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PRODUCT SPECIFICATION

# KOPI ARABIKA FLORES MANGGARAI

## GEOGRAPHICAL INDICATION PROTECTION SOCIETY OF KOPI ARABIKA FLORES MANGGARAI

***MASYARAKAT PERLINDUNGAN INDIKASI GEOGRAFIS KOPI ARABIKA FLORES MANGGARAI***

## ABSTRACT

'Kopi Arabika Flores Manggarai' is produced from Arabica coffee plants grown in the Manggarai highlands at an elevation above 900 meters above sea level. This Arabica coffee grows on the mountains that extend from the regencies of Manggarai Barat, Manggarai, to Manggarai Timur. This area has cold and dry air with a temperature range between $17^0$ – $28^0$C, air humidity between 74-92%, cumulative rainfall between 2,400-4,800 mm/year and is supported by high soil fertility. The *'Kopi Arabika Flores Manggarai'* Plantation is located in the middle of Flores island at longitude $120^0$17.760' east longitude - $120^0$45.517 East Longitude, and latitude $08^0$33.127' South Latitude - $08^0$41.760' South Latitude.

The results of sensorial analysis show that the taste of *'Kopi Arabika Flores Manggarai'* has a herbal, floral and spicy aroma. *'Kopi Arabika Flores Manggarai'* has a taste that is not bitter and not astringent, because the farmers of *'Kopi Arabika Flores Manggarai'* perform selective picking procedures (only red coffee cherry) during harvest. 'Kopi Arabika Flores Manggarai' farmers have applied the principles of Good Manufacturing Practices (GMP) by following technical instructions from experts, both from research institutions and from the government.

The application for *'Kopi Arabika Flores Manggarai'* is under the communities who are members of the Geographical Indication Protection Society of *'Kopi Arabika Flores Manggarai'* (hereinafter referred to as "MPIG-KAFM"), in the form of **Green Coffee Beans.**

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# CHAPTER I
# INTRODUCTION

Indonesia is an archipelagic country that is rich in natural potential with a very strategic position. Indonesia is astronomically located at 6° NL (North Latitude) - 11° SL (South Latitude) and between 95° EL (East Longitude) - 141° EL (East Longitude). In view of this astronomical position, Indonesia is located in a tropical climate area. With this tropical climate, Indonesia is always exposed to the sun throughout the year. Indonesia only changes seasons biannually, namely the dry season and the rainy season. Countries that have a tropical climate are generally blessed with extraordinary nature. High rainfall makes the land fertile, with very diverse flora and fauna.

Geographically, Indonesia is located between two continents and two oceans, respectively namely Asia and Australia, as well as the Indian Ocean and the Pacific Ocean. Indonesia's position is very strategic and important in relation to the economy. Indonesia is at the crossroads of global traffic. Geographical location is one of the determinants that shapes the future of a country in international relations. Although temporarily ignored, the geographical conditions of a country greatly determine events that have a global impact.

Indonesia is a country with a high level of biodiversity. This is indicated by the presence of 10% of the world's known flowering plants that can be found in Indonesia, 12% of mammals, 16% of reptiles, 17% of birds, 18% of coral reef species, and 25% of marine animals. In the field of agriculture, Indonesia is also famous for its abundance of plantation crops, such as cocoa beans, rubber, oil palms, cloves and even timber, many of them holding the top ranks in terms of global production.

Natural resources in Indonesia are not limited to their biological abundance. Various regions in Indonesia are also known as producers of various types of minerals, such as petroleum, tin, natural gas, nickel, copper, bauxite, coal, gold, and silver. In addition, Indonesia also has fertile soil and is well used for various types of plants. The territorial waters that reach 7.9 million $km^2$ also provide enormous natural potential.

Indonesia is known as an agrarian country because most of Indonesia's population works in agriculture or farming. Statistical data in 2001 shows that 45% of Indonesia's population works in agriculture. This is based on the fact that the country has more than 31 million Ha of land ready for planting. Agriculture in Indonesia produces various kinds of

export commodities, among others rice, corn, soybeans, vegetables, chilies, sweet potatoes, and cassava. In addition, Indonesia is also known for its plantation products, among others rubber (raw material for tires), oil palm (raw material for cooking oil), tobacco (raw material for drugs and cigarettes), cotton (raw material for textiles), coffee (material for beverages), and sugar cane (raw material for sugar).

One of the plants that thrive in Indonesia is coffee. Coffee plants are classified into the genus Coffea of the family Rubiaceae. The genus Coffea has more than 100 member species. Only three species out of such figure are cultivated for commercial purposes, namely Coffea arabica, Coffea canephora, and Coffea liberica. This tropical climate plant has been a legacy of our ancestors since time immemorial. It grows on almost all the islands in the country, but the taste of coffee from every region is also very different. The taste of coffee in Sumatra, Java, Sulawesi and on other islands is different due to different genetic sources and local environmental factors, such as local climate which also differs from place to place. Such taste uniqueness remains maintained and accentuated as a unique characteristic of coffee in each region.

Flores Island is one of the islands that are unique, beautiful and have extraordinary natural potential. This island is also one of the best coffee-producing regions in Indonesia and the world. Data from the Directorate General of Plantations *(Ditjenbun, 2014)* records that the total area of coffee plantations on Flores island is around 72,451 Ha with an estimated production of 21,734 tons. These coffees consist of Robusta and Arabica types, which are spread from the western part of Flores to the eastern end. The land area for Robusta coffee cultivated by the people is recorded at 54,341 Ha with productivity of 520 kg/Ha, while the land area for smallholder Arabica coffee is 17,563 Ha with productivity of 648 kg/Ha (Ditjenbun, 2014). The productivity is categorized as relatively good for smallholder coffee plantations, even with technical improvements in cultivation, the level of productivity can still be increased. With such a large area of land, coffee has now become one of the important export commodities for the local community.

One of the important coffee-producing centers in Flores is in the Manggarai Raya area. The Manggarai Raya area covers 3 regencies, namely Manggarai, Manggarai Barat and Manggarai Timur Regencies. The Plantation and Forestry Service Office of Manggarai Regency reports that the land area of Arabica Coffee in 2014 in Manggarai Regency is 4,757 Ha with total production of 1,517 tons. While the land area of Arabica coffee in Manggarai

Timur Regency is around 7,071 Ha with productivity of 2,421.93 tons in 2014 (Manggarai Timur Dalam Angka, 2015). The coffee plantation area in Manggarai Barat Regency is 6,303 Ha with production of 1,771.57 tons *(Manggarai Barat Dalam Angka, 2014)*. Most of the coffee in Manggarai Barat is Robusta coffee. These growth figures show that coffee plants on Flores Island, especially in the Manggarai area, still exist today, and even have a positive trend in growth due to various successful campaigns of coffee farmers and the expansion of the coffee trade which benefits many parties.

Recently, the coffee market has continued to grow, and consumers have tended to buy coffee with good taste and unique character. In today's era of increasingly fierce global market competition, product differentiation is an important means to attract consumers' attention. At the coffee farmer level, various efforts have been made to improve coffee production and quality, especially taste quality.

Geographical Indication is one the solutions that can play an important role in attracting consumer interest by providing added value to local products related to places of growth and special areas, with their own techniques, such as in the Manggarai area. The special characteristics of products with Geographical Indication protection against good quality coffee can increase the competitiveness of these products. That is why governments in various countries encourage efforts to protect Geographical Indications for products that have characteristics and quality.

Based on the conditions and considerations above, the Arabica coffee farming community in the Manggarai Flores area intends to increase the added value of their coffee cultivation and processing business. It is aimed at gaining recognition for the quality and uniqueness of the coffee product, as well as a way to preserve the coffee production tradition in the region. To that end, the Arabica coffee farming community in the area intends to file an application for Protected Geographical Indication 'Kopi Arabika Flores Manggarai', so that the farmers' product is legally protected.

Provision of Geographical Indication Protection to 'Kopi Arabika Flores Manggarai' can be considered for the following reasons:

1. 'Kopi Arabika Flores Manggarai' originates from a specific area with an elevation above 900 meters above sea level with an agro-ecosystem of highland areas suitable for Arabica coffee cultivation.
2. 'Kopi Arabika Flores Manggarai' which is spread in Manggarai, Manggarai Barat and

Manggarai Timur Regencies grows in specific climatic conditions with cool and dry air (temperature range between $17^0 – 28^0$C), humidity between 74-92%, with relatively high temperature fluctuations.

3. This region has a short rainy season and a long and clear dry season. This climate becomes the regional uniqueness of the Manggarai highlands.
4. The soil in this area is volcanic soil with the Ordo Inceptisol soil type with a dominant texture of clay so that it tends to be sensitive to dryness due to a dry climate.
5. 'Kopi Arabika Flores Manggarai' is a product that has high physical and taste quality because it is planted by people who have a concern for quality. These coffee growing communities are members of traditional farmer institutions referred to as farmer groups. As for the processing, they join the coffee PPU (Product Processing Unit).
6. 'Kopi Arabika Flores Manggarai' has a long history of cultivating coffee plants through local culture that is adaptive to the taste of coffee, contributing to 'Kopi Arabika Flores Manggarai' so that it gains a high reputation and is known as one of the original Indonesian coffees.
7. 'Kopi Arabika Flores Manggarai' farmers already have quite strong institutions (farmer groups) with distinctive and relatively homogeneous agricultural management based on traditional knowledge, in which the farming community can share knowledge and skills in doing their farming business.

In an effort to get this protection, the 'Kopi Arabika Flores Manggarai' farming community has joined an organization referred to as the Geographical Indication Protection Society of 'Kopi Arabika Flores Manggarai'. This group files an application for Protected Geographical Indications to the EU Commission. This application document will explain about the Applicant and Product Specification of 'Kopi Arabika Flores Manggarai'.

## CHAPTER II
## APPLICANT

The applicant is the **Geographical Indication Protection Society of 'Kopi Arabika Flores Manggarai'** ***(Masyarakat Perlindungan Indikasi Geografis*** **'Kopi Arabika Flores Manggarai'*)***, abbreviated to MPIG-KAFM, which was officially established in 2015. This institution is a community association developed on the basis of a shared vision and mission to carry out, maintain, and preserve the production and quality of 'Kopi Arabika Flores Manggarai' products while also proposing the protection of products produced as Protected Geographical Indications, for the purpose of increasing competitiveness in the global market. MPIG-KAFM members are coffee farmer groups and other related parties based on coffee.

'Kopi Arabika Flores Manggarai' production is the result of organizational dynamics and therefore the decision to have a membership consisting of organizations/groups is not meant to exclude individual producers. Individual producers can be registered after joining as a group member.

MPIG KAFM is inclusive, in the sense that local groups of coffee farmers based in this region can join this organization as long as the members are coffee producers, companies or processors who have complied with the rules in the Product Specification of Geographical Indication. The Farmer Groups consist of farmers who are producers of red coffee cherry. These farmer groups form a Product Processing Unit (PPU) which has facilities for processing, producing and producing coffee products.

**The secretariat of MPIG of 'Kopi Arabika Flores Manggarai' is located at:**

**Jl. Pelita, Wae Palo, Bangka Nekang Sub-district, Langke Rembong District - Ruteng Manggarai Regency (86511)**

**Verification of Compliance**

**The body verifying compliance with the provisions of the product specification:**

**Name: CSQA Certificazioni Srl**

**Address: Via S. Gaetano, 74, 36016 Thiene (VI)**

# CHAPTER III
# PRODUCT SPECIFICATION

## A. NAME OF GEOGRAPHICAL INDICATIONS

The coffee proposed to get this Protected Geographical Indications is Arabica coffee originating from the Manggarai highland area which includes three regency areas, namely Manggarai Regency, Manggarai Barat Regency and Manggarai Timur Regency. The name of the proposed Geographical Indication is **'Kopi Arabika Flores Manggarai'**.

## B. NAME OF PRODUCT

The coffee proposed for this Geographical Indications Protection is Arabica Coffee produced by MPIG-KAFM from the Manggarai highland area which includes three regencies, namely Manggarai Regency, Manggarai Barat Regency and Manggarai Timur Regency. The processing system is carried out by the Wet Hulling and Fully Washed methods with products in the form of green coffee beans.

## C. DESCRIPTION OF CHARACTERISTICS AND QUALITY

### 1. Product Characteristics

'Kopi Arabika Flores Manggarai' is produced from Arabica coffee plants grown in the Manggarai highlands, with an elevation between 900 - 1500 meters above sea level. This Arabica coffee grows in the mountains that extend from Manggarai Barat, Manggarai to Manggarai Timur Regencies.

'Kopi Arabika Flores Manggarai' is green coffee beans that are processed by fully washed and wet hulled methods then dried. It has moisture content of 11-12% (weight/weight), maximum dirt content of 0.5% (weight/weight), maximum defect beans of 25 beans/300 grams of beans and contains no live insect.

For wet hulling 'Kopi Arabika Flores Manggarai' has ±18% of fat (fatty acid) compound (±10,56% Lionelic Acid and ±8,15% Palmitic acid). Whereas for fully washed 'Kopi Arabika Flores Manggarai' has ±55% fat compound (±25,82% Lionelic Acid and

±28,04% Palmitic acid)

In addition to the fat composition, Kopi Arabika Flores Manggarai also demonstrates identifiable chemical characteristics that form part of its inherent quality profile. Based on GC-MS analysis of Arabica coffee originating from the Manggarai highlands, caffeine is present in beans processed under both the fully washed and wet-hulled methods. In wet-hulled beans, caffeine accounts for approximately 6.7% of the total relative peak area of detected volatile and semi-volatile compounds, while in fully washed beans caffeine is detected in trace relative abundance, remaining below the predominant compounds due to the higher proportion of ester- and fatty-acid–derived components found in this processing method. *These values describe the distribution of caffeine within the volatile profile of the beans, reflecting the characteristic chemical expression across its two recognised processing methods. (Nugroho A.P., et al., 2025, GC-MS Profile of Arabica Coffee from Manggarai, Jurnal Sains dan Teknologi Pangan, 10(1), 8184–8192.)*

'Kopi Arabika Flores Manggarai' has approximate size of around 6,5 mm with a yellowish light-green and bluish green color and does not emit a foul odor or musty smell. Further, organoleptic test result revealed that 'Kopi Arabika Flores Manggarai' has a herbal, floral, and spicy aroma without bitter and astringent taste with moderate to high acidity level.



Figure 1. Fully Washed Green Coffee Bean

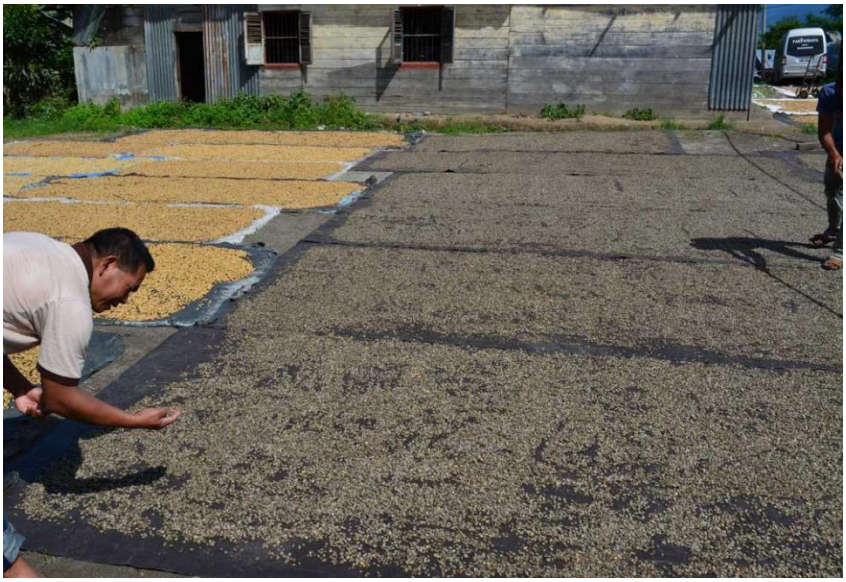


Figure 2. Wet Hulling Green Coffee Bean

## 2. Taste Profile

To find out the taste profile of 'Kopi Arabika Flores Manggarai', sampling is carried out evenly in order to represent the locations designated as 'Kopi Arabika Flores Manggarai' Geographical Indication areas.

The results of taste profile analysis show that the taste of 'Kopi Arabika Flores Manggarai' has an herbal, floral and spicy aroma. 'Kopi Arabika Flores Manggarai' has a taste that is not bitter and not astringent, because 'Kopi Arabika Flores Manggarai' farmers carry out selective picking procedures (only red coffee cherry is picked) during harvest. 'Kopi Arabika Flores Manggarai' farmers have applied the principles of Good Manufacturing Practices (GMP) by following technical instructions from experts, especially from research institutions.

Table 1. Results of the 'Kopi Arabika Flores Manggarai' Taste Test

| No. | Sample Origin / Farmer Group | Arm | Fla | At | Ad | Bd | Un | Bl | Cc | Sn | Oa | Nt |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. | Waling Borong | 7.75 | 7.50 | 7.50 | 7.50 | 7.50 | 10 | 7.50 | 10 | 10 | 7.50 | 82.75 |
| 2. | Compang Lawi Sambi Rampas | 7.50 | 7.67 | 7.33 | 7.25 | 7.33 | 10 | 7.25 | 10 | 10 | 7.42 | 81.75 |
| 3. | Pocolia Poco Ranaka | 7.67 | 7.75 | 7.50 | 7.92 | 7.67 | 10 | 7.67 | 10 | 10 | 7.75 | 83.92 |
| 4. | Golo Loni Rana Mese | 7.75 | 7.33 | 7.08 | 7.00 | 7.50 | 10 | 7.0 | 10 | 10 | 6.83 | 80.50 |
| 5. | Ngkiong Dora | 7.67 | 7.58 | 7.58 | 7.75 | 7.58 | 10 | 7.50 | 10 | 10 | 7.50 | 83.17 |
| 6. | Way Bangka Lembor | 8.0 | 7.75 | 7.50 | 7.75 | 7.50 | 10 | 7.50 | 10 | 10 | 7.50 | 83.50 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7. | Cumbi Ruteng | 7.75 | 7.75 | 7.50 | 7.50 | 7.75 | 10 | 7.75 | 10 | 10 | 7.50 | 83.50 |
| 8. | Golo Meni Kota Komba | 7.50 | 7.33 | 7.25 | 7.50 | 7.42 | 10 | 7.33 | 10 | 10 | 7.42 | 81.75 |
| 9. | Gulang Nati Lelak | 7.75 | 8.0 | 7.75 | 8.0 | 8.0 | 10 | 7.75 | 10 | 10 | 8.0 | 85.25 |
| 10. | Rana Mbeling Kota Komba | 7.75 | 7.67 | 7.67 | 7.75 | 7.67 | 10 | 7.50 | 10 | 10 | 7.58 | 83.58 |
| 11. | Pong Leko Wae Rii | 8.0 | 8.0 | 8.50 | 8.0 | 8.0 | 10 | 8.25 | 10 | 10 | 8.50 | 87.25 |
| 12. | Lungar Satar Mese | 7.75 | 8.0 | 8.0 | 8.0 | 7.75 | 10 | 8.0 | 10 | 10 | 8.0 | 85.50 |
| 13. | Carep Lake Rembong | 8.0 | 8.0 | 7.75 | 8.0 | 7.75 | 10 | 7.75 | 10 | 10 | 7.75 | 84.75 |
| 14. | Peleng Haju Ngendong Elar | 7.58 | 7.58 | 7.25 | 7.42 | 7.33 | 10 | 7.17 | 10 | 10 | 7.17 | 81.50 |
| 15. | Nancur Tonemese Elar Selatan | 7.75 | 7.58 | 7.58 | 7.67 | 7.67 | 10 | 7.50 | 10 | 10 | 7.58 | 83.33 |
| 16. | Nantal Kuwus | 7.75 | 7.75 | 7.50 | 7.50 | 8.0 | 10 | 7.75 | 10 | 10 | 7.50 | 83.75 |

Data Source: Test Results of the Indonesian Coffee and Cocoa Research Institute of Jember (Test results are attached).
**Remarks**: Arm (Aroma), Fla (Flavor), At (After Taste), Ad (Acidity), Bd (Body), Un (Uniformity), Bl (Balance), Cc (Cleancup), Sn (Sweetness), Oa (Overall), Nt (Total Score).

Based on the table above, 'Kopi Arabika Flores Manggarai' has a score of above 80 (very good) and is included in the type of Specialty coffee. The taste profile diagram of 'Kopi Arabika Flores Manggarai' can be described as follows.

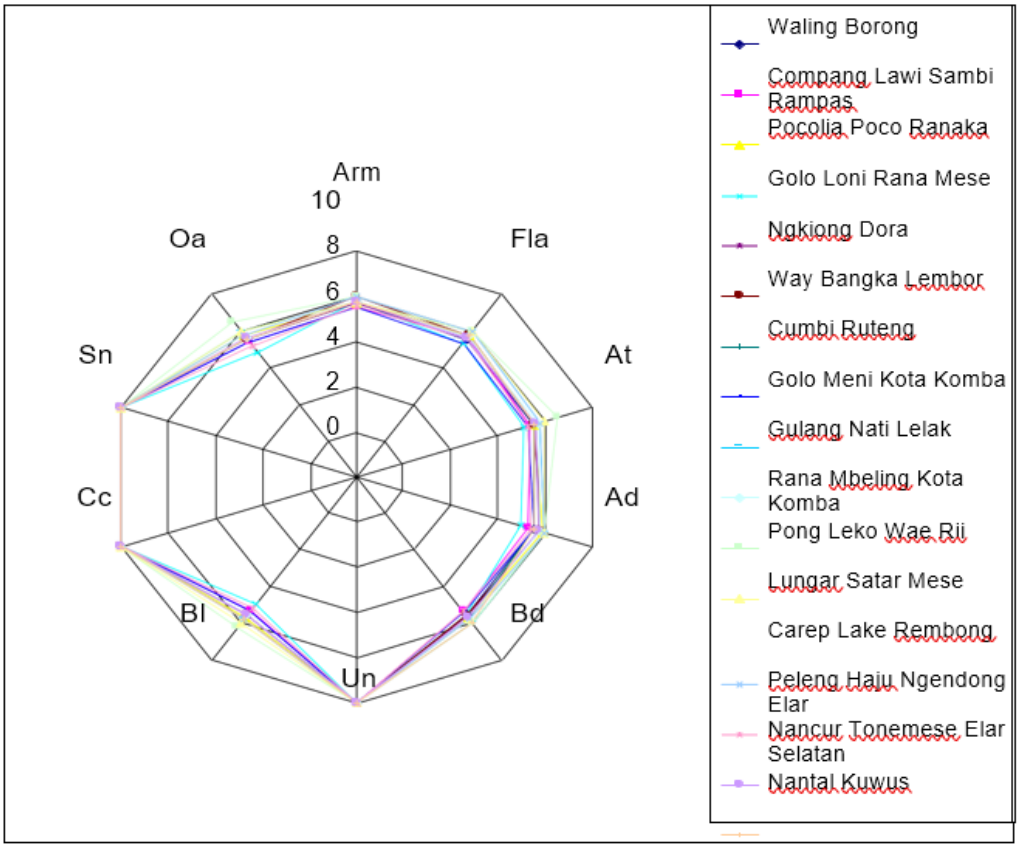



Figure 3. Taste Profile Diagram of 'Kopi Arabika Flores Manggarai'

From observations and studies, it is known that there are no significant taste defects in the taste of 'Kopi Arabika Flores Manggarai'. One of the reasons is because Manggarai farmers have applied the principles of Good Agricultural Practices (GAP) and Good Manufacturing Practices (GMP). Overall, the taste profile of 'Kopi Arabika Flores Manggarai' are:

- Spicy aroma
- Floral aroma
- Herbal aroma

## D. DESCRIPTION OF GEOGRAPHIC ENVIRONMENT

### 1. Natural Factors

The high number of volcanoes and the vast extent of fertile land characterize the land in Flores Island. According to geological theory, Flores is a young island with a high number of volcanoes. Therefore, it is not surprising if the fertile land is spread evenly even to the highlands.

The air in the Manggarai mountains is categorized as cool and even cold, at an elevation above 900 meters above sea level. Dry wind from Australia has a bearing on the natural mountainous conditions of the region, so the air is felt to be quite dry. The number of mountains that line along the Manggarai mountains causes this area to have valleys and peaks that are quite unique. The expanse of coffee is wide with a less significant difference in height. This also encourages the unique taste of 'Kopi Arabika Flores Manggarai'.

'Kopi Arabika Flores Manggarai' is located in the middle of Flores Island with coordinates between 120°17,760‟ East Longitude - 120°45.517 East Longitude and 08°33,127‟ South Latitude - 08°41.760‟ South Latitude. This area has a cool mountainous nature that includes slopes and undulating plains. The vegetation includes forest plants, horticulture, and food crops as well as Arabica coffee plantation crops.

#### a. Topography

Topographically, about 38.6% of the Manggarai area is mountainous. The slope or inclination can be up to more than 45 degrees. Such a topographical patterns greatly affect land use in Manggarai. The situation is indeed suitable for Arabica coffee cultivation.

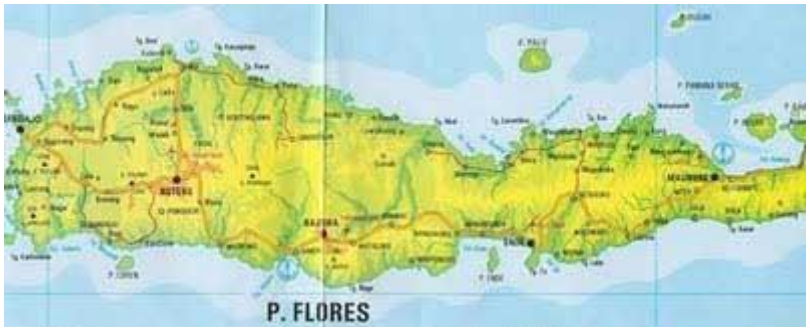



Figure 4. Map of Flores Island

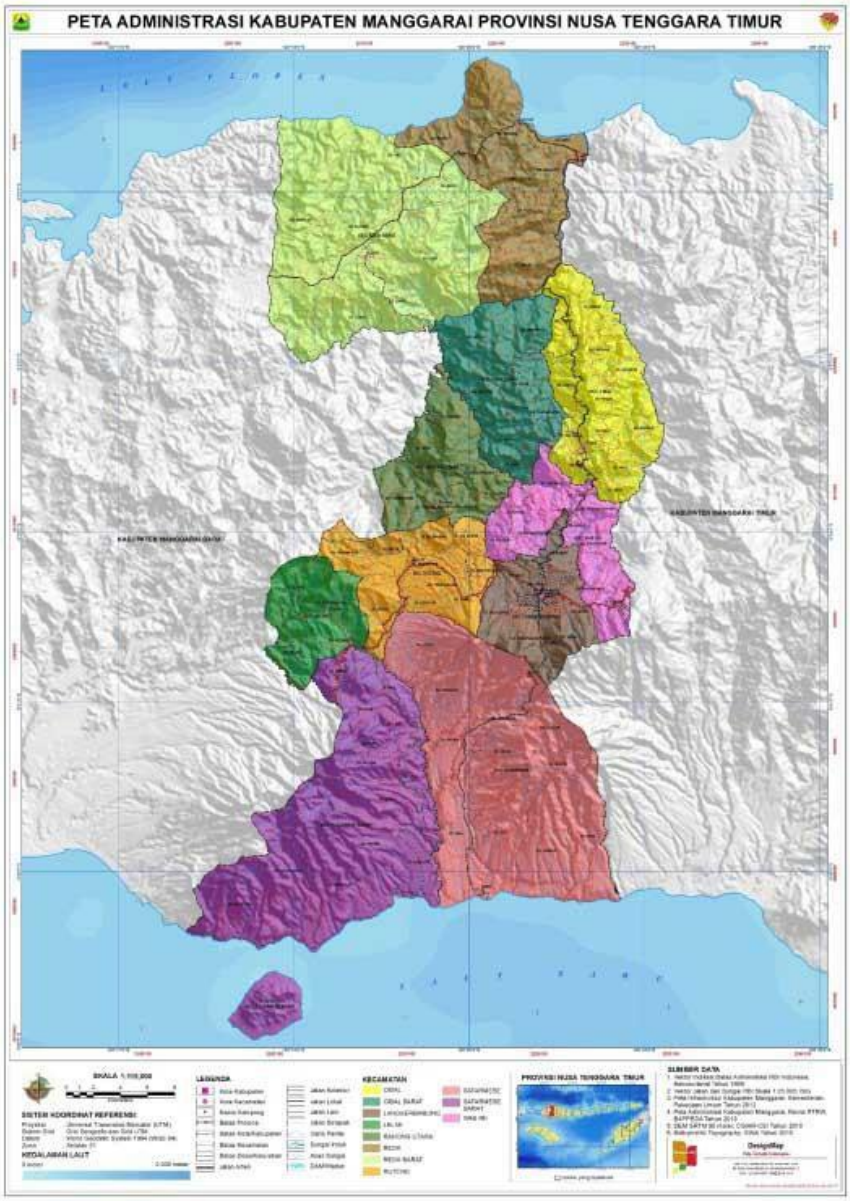



Figure 5. Topographic Map of Manggarai Regency


PETA ADMINISTRASI KABUPATEN MANGGARAI TIMUR PROVINSI NUSA TENGGARA TIMUR
KABUPATEN MANGGARAI
KABUPATEN NGADA
SKALA 1:120.000
LEGENDA
KECAMATAN
PROVINSI NUSA TENGGARA TIMUR
SUMBER DATA
SISTEM KOORDINAT REFERENSI:
KEDALAMAN LAUT

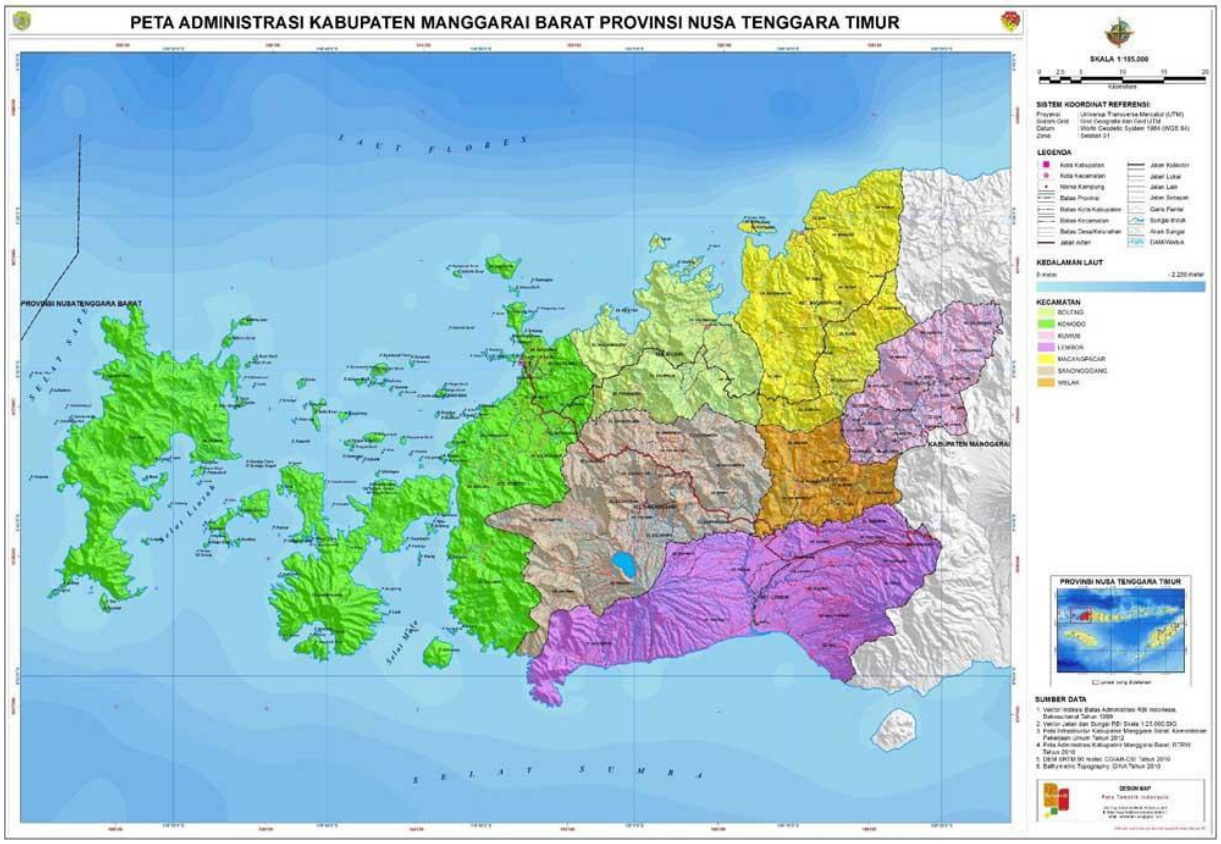



Figure 7. Topographic Map of Manggarai Barat Regency

**b. Climate Condition and Rainfall**

**1) Climate Condition**

The Manggarai mountain area is located in the middle of Flores Island where the climate is generally influenced by the surrounding environment and the dynamics of sea temperature and wind blowing from Australia and Asian region. In general, the climate in Eastern Indonesia (which includes daily air temperature, rainfall, and other environmental factors) has little rainfall with a longer dry season.

**2) Rainfall**

The Manggarai plateau is at an elevation between 900 - 1,500 meters above sea level, the ideal elevation for Arabica coffee. Cumulative rainfall ranges between 2000 - 5000 mm/year. Such rainy conditions are suitable for Arabica coffee plants. The dry months in Flores are longer so they can affect the ripening process of coffee fruit.

The Meteorological Agency of Ruteng Branch notes that rainfall in the Manggarai area is low compared to other regions in Indonesia. The recorded rainfall is rainy days, average rainfall, and cumulative rainfall. The sample data below presents monthly rainfall data from

2012 to 2016.

Table 2. Rainfall in Manggarai Area from 2012-2016

| Month | Year | | | | | | | | | | Total | | Average | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2012 | | 2013 | | 2014 | | 2015 | | 2016 | | | | | |
| | HH | CHK | HH | CHK | HH | CHK | HH | CHK | HH | CHK | HH | CHK | HH | CHK |
| January | 28 | 555.3 | 28 | 819.2 | 18 | 294.5 | 19 | 348 | 26 | 823.7 | 119 | **2840.7** | 24 | 568.1 |
| February | 22 | 386 | 27 | 639 | 19 | 142.5 | 25 | 623.6 | 27 | 529 | 120 | **2320.1** | 24 | 464.0 |
| March | 26 | 610.9 | 16 | 263 | 16 | 292.5 | 25 | 373.2 | 30 | 354.2 | 113 | **1893.8** | 23 | 378.8 |
| April | 26 | 537.7 | 20 | 342.2 | 26 | 468.4 | 25 | 530.2 | 30 | 518.9 | 127 | **2397.4** | 25 | 479.5 |
| May | 12 | 122.1 | 20 | 449.6 | 20 | 298.1 | 10 | 158.8 | 26 | 392.5 | 88 | **1421.1** | 18 | 284.2 |
| June | 4 | 97.8 | 13 | 167 | 9 | 102.4 | 2 | 89.5 | 9 | 151.6 | 37 | **608.3** | 7 | 121.7 |
| July | 5 | 59.6 | 8 | 98 | 9 | 45.7 | 3 | 4.9 | 13 | 180.4 | 38 | **388.6** | 8 | 77.7 |
| August | 0 | 0 | 4 | 41 | 6 | 94.4 | 0 | 0 | 13 | 131.3 | 23 | **266.7** | 5 | 53.3 |
| September | 4 | 61 | 6 | 37.3 | 2 | 1.4 | 2 | 12 | 23 | 464.1 | 37 | **575.8** | 7 | 115.2 |
| October | 15 | 253 | 18 | 286.6 | 4 | 28.8 | 6 | 58.1 | 20 | 342.6 | 63 | **969.1** | 13 | 193.8 |
| November | 26 | 441 | 17 | 276.7 | 23 | 504.7 | 19 | 216.8 | 25 | 408.8 | 110 | **1848** | 22 | 369.6 |
| December | 26 | 619.7 | 27 | 916.1 | 28 | 624.9 | 20 | 376.8 | 26 | 581.7 | 127 | **3119.2** | 25 | 623.8 |
| Total | **194** | **3744.1** | **204** | **4335.7** | **180** | **2898.3** | **156** | **2791.9** | **268** | **4878.8** | | | | |
| Average | 16 | 312.0 | 17 | 361.3 | 15 | 241.5 | 13 | 232.7 | 22 | 406.6 | | | | |

Source: Meteorological, Climatological, and Geophysical Agency, Meteorological Station Frans Sales Lega
Remarks: HH = Rainy Day
CHK = Cumulative Rainfall

**c. Temperature and Humidity**

The air humidity in the Manggarai highlands is relatively high (85%), the lowest air temperature is around 12°C at night and the highest temperature is 28°C during the day, but certain months have the average daily temperature of 20°C. The dry period in the highlands has a positive impact on the production of 'Kopi Arabika Flores Manggarai', because it can encourage the growth of good coffee cherries to ripen quickly, and after processing, drying can take place rather quickly.

**d. Geology and Soil**

Soil types in the Manggarai area generally consist of Alluvial, Mediterranean, Lithosol, and Latosol. From geological data and information, the Flores Island is part of the Volcanic Arc in Cenozoic Alkaline Calc, which is still active to date. The arc is formed by the subduction of the crust Indian Ocean to the north. The shape of this island arc is

still undergoing changes in the eastern part due to collision with the edge of Australia.

The West Flores area is mostly covered by lava and andesitic breccias to basaltic, interspersed with sandy tuff and tuffaceous sands of the alternating Kiro Formation with Early Miocene Old Volcanic Rock Unit (Tlmv) as the oldest rocks in West Flores. This sequence is covered by sedimentary rock, marl, and sandstone limestone, interspersed with volcanic rocks of dacite lava, breccia, ash and tuff of Upper Middle Miocene penetrated by granodiorite, diorite and rhyolite. Breccia, lava and tuff and Holocene volcanic products such as lava, volcanic bombs and lapilli cover the rocks in some places.

Flores Island, based on Indonesia's tectonic framework, is included in the Neogene Sunda Banda magmatic arc which stretches from Sumatera, Java, Bali, Lombok, Sumbawa, Flores Islands to Seram Island. This arc is formed by the collision of some plates along with subduction and reversal of subduction occurring in the Oligocene. This activity is thought to have stopped in the Pliocene and caused the formation of a series of volcanoes in the East Nusa Tenggara Islands.

**Soil properties in the Manggarai Highlands**

The topography of 'Kopi Arabika Flores Manggarai' plantations varies from sloping to mountainous. The slope is approximately 5-30%. The use of terracing must be applied to sloping slopes. We show some examples of land locations with the elevation (m-asl) as presented in table 3 below.

Table 3. Location of Soil Sampling of *'Kopi Arabika Flores Manggarai'* GI

| No. | Location | Elevation (masl) | South Latitude | East Longitude |
|---|---|---|---|---|
| 1 | Galak Leleng | 1134 | $08^0$36.453‟ | $120^0$33.525‟ |
| 2 | Satar Nawang | 941 | $08^0$41.340‟ | $120^0$17.760‟ |
| 3 | Lento | 916 | $08^0$34.465‟ | $120^0$34.668‟ |
| 4 | Wae Mowol | 1381 | $08^0$36.004‟ | $120^0$37.929‟ |
| 5 | Ngkiong Dora | 1290 | $08^0$34.133‟ | $120^0$39.225‟ |
| 6 | Wae Bangka | 1012 | $08^0$40.741‟ | $120^0$18.645‟ |
| 7 | Cumbi | 1217 | $08^0$37.150‟ | $120^0$24.332‟ |
| 8 | Gala Meni | 1095 | $08^0$39.290‟ | $120^0$41.276‟ |
| 9 | Nati | 1136 | $08^0$35.477‟ | $120^0$18.372‟ |
| 10 | Rana Mbeling | 1040 | $08^0$39.331‟ | $120^0$42.140‟ |
| 11 | Wae Ri‟i | 1163 | $08^0$36.538‟ | $120^0$30.238‟ |

| | | | | |
|---|---|---|---|---|
| 12 | Lungar | 1173 | $08^{0}41.760$‟ | $120^{0}27.020$‟ |
| 13 | Carep | 1256 | $08^{0}36.991$‟ | $120^{0}29.350$‟ |
| 14 | Haju Ngendong | 1197 | $08^{0}33.127$‟ | $120^{0}44.047$‟ |
| 15 | Teno Mese | 1323 | $08^{0}35.344$‟ | $120^{0}45.577$‟ |
| 16 | Pondok/ Nantal | 1038 | $08^{0}34.097$‟ | $120^{0}18.019$‟ |

The ‘Kopi Arabika Flores Manggarai’ location has good soil fertility. The fertile soil is influenced by the Namparnos volcano in the Mandosawu Mountains which materials can fertilize the soil. Most of the organic matters have high contents, with only two locations that have low soil fertility, namely in Lento and Uluwae.

Table 4. Soil Sample Test Results from ‘Kopi Arabika Flores Manggarai’ Cultivation Locations

| No. | Sample Origin | Sample Texture (%) | | | Against 100 grams of dry sample 105 C | | | NH4 Extract | $P_2O_5$ | pH |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Sand | Silt | Clay | C | N | C/N | K + | eBray | $H_2O$ |
| 1. | Galak Leleng | 14 | 46 | 40 | 4.08 | 0.79 | 5 | 1.37 | 2 | 4.8 |
| 2. | Satar Nawang | 9 | 28 | 63 | 3.32 | 0.37 | 9 | 0.76 | 58 | 4.4 |
| 3. | Lento | 10 | 44 | 46 | 1.92 | 0.19 | 10.1 | 0.12 | 2 | 4.4 |
| 4. | Ngkiong Dora | 25 | 29 | 46 | 4.88 | 0.49 | 10.0 | 0.66 | 3 | 5.0 |
| 5. | Gala Meni | 19 | 43 | 38 | 3.08 | 0.24 | 12.8 | 0.99 | 37 | 5.6 |
| 6. | Rana Mbeling | 35 | 27 | 38 | 3.96 | 0.40 | 9.9 | 0.57 | 24 | 5.1 |
| 7. | Haju Ngendong | 13 | 57 | 30 | 6.99 | 0.64 | 10.9 | 0.93 | 37 | 4.8 |
| 8. | Tanamese | 21 | 44 | 35 | 6.67 | 0.42 | 15.9 | 0.48 | 135 | 4.5 |
| 9. | Cumbi | 12 | 27 | 61 | 3.59 | 0.34 | 10.6 | 0.37 | 2 | 4.8 |
| 10. | Nati | 10 | 34 | 56 | 5.04 | 0.53 | 9.5 | 0.16 | 3 | 4.3 |
| 11. | Wae Ri‟i | 23 | 28 | 49 | 5.60 | 0.52 | 10.8 | 0.23 | 3 | 4.8 |
| 12. | Lungar | 15 | 36 | 49 | 6.24 | 0.67 | 9.3 | 0.64 | 2 | 5.2 |
| 13. | Cerep | 17 | 39 | 44 | 3.95 | 0.70 | 5.6 | 0.45 | 6 | 4.8 |
| 14. | Pondok Nantal | 13 | 40 | 47 | 5.27 | 0.45 | 11.7 | 0.56 | 3 | 4.4 |
| 15. | Wae Mowol | 13 | 37 | 50 | 1.92 | 0.19 | 10.1 | 1.33 | 6 | 5.2 |
| 16. | Wae Bangka | 13 | 31 | 56 | 3.15 | 0.26 | 12.1 | 0.31 | 17 | 5.0 |

The nitrogen content of most of the planted area is in the medium to high category, while some of them are in the low category. The phosphorus and potassium content in ‘Kopi Arabika Flores Manggarai’ plantations are mostly moderate to high, but phosphorus content is mostly low to moderate. This low phosphorus content is common in Andosol soil.

The phosphorus content is more bound into the soil, resulting in low phosphorus available to plants. The soil texture of ‘Kopi Arabika Flores Manggarai’ GI is shown in

table 5 below:

Table 5. Soil Texture of ‘Kopi Arabika Flores Manggarai’ GI

| No. | Location | Soil Texture |
|---|---|---|
| 1 | Galak Leleng | Silty clay loam |
| 2 | Satar Nawang | Loam |
| 3 | Lento | Clayey loam |
| 4 | Wae Mowol | Loam |
| 5 | Ngkiong Dora | Loam |
| 6 | Wae Bangka | Loam |
| 7 | Cumbi | Loam |
| 8 | Gala Meni | Silty clay loam |
| 9 | Nati | Loam |
| 10 | Rana Mbeling | Clayey loam |
| 11 | Wae Ri‟i | Loam |
| 12 | Lungar | Loam |
| 13 | Carep | Loam |
| 14 | Haju Ngendong | Silty clay loam |
| 15 | Teno Mese | Clayey loam |
| 16 | Pondok/ Nantal | Clayey loam |

Most of the soil in ‘Kopi Arabika Flores Manggarai’ plantations have a loam texture. In addition to loam, there are also silty clay loam and clayey loam textures. Clay texture has advantages and disadvantages. The rather long dry season in Flores greatly impacts the clay texture. If soil preservation goes well, then soil moisture will still be available for plants, but if soil moisture is lacking, the soil will appear cracked and broken.

Soil in Manggarai area contains high carbon, nitrogen, and potassium. These three elements greatly affect the characteristics of ‘Kopi Arabika Flores Mangga high carbon, nitrogen, and potassium. These three elements greatly affect the characteristics of ‘Kopi Arabika Flores Manggarai’.

Carbon is a critical component of soil organic matter. It influences soil structure, water retention, and nutrient retention. Healthy amounts of organic matter in the soil promote microbial activity, that can affect nutritional availability to coffee plants. Nitrogen contained in the soil of Manggarai area is adequate. Categorized as medium to high level of nitrogen. This encourage robust vegetative growth in coffee plants leading to healthy foliage and more vigorous production. Potassium is also important for ‘Kopi Arabika Flores Manggarai’. Manggarai area soil has proper potassium which is useful for enzyme activation, water regulation, and carbohydrate metabolism.

These above elements play its role in ‘Kopi Arabika Flores Manggarai’ characteristics, having herbal, floral, and spicy aroma without having bitter and astringent taste. Spiciness is influenced by nitrogen contained in the soil. Herbal aroma in ‘Kopi Arabika Flores Manggarai’ is influenced by the soil’s nutrient composition, particularly potassium levels that contribute to the development of the herbal notes by aiding in the proper synthesis and transport of essential compounds within the plant. Floral aroma can be obtained by nitrogen and potassium through their influence on plant growth and health of the coffee varieties used for ‘Kopi Arabika Flores Manggarai’. Furthermore, the high nitrogen levels, which affect the plants, contribute to the medium to high acidity of ‘Kopi Arabika Flores Manggarai’ beans.

**2. Human Factors**

For most of the Manggarai people, coffee has an important role as a main source of family income. Farmer groups have important tasks and functions in Manggarai area, especially in

terms of consistent production management and quality control. People of Manggarai area have found a way to use shade/protective plants for farmers in the Manggarai area to protect coffee plants in Manggarai area. The dominant types of protective plants used by farmers in the Manggarai area are *dadap (Erythrina orientalis)*, *sengon (Albizia chinensis)*, *menii (Maesopsis eminii),* and jackfruit.

People of Manggarai also found a way to manage cultivation, especially using local trees that can reduce the air temperature around the canopy during the dry season so that the process of draining soil moisture can be reduced. The daily temperature is relatively low, and the air humidity is high in the dry months, therefore the soil moisture is still sufficient to support growth during the dry season. This way people of Manggarai maintain the moisture level of the soil which affects the nutritional availability for coffee plants.

Soil texture, which is dominantly loam, should also be added with organic matters to improve the physical condition of the soil. Loam soil has high swelling and contracting abilities which can have an impact on the development of coffee root. The addition of these organic materials can reduce the swelling and contracting abilities for optimal root development. This method has been used by the people of Manggarai for generations.

The size of the bean of around 6,5 mm is due to the chosen coffee varieties – S-795, yellow Caturra/Yellow Colombia, Juria, Kartika, USDA, Red Caturra/red Colombian and Andungsari. These chosen varieties also underpin the characteristic caffeine expression of 'Kopi Arabika Flores Manggarai,' as their relatively stable alkaloid profiles interact with the highland environment (i.e low temperature, high humidity, and mostly cloudy) and the region's wet-hulling and fully washed processing methods, resulting in the specific caffeine profile associated.

Further, human factors that play a great role in 'Kopi Arabika Flores Manggarai' characteristics are the fermentation and the drying process. People of Manggarai area have found a way of fermenting and drying process that have been passed from generation to generation.

Fermentation

The fermenting procedure is designed to remove mucilage, allowing for easy washing and a nice coffee flavor. Fermentation is done organically and flawlessly, with no added substances. Through microbial action, enzymes break down the sugars in the mucilage (the

sticky substance around the coffee bean) during fermentation. Compound breakdown during fermentation can result in the creation of taste chemicals that contribute to spicy aroma. By influencing the production of certain volatile molecules, fermentation can also promote the creation of herbal and floral fragrances. The fermentation process lasts for around 12 to 36 hours.

Drying

People of Manggarai area also practice drying process which is crucial to the characteristics of 'Kopi Arabika Flores Manggarai'. Drying is done slowly, especially at the beginning (first 1-4 days) by using a drying rack or tarpaulin. The process of drying is conducted until the product reaches a moisture content of 11-12% (weight/weight).

Drying has an impact on the development and preservation of spicy notes in coffee. This rate and method of drying can contribute to spiciness. The drying process also helps to retain specific herbal characteristics in the beans. Drying is crucial for maintaining the aromatic qualities of coffee beans obtained during fermentation.

## E. LIMITATION OF PRODUCTION AREA

'Kopi Arabika Flores Manggarai' can only be obtained from red coffee cherry originating from the highland region of Manggarai Regency, *Manggarai Barat* Regency and *Manggarai Timur* Regency, as shown on the map. The whole area lies between 900 m asl up to 1,500 m asl.

Other criteria used as requirements are soil and climate characteristics, Arabica coffee production system and collective management of coffee production in farmer groups. All of these factors are homogeneous within the region.

With volcanic soil (Andisol type) which is considered very helpful for many plants, this area is basically an agricultural area having intensive and environmentally friendly agricultural cultivation, with good diversified cropping patterns. The climatic conditions are relatively homogeneous and suitable for Arabica coffee plants, because:

- Relatively significant cumulative rainfall of 2000 – 5000 mm/year during the rainy season. The identical longer dry season causes farmers in the Manggarai plain to adapt to the typical northern climate.
- The weather is generally cool (between 17°C – 28°C).

- The difference in air temperature between day and night is usually sufficient.

The production process in this area is relatively homogeneous, due to the existence of the same production model (small plantations are managed through farmer groups throughout the area) and the same natural factors. The map of 'Kopi Arabika Flores Manggarai' cultivation areas of each regency is shown in the following figure:

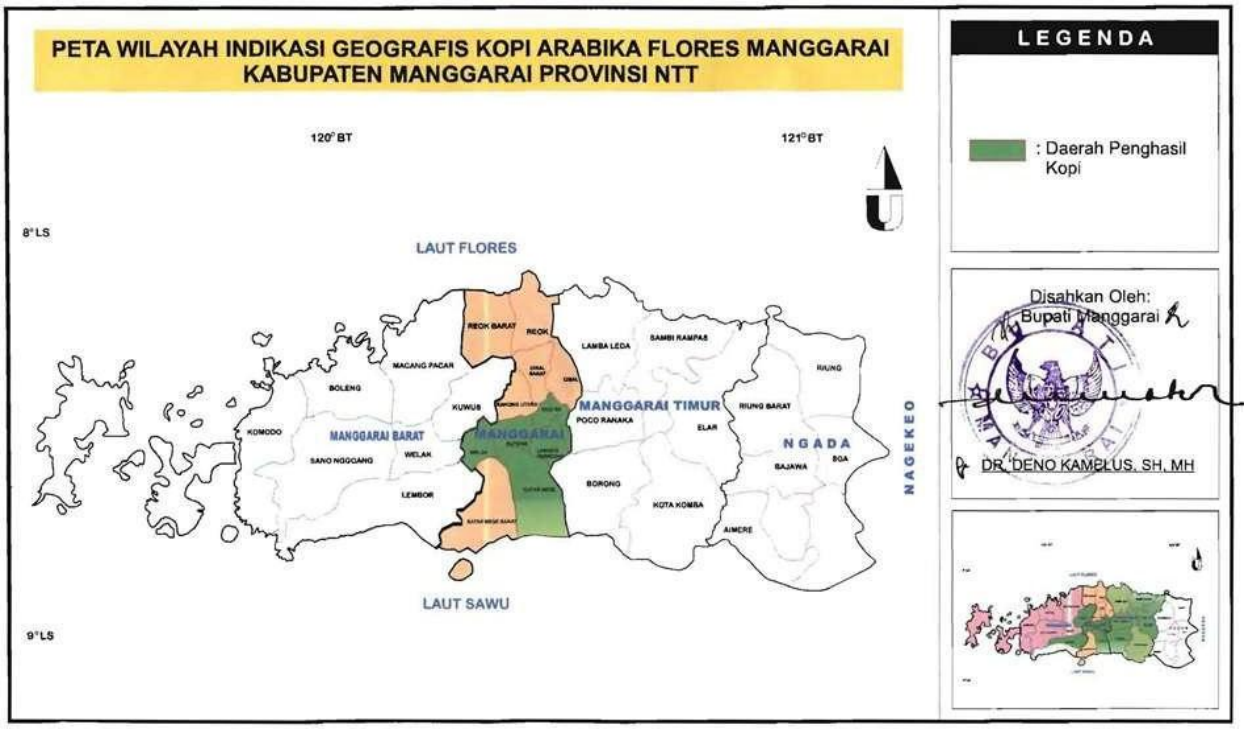



Figure 8. Map of 'Kopi Arabika Flores Manggarai' Production Areas, Manggarai Regency

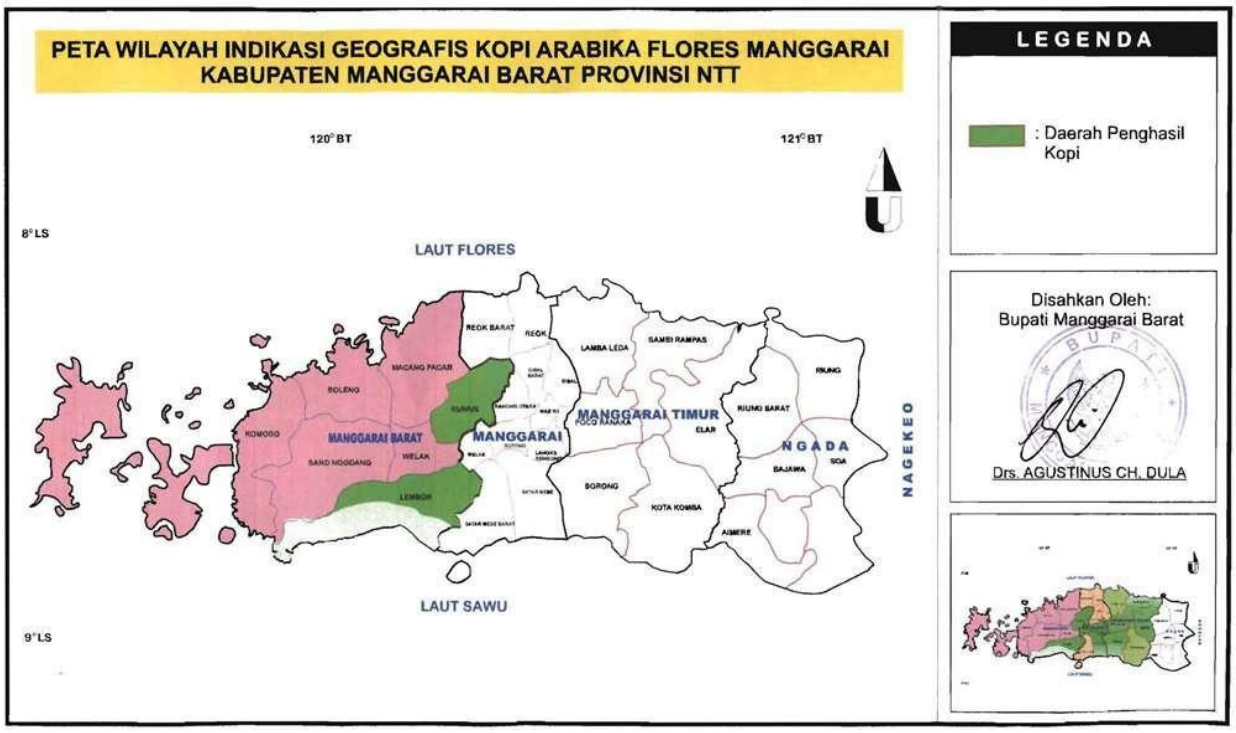



Figure 9. Map of 'Kopi Arabika Flores Manggarai' Production Areas, Manggarai Barat Regency

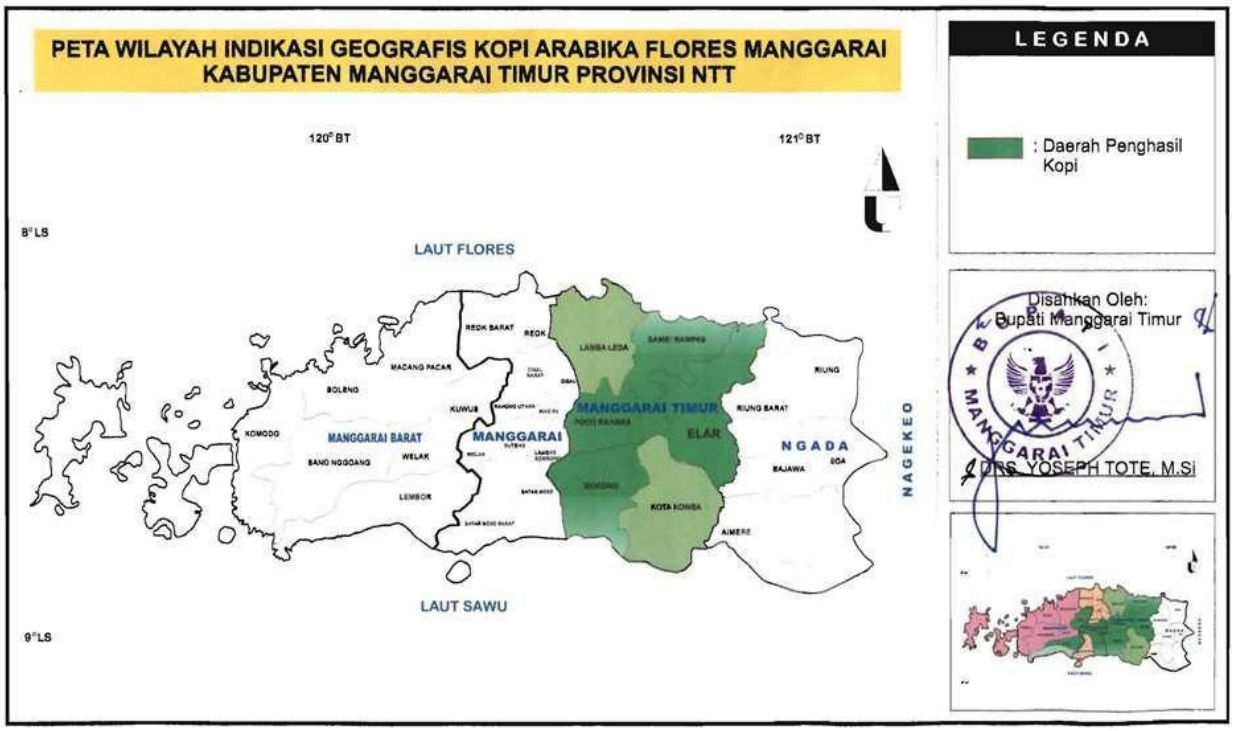



Figure 10. Map of the 'Kopi Arabika Flores Manggarai' Production Areas, Manggarai Timur Regency

From the map of the coffee field distribution, it is known that these areas have a fairly good elevation for coffee plants to grow and develop.

Table 6. 'Kopi Arabika Flores Manggarai' Production Process Areas

| **Stages of Coffee Production and Processing** | **Place** |
|---|---|
| Production of red cherries (Harvesting and Fruit Sorting) | Geographical Area |
| Processing to wet hard shell coffee (Soaking and Pulping) | Geographical Area |
| Drying | Flores Island, Including Geographical Area |
| Storage (2 months) | Geographical Area (place for processing) |
| Hulling | Flores Island, Including Geographical Area |
| Sorting | |
| Green coffee packaging | |

## F. HISTORY AND CUSTOMS

The history of coffee in Manggarai is not found in a detailed and complete manner at the time the Bima kingdom influenced Manggarai. It is the same during the Goa kingdom. At that time, coffee had not been cultivated in the hinterland of Manggarai and the resources used were still limited to non-plantation natural resources and livestock. According to a journalistic report (*Kompas, 2012*), the Dutch was the first to introduce coffee in Manggarai. Coffee was first grown in the Eastern part of Flores Island, considering that the Dutch started their reign from the East and expanded to the West. The Dutch officially had a presence in Manggarai in 1908 and concentrated their administration in Ruteng City, located in the Manggarai highlands. The natural conditions in the Manggarai highlands allow for coffee cultivation.

The Manggarai Raya area, which includes Manggarai, Manggarai Barat and Manggarai Timur Regencies, has known coffee cultivation since the late 1920s, directly from the Dutch colonial era. The coffee plantation and trading business started in Colol, Poco Ranaka Timur District, Manggarai Timur. Its history is evidenced, among others, by an award in the form of a three-colored flag from the Dutch colonial government to a Colol farmer who was considered successful in cultivating coffee circa 1937. Since then, coffee has been

the flagship plant of the people of Manggarai Raya until now.




Figure 11. Three-Colored Flag, Gift of the Dutch Colonial Government to Bernard Odjong, 1937

Not long after crowning Baroek of Todo as the King of Manggarai, the Dutch held the "Keboen Match" which is a coffee growing competition throughout Manggarai Raya in 1937. Through a rigorous selection process, finally a farmer from Colol named Bernadus Odjong came out as the winner. As the winner, he was awarded a Dutch flag which is now kept by his descendants in Biting Hamlet, Uluwae Village, Colol (*Kompas, 2012*).

Colol is the name of an area in Poco Ranaka District, Manggarai Timur Regency. Colol is about 35 km from Ruteng, the capital of Manggarai Regency and about 60 km from Borong, the capital of Manggarai Timur Regency. Colol is known as a center for producing Arabica and Robusta coffee throughout the Manggarai Raya area. In the past, Colol was also a *Gelarang*, a government unit under *Kedaluan* Lamba Leda.

The Keboen Match in 1937 above is a momentum for the presence of coffee in Manggarai. Even so, it is estimated that by the end of 1920 coffee began to be widely cultivated throughout the Manggarai highlands at the suggestion and support of the Dutch Colonial Government and the King of Manggarai at that time, Alexander Baroek (*Kompas, 2012*).

Other history states that in the local language, coffee in Manggarai is often referred to as ***Kopi Tuang***. It is named *Tuang* (master) because it was the Dutch government and European missionaries working in Manggarai who brought the coffee. Coffee for the

Manggarai people is a drink that is served on various occasions, both when relaxing and in official situations. Coffee is served spontaneously to everyone, even foreigners who are passing through the village. In the local language it is often said, « *Ite, cenggo inung kopi di* » (O brothers, let's stop for coffee).

In addition, coffee is also brought into the spiritual realm. In general, people in Manggarai have a ***Toto Kopi*** tradition, which is to predict someone using coffee grounds, which in common language is known as ***Tasseography***. This tradition is also known in people in the Middle East, Europe to Asia. The *Toto Kopi* tradition is usually carried out by the community after enjoying coffee. After the coffee water runs out, the glass is then inverted so that the remaining residue in the glass leaves a trail of lines on the walls of the glass. The traces of the coffee lines left by the surrounding community are considered symbols that provide information about life in the past, present and future. However, the interesting point is that only intuitive women are able to dialogue and convey the message left by the traces of the coffee lines. In the tradition in Manggarai, coffee is a symbol of life as well as a special means, especially for women as a means of appreciation for guests who visit someone's home. Hence, Manggarai coffee is not only limited to having a historical relationship between coffee and society, but also has a very deep spiritual relationship with the lives of its people.

Coffee cultivation in Manggarai is very closely related to the traditional culture of Manggarai. Traditional rituals are still preserved by the Manggarai community. In this case, Manggarai coffee farmers adhere to the traditional rites and philosophy of Manggarai culture because they have deep values and an intense influence on the meaning of life. Some of the traditional rites can be explained as follows:

**Oli**

*Oli* is an *adak* invoking the blessing of fertility on the whole plant from *wura agu ceki* (ancestors and spirits).

**Penti**

The traditional rite *Penti* is a traditional ceremony celebrating thanksgiving for the harvest that is celebrated together by all villagers. In this joyful celebration, all the villagers gather to give thanks and at the same time ask for protection and success for the upcoming planting season. Before *penti* is carried out there is a *barong wae* ceremony.

**Barong Wae**

Through the *Barong Wae* ritual, residents will again invite the ancestral spirits who inhabit springs. According to belief, all this time the ancestral spirits have been guarding springs, so that the water remains alive and gives life force to the inhabitants of nature, including humans.

'Kopi Arabika Flores Manggarai' is growing and known to various regions throughout the archipelago and even to foreign countries including the United States, Germany, Australia, South Korea and the Netherlands. This is closely related to elements, among others: a strong and sustainable blend of local culture, 'Kopi Arabika Flores Manggarai' produced by community organizations that are joined in MPIG KAFM is a regional flagship product, based on the following reasons:

1. Coffee is used as a gift or donation in certain events in several activities, such as weddings, naming events for new born children, death, thus neighbors and relatives can donate coffee to be consumed during the activity.
2. Coffee is also used as a healing medicine, for example, if someone suffers from dizziness, they can drink coffee. If there is a small wound that bleeds, then coffee can also be used as a wound dressing. For women who have difficulty in giving birth, their family members usually give sweet coffee drinks to help the labor process.
3. Coffee is a traditional drink that is consumed at events such as feasts, traditional events, *wuat wai* (fundraising events for children who go to college) and *kope* gatherings (fundraising for dowries/weddings).

'Kopi Arabika Flores Manggarai' is processed using the Wet Hulling and Fully washed methods and is dried to become green coffee beans with herbal, spicy and floral aromas. The dry aroma that can be smelled during the grinding process is caramel. After brewing, the caramel fruity aroma is still quite dominant, the body feels quite strong, and the coffee tastes sweet with medium acidity. Coffee from 3 areas of Manggarai regency with a distinctive taste and strong aroma, has been known for a long time. Manggarai is also one of the largest coffee production centers in NTT. This "green pearl" commodity is also the foundation of life for the local community so that they can send their children to higher education.

After independence, the Government of the Republic of Indonesia through the Plantation Service Office of East Nusa Tenggara Province began trying to revive Arabica

coffee production in Flores, including in the Manggarai area, through the Export Plant Rehabilitation and Development Project (PRPTE) for the 1978/1979 budget year, whereby the Plantation Service Office of NTT Province started to make endeavors to revive Arabica coffee cultivation in Flores. The consideration for developing Arabica coffee in Flores is not only based on export interests, but coffee plantations in the Manggarai highlands are also deemed having a strategic role in preserving hydrological functions. PRPTE in Flores has been able to restore and increase the area of coffee plantations in Flores so that coffee production from Flores has begun to increase. In the late 1980s, the area of coffee plantations in Flores reached about 8,000 Ha.

To overcome this, the Plantation Service Office of NTT Province in collaboration with the Indonesian Coffee and Cocoa Research Institute (*Puslitkoka*) developed Arabica Coffee agribusiness in Manggarai with an institutional empowerment approach at the farmer level. In this collaboration, the function of the Plantation Service Office is more emphasized on dealing with the farmer sector, while the function of Puslitkoka is more focused on dealing with market, technology control, quality improvement, and agribusiness system development issues. Processing machines facilitated for PPU are in the form of pulper and washer. In 2006, Puslitkoka (Indonesian Coffee and Cocoa Research Institute/ICCRI) has started exploring the market by bringing in a prospective buyer, PT. Indokom Citra Persada, Sidoarjo.

At the beginning of 2006, socialization on the importance of relationship between quality and selling price of Arabica coffee began to be carried out. In addition, training which was held in the form of field school in the procedure for wet processing of Arabica coffee to obtain good taste quality using available machines was also started. The training was directly guided by an expert team of Puslitkoka. In addition, the Plantation Service Office also facilitated the drying of hard skin coffee (HS coffee). After the training, the farmers have started to process coffee by the wet process, although by exercising extreme care.

This expectation of an improvement in prices seems to have encouraged farmers to take better care of their coffee plantations and rejuvenate old plantations. This can be seen from the farmers' interest in asking the Disbun for assistance for coffee seeds. Since the 2005 coffee post-harvest mentoring activity conducted by the Puslitkoka of Jember, the quality and taste of coffee have improved. Therefore, more and more consumers want to buy ‘Kopi Arabika Flores Manggarai’. This demand can be fulfilled by PPU facilitated by the Plantation Service Office and several buyers who have provided equipment in recent years. Some farmer

groups also bought their own equipment. This situation further encourages all farmers who have developed red coffee cherry picking to expand their plantation area. The Plantation Service Office of NTT Province and the Plantation Service of Manggarai Timur Regency also provided coffee seeds of various varieties such as S-795, Komasti and AS2K with the aim of assisting them in developing these plantations.

In carrying out their duties and functions, farmer groups in the Manggarai highlands are guided by the principles of togetherness and mutual cooperation. The forms of togetherness in the production, processing and marketing of 'Kopi Arabika Flores Manggarai' results are as follows:

1. Strengthening religion in getting closer to the God Almighty in Churches where they carry out worship activities.
2. Conducting social and religious activities as a form of gratitude and thanks to the God Almighty, as well as asking for his blessings and mercy so that the produced coffee is of high quality, good price and sustainable.
3. Carrying out planned and integrated activities in the management of coffee plants that are attacked by pests and diseases.
4. Making internal MPIG KAFM rules that must be obeyed by members, as well as sanctions that will be imposed by farmer groups democratically through meetings.
5. Holding regular meetings to plan and determine several matters such as:
    - Implementation of mutual aid activities, whether coffee cultivation, harvesting, processing or marketing
    - Update of internal rules to suit developments,
    - Determining incidental meetings related to coaching, counseling and so forth.

Therefore, 'Kopi Arabika Flores Manggarai' becomes a very important part of religious life and social community. As described above, residents in the Manggarai area believe that it is very important for them to carry out community and religious activities at the time they produce Arabica Coffee (usually held before and at the end of harvest, and when plants are attacked by pests and diseases). This matter further strengthens the link between production and local customs and beliefs.

Currently, thanks to the development of the Arabica Coffee agribusiness in Manggarai, more and more people from outside the island and abroad are coming to Flores (Manggarai).

This can further enhance the reputation of coffee and other products in the region. Therefore, it is necessary to obtain protection in the form of Protected Geographical Indications for 'Kopi Arabika Flores Manggarai'. This protection will provide assurance to producers and consumers that the consumed coffee is the original product of Manggarai.

## G. PRODUCTION AND PROCESSING METHODS

### 1. Production Method

#### a. Land and Land Preparation

Nearly all of the land in the Manggarai highland area of Nusa Tenggara Timur has potential for planting Arabica coffee. In general, terracing can be developed for sloped areas serving as a function of conservation. In areas with a slope below 30°, terraces are made in the form of a mountain belt, while with a slope above 30°, individual terraces have been developed, each of which is planted with only one plant species.

For rejuvenation, the coffee planting space is set (2.5 x 2.5) m or (2.5 x 2) m, so approximately 1,600 to 2,000 seeds/ha are needed. Coffee seeds are planted in planting holes made with a size of (60 x 60 x 60) cm. Planting holes are made 3-6 months before planting and given organic fertilizer of approximately 5-10 kg per hole. At the time of planting and closing of the hole, the soil is mixed with manure. The shade is planted 1 year before the coffee plant is moved to the plantation, with approximately 25% of the total coffee tree population.

There are 3 (three) land statuses legally allowed for growing Coffee in the Geographical Area. The first land status is the status of Other Utilization Area (*APL*). *APL* is an area outside a State forest area allocated for construction other than the field of forestry (such as settlement). *APL* also typically constitutes communities' Title.

The next land status is Social Forestry, namely a sustainable forest management system implemented in a state forest or customary forest area by the local community to improve their well-being. Social forestry can be divided into 5 (five) schemes, namely Village forest, community forest, people's plantation forest, Customary forest and Forestry partnership. Social forestry has strict regulations, among others may not use chemicals, only for certain allowed commodities (including coffee), must apply Good Agroforestry Practices, must be carried out by the local community and obtain approval form the relevant authorities.

The next land status is Land for Agrarian Reform Objects or TORA. TORA is land controlled by the state and/or land owned by the community for legalization. TORA is generally derived from derelict state land. Therefore, this land is delegated to the surrounding community for solving land dispute conflicts and land status overlap.

Regional division on the basis of this status refers to the official map of the Ministry of Environment of the Republic of Indonesia, while clearing for coffee plantation by illegal logging is prohibited. The growing process must refer to the Conservation principles.

**b. Seeding**

The current varieties that are commonly cultivated by farmers of 'Kopi Arabika Flores Manggarai' are S-795, Yellow Caturra/yellow Colombia, Juria, Kartika, USDA, Red Caturra/Red Colombian and Andungsari.

For new types of plants:

- Seeding can be carried out directly by farmer groups or purchased from a provider/agent that is certified or acceptable to the relevant Agency.
- MPIG recommendations for the varieties to be developed in GI protected area are submitted to the relevant Agency.

**c. Coffee Plant Care and Treatment**

- Fertilization of plants is carried out twice a year at the beginning and end of the rainy season. Sources of organic fertilizer are obtained from litter and some manure mixtures.
- Coffee pruning is done by cutting branches alternately during post-harvest pruning so as to stimulate the formation of new branches for coffee fertilization.
- Control of pests and diseases such as Nematodes, coffee fruit borers and branch as well as stem borers is carried out through an integrated Pest/Disease Control system), using natural enemies and biological agents and or organic pesticides. The use of inorganic pesticides are prohibited in this GI protected area.
- The commonly used shades are *Dadap*, *Lamtoro* (river tamarind) trees, because *dadap* is easy to grow through cuttings, easy to prune and a great source of food for the farmer's livestock.

- Farmers usually use litter to fertilize plants by making a trench around the coffee plant. The size of trench is 1 m long and 30 cm wide with a depth of 30 cm.
- Farmers do not really have expansive land for coffee plantations and coffee farmers in the Manggarai highlands are accustomed to endeavoring horizontal diversification with other plants. There is a positive impact from this kind of diversification on the quality of coffee, thus this diversification needs to be recommended. Such a diversification effort in addition to being able to increase farmers' income, can also provide organic fertilizing materials.

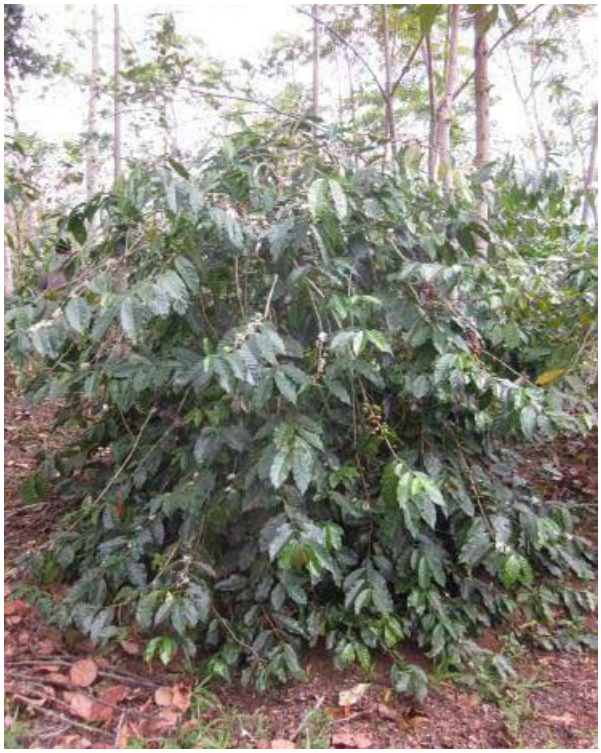


Figure 12. Planting of Arabica Coffee Trees in Manggarai

In summary, 'Kopi Arabika Flores Manggarai' plant care is carried out in a natural and organic manner, without the use of inorganic fertilizers and pesticides.



Figure 13. Planting of Arabica Coffee Trees With Different Types of Shades



Figure 14. Planting of Arabica Coffee Trees That Grow in a Yard

**d. Coffee Rejuvenation**

Rejuvenation is done by:

1. New planting (Planting new saplings in a coffee plantation area)



Figure 15. Planting of New Coffee Trees

2. Pruning and grafting (Robusta coffee trees grown in Arabica coffee seasonal plants are rejuvenated and the shoots are grafted with Arabica coffee shoots)



Figure 16. Coffee Tree Pruning and Grafting

3. Laying down old trees. Rejuvenation is done by laying down old coffee trees onto the ground, and allowing for new shoots to grow.




Figure 17. Laying Coffee Trees onto the Ground

## 2. Processing Method

The 'Kopi Arabika Flores Manggarai' processing process is carried out using the wet hulling and fully washed method as regulated in the Standard Operating Procedures (SOP). The following are the processing steps in question which are the special requirements to produce 'Kopi Arabika Flores Manggarai'.

### a. Harvest

The wet processing of coffee must begin with the picking of red fruit. Harvesting is done manually, namely picking by hand. To be processed properly, harvesting must be done selectively. Only fruit that has ripen / red is picked to get a minimum of 95% red coffee cherry, a maximum of 5% yellow cherry, but no green or black cherry at all. Moreover, it is also necessary to prepare good and clean harvesting facilities such as fruit containers, stairs, plastic sheets/bags for dried, black and defective fruit.

### b. Fruit Sorting

Sorting is carried out on harvested coffee fruit with the aim to separate the coffee fruit that are still green, dry, dirt and others. The minimum limit of ripe coffee fruit to be processed is 95% of red fruit. Determining the percentage of red fruit can be carried out

by preparing a container/media for spreading the coffee fruit, then observing and sorting the red fruit, green fruit and black and reddish yellow fruit. Checking is carried out before processing/pulper process in each PPU. Only properly sorted red coffee cherry can be processed to get 'Kopi Arabika Flores Manggarai'. It is prohibited to store ripe fruit more than 6 hours after harvest, and fruit must be immediately peeled on the same day to prevent fruit spoilage which will affect coffee aroma or cause fermentation.



Figure 18. Coffee Cherries Sorting Activity

**c. Soaking**

Before peeling, the sorted red coffee cherries are soaked in water, stirred, and separated from cherries that are floating/cherries attacked by pest. The floating coffee cherry is separated and is not processed as 'Kopi Arabika Flores Manggarai'. Farmers also ensure that stones, iron, and other hard objects are not included, because they will damage the pulper.



Figure 19. Coffee cherries Soaking Process

**d. Pulping**

The examination and cleaning of the pulper must be carried out before usage to ensure the pulper functions properly. Pulping is carried out using a mechanical pulper or a manually operated machine with the addition of sufficient clean water. Processed coffee fruit are fresh red coffee cherry. Today's picks must be deposited and processed in the processing unit on the same day to completion (no leftovers). Immediately pulp fresh ripe fruit (do not delay). Adjust the Pulper setting for good pulping result, not broken, so that hard shell coffee does not mixed with the pulp, and, the pulp not much mixed with seeds. Wash and clean tools after use.

**e. Pulped Coffee Bean Cleaning**

After pulping, the pulped wet hard shell coffee beans are soaked for the second time and floating seeds are separated. The remaining pulp attached to the hard-shell coffee beans (HS coffee) is also separated so that HS coffee beans are completely clean. In addition, before fermenting, separate the remaining pulp from HS coffee because pulp included during fermentation will rot and contaminate coffee taste.

**f. Fermentation**

The fermentation process is intended to shed mucilage for easy washing so that it will form a good coffee taste. Fermentation is done naturally and perfectly without any additional ingredients. The fermentation process can be carried out in a bucket (with a hole at the bottom) or a clean plastic bag so that the mucilage can drain out. The container must be clean and free from strong odors (e.g.: kerosene, pesticides, rust, etc.). Do not use wooden or bamboo containers because they can cause unwanted odors. The fermentation process lasts for 12 to 36 hours, depending on consumer demand.

**g. Washing**

Fermented coffee needs to be washed to remove mucilage using clean water. Washing can be done manually by hand or mechanically using a washer. Clean the mucilage from the fermentation process until the coffee beans look clean and then proceed with drying.

**h. Drying**

Drying is a critical step in acquiring good physical quality and taste. Drying is done slowly, especially at the beginning (first 1-4 days) by using a drying rack or tarpaulin. For wet hulled coffee, drying is carried out until the moisture content reaches 40% and then it is hulled. The green coffee bean is then dried again on a tarpaulin until it reaches a moisture content of 11-12%. Meanwhile, for fully washed coffee, drying is carried out on a drying rack with a thickness of 6-10 cm and reversal every 1 hour. Do this drying until it reaches a moisture content of 11-12%.

Use clean plastic tarpaulin mats, dry floors made of cement or preferably drying rack. During the drying process, coffee beans are stirred to dry evenly and to prevent re-absorption of moisture content. At the beginning (first 1-2 days), reversal should be more frequent because the coffee is still wet. Close the coffee at night with tarpaulin. Closure would be better if the tarpaulin is not in direct contact with seeds and a space between seeds and the cover is given to prevent condensation. The cover is adjusted in an inclined position so that the condensed water droplets flow sideways and do not fall into the coffee. Keep away from water and rain for coffee that is almost dry to prevent damage. Stop drying the coffee when the moisture content has reached 11-12%. Check with a moisture

meter in the morning or can be estimated by weighing one can of oil (volume of 19 liters) when it has achieved a constant weight/no loss every day for 3 days (approximately 8.0 kg/19 liters), then drying can be stopped.

**i. Storage**

Dried hard shell coffee and the resulting Green coffee are packaged in new sacks in a place (warehouse) for storage by farmer groups or Processing Units. The storage warehouse is in the form of a dry and clean room, free from harmful chemicals that may contaminate it with foreign odors, smoke free, free from cigarette butts free and insect repellent, and is not damp. Hard shell coffee bean storage does not allow any direct contact with the floor. Use wooden pallets (pads) under piles of sacks and the floor surface to avoid moisture and do not let it be in contact with walls. Each sack must be assigned a traceability code and a GI label.

**j. Packing and Shipping**

HS coffee that is ready to be marketed must be packaged using new packaging with the size according to the buyer's request. The used packaging is a sack which on the inside uses plastic with a weight according to the buyer's request, is given a label and a traceable code. Green coffee originating from dry HS must first be subject to hulling. Hulling using a huller is carried out by the processing unit. Green coffee bean packaging uses a sack which on the inside uses plastic with a weight according to the buyer's request, is given a label and a traceable code.

Use new food grade (suitable for foodstuffs), and free mineral oil (non-mineral oil-based jute-bag) sacks. Coffee sent by means of transportation must be completely clean and free from dirt or other contaminants such as used oil, oil, diesel, asphalt, soil, artificial fertilizers, natural fertilizers, or other materials which is easy to smell. The interior of conveyance must be covered by tarpaulin or another clean coating to keep the coffee from polluting contaminants.

**k. Standard Operational Procedures for Post-Harvest Processing**

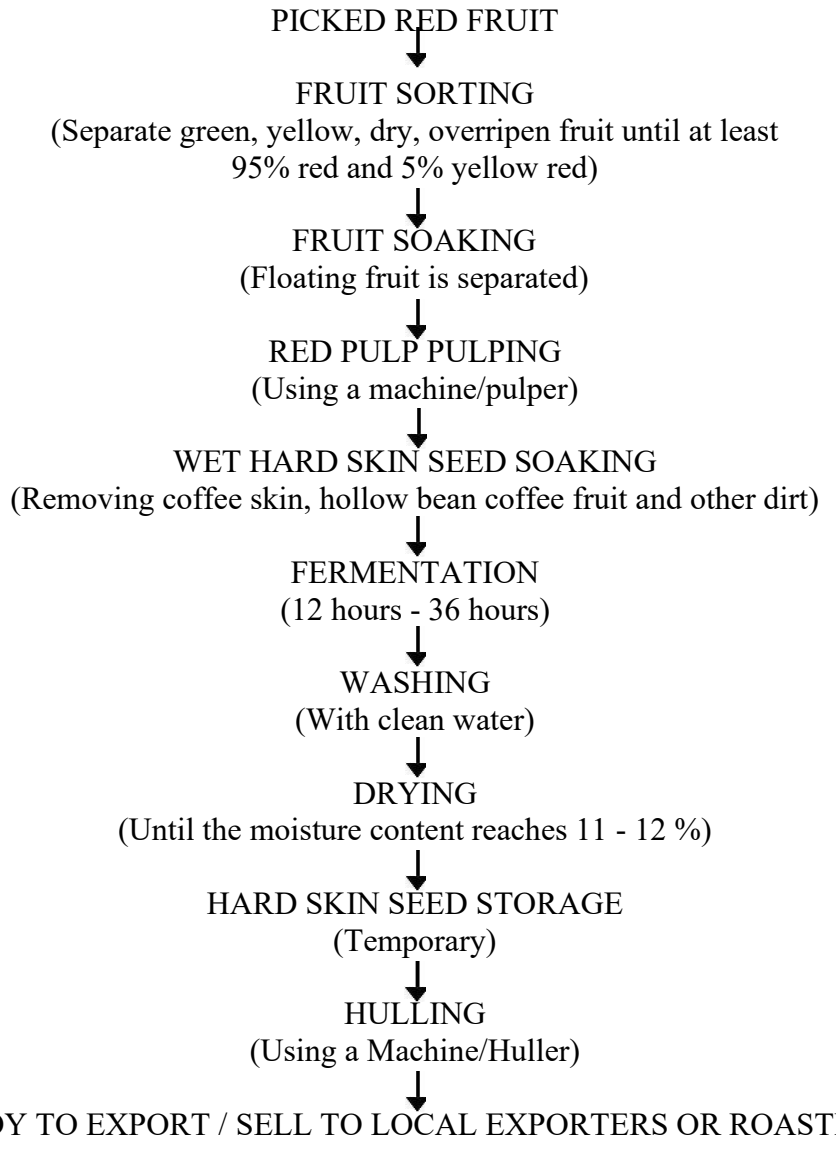



Figure 20. SOP (Standard Operational Procedure) for Wet Method
'Kopi Arabika Flores Manggarai' Processing (Wet Process)

## H. CONTROL METHODS AND TRACEABILITY

### 1. Control Method

To guarantee the production and quality of 'Kopi Arabika Flores Manggarai', a quality control method has been developed with the aim of maintaining the characteristics of the quality standards that have been set. This control is done by:

- Complying with the rules of cultivation and processing that have been specified in the

Product Specification

- Guaranteeing the traceability of product origin (the form to be filled out by the ICS manager of the farmer group and then checked by the MPIG ICS team).
- Ensuring product quality is in accordance with the standards set in the Product Specification by MPIG ICS before being issued and proven by MPIG ICS test result documents.
- Implementation of product control consists of: Self-control, Control by farmer groups and control by MPIG.

**2. Crop Control (Cultivation)**

**a. Self-control**

Each producer must check that a plantation complies with the rules in the Product Specification, including regarding shade trees, varieties (only for new plantings), density (planting distance), maintenance (especially for fertilization and pest and disease control), and others. Each producer must know or be informed of the regulations that must be adhered to in coffee farming by farmer groups or MPIG. Report self-control results to the manager of the farmer group every 3 months.

**b. Control by farmer groups**

Every year, the head or manager of the farmer group must ensure that the Product Specification are met by member plantations and must report to MPIG. Each farmer group can choose ways to achieve this control. The manager of farmer groups can do it themselves or appoint someone who can be assigned. In certain cases, a meeting may be held to determine whether a special examination is necessary.

**c. Control by MPIG**

The MPIG conducts control every year, before the harvest season several farmer groups joined in MPIG 'Kopi Arabika Flores Manggarai' who are selected randomly. This activity is done by a quality control team appointed by MPIG 'Kopi Arabika Flores Manggarai'.

**3. Processing Control**

**a. Control by a farmer group / Processing Unit (Self-control)**

For each processing unit (farmer group or PPU), there is one person tasked with

controlling the processing operation to ensure conformity with those specified in the Product Specification. The officer controls the daily processing activities, including:

- Red Cherries to be processed originate from registered producers;
- The percentage of red cherries meets the requirements (> 95%);
- The pulping process is carried out on the same day as the picking;
- Fermentation is carried out for 12 to 36 hours;
- Drying is done on a drying rack or tarpaulin and may not be in direct contact with the ground. Drying is carried out until it reaches a moisture content of 11-12%;
- The cleanliness of Processing Units (including machines, fermentation facilities, processing room floor, drying, etc.);
- Ensure the storage of HS and Green coffee products is in accordance with the provisions which have been determined.

**b. Control by MPIG**

The MPIG performs control every year, during the harvest and processing period on several farmer groups joined in MPIG KAFM who are selected randomly. This activity is carried out by a quality control team appointed by MPIG KAFM. If it is found that the Product Specification is not fully complied with, then MPIG will decide the appropriate actions to be imposed, which can be in the form of giving a recommendation for termination to temporary suspension. In all cases above, this action is then checked after the farmer groups or processing units have carried out the necessary evaluations to meet the demands in the Product Specification.

**4. Traceability**

**a. Member Registration**

MPIG member farmer groups have been asked to list members of their coffee producers. This list has been entered into a computer. In this list, the producers get a GI card with a membership number from MPIG. An updated list of producers will be issued annually. MPIG will send a list of producers to each farmer group and will ask them if they have changes in membership. For example, there may be new producers (who will receive new cards) or those who stop producing coffee (who should return their card). If there are producers who have changes to their crops and no longer comply with the rules

in the Product Specification, their membership can be canceled, and they are also asked to return their card. Each Processing Unit must be registered as “GI Processor”. To ease control at each stage of GI coffee processing, each Processing Unit must list the places where they do coffee processing (also where the coffee will be stored).

**b. During harvesting and processing: Control of cherry origin**

Every time a producer deposits or sells red coffee cherry to a Processing Unit (PU), the PU must check the card and record the name of producer, producer number, number of coffees purchased and the date of transaction. If there is a problem, PU can check the registration of the producer, MPIG sends a list of all farmers which have been registered with all PU every year before harvest. Individual farmers (who are not members of a farmer group) also have the freedom to sell red cherries (if their plants are located in areas marked for GI and meet the requirements) to the PU after they are registered by the farmer groups as GI producers. PU must send a list of red coffee cherry suppliers to the MPIG twice a year: mid-July (mid-harvest), and end of September (end of harvest). MPIG checks whether the required quantity of red coffee cherry **s**old by a producer matches the area and number of trees owned.

**c. Tracing the Coffee Lot Order**

Right after processing, the PU must identify each sack with a code lot. This code includes Processing Unit code (XX), production year (YYYY) and lot number (ZZ). This code consists of 8 numbers: XX-YYYY-ZZ. Each processing unit should make up 10 to 15 lots of their annual production (these lots can be formed depending on the weeks of production or by forming producer sub-groups within farmer groups and see information below about lot formation). These lot codes are stored until the GI coffee sales stage (if the certificate has been obtained, see below), and allow for thorough traceability.

**d. GI Coffee Sales and Purchases**

After processing and storage and getting a GI certificate (see information below), PU can sell their GI coffee. Every transaction must be recorded. Once a year (April/before the next harvest season), the data must be sent to MPIG. MPIG then checks the transactions and matches the quantity of Green or HS coffee sold against the quantity of red cherries purchased from GI producers.

## 5. Control of Physical Quality and Taste Quality of 'Kopi Arabika Flores Manggarai'

In recent developments, consumers do not only demand good quality coffee, but also healthy coffee (safe for health). Essentially, the quality of coffee beans can be divided into two types, namely physical quality, and taste quality. During the processing phase, sampling of Arabica coffee beans is carried out for the processing of each PPU (Product Processing Unit). The coffee samples are subject to physical quality and taste quality analysis at the Testing Laboratory (LP) of the Indonesian Coffee and Cocoa Research Institute in Jember and MPIG internal professionals or other related institutions to find out the extent of the quality of the coffee produced by the farmer above. Then as a comparison, sampling and testing are also carried out on the quality of local (original) Arabica coffee which is usually processed by farmers in general and also on market coffee.

### a. Control of Physical Quality

The physical quality is determined based on the physical value contained in coffee beans based on Indonesian National Standard (SNI) 01-2907-2008. The physical quality of beans is generally divided into six levels, namely from quality I (good) to quality VI (poor) as shown in Table 8. The difference in this level is based on the defect value, thus such a quality differentiation system is known as a *defect system*.

Table 7. Classification of Quality Based on the Defect Value System

| Quality | Quality Conditions |
|---|---|
| Quality I | Max. defect value 11 |
| Quality II | Defect value 12 – 25 |
| Quality III | Defect value 26 – 44 |
| Quality IV a | Defect value 45 – 60 |
| Quality IV b | Defect value 61 – 80 |
| Quality V | Defect value 81 – 150 |
| Quality VI | Defect value 151 – 225 |

*Source: BSN (National Standardization Agency), 2008*

### b. Control of Taste Quality

Meanwhile, the taste quality of coffee beans is greatly determined by the presence of

taste defect and the nature of the original taste of a type of coffee. Coffee beans that have taste defects are classified as coffee that tastes bad and is often declared unfit for drinking (for example: stale smell, mildew smell, petroleum smell, etc.). The taste quality of coffee is determined based on an organoleptic test (sensorial analysis). The taste of new coffee beans can be assessed after roasting and grinding. Important flavors that exist in coffee include Flavor (typical smell of coffee), aroma (savory smell), body (thickness), acidity (good acid taste), bitterness (delicious bitter taste), and astringent (good astringent taste). Meanwhile, taste defects that should not exist among others: Stink (stale smell), earthy (smell of earth), moldy (smell of mildew), musty (smell of moss), sour (horrible sour taste), oily (smell of petroleum), chemical (smell of chemicals), smoky (smell of smoke), and others.

## 6. Uniqueness Control of 'Kopi Arabika Flores Manggarai' and Awarding of Certificates to Processing Units

A GI certificate is requested by Processing Units, after processing red coffee cherry to HS coffee at two months of storage. Several "lots" must be made (meaning the production must be divided into separate parts), and each lot will be checked by MPIG regarding its fulfillment with the Product Specification, traceability and quality/ uniqueness of the coffee.

### a. Lot Formation

After processing (and 2 months of storage), the coffee is able to receive the GI certificate. Each PU must group coffee into 10 to 15 lots. There are two types of farmer groups:

- Some of them work collectively: red coffee cherry is bought from members, and processed together every day, until it becomes HS coffee and Green coffee.
- Other farmer groups work semi-collectively, red coffee cherry is pulped and ripened in a shared facility, then each producer takes their HS coffee and dries the coffee in their yard. After drying and storage, in October/November, the coffee is collected together, before being sold.

In the two types of farmer groups above, lot formation is carried out in different ways:

- For farmer groups working collectively, one lot is formed in one production week.

Since there are 3 months of harvest, there are between 10 and 15 lots.

- For farmer groups who work semi-collectively, the separation of production weeks seems difficult. Consequently, the solution is by forming between 10 and 15 producer groups, which collect production from several producers, producing 10 to 15 lots. However, in some farmer groups like this, the production for each month is already separated, and the formation of the lots is somewhat different (the production of each 3 months only have to be separated into 5 groups, to produce a total of 15 lots). Processing units can specify one process lot/week (as in the first type of farmer groups). The certification is requested for each of the 10 or 15 lots formed by the Processing Unit. MPIG will check if the taste and traceability requirements are met.

**b. Traceability Control**

For each lot, MPIG will check the traceability of processing units that must specify a list of sellers of red coffee for each lot.

## I. LABELING

### 1. Geographical Indication Label of 'Kopi Arabika Flores Manggarai'

The 'Kopi Arabika Flores Manggarai' GI label must contain:

- Name of "Geographical Indication"
- 'Kopi Arabika Flores Manggarai' GI Logo (Figure 25) - Traceability code (refer to "Traceability" section)

Inside the logo, there are:

- Pictures of traditional houses
- Pictures of a Komodo
- Image of Coffee Beans
- The text 'Kopi Arabika Flores Manggarai'

The arrangement of the images and text is like the logo below.




Figure 21. Geographical Indication Logo of 'Kopi Arabika Flores Manggarai'

The philosophy of using images in the 'Kopi Arabika Flores Manggarai' GI logo:

- Komodo : Typical Animal from Manggarai, Flores Komodo
- Traditional House : Illustrates the traditional house of Manggarai, Manggarai Barat Barat and Manggarai Timur Regencies
- Triangle border inside the circle : Symbolizes "*lodok"* namely the land division system in Manggarai, Manggarai Barat Barat and Manggarai Timur Regencies
- Brown color : Illustrates the color of coffee
- Three coffee beans : Illustrates the best coffee in Manggarai, Manggarai Barat and Manggarai Timur Regencies
- Chicken (bird) eyes in the circle belt logo : The general motif of *songke* woven fabric in Manggarai, Manggarai Barat and Manggarai Timur Regencies
- Round shaped logo : Illustrates the spirit of unity in Manggarai, Manggarai Barat and Manggarai Timur Regencies

**2. Use of the Name ‘Kopi Arabika Flores Manggarai’**

The name ‘Kopi Arabika Flores Manggarai’ is only used for coffee that is 100% produced by the MPIG ‘Kopi Arabika Flores Manggarai’. ‘Kopi Arabika Flores Manggarai’ blended coffee may not be sold using the ‘Kopi Arabika Flores Manggarai’name.

**3. National Geographical Indication Logo**




Figure 22. National Geographical Indication Logo

The packaging of ‘Kopi Arabika Flores Manggarai’ products in addition to using the Geographical Indication Label of ‘Kopi Arabika Flores Manggarai’ also uses the Indonesian Geographical Indication Logo as shown above.

# CHAPTER IV
# CONCLUSION

The "Geographical Indication Protection Society of 'Kopi Arabika Flores Manggarai' was formed in 2015. It consists of farmer organizations, local private managers, and other coffee stakeholders in the Manggarai highlands. 'Kopi Arabika Flores Manggarai' is filing an application for Protected Geographical Indications for their local coffee products. This application is filed considering that this coffee has a specialty and uniqueness, namely Arabica coffee which is produced in the Manggarai highlands with volcanic mountains. Produced with good cultivation and processing techniques by traditional farmer group organizations that produce specialty coffee.

The taste quality test conducted by *Puslitkoka* produced a distinctive taste of 'Kopi Arabika Flores Manggarai', with a distinctive aroma and thickness, moderate to high acidity, and no bitter taste. The uniqueness of this taste is a combination of the roles of nature and humans. Farmers work together to produce coffee with a distinctive taste while the beautiful nature influences the process of forming the taste. Climatic, shade, and human treatment factors also play a role in forming the taste of 'Kopi Arabika Flores Manggarai'.

This Product Specification serves as a guide for 'Kopi Arabika Flores Manggarai' farmers to produce their coffee thus production consistency and coffee quality are maintained. This consistency comes from the awareness of organizing within the 'Kopi Arabika Flores Manggarai' forum, the commitment to building egalitarian cooperation in every element and the creation of a fair system at every level: production, distribution and consumers.

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**Appendix 1.** Coffee Defect Types and Values According to SNI 01-2907-2008

| No | Defect Type | Defect Value/Bean | Remarks of the Term Defective Seed |
|---|---|---|---|
| 1 | Black bean | 1 | Coffee bean with 1/2 surface or more is black |
| 2 | Partially black bean | ½ | Coffee bean with 1/2 surface or more is black |
| 3 | Cracked black bean | ½ | Incomplete black coffee bean, measuring equal to or less than 3/4 of the whole bean |
| 4 | Cherry Coffee | 1 | Dried coffee fruit wrapped in pulp, whole or equal to or more than 3/4 part of whole pericarp |
| 5 | Brown bean | ¼ | Bean with brown 1/2 exterior part or more |
| 6 | Large size coffee pulp | 1 | Pericarp larger than 3/4 of whole pulp |
| 7 | Medium size coffee pulp | ½ | Pericarp measuring 1/2 to 3/4 whole pulp |
| 8 | Small size coffee pulp | 1/5 | Pericarp measuring less than 1/2 whole pulp |
| 9 | Hard skin bean | ½ | Coffee beans still wrapped in parchment |
| 10 | Large size hard skin | ½ | Hard skin that is detached from the coffee bean larger than 3/4 of the whole hard skin |
| 11 | Medium size hard skin | 1/5 | Hard skin that is detached from the coffee bean measuring 1/2 to 3/4 of the whole hard skin |
| 12 | Small size hard skin | 1/10 | Hard skin that is detached from the coffee bean measuring less than 1/2 of the whole hard skin |
| 13 | Cracked bean | 1/5 | Incomplete coffee bean, the size of which is equal to or less than 3/4 of the whole seed |
| 14 | Young bean | 1/5 | Small coffee bean and wrinkled all over the outside |
| 15 | Bean with one hole | 1/10 | Coffee beans with one hole due to insect attacks |
| 16 | Bean with many holes | 1/5 | Coffee beans with more than one hole due to insect attacks |
| 17 | Spotted bean | 1/10 | Seeds that are spotted at 1/2 seed surface or more. This provision is only |
| 18 | Twig, soil, or big-sized stone | 5 | Twig, soil, or stone with length or diameter of more than 10 mm |
| 19 | Twig, soil, or medium-sized stone | 2 | Twig, dirt, or stone with length or diameter of 5 - 10 mm |
| 20 | Twig, soil, or small-sized stone | 1 | Twig, dirt, or stone with length or diameter of less than 5 mm |

**Appendix 2.** Results of the 2015 ‘Kopi Arabika Flores Manggarai’ Taste Test

| No | Coffee Origin | Taste Test Score | Regency |
|---|---|---|---|
| 1 | Waling Borong | 82.75 | Manggarai Timur |
| 2 | Pocolia, Pocoranaka | 83.92 | Manggarai Timur |
| 3 | Gololeni, Ranamese | 80.50 | Manggarai Timur |
| 4 | Ngkiong Dora Pocoranak | 83.17 | Manggarai Timur |
| 5 | Wae Bangka Lembor | 83.50 | Manggarai Barat |
| 6 | Cumbi Ruteng | 83.50 | Manggarai Timur |
| 7 | Golomeni Kota Kumba | 81.75 | Manggarai Timur |
| 8 | Nati Lelak | 85.25 | Manggarai Timur |
| 9 | Ranambeling Kota Kumba | 83.58 | Manggarai Timur |
| 10 | Wae Ri'i | 87.25 | Manggarai |
| 11 | Lungar Satarmese | 85.50 | Manggarai |
| 12 | Carep Lake Rembong | 84.75 | Manggarai |
| 13 | Peleng Haju Ngendong Elar | 81.50 | Manggarai Timur |
| 14 | Pondok Nantal Kuwus | 83.75 | Manggarai Barat |

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# LAPORAN HASIL ANALISIS (*Report Of Analysis*)

## *02.15.1.0343 AMD*

| | | |
|---|---|---|
| **Pemohon**<br>**Applicant** | : | **Pusat Penelitian Kopi dan Kakao Indonesia** |
| **Alamat**<br>**Address** | : | **Jl. PB. Sudirman No. 90 Jember** |
| **Uraian Contoh** | : | **Biji Kopi Arabika Manggarai Timur, Waling Borong** |
| **Sample Description** | | **( Di kemas dalam Plastik )** |
| **Tanggal Terima**<br>**Date of Received** | : | **04 November 2015** |
| **Tanggal Analisis**<br>**Date of Analysis** | : | **25 s/d 27 November 2015** |
| **Hasil Analisis**<br>**Analysis Result** | : | **Terlampir** |

**Jember, 27 November 2015**

**Manager Teknis,**

**Ir. Budi Sumartono, MP.**



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## LAPORAN HASIL UJI CITARASA
## (Report of Cup Testing)

**No. 02.15.1.0343 - C**

No. Contoh (Sample number) : 02.15.1.0343 Amd
Tanggal Penerimaan Contoh (Sample recieved) : 04-11-2015
Tanggal Pengujian (Date of testing) : 25-11-2015 —— 27-11-2015
Jenis Contoh (Kind of sample) : Biji kopi/green beans Arabica
Identitas Contoh (Sample identity) : Kopi Arabika Waling Borong.

| Karakteristik (Characteristic) | Skor Citarasa (Cup testing Score)* | Karakteristik (Characteristic) | Skor Citarasa (Cup testing Score)* |
|---|---|---|---|
| Fragrance/aroma | 7.75 | Balance | 7.50 |
| Flavor | 7.50 | Clean cup | 10.00 |
| Aftertaste | 7.50 | Sweetness | 10.00 |
| Acidity | 7.50 | Overall | 7.50 |
| Body | 7.50 | Taint/Defect: | None |
| Uniformity | 10.00 | Final Score** | 82.75 |
| Comments: | Herbal, Tobaco, Clean. | | |

* Keterangan skor: 6.00 - 6.75= Good; 7.00 - 7.75= Very good; 8.00 - 8.75= Excellent; 9.00 - 9.75= Outstanding
(Score notation)

** Final Score notation: Nilai minimum untuk (Minimum Value for) Specialty Grade = 80

Jember, 27-11-2015

Catatan (Notes):

Hasil analisis ini hanya menerangkan atribut mutu berdasarkan contoh yang diuji BUKAN menerangkan atribut nama, jenis atau asal contoh (This result explains only the attribute of the quality based on the sample tested, NOT explains attributes of name, type and origin of the sample).

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Ir. Bambang Sumartono, MP.

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# LAPORAN HASIL ANALISIS (*Report Of Analysis*)

***02.15.1.0328 AMD***

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| **Alamat**<br>**Address** | : | **Jl. PB. Sudirman No. 90 Jember** |
| **Uraian Contoh** | : | **Biji Kopi Arabika Manggarai Timur**<br>**Pocolia Pocoranaka** |
| **Sample Description** | | **( Di kemas dalam Plastik )** |
| **Tanggal Terima**<br>**Date of Received** | : | **04 November 2015** |
| **Tanggal Analisis**<br>**Date of Analysis** | : | **25 s/d 27 November 2015** |
| **Hasil Analisis**<br>**Analysis Result** | : | **Terlampir** |

**Jember, 27 November 2015**

**Manager Teknis,**

**Ir. Budi Sumartono, MP.**



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## LAPORAN HASIL UJI CITARASA
## (Report of Cup Testing)

**No. 02.15.1.0328 - C**

02 . 15 . 1 . 0328

No. Contoh (Sample number) : 02.15.1.0328 Amd
Tanggal Penerimaan Contoh (Sample recieved) : 04-11-2015
Tanggal Pengujian (Date of testing) : 25-11-2015 — 27-11-2015
Jenis Contoh (Kind of sample) : Biji kopi/green beans Arabica
Identitas Contoh (Sample identity) : Kopi Arabika Pocolia Pocoranaka.

| Karakteristik (Characteristic) | Skor Citarasa (Cup testing Score)* | Karakteristik (Characteristic) | Skor Citarasa (Cup testing Score)* |
|---|---|---|---|
| Fragrance/aroma | 7.67 | Balance | 7.67 |
| Flavor | 7.75 | Clean cup | 10.00 |
| Aftertaste | 7.50 | Sweetness | 10.00 |
| Acidity | 7.92 | Overall | 7.75 |
| Body | 7.67 | Taint/Defect: | None |
| Uniformity | 10.00 | Final Score** | 83.92 |
| Comments: | Herbal, Sweet, Medicinal, Spicy, Greenish, Flowery. | | |

* Keterangan skor: 6.00 - 6.75= Good; 7.00 - 7.75= Very good; 8.00 - 8.75= Excellent; 9.00 - 9.75= Outstanding
(Score notation)

** Final Score notation: Nilai minimum untuk (Minimum Value for) Specialty Grade = 80

Jember, 27-11-2015

Manajer Teknis

Ir. Dwi Sumartono, MP.

Catatan (Notes):
Hasil analisis ini hanya menerangkan atribut mutu berdasarkan contoh yang diuji BUKAN menerangkan atribut nama, jenis atau asal contoh (This result explains only the attribute of the quality based on the sample tested, NOT explains attributes of name, type and origin of the sample).

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# LAPORAN HASIL ANALISIS (*Report Of Analysis*)

***02.15.1.0340 AMD***

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| **Alamat**<br>**Address** | : | **Jl. PB. Sudirman No. 90 Jember** |
| **Uraian Contoh** | : | **Biji Kopi Arabika Manggarai Timur, Golo Loni Ranamese** |
| **Sample Description** | | **( Di kemas dalam Plastik )** |
| **Tanggal Terima**<br>**Date of Received** | : | **04 November 2015** |
| **Tanggal Analisis**<br>**Date of Analysis** | : | **25 s/d 27 November 2015** |
| **Hasil Analisis**<br>**Analysis Result** | : | **Terlampir** |

**Jember, 27 November 2015**

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## LAPORAN HASIL UJI CITARASA
## (Report of Cup Testing)

**No. 02.15.1.0340 - C**

02 . 15 . 1 . 0340

No. Contoh (Sample number) : 02.15.1.0340 Amd
Tanggal Penerimaan Contoh (Sample recieved) : 04-11-2015
Tanggal Pengujian (Date of testing) : 25-11-2015 — 27-11-2015
Jenis Contoh (Kind of sample) : Biji kopi/green beans Arabica
Identitas Contoh (Sample identity) : Kopi Arabika Golo Loni Ranamese.

| Karakteristik (Characteristic) | Skor Citarasa (Cup testing Score)* | Karakteristik (Characteristic) | Skor Citarasa (Cup testing Score)* |
|---|---|---|---|
| Fragrance/aroma | 7.75 | Balance | 7.00 |
| Flavor | 7.33 | Clean cup | 10.00 |
| Aftertaste | 7.08 | Sweetness | 10.00 |
| Acidity | 7.00 | Overall | 6.83 |
| Body | 7.50 | Taint/Defect: | None |
| Uniformity | 10.00 | Final Score** | 80.50 |
| Comments: | Spicy, Floral, Rather Fishy, Low Acidity, Astrigent. | | |

* Keterangan skor: 6.00 - 6.75= Good; 7.00 - 7.75= Very good; 8.00 - 8.75= Excellent; 9.00 - 9.75= Outstanding
(Score notation)

** Final Score notation: Nilai minimum untuk (Minimum Value for) Specialty Grade = 80

Jember, 27-11-2015

Catatan (Notes):

Hasil analisis ini hanya menerangkan atribut mutu berdasarkan contoh yang diuji BUKAN menerangkan atribut nama, jenis atau asal contoh (This result explains only the attribute of the quality based on the sample tested, NOT explains attributes of name, type and origin of the sample).

Manajer Teknis

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# LAPORAN HASIL ANALISIS (*Report Of Analysis*)

***02.15.1.0330 AMD***

| | | |
|---|---|---|
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| **Alamat**<br>**Address** | : | **Jl. PB. Sudirman No. 90 Jember** |
| **Uraian Contoh** | : | **Biji Kopi Arabika Manggarai Timur Ngklong Dora Pacoranaka Timur** |
| **Sample Description** | | **( Di kemas dalam Plastik )** |
| **Tanggal Terima**<br>**Date of Received** | : | **04 November 2015** |
| **Tanggal Analisis**<br>**Date of Analysis** | : | **25 s/d 27 November 2015** |
| **Hasil Analisis**<br>**Analysis Result** | : | **Terlampir** |

**Jember, 27 November 2015**

**Manager Teknis,**

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## LAPORAN HASIL UJI CITARASA
## (Report of Cup Testing)

**No. 02.15.1.0330 - C**

02 . 15 . 1 . 0330

No. Contoh (Sample number) : 02.15.1.0330 Amd
Tanggal Penerimaan Contoh (Sample recieved) : 04-11-2015
Tanggal Pengujian (Date of testing) : 25-11-2015 — 27-11-2015
Jenis Contoh (Kind of sample) : Biji kopi/green beans Arabica
Identitas Contoh (Sample identity) : Kopi Arabika Ngklong Dora Pocoranaka Timur.

| Karakteristik (Characteristic) | Skor Citarasa (Cup testing Score)* | Karakteristik (Characteristic) | Skor Citarasa (Cup testing Score)* |
|---|---|---|---|
| Fragrance/aroma | 7.67 | Balance | 7.50 |
| Flavor | 7.58 | Clean cup | 10.00 |
| Aftertaste | 7.58 | Sweetness | 10.00 |
| Acidity | 7.75 | Overall | 7.50 |
| Body | 7.58 | Taint/Defect: | None |
| Uniformity | 10.00 | Final Score** | 83.17 |
| Comments: | Herbal, Tobacco. | | |

* Keterangan skor: 6.00 - 6.75= Good; 7.00 - 7.75= Very good; 8.00 - 8.75= Excellent; 9.00 - 9.75= Outstanding
(Score notation)

** Final Score notation: Nilai minimum untuk (Minimum Value for) Specialty Grade = 80

Jember, 27-11-2015

Catatan (Notes):

Hasil analisis ini hanya menerangkan atribut mutu berdasarkan contoh yang diuji BUKAN menerangkan atribut nama, jenis atau asal contoh (This result explains only the attribute of the quality based on the sample tested, NOT explains attributes of name, type and origin of the sample).

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# LAPORAN HASIL ANALISIS (*Report Of Analysis*)

***02.15.1.0348 AMD***

| | | |
|---|---|---|
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| **Alamat**<br>**Address** | : | **Jl. PB. Sudirman No. 90 Jember** |
| **Uraian Contoh** | : | **Biji Kopi Arabika Manggarai Timur, Way Bangka Lemboi** |
| **Sample Description** | | **( Di kemas dalam Plastik )** |
| **Tanggal Terima**<br>**Date of Received** | : | **04 November 2015** |
| **Tanggal Analisis**<br>**Date of Analysis** | : | **25 s/d 27 November 2015** |
| **Hasil Analisis**<br>**Analysis Result** | : | **Terlampir** |

**Jember, 27 November 2015**

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## LAPORAN HASIL UJI CITARASA
## (Report of Cup Testing)

**No. 02.15.1.0348 - C**

02.15.1.0348

No. Contoh (Sample number) : 02.15.1.0348 Amd
Tanggal Penerimaan Contoh (Sample recieved) : 04-11-2015
Tanggal Pengujian (Date of testing) : 25-11-2015 — 27-11-2015
Jenis Contoh (Kind of sample) : Biji kopi/green beans Arabica
Identitas Contoh (Sample identity) : Kopi Arabika Way Bangka Lembor.

| Karakteristik (Characteristic) | Skor Citarasa (Cup testing Score)* | Karakteristik (Characteristic) | Skor Citarasa (Cup testing Score)* |
|---|---|---|---|
| Fragrance/aroma | 8.00 | Balance | 7.50 |
| Flavor | 7.75 | Clean cup | 10.00 |
| Aftertaste | 7.50 | Sweetness | 10.00 |
| Acidity | 7.75 | Overall | 7.50 |
| Body | 7.50 | Taint/Defect: | None |
| Uniformity | 10.00 | Final Score** | 83.50 |
| Comments: | Spicy, Nutty, Clean. | | |

* Keterangan skor: 6.00 - 6.75= Good; 7.00 - 7.75= Very good; 8.00 - 8.75= Excellent; 9.00 - 9.75= Outstanding
(Score notation)

** Final Score notation: Nilai minimum untuk (Minimum Value for) Specialty Grade = 80

Jember, 27-11-2015

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Ir. Budi Sumartono, MP.

Catatan (Notes):

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# LAPORAN HASIL ANALISIS (*Report Of Analysis*)

***02.15.1.0346 AMD***

| | | |
|---|---|---|
| **Pemohon**<br>**Applicant** | : | **Pusat Penelitian Kopi dan Kakao Indonesia** |
| **Alamat**<br>**Address** | : | **Jl. PB. Sudirman No. 90 Jember** |
| **Uraian Contoh** | : | **Biji Kopi Arabika Manggarai Timur, Cumbi Ruteng** |
| **Sample Description** | | **( Di kemas dalam Plastik )** |
| **Tanggal Terima**<br>**Date of Received** | : | **04 November 2015** |
| **Tanggal Analisis**<br>**Date of Analysis** | : | **25 s/d 27 November 2015** |
| **Hasil Analisis**<br>**Analysis Result** | : | **Terlampir** |

**Jember, 27 November 2015**

**Manager Teknis,**

**Ir. Budi Sumartono, MP.**



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FR-LP. 5.10.01.02.01-C2

## LAPORAN HASIL UJI CITARASA
## (Report of Cup Testing)

**No. 02.15.1.0346 - C**

02.15.1.0346

No. Contoh (Sample number) : 02.15.1.0346 Amd
Tanggal Penerimaan Contoh (Sample recieved) : 04-11-2015
Tanggal Pengujian (Date of testing) : 25-11-2015 — 27-11-2015
Jenis Contoh (Kind of sample) : Biji kopi/green beans Arabica
Identitas Contoh (Sample identity) : Kopi Arabika Cumbi Ruteng.

| Karakteristik (Characteristic) | Skor Citarasa (Cup testing Score)* | Karakteristik (Characteristic) | Skor Citarasa (Cup testing Score)* |
|---|---|---|---|
| Fragrance/aroma | 7.75 | Balance | 7.75 |
| Flavor | 7.75 | Clean cup | 10.00 |
| Aftertaste | 7.50 | Sweetness | 10.00 |
| Acidity | 7.50 | Overall | 7.50 |
| Body | 7.75 | Taint/Defect: | None |
| Uniformity | 10.00 | Final Score** | 83.50 |
| Comments: | Spicy, Rather Woody, Astrigent. | | |

* Keterangan skor: 6.00 - 6.75= Good; 7.00 - 7.75= Very good; 8.00 - 8.75= Excellent; 9.00 - 9.75= Outstanding
(Score notation)

** Final Score notation: Nilai minimum untuk (Minimum Value for) Specialty Grade = 80

Jember, 27-11-2015

Manajer Teknis

Budi Hartono, MP.

Catatan (Notes):

Hasil analisis ini hanya menerangkan atribut mutu berdasarkan contoh yang diuji BUKAN menerangkan atribut nama, jenis atau asal contoh (This result explains only the attribute of the quality based on the sample tested, NOT explains attributes of name, type and origin of the sample).

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Email: lappuslitkoka@gmail.com, lappuslitkoka@iccri.net

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# LAPORAN HASIL ANALISIS (*Report Of Analysis*)

***02.15.1.0336 AMD***

| | | |
|---|---|---|
| **Pemohon**<br>**Applicant** | : | **Pusat Penelitian Kopi dan Kakao Indonesia** |
| **Alamat**<br>**Address** | : | **Jl. PB. Sudirman No. 90 Jember** |
| **Uraian Contoh** | : | **Biji Kopi Arabika Manggarai Timur, Gelo Meni Kota Komba** |
| **Sample Description** | | **( Di kemas dalam Plastik )** |
| **Tanggal Terima**<br>**Date of Received** | : | **04 November 2015** |
| **Tanggal Analisis**<br>**Date of Analysis** | : | **25 s/d 27 November 2015** |
| **Hasil Analisis**<br>**Analysis Result** | : | **Terlampir** |

**Jember, 27 November 2015**

**Manager Teknis,**

**Ir. Budi Sumartono, MP.**



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FR-LP. 5.10.01.02.01-C2

## LAPORAN HASIL UJI CITARASA
## (Report of Cup Testing)

**No. 02.15.1.0336 - C**

02.15.1.0336

No. Contoh (Sample number) : 02.15.1.0336 Amd
Tanggal Penerimaan Contoh (Sample recieved) : 04-11-2015
Tanggal Pengujian (Date of testing) : 25-11-2015 — 27-11-2015
Jenis Contoh (Kind of sample) : Biji kopi/green beans Arabica
Identitas Contoh (Sample identity) : Kopi Arabika Golo Meni Kota Komba.

| Karakteristik (Characteristic) | Skor Citarasa (Cup testing Score)* | Karakteristik (Characteristic) | Skor Citarasa (Cup testing Score)* |
|---|---|---|---|
| Fragrance/aroma | 7.50 | Balance | 7.33 |
| Flavor | 7.33 | Clean cup | 10.00 |
| Aftertaste | 7.25 | Sweetness | 10.00 |
| Acidity | 7.50 | Overall | 7.42 |
| Body | 7.42 | Taint/Defect: | None |
| Uniformity | 10.00 | Final Score** | 81.75 |
| Comments: | Spicy, Herbal, Astrigent, Fruity, Greenish. | | |

* Keterangan skor: 6.00 - 6.75= Good; 7.00 - 7.75= Very good; 8.00 - 8.75= Excellent; 9.00 - 9.75= Outstanding
(Score notation)

** Final Score notation: Nilai minimum untuk (Minimum Value for) Specialty Grade = 80

Jember, 27-11-2015

Manajer Teknis

Ir. Rubiyo Samartono, MP.

Catatan (Notes):
Hasil analisis ini hanya menerangkan atribut mutu berdasarkan contoh yang diuji BUKAN menerangkan atribut nama, jenis atau asal contoh. (This result explains only the attribute of the quality based on the sample tested, NOT explains attributes of name, type and origin of the sample).

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# LAPORAN HASIL ANALISIS (*Report Of Analysis*)

***02.15.1.0361 AMD***

| | | |
|---|---|---|
| **Pemohon**<br>**Applicant** | : | **Pusat Penelitian Kopi dan Kakao Indonesia** |
| **Alamat**<br>**Address** | : | **Jl. PB. Sudirman No. 90 Jember** |
| **Uraian Contoh** | : | **Biji Kopi Arabika Manggarai Timur, Gulang Natilelak** |
| **Sample Description** | | **( Di kemas dalam Plastik )** |
| **Tanggal Terima**<br>**Date of Received** | : | **17 November 2015** |
| **Tanggal Analisis**<br>**Date of Analysis** | : | **26 s/d 30 November 2015** |
| **Hasil Analisis**<br>**Analysis Result** | : | **Terlampir** |

**Jember, 30 November 2015**

**Manager Teknis,**

**Ir. Budi Sumartono, MP.**



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## LAPORAN HASIL UJI CITARASA
## (Report of Cup Testing)

**No. 02.15.1.0361 - C**

02.15.1.0361

No. Contoh (Sample number) : 02.15.1.0361 Amd
Tanggal Penerimaan Contoh (Sample recieved) : 17-11-2015
Tanggal Pengujian (Date of testing) : 26-11-2015 — 30-11-2015
Jenis Contoh (Kind of sample) : Biji kopi/green beans Arabica
Identitas Contoh (Sample identity) : Kopi Arabika Gulang ,Nati Lelak.

| Karakteristik (Characteristic) | Skor Citarasa (Cup testing Score)* | Karakteristik (Characteristic) | Skor Citarasa (Cup testing Score)* |
|---|---|---|---|
| Fragrance/aroma | 7.75 | Balance | 7.75 |
| Flavor | 8.00 | Clean cup | 10.00 |
| Aftertaste | 7.75 | Sweetness | 10.00 |
| Acidity | 8.00 | Overall | 8.00 |
| Body | 8.00 | Taint/Defect: | None |
| Uniformity | 10.00 | Final Score** | 85.25 |
| Comments: | Spicy, Caramelly, Bright Acidity | | |

* Keterangan skor: 6.00 - 6.75= Good; 7.00 - 7.75= Very good; 8.00 - 8.75= Excellent; 9.00 - 9.75= Outstanding
(Score notation)

** Final Score notation: Nilai minimum untuk (Minimum Value for) Specialty Grade = 80

Jember, 30-11-2015

Catatan (Notes):

Hasil analisis ini hanya menerangkan atribut mutu berdasarkan contoh yang diuji BUKAN menerangkan atribut nama, jenis atau asal contoh (This result explains only the attribute of the quality based on the sample tested, NOT explains attributes of name, type and origin of the sample).

Manajer Teknis

Ir. [illegible]martono, MP.

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# LAPORAN HASIL ANALISIS (*Report Of Analysis*)

***02.15.1.0335 AMD***

| | | |
|---|---|---|
| **Pemohon**<br>**Applicant** | : | **Pusat Penelitian Kopi dan Kakao Indonesia** |
| **Alamat**<br>**Address** | : | **Jl. PB. Sudirman No. 90 Jember** |
| **Uraian Contoh** | : | **Biji Kopi Arabika Manggarai Timur, Rana Mbeling Kota Komba** |
| **Sample Description** | | **( Di kemas dalam Plastik )** |
| **Tanggal Terima**<br>**Date of Received** | : | **04 November 2015** |
| **Tanggal Analisis**<br>**Date of Analysis** | : | **25 s/d 27 November 2015** |
| **Hasil Analisis**<br>**Analysis Result** | : | **Terlampir** |

**Jember, 27 November 2015**

**Manager Teknis,**

**Ir. Budi Sumartono, MP.**



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## LAPORAN HASIL UJI CITARASA
## (Report of Cup Testing)

**No. 02.15.1.0335 - C**

02.15.1.0335

No. Contoh (Sample number) : 02.15.1.0335 Amd
Tanggal Penerimaan Contoh (Sample recieved) : 04-11-2015
Tanggal Pengujian (Date of testing) : 25-11-2015 — 27-11-2015
Jenis Contoh (Kind of sample) : Biji kopi/green beans Arabica
Identitas Contoh (Sample identity) : Kopi Arabika Rana Mbeling Kota Komba.

| Karakteristik (Characteristic) | Skor Citarasa (Cup testing Score)* | Karakteristik (Characteristic) | Skor Citarasa (Cup testing Score)* |
|---|---|---|---|
| Fragrance/aroma | 7.75 | Balance | 7.50 |
| Flavor | 7.67 | Clean cup | 10.00 |
| Aftertaste | 7.67 | Sweetness | 10.00 |
| Acidity | 7.75 | Overall | 7.58 |
| Body | 7.67 | Taint/Defect: | None |
| Uniformity | 10.00 | Final Score** | 83.58 |
| Comments: | Floral, Sweet, Caramelly, Herbal, Fruity. | | |

* Keterangan skor: 6.00 - 6.75= Good; 7.00 - 7.75= Very good; 8.00 - 8.75= Excellent; 9.00 - 9.75= Outstanding
(Score notation)

** Final Score notation: Nilai minimum untuk (Minimum Value for) Specialty Grade = 80

Jember, 27-11-2015

Catatan (Notes):

Hasil analisis ini hanya menerangkan atribut mutu berdasarkan contoh yang diuji BUKAN menerangkan atribut nama, jenis atau asal contoh (This result explains only the attribute of the quality based on the sample tested, NOT explains attributes of name, type and origin of the sample).

Penanggung Jawab Teknis

Ir. Budi Sumartono, MP.

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Email: lappuslitkoka@gmail.com, lappuslitkoka@iccri.net

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# LAPORAN HASIL ANALISIS (*Report Of Analysis*)

***02.15.1.0363 AMD***

| | | |
|---|---|---|
| **Pemohon**<br>**Applicant** | : | **Pusat Penelitian Kopi dan Kakao Indonesia** |
| **Alamat**<br>**Address** | : | **Jl. PB. Sudirman No. 90 Jember** |
| **Uraian Contoh** | : | **Biji Kopi Arabika Manggarai Timur, Pong Lekowae Ri'i** |
| **Sample Description** | | **( Di kemas dalam Plastik )** |
| **Tanggal Terima**<br>**Date of Received** | : | **17 November 2015** |
| **Tanggal Analisis**<br>**Date of Analysis** | : | **26 s/d 30 November 2015** |
| **Hasil Analisis**<br>**Analysis Result** | : | **Terlampir** |

**Jember, 30 November 2015**

**Manager Teknis,**

**Ir. Budi Sumartono, MP.**



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## LAPORAN HASIL UJI CITARASA
## (Report of Cup Testing)

**No. 02.15.1.0363 - C**

02.15.1.0363

No. Contoh (Sample number) : 02.15.1.0363 Amd
Tanggal Penerimaan Contoh (Sample recieved) : 17-11-2015
Tanggal Pengujian (Date of testing) : 26-11-2015 — 30-11-2015
Jenis Contoh (Kind of sample) : Biji kopi/green beans Arabica
Identitas Contoh (Sample identity) : Kopi Arabika Pong Leko Wae Ri'i .

| Karakteristik (Characteristic) | Skor Citarasa (Cup testing Score)* | Karakteristik (Characteristic) | Skor Citarasa (Cup testing Score)* |
|---|---|---|---|
| Fragrance/aroma | 8.00 | Balance | 8.25 |
| Flavor | 8.00 | Clean cup | 10.00 |
| Aftertaste | 8.50 | Sweetness | 10.00 |
| Acidity | 8.00 | Overall | 8.50 |
| Body | 8.00 | Taint/Defect: | None |
| Uniformity | 10.00 | Final Score** | 87.25 |
| Comments: | Floral, Rather Spicy, Excellence. | | |

* Keterangan skor: 6.00 - 6.75= Good; 7.00 - 7.75= Very good; 8.00 - 8.75= Excellent; 9.00 - 9.75= Outstanding
(Score notation)

** Final Score notation: Nilai minimum untuk (Minimum Value for) Specialty Grade = 80

Jember, 30-11-2015

Catatan (Notes):

Hasil analisis ini hanya menerangkan atribut mutu berdasarkan contoh yang diuji BUKAN menerangkan atribut nama, jenis atau asal contoh (This result explains only the attribute of the quality based on the sample tested, NOT explains attributes of name, type and origin of the sample).

Manajer Teknis

Ir. Edy Sumartono, MP.

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# LAPORAN HASIL ANALISIS (*Report Of Analysis*)

***02.15.1.0345 AMD***

| | | |
|---|---|---|
| **Pemohon**<br>**Applicant** | : | **Pusat Penelitian Kopi dan Kakao Indonesia** |
| **Alamat**<br>**Address** | : | **Jl. PB. Sudirman No. 90 Jember** |
| **Uraian Contoh** | : | **Biji Kopi Arabika Manggarai Timur, Lungar Satarmese** |
| **Sample Description** | | **( Di kemas dalam Plastik )** |
| **Tanggal Terima**<br>**Date of Received** | : | **04 November 2015** |
| **Tanggal Analisis**<br>**Date of Analysis** | : | **25 s/d 27 November 2015** |
| **Hasil Analisis**<br>**Analysis Result** | : | **Terlampir** |

**Jember, 27 November 2015**

**Manager Teknis,**

**Ir. Budi Sumartono, MP.**



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## LAPORAN HASIL UJI CITARASA
## (Report of Cup Testing)

**No. 02.15.1.0345 - C**

02.15.1.0345

No. Contoh (Sample number) : 02.15.1.0345 Amd
Tanggal Penerimaan Contoh (Sample recieved) : 04-11-2015
Tanggal Pengujian (Date of testing) : 25-11-2015 — 27-11-2015
Jenis Contoh (Kind of sample) : Biji kopi/green beans Arabica
Identitas Contoh (Sample identity) : Kopi Arabika Lungar Satarmese.

| Karakteristik (Characteristic) | Skor Citarasa (Cup testing Score)* | Karakteristik (Characteristic) | Skor Citarasa (Cup testing Score)* |
|---|---|---|---|
| Fragrance/aroma | 7.75 | Balance | 8.00 |
| Flavor | 8.00 | Clean cup | 10.00 |
| Aftertaste | 8.00 | Sweetness | 10.00 |
| Acidity | 8.00 | Overall | 8.00 |
| Body | 7.75 | Taint/Defect: | None |
| Uniformity | 10.00 | Final Score** | 85.50 |
| Comments: | Spicy, Bright Acidity, floral. | | |

* Keterangan skor: 6.00 - 6.75= Good; 7.00 - 7.75= Very good; 8.00 - 8.75= Excellent; 9.00 - 9.75= Outstanding
(Score notation)

** Final Score notation: Nilai minimum untuk (Minimum Value for) Specialty Grade = 80

Jember, 27-11-2015

Penyelia Teknis

Ir. Budi Sumartono, MP.

Catatan (Notes):

Hasil analisis ini hanya menerangkan atribut mutu berdasarkan contoh yang diuji BUKAN menerangkan atribut nama, jenis atau asal contoh (This result explains only the attribute of the quality based on the sample tested, NOT explains attributes of name, type and origin of the sample).

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Email: lappuslitkoka@gmail.com, lappuslitkoka@iccri.net

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# LAPORAN HASIL ANALISIS (*Report Of Analysis*)

***02.15.1.0344 AMD***

| | | |
|---|---|---|
| **Pemohon**<br>**Applicant** | : | **Pusat Penelitian Kopi dan Kakao Indonesia** |
| **Alamat**<br>**Address** | : | **Jl. PB. Sudirman No. 90 Jember** |
| **Uraian Contoh**<br>**Sample Description** | : | **Biji Kopi Arabika Manggarai Timur, Carep Lake Rembong**<br>**( Di kemas dalam Plastik )** |
| **Tanggal Terima**<br>**Date of Received** | : | **04 November 2015** |
| **Tanggal Analisis**<br>**Date of Analysis** | : | **25 s/d 27 November 2015** |
| **Hasil Analisis**<br>**Analysis Result** | : | **Terlampir** |

**Jember, 27 November 2015**

**Manager Teknis,**

**Ir. Budi Sumartono, MP.**



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## LAPORAN HASIL UJI CITARASA
## (Report of Cup Testing)

**No. 02.15.1.0344 - C**




No. Contoh (Sample number) : 02.15.1.0344 Amd
Tanggal Penerimaan Contoh (Sample recieved) : 04-11-2015
Tanggal Pengujian (Date of testing) : 25-11-2015 — 27-11-2015
Jenis Contoh (Kind of sample) : Biji kopi/green beans Arabica
Identitas Contoh (Sample identity) : Kopi Arabika Carep Lake Rembong.

| Karakteristik (Characteristic) | Skor Citarasa (Cup testing Score)* | Karakteristik (Characteristic) | Skor Citarasa (Cup testing Score)* |
|---|---|---|---|
| Fragrance/aroma | 8.00 | Balance | 7.75 |
| Flavor | 8.00 | Clean cup | 10.00 |
| Aftertaste | 7.50 | Sweetness | 10.00 |
| Acidity | 8.00 | Overall | 7.75 |
| Body | 7.75 | Taint/Defect: | None |
| Uniformity | 10.00 | Final Score** | 84.75 |
| Comments: | Spicy, Floral, Bright Acidity. | | |

* Keterangan skor: 6.00 - 6.75= Good; 7.00 - 7.75= Very good; 8.00 - 8.75= Excellent; 9.00 - 9.75= Outstanding
(Score notation)

** Final Score notation: Nilai minimum untuk (Minimum Value for) Specialty Grade = 80

Jember, 27-11-2015

Catatan (Notes):

Hasil analisis ini hanya menerangkan atribut mutu berdasarkan contoh yang diuji BUKAN menerangkan atribut nama, jenis atau asal contoh. (This result explains only the attribute of the quality based on the sample tested, NOT explains attributes of name, type and origin of the sample).

Manajer Teknis

Ir. Bambang Sumartono, MP.

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Email: lappuslitkoka@gmail.com, lappuslitkoka@iccri.net

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LP-592-IDN

# LAPORAN HASIL ANALISIS *(Report Of Analysis)*

***02.15.1.0337 AMD***

| | | |
|---|---|---|
| **Pemohon**<br>**Applicant** | : | **Pusat Penelitian Kopi dan Kakao Indonesia** |
| **Alamat**<br>**Address** | : | **Jl. PB. Sudirman No. 90 Jember** |
| **Uraian Contoh** | : | **Biji Kopi Arabika Manggarai Timur**<br>**Peleng Haju Ngendong Elar** |
| **Sample Description** | | **( Di kemas dalam Plastik )** |
| **Tanggal Terima**<br>**Date of Received** | : | **04 November 2015** |
| **Tanggal Analisis**<br>**Date of Analysis** | : | **25 s/d 27 November 2015** |
| **Hasil Analisis**<br>**Analysis Result** | : | **Terlampir** |

**Jember, 27 November 2015**

**Manager Teknis,**

**Ir. Budi Sumartono, MP.**



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FR-LP. S.10.01.02.01-C2

## LAPORAN HASIL UJI CITARASA
## (Report of Cup Testing)

**No. 02.15.1.0337 - C**

02.15.1.0337

No. Contoh (Sample number) : 02.15.1.0337 Amd
Tanggal Penerimaan Contoh (Sample recieved) : 04-11-2015
Tanggal Pengujian (Date of testing) : 25-11-2015 — 27-11-2015
Jenis Contoh (Kind of sample) : Biji kopi/green beans Arabica
Identitas Contoh (Sample identity) : Kopi Arabika Peleng Haju Ngendong Elar.

| Karakteristik (Characteristic) | Skor Citarasa (Cup testing Score)* | Karakteristik (Characteristic) | Skor Citarasa (Cup testing Score)* |
|---|---|---|---|
| Fragrance/aroma | 7.58 | Balance | 7.17 |
| Flavor | 7.58 | Clean cup | 10.00 |
| Aftertaste | 7.25 | Sweetness | 10.00 |
| Acidity | 7.42 | Overall | 7.17 |
| Body | 7.33 | Taint/Defect: | None |
| Uniformity | 10.00 | Final Score** | 81.50 |
| Comments: | Herbal, Daun Sirih, Astrigent, Fruity. | | |

* Keterangan skor: 6.00 - 6.75= Good; 7.00 - 7.75= Very good; 8.00 - 8.75= Excellent; 9.00 - 9.75= Outstanding
(Score notation)

** Final Score notation: Nilai minimum untuk (Minimum Value for) Specialty Grade = 80

Jember, 27-11-2015

Penanggung Jawab Teknis

Ir. Budi Sumartono, MP.

Catatan (Notes):

Hasil analisis ini hanya menerangkan atribut mutu berdasarkan contoh yang diuji BUKAN menerangkan atribut nama, jenis atau asal contoh. (This result explains only the attribute of the quality based on the sample tested, NOT explains attributes of name, type and origin of the sample).

Hasil Uji Citarasa ini tidak termasuk dalam lingkup Akreditasi KAN (This Cup Tasting Results is not covered in KAN accreditation)

Hasil analisis ini hanya berlaku selama 3 bulan (This results valid within 3 months).



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# LAPORAN HASIL ANALISIS (*Report Of Analysis*)

## *02.15.1.0347 AMD*

| | | |
|---|---|---|
| **Pemohon**<br>**Applicant** | : | **Pusat Penelitian Kopi dan Kakao Indonesia** |
| **Alamat**<br>**Address** | : | **Jl. PB. Sudirman No. 90 Jember** |
| **Uraian Contoh** | : | **Biji Kopi Arabika Manggarai Timur, Pondok Nantal Kuwus** |
| **Sample Description** | | **( Di kemas dalam Plastik )** |
| **Tanggal Terima**<br>**Date of Received** | : | **04 November 2015** |
| **Tanggal Analisis**<br>**Date of Analysis** | : | **25 s/d 27 November 2015** |
| **Hasil Analisis**<br>**Analysis Result** | : | **Terlampir** |

**Jember, 27 November 2015**

**Manager Teknis,**

**Ir. Budi Sumartono, MP.**



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FR-LP. 5.10.01.02.01-C2

## LAPORAN HASIL UJI CITARASA
## (Report of Cup Testing)

**No. 02.15.1.0347 - C**

02 . 15 . 1 . 0347

No. Contoh (Sample number) : 02.15.1.0347 Amd
Tanggal Penerimaan Contoh (Sample recieved) : 04-11-2015
Tanggal Pengujian (Date of testing) : 25-11-2015 — 27-11-2015
Jenis Contoh (Kind of sample) : Biji kopi/green beans Arabica
Identitas Contoh (Sample identity) : Kopi Arabika Pondok, Nantal Kuwus.

| Karakteristik (Characteristic) | Skor Citarasa (Cup testing Score)* | Karakteristik (Characteristic) | Skor Citarasa (Cup testing Score)* |
|---|---|---|---|
| Fragrance/aroma | 7.75 | Balance | 7.75 |
| Flavor | 7.75 | Clean cup | 10.00 |
| Aftertaste | 7.50 | Sweetness | 10.00 |
| Acidity | 7.50 | Overall | 7.50 |
| Body | 8.00 | Taint/Defect: | None |
| Uniformity | 10.00 | Final Score** | 83.75 |
| Comments: | Caramelly, Rather Woody, Astrigent. | | |

* Keterangan skor: 6.00 - 6.75= Good; 7.00 - 7.75= Very good; 8.00 - 8.75= Excellent; 9.00 - 9.75= Outstanding
(Score notation)

** Final Score notation: Nilai minimum untuk (Minimum Value for) Specialty Grade = 80

Jember, 27-11-2015

Catatan (Notes):

Hasil analisis ini hanya menerangkan atribut mutu berdasarkan contoh yang diuji BUKAN menerangkan atribut nama, jenis atau asal contoh (This result explains only the attribute of the quality based on the sample tested, NOT explains attributes of name, type and origin of the sample).

Manajer Teknis

Ir. Budi Sumartono, MP.

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**Appendix 3.** Results of Soil Analysis in 'Kopi Arabika Flores Manggarai' GI Areas

| Regency | Sample Location | Texture | | | C | N | Available P | K | pH |
|---|---|---|---|---|---|---|---|---|---|
| | | Sand | Silt | Clay | | | | | |
| Manggarai Timur | Galak Leleng | 14 | 46 | 40 | 4.08 | 0.79 | 2 | 1.37 | 4.8 |
| Manggarai Timur | Satar Nawang | 9 | 28 | 63 | 3.32 | 0.37 | 58 | 0.76 | 4.4 |
| Manggarai Timur | Lento | 10 | 44 | 46 | 1.92 | 0.19 | 2 | 0.12 | 4.4 |
| Manggarai Timur | Ngkiong Dora | 25 | 29 | 46 | 4.88 | 0.49 | 3 | 0.66 | 5.0 |
| Manggarai Timur | Gala Meni | 19 | 43 | 38 | 3.08 | 0.24 | 37 | 0.99 | 5.6 |
| Manggarai Timur | Rana Mbeling | 35 | 27 | 38 | 3.96 | 0.40 | 24 | 0.57 | 5.1 |
| Manggarai Timur | Haju Ngendong | 13 | 57 | 30 | 6.99 | 0.64 | 37 | 0.93 | 4.8 |
| Manggarai Timur | Tanamese | 21 | 44 | 35 | 6.67 | 0.42 | 135 | 0.48 | 4.5 |
| Manggarai | Cumbi | 12 | 27 | 61 | 3.59 | 0.34 | 2 | 0.37 | 4.8 |
| Manggarai | Nati | 10 | 34 | 56 | 5.04 | 0.53 | 3 | 0.16 | 4.3 |
| Manggarai | Wae Ri‟i | 23 | 28 | 49 | 5.60 | 0.52 | 3 | 0.23 | 4.8 |
| Manggarai | Lungar | 15 | 36 | 49 | 6.24 | 0.67 | 2 | 0.64 | 5.2 |
| Manggarai | Carep | 17 | 39 | 44 | 3.95 | 0.70 | 6 | 0.45 | 4.8 |
| Manggarai Barat | Pondok Nantal | 13 | 40 | 47 | 5.27 | 0.45 | 3 | 0.56 | 4.4 |
| Manggarai Barat | Wae Mowol | 13 | 37 | 50 | 1.92 | 0.19 | 6 | 1.33 | 5.2 |
| Manggarai Barat | Wae Bangka | 13 | 31 | 56 | 3.15 | 0.26 | 17 | 0.31 | 5.0 |

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FR-LP. 5.10.01.01.01-T

**HASIL ANALISIS *( Result of Analysis )* :**

| Identitas Contoh | | Tekstur Cara Pipet | | | Terhadap 100 gram contoh kering 105 °C | | | | | | | | | | | | | | Terhadap 1 kg contoh kering 105°C | | | | | | | | | | pH (1:5) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | C | N | C/N | Ekstrak HCl 25 % * ) | | | | Ekstrak $NH_4OAc$ 1 M pH 7 | | | | | | | $P_2O_5$ * ) | | Ekst. $NH_4$-Oxalat pH 4,6 * ) | | | Ekst. HCl 25% | Min Total Destruksi Cang. Asam Kuat * ) | | Ekst. HCl 0,1 N * ) | | Al-dd | $H_2O$ | KCl 1 N * ) |
| Nomor Analisa | Kode Pengirim | Pasir | Debu | Liat | Walkley & Black | Kjeldahl | | $P_2O_5$ | $K_2O$ | CaO | MgO | Na | $K^+$ * ) | Ca | Mg | Nilai Kation | KTK | KB | Ekst. Olsen | Ekst. Bray | Si | Fe | Cl | SI | | | Cu | Zn | KCl * ) T.N | | |
| | | % | | | gram | | | mg | | | | c.mol$^+$ | | | | | | % | mg | | mg | | | | | | | c.mol$^+$ | | |
| | **Manggarai Timur** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 01.15.1.0412 | Galak Ideng | 14 | 46 | 40 | 4,08 | 0,79 | 5 | - | - | - | - | - | 1,37 | - | - | - | - | - | 2 | - | - | - | - | - | - | - | - | - | - | 4,8 | - |
| 01.15.1.0413 | Satar Nawang | 9 | 28 | 63 | 3,22 | 0,37 | 9 | - | - | - | - | - | 0,76 | - | - | - | - | - | 5 | - | - | - | - | - | - | - | - | - | - | 4,4 | - |
| 01.15.1.0414 | Lemo | 10 | 44 | 46 | 1,92 | 0,18 | 10 | - | - | - | - | - | 0,12 | - | - | - | - | - | 2 | - | - | - | - | - | - | - | - | - | - | 4,4 | - |
| 01.15.1.0415 | Wae Mowol | 13 | 37 | 50 | 1,82 | 0,19 | 10 | - | - | - | - | - | 1,20 | - | - | - | - | - | 6 | - | - | - | - | - | - | - | - | - | - | 5,2 | - |
| 01.15.1.0416 | Ngkong Dora | 25 | 29 | 46 | 4,88 | 0,49 | 10 | - | - | - | - | - | 0,66 | - | - | - | - | - | 3 | - | - | - | - | - | - | - | - | - | - | 5,0 | - |
| 01.15.1.0417 | Wae Bangka | 13 | 31 | 56 | 3,15 | 0,26 | 12 | - | - | - | - | - | 0,31 | - | - | - | - | - | 17 | - | - | - | - | - | - | - | - | - | - | 5,0 | - |
| 01.15.1.0418 | Cumbi | 12 | 27 | 61 | 3,59 | 0,34 | 11 | - | - | - | - | - | 0,20 | - | - | - | - | - | 2 | - | - | - | - | - | - | - | - | - | - | 4,8 | - |
| 01.15.1.0419 | Gata Meri | 19 | 43 | 38 | 3,09 | 0,24 | 13 | - | - | - | - | - | 0,89 | - | - | - | - | - | 37 | - | - | - | - | - | - | - | - | - | - | 5,0 | - |
| 01.15.1.0420 | Nali | 10 | 34 | 56 | 5,04 | 0,53 | 10 | - | - | - | - | - | 0,16 | - | - | - | - | - | 3 | - | - | - | - | - | - | - | - | - | - | 4,3 | - |
| 01.15.1.0421 | Rana Mbeleng | 35 | 27 | 38 | 3,96 | 0,40 | 10 | - | - | - | - | - | 0,57 | - | - | - | - | - | 24 | - | - | - | - | - | - | - | - | - | - | 5,1 | - |
| 01.15.1.0422 | Wae Ra | 25 | 28 | 49 | 5,60 | 0,52 | 11 | - | - | - | - | - | 0,27 | - | - | - | - | - | 3 | - | - | - | - | - | - | - | - | - | - | 4,8 | - |
| 01.15.1.0423 | Lungar | 15 | 36 | 49 | 6,24 | 0,67 | 9 | - | - | - | - | - | 0,24 | - | - | - | - | - | 2 | - | - | - | - | - | - | - | - | - | - | 5,2 | - |
| 01.15.1.0424 | Carep | 17 | 39 | 44 | 3,95 | 0,70 | 6 | - | - | - | - | - | 0,45 | - | - | - | - | - | 6 | - | - | - | - | - | - | - | - | - | - | 4,8 | - |

1. Hasil analisis ini hanya berdasarkan contoh yang diuji
   *(This result based on the tested sample only)*
2. Hasil analisis ini hanya berlaku enam bulan
   *(This result is valid within six months )*
3. Semua hasil analisis kecuali kadar air di hitung atas dasar contoh kering
   *( All analytical results except the moisture was calculated on the basis of dry sample )*
4. *Pengambilan contoh di lakukan oleh Customer*
   *( Sampling have been done by Customer )*

* Tidak termasuk ruang lingkup akreditasi
*( Not included in the scope of accreditation )*

Jember, 17 November 2015
Manajer Teknis,
*( Technical Manager )*

Sugiyanto, SP MP

ORIGINAL

Manggarai Timur-01.15.1.0412-01.15.1.0424-13I-2015



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**HASIL ANALISIS** ***( Result of Analysis ) :***

FR-LP. 5.10.01.01.01-T

| Identitas Contoh | | Tekstur Cara Pipet | | | Terhadap 100 gram contoh kering 105 °C | | | Ekstrak HCl 25 % * ) | | | | Ekstrak $NH_4OAc$ 1 M pH 7 | | | | | | | Terhadap 1 kg contoh kering 105°C | | | | | | | | | | | | pH (1:5) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Nomor Analisis | Kode Pengirim | Pasir | Debu | Liat | C (Walkley & Black) | N (Kjeldahl) | C/N | $P_2O_5$ | $K_2O$ | CaO | MgO | Na | K *) | Ca | Mg | Nilai Kation | KTK | KB | $H_2O$ *) Eksi. Oksalat | $H_2O$ *) Eksi. Bray I | Eksi. $NH_4OAc$ pH 4,8 * ) S | Fe | Cl | Eksi. HCl 25% B | Mn Total Destruksi Cuprum Asam Kuat *) | Eksi. HCl 0,1 N *) Cu | Zn | Al-dd KCl *) 1 N | $H_2O$ | KCl 1 N *) |
| | | % | | | gram | | | mg | | | | c mol * | | | | | | % | mg | | | | | | mg | | | c mol * | | |
| | Manggarai Timur | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 01.15.1.0439 | Haju Nggencong | 13 | 57 | 30 | 6,99 | 0,64 | 11 | - | - | - | - | | 0,93 | - | - | - | - | - | - | 1 | - | - | - | - | - | - | - | - | 6,8 | - |
| 01.15.1.0440 | Teno Mese | 21 | 44 | 35 | 6,87 | 0,42 | 16 | - | - | - | - | | 0,48 | - | - | - | - | - | - | 135 | - | - | - | - | - | - | - | - | 4,5 | - |
| 01.15.1.0441 | Pondok Rental | 13 | 40 | 47 | 5,27 | 0,45 | 12 | - | - | - | - | | 0,56 | - | - | - | - | - | - | 3 | - | - | - | - | - | - | - | - | 4,4 | - |

1. Hasil analisis ini hanya berdasarkan contoh yang diuji
   *(This result based on the tested sample only)*
2. Hasil analisis ini hanya berlaku enam bulan
   *(This result is valid within six months )*
3. Semua hasil analisis kecuali kadar air di hitung atas dasar contoh kering
   *( All analytical results except the moisture was calculated on the basis of dry sample )*
4. Pengambilan contoh di lakukan oleh Customer
   *( Sampling have been done by Customer )*

* Tidak termasuk ruang lingkup akreditasi
*( Not included in the scope of accreditation )*

Jember, 26 November 2015
Manajer Teknis
*(Technical Manager)*

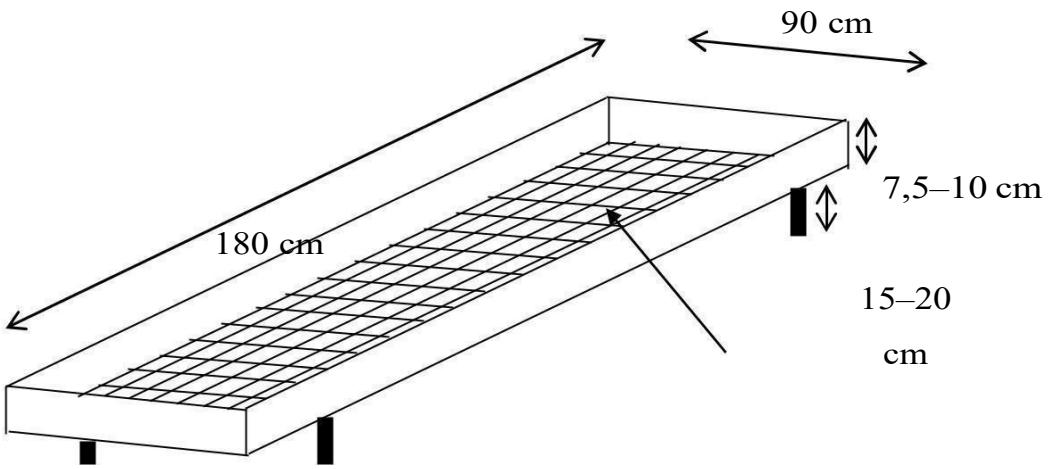
Sugiyanto, SP, MP

Manggarai Timur-joko-01.15.1.0439-01.15.1.0441-3t-2015

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**Appendix 4.** Coffee Dryer Model (Drying Rack)




Sand sieve wire or other materials.A sheet of grid/fish net/plastic bag is put on it