cocoa cooperative, and responsible government organ (coffee and cocoa board), etc are all in place in all the areas visited and this is a great opportunity. It is a matter of revising the system to reactivate the whole structure and effectively coordinate towards a common goal.

On the other hand, coffee production is at risk and the decline in coffee production and export may continue if immediate measures are not taken. Government intervention is indispensable at least in the areas indicated above under section IV (4). Since the resource poor farmers are cost sensitive, unless incentive mechanisms are devised to support coffee producers, it is very unlikely that coffee can withstand the competition by rubber, cocoa and palm oil.

Apart from rehabilitation of the neglected coffee farms and proper management of the other farms already in good condition, it appeared necessary to concentrate on value addition such as quality improvement, organic farming, specialty coffee by origin (terroir) or variety, etc. to increase the income of the resource poor smallholder coffee growers and change their negative image.

VI. Acknowledgement

This visit would not have been successful without the kind assistance of Dr. Koffi N’goran in arranging the visit program with all concerned regional bodies, facilitating fruitful discussions with the different bodies (extension office, cooperatives, research staff, farmers, etc) regardless of language barrier, and for sharing his valuable time for the tour.

I also wish to express my sincere appreciation and gratitude to all regional agricultural staff listed below who provided us valuable information and facilitated fruitful meetings:

(a) Aboisso – Konardio Dongo – Head of the zone; Ecrabe Lucin; Amow Angovi – Secretary of Coopamas Cooperative; Kakou Chantal

b. Abengourou - Mr Coulibaly Samiga – head of Abengourou regional center of the Coffee and Cocoa Board (BCC) of Cote d’Ivoire; Coffee and Cocoa cooperative staff

b. Divo – M. N’cho Rchiye Ludovic – Director, Research Station DIVO; Mr Sekou Aidara – Deputy director, Research Station DIVO and entomologist; Mr. Yapo Abi Antoine – Researcher in charge of Arabusta coffee breeding and coffee genetics