Documentation of Traditional Knowledge on "Coffee" (*Coffea arabica*) in Jimma, Ilubabor and West Wollega Zone

Guta Waktole Weyesa, Rahel Tilahun

Ethiopian Biodiversity Institute, Genetic Resources Access and Benefit Sharing Directorate, Addis Ababa, Ethiopia

Email address:

waaqtoleegutaa@gmail.com (G. W. Weyesa), Raheltilahun01@gmail.com (R. Tilahun)

Abstract: Coffee, of genus Coffea, is a member of Rubiaceae family that consists of more than 400 species and is mostly grown in the tropical and subtropical regions. The major coffee production systems include forest, semi-forest, garden and plantations. Coffee is intercropped with other companion crops or leguminous shade trees as low-cost production options to diversify food and cash security. Rainfall is the most important factor governing the distribution of coffee farming and wild coffee forests in Ethiopia. The distribution of rainfall varies greatly across Ethiopia, according to season, altitude and physical features of the landscape. Coffee is made from coffee bean and known to have the properties of keeping drinkers alert and awake. The use of coffee leaves to make tea has long been a tradition in West Sumatera, Ethiopia, Jamaica, India, Java and South Sudan. The main objective of this study is to document the traditional knowledge of people on "Coffee" (Coffea arabica) in Jimma, Ilubabor and West Wollega Zone. This study was conducted in Jimma, Elubabor and West Wollega Zone from January - November, 2019. Multistage sampling technique was employed to collect traditional knowledge of people on Coffea arabica. Primary data were collected from the respondents by distributing questionnaires and focus group discussion. The collected data were analyzed by using SPSS (statistical package for social sciences). The result of the study indicates that: the type of land preferred for the production of Coffeaarabica was semi forest whereas the most preferable soil was sand soil. The type of land preferred for the production of Coffeaarabica was semi forest whereas the most preferable soil was sand soil. Summer and spring were preferable seasons by the farmers of the study area for coffee production. Cordia Africana, Croton macrostachyus, Ziziumguaniense and Acacia abyssinica were very relevant for coffea arabica shade. The respondents manage the disease by removing the affected part of Coffea arabica tree and burning it. Coffea Arabica also has cultural and spiritual values.

Keywords: Traditional Knowledge, *Coffea arabica*, Intercropped, Consumption and Roasting

1. Introduction

Coffee, of genus Coffea, is a member of Rubiaceae family that consists of more than 400 species and is mostly grown in the tropical and subtropical regions [7]. The two main species of coffee cultivated in Indonesia are arabica (Coffea arabica L.) and robusta (Coffea canephora L.). Coffea arabica L originally came from mountainous regions in Ethiopia and Yemen.

The coffee production systems include forest, semi-forest, garden and plantations. Coffee is intercropped with other companion crops and protected from dangerous sun light under leguminous shade trees as low-cost production options to diversify food and cash security. Thus about 90%

of coffee production comes from the small holders comes from the smallholders while the rest is produced by large-scale producers. Ethiopian coffee is processed and exported in two processing mechanisms, namely, natural sun-dried about 70% and washed about 30% coffees. The diversity of coffee, soil and climate, among others, enable the country to produce and supply the *de facto* organic coffees [13]. The traditional organic coffee production system is the only viable option to remain competitive in the world market and the only hope for smallholder coffee producers in Ethiopia [13].

Rainfall is the most important factor regulating the distribution of coffee farming and wild coffee forests in different parts of Ethiopia. The distribution of rainfall

variesacross Ethiopia, according to season, altitude and physical features of the landscape of the country. There are clear annual patterns as evident, although rainfall is extremely variable [4].

The roasting process, which is responsible for the characteristic aroma of the seeds, takes place only in customer country at 200–250°C [1]. This roasting process presents three phases such as an initial drying phase (during this endothermic step, the wet is eliminated and the color is changed to yellowish), the roasting phase (based on several complex pyrolytic reactions resulting in many chemical compounds which will confer the aroma and taste of coffee the beans are completely changed to to dark brown during exothermic and endothermic phases), and the cooling phase (using air or water in order to end the last exothermic process [1].

Coffee is made from coffee bean and known to have the properties of keeping drinkers alert and a wake [12]. Use of coffee beans as a beverage has continued to develop over several centuries, but other parts of the plant have not been so commonly used until recently. The use of coffee leaves to make tea has long been a tradition in Ethiopia, West Sumatera, Jamaica, India, Java, and South Sudan, but the literature about the Sumatran use is limited. The Sumatran drink is called kahwa daun or kawa (Figure 1 a). Kahwa daun is locally regarded to be a healthy drink with a delicious taste. According to Hewitt [9]. An infusion of the roasted coffee leaves is used to make a tea with a delicious smell and taste. Researchers have shown interest in the phenolic compounds of plant and their potency in the prevention of degenerative diseases [2].

Figure 1. A coffee leaf herbal tea from West Sumatera is also known as kahwa daun. (B) Traditional serving of kahwa daun beverage [10].

In its wild state, Arabica coffee (*Coffea arabica*) is a forest plant restricted to the highlands of Ethiopia and a small area in neighboring South Sudan [3]. It has been used in Ethiopia as a food and beverage for many hundred years if not thousands, of years. Thus, Ethiopia can be considered as the biological and cultural home of coffea arabica. Today, an estimated 525,000 hectares (5,250 km^2) of coffee are planted to increase coffee production in Ethiopia [15]. Coffee provides Ethiopia with its most important agricultural commodity, contributing around one quarter of its total export earnings [8]. In 2014/15 Ethiopia exported around 180,000 metric tonnes of coffee [6] at a value estimated to be in excess of 800 million USD. Ethiopia is the largest coffee producer in Africa and the fifth largest *Coffea arabica* exporter country of this world. [6], even though yields (kg/hectare) are low compared to other coffee producing countries. Coffee farming alone provides a livelihood income for around 15 million Ethiopians (16% of the population) [14].

Ethiopia is considered asthe oldest exporter of coffee, and in 2005 Ethiopia was the sixth-largest coffee producer and seventh-largest exporter worldwide [11]. These facts indicate the importance of coffee as a commodity, but do not adequately reflect its immense cultural and social significance for Ethiopian people. Coffee preparation and consumption are included in Islamic and Christian religious celebrations. It also serves as a key element in sacred ceremonies and rituals celebrations associated with indigenous religions. In Oromo traditional belief systems, coffee is assigned a ceremonial role and its consumption as part of a ritual meal is thought to bring blessings from the God through invocations and prayers [11].

1.1. Statement of the Problem

Coffee is very important to the livelihoods of millions of people, particularly in developing countries. It is produced in most African developing countries and plays a central role in the national economies of Ethiopia, Côte d'Ivoire, Uganda, Zimbabwe, the Democratic Republic of Congo, Angola, Rwanda, Tanzania, Cameroon, Burundi and others [6]. Despite its importance, the value of coffee exported from Africa has declined considerably over the years due to various reasons, particularly inefficient policy frameworks, lack of sustainability and competitiveness in the coffee sector, inadequate access to improved technologies, deficient services, poor market access and lack of incentives [5].

Ethiopia is a unique among the world's coffee producing countries in that around 50% of the coffee it produces stays within the domestic market and used forconsumption by Ethiopians. Drinking is not only just part of everyday life; it is also deeply embedded in Ethiopian culture. Apart from the well-known Ethiopian coffee ceremony, coffee is used at major events such as marriage and birth, regionally-specific celebrations, and as a medium to build and sustain

relationships between family, friends and community. There is no any report of documentation of traditional knowledge on *Coffea arabica* from Jimma, Ilubabor and West Wollega Zone. This indicates a knowledge gap of the study area regarding to documentation of traditional knowledge on *Coffea arabica.* In order to fill this knowledge gap the researcher is interested to investigate on this topic.

1.2. Objective of the Study

1.2.1. General Objective

The main objective of this study is to document the traditional knowledge of people on "*Coffee*" (*Coffea arabica*) in Jimma, Ilubabor and West Wollega Zone

1.2.2. Specific Objectives

1) To collect and document *Coffea arabica* farming systems
2) To document the way of *Coffea arabica* consumption
3) To assess the economic and health importance of *Coffea arabica* in three Zones
4) To study the cultural and spiritual value of *Coffea Arabica* in the study area

2. Methods and Materials

2.1. Study Area and Period

This study was conducted in Jimma, Elubabor and West Wollega Zone from January - November, 2019.

2.2. Population

The study population of this research was the number of households in Jimma, Elubabor and West Wollega Zone, those were selected by simple random sampling technique and those give response to the investigator.

2.3. Sample Size Determination

Taking into consideration cost, labor and time the researchers were decided the sample size, using the formula: N > 50 + 8m [16], where number of independent variables. The study districts were selected purposively accordingly the level of Coffee production. More information regarding to in which District Coffee is highly producing was gained from the Agricultural Offices of the three Zones. Based on the above selection criteria, 9 districts were selected from the three zones of which three districts from one zone. Similarly, each two representative kebeles were selected from 9 Districts means total of 18 kebeles were randomly selected. Hence, from each Kebele, 5 households were randomly selected and a total of 90 households were participated to give their traditional knowledge on *Coffea Arabica*. Both male and female headed household were equally included in the sampling.

2.4. Sampling Techniques

Simple random sampling technique was employed to collect traditional knowledge of local community on *Coffea arabica*. Data were collected from Coffee producer farmers randomly in order to get enough traditional knowledge of local community on Coffee.

2.5. Methods of Data Collection

Primary data were collected from the respondents by distributing questionnaires and focus group discussion. The questionnaires did focus on the traditional knowledge including consumption, growing system, farming system, health, ritual and economic importance of *Coffea Arabica* in three Zones. Preference ranking has been applied to collect data.

2.6. Method of Analysis

To analyze the data both quantitative and qualitative methods have been applied. For quantitative data some of the descriptive method tables and percentages were applied. For qualitative methods, some in depth analyses or paragraph have applied. Microsoft Excel and SPSS soft wares were used to analyze the data.

3. Result and Discussion

3.1. Result

Table 1. Socio demographic Characteristics of the respondents.

	Item	Number of respondents
1	Age:-	
	15-35	31
	36-50	47
	51-65	12
	>65	
	Total	90
2	Sex:-	
	Male	66
	Female	24
	Total	90

About 31 respondents of the study area were between 15 and 35 ages. Whereas, 47 respondents were between the age interval of 36 – 50. The age of the rest 12 respondents is above 65 years old. Of 90 respondents replied to this study 66 were male and 24 female.

Table 2. Land use types used for Coffea arabica production.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Forest	11	12.2	12.2	12.2
	Garden	8	8.9	8.9	21.1
	Crop Land	8	8.9	8.9	30.0
	semi forest	63	70.0	70.0	100.0
	Total	90	100.0	100.0	

The type of land used for the production of *Coffea arabica* is (11, 12.2%) in forest, (8, 8.9%) in garden, (8, 8.9%) in cropland, (63, 70%) in semi forest.

Table 3. *The most preferable soil types for coffea arabica growth.*

	Frequency	Percent	Valid Percent	Cumulative Percent
Clay soil	7	7.8	7.8	7.8
Sand soil	83	92.2	92.2	100.0
Total	90	100.0	100.0	

The preferable soil type for production of Coffea arabica production is Clay soil (7, 7.8%), sand soil (83, 92.2%).

Table 4. *Which season is the most suitable for Coffea arabica plantation.*

		Frequency	Percent	Valid Percent	Cumulative Percent
	Summer	20	22.2	22.2	22.2
Valid	Spring	70	77.8	77.8	100.0
	Total	90	100.0	100.0	

Summer season (20, 22.2%), spring season (70, 77.8%) seasons are suitable for coffea arabica plantation.

Table 5. *Which type of trees used as ashade for Coffea arabica plantation.*

		Frequency	Percent	Valid Percent	Cumulative Percent
	Decidous	83	92.2	92.2	92.2
Valid	Non Decidous	7	7.8	7.8	100.0
	Total	90	100.0	100.0	

Deciduous (83, 92.2%) and Non deciduous (7, 7.8%) tree types are usesed for coffea arabica plantation.

Table 6. *Best tree for Coffea arabica shade.*

		Frequency	Percent	Valid Percent	Cumulative Percent
	Cordia africana	2	2.2	2.2	2.2
	Croton macrostachyus	4	4.4	4.4	6.7
	Ziziumguaniense	4	4.4	4.4	11.1
Valid	Acacia abyssinica	10	11.1	11.1	22.2
	All trees are relevant	70	77.8	77.8	100.0
	Total	90	100.0	100.0	

Cordia Africana (2, 2.2%), Croton macrostachyus (4, 4.4%), Ziziumguaniense (4, 4.4%), Acacia abyssinica (10, 11.1%), All trees (70, 77.8%) are relevant for coffea arabica shade.

Table 7. *Is there any disease that affect your Coffea arabica production?*

		Frequency	Percent	Valid Percent	Cumulative Percent
	No	12	13.3	13.3	13.3
Valid	Yes	78	86.7	86.7	100.0
	Total	90	100.0	100.0	

There is no disease that affects Coffea arabica (12, 13.3%), disease that affects Coffea arabica (78, 86.7%).

Table 8. *If your answer is yes for the question number 13 by what mechanisms you manage it?*

	Frequency	Percent	Valid Percent	Cumulative Percent
Removing the affected coffee tree and burn it	8	8.9	8.9	8.9
avoiding the material which cut the affected coffee	5	5.6	5.6	14.4
Both methods a	64	71.1	71.1	47,8
No techniques used	13	14.4	14.4	28.9
Total	90	100.0	100.0	100

They manage the disease by removing the affected part of Coffea arabica tree and Burn it (8, 8.9%), Avoiding the material that was used to cut the affected coffee tree in order to prevent contamination (5, 5.6%), No techniques are used to manage the coffea arabica disease (13,14.4%), Both removing the affected part of Coffea arabica tree and Burn it and Avoiding the material that was used to cut the affected coffee tree in order to prevent contamination techniques are used to manage coffea arabica disease (64,71.1%).

Table 9. *Are there any special techniques which harvastcoffeein your locality?*

		Frequency	Percent	Valid Percent	Cumulative Percent
	Yes	82	91.1	91.1	91.1
Valid	No	8	8.9	8.9	100.0
	Total	90	100.0	100.0	

There are special techniques to harvest coffee (82, 91.1%), there are no special techniques to harvest coffee locally (8, 8.9%).

Table 10. If your answer is yes for question of harvesting technique list the techniques.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Picking the red colored coffee cherries/ beans	14	15.6	15.6	15.6
	Spreading beanson huge sheet for drying in the sun	4	4.4	4.4	20.0
	Covering the beans at night time to protect it from moisture/rain	3	3.3	3.3	23.3
	All methods are relevant	69	76.7	76.7	100.0
	Total	90	100.0	100.0	

Majority of the respondents use all methods of harvesting techniques; i.e. picking ripen coffee cherry, spreading thecherry on huge sheet to let it dry in the sun, covering the cherries at night time to protect it from moisture/rain. Minority (15.6 percent) of respondents use picking ripen coffee as a harvest system, 4.4 percent of respondents spread cherries on huge sheet to let it dry in the sun and 3.3 percent of respondents cover the cherries during night time to protect from moisture.

Table 11. Techniques of making.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Washing underneath the skin	2	2.2	2.2	2.2
	Roasting on griddles	2	2.2	2.2	4.4
	Grinding	4	4.4	4.4	8.9
	Boiling	1	1.1	1.1	10.0
	Settling	1	1.1	1.1	11.1
	All	80	88.9	88.9	100.0
	Total	90	100.0	100.0	

Techniques of making coffee includes; washing underneath the skin after extracting the bean from the outer layer; roasting on griddles, grinding, boiling, resting to settle then it's ready.

About 2.2 percent of respondents wash underneath the skin of the coffee while making coffee. 2.2 percent of our respondents roast coffee beans on griddle, 4.4 percent of the respondents grind the roasted beans, 1.1 percent of respondents boil the coffee powder. While 1.1 percent of our respondents wait till coffee powder settles, 88.9 of them used all techniques during making their coffee.

Table 12. Techniques of making Buna Kala.

	Frequency	Percent	Valid Percent	Cumulative Percent
Washing coffee cherries	3	3.3	3.3	3.3
Coddle the cherries in boiled water	2	2.2	2.2	5.6
Adding Butter and cook well	3	3.3	3.3	8.9
mix with other cooked-cereals or grains such as beans, peas, wheat, maize etc	2	2.2	2.2	11.1
All	80	88.9	88.9	100.0
Total	90	100.0	100.0	

Making Buna kala passes through the process of; washing coffee cherries, coddle the cherries in water, adding butter in the coddling cherry and wait till cook well, mixing with other cooked cereals orgrains such asbeans, peas, barley or wheat. About 3.3 percent of respondents wash coffee cherries while making Buna kala. 2.2 percent of respondents coddle cherries in water. While 3.3 percent of respondents add butter, 2.2 percent of respondents mix with other cereals or grains and 88.9 percent of respondents use all techniques while making Buna kala.

Table 13. What types of economic benefit did you get from Coffea arabica production?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Income generate	90	100.0	100.0	100.0

Considering economic benefit, income generating takes the 100 percent objective of producing *Coffea arabica*.

Table 14. For which health problem Coffea arabica used as a traditional medicine?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Headache	5	5.6	5.6	5.6
	Common Cold	7	7.8	7.8	13.3
	Diarrhea	10	11.1	11.1	24.4
	Wound treatment	4	4.4	4.4	28.9
	All	64	71.1	71.1	100.0
	Total	90	100.0	100.0	

Coffea Arabica is used as traditional medicine; it is known to relieve headache, common cold, diarrhea, wound treatment. Around 5.6 percent of our respondents use coffea Arabica as a headache treatment, 7.8 of respondents use it as medicine for

common cold, 11.1 of respondents use it to treat diarrhea, 4.4 percent of respondents use it for wound treatment and 71.1 percent of respondents use coffea Arabica to as a medicine for all listed health issues.

Table 15. *Doyou think that Coffeaarabica has cultural values in your locality?*

		Frequency	Percent	Valid Percent	Cumulative Percent
	Yes	89	98.9	98.9	98.9
Valid	No	1	1.1	1.1	100.0
	Total	90	100.0	100.0	

The significance of coffea Arabica as a cultural value is positively affirmed by (98.9 percent) of our respondents. The amount of respondents who replied to the contrary carried (1.1 percent).

Table 16. *If you answered "yes" for cultural values mention the values.*

		Frequency	Percent	Valid Percent	Cumulative Percent
	Social interaction	5	5.6	5.6	5.6
	Holiday	6	6.7	6.7	12.2
	Funeral Ceremony	4	4.4	4.4	16.7
Valid	Wedding	2	2.2	2.2	18.9
	For all program	73	81.1	81.1	100.0
	Total	90	100.0	100.0	

Among the respondents who replied affirming coffea Arabica as cultural value (5.6 percent) of the respondents mentioned social interaction as a cultural value. Celebrating holiday event by making coffee is another cultural value which (6.7 percent) of our respondents mentioned. Accompanying Funeral ceremony with making coffea Arabica is considered as cultural value by (4.4 percent) of respondents. Same goes with wedding programs as (2.2 percent) of respondents referred. Respondents who named all the above listed events as cultural value of coffea Arabica include (81.1 percent).

Table 17. *Does Coffea arabica give spiritual values in your locality?*

		Frequency	Percent	Valid Percent	Cumulative Percent
	Yes	72	80.0	80.0	80.0
Valid	No	18	20.0	20.0	100.0
	Total	90	100.0	100.0	

Coffea Arabica is considered to have a spiritual value by (80 percent) of our respondents while (20 percent) of respondents respond negating.

Table 18. *If your answer to spiritual values is "yes" please state the values.*

		Frequency	Percent	Valid Percent	Cumulative Percent
	Worship during ceremony	19	21.1	21.1	21.1
	Praying when the lightening disaster happened	13	14.4	14.4	35.6
Valid	Praying God for rain during dry season	7	7.8	7.8	43.3
	All	51	56.7	56.7	100.0
	Total	90	100.0	100.0	

From among respondents who considered coffea Arabica as having a spiritual value (21.1 percent) said coffee ceremony has worship service. When Lightening disaster occur, praying by making coffee is another spiritual value stated by (14.4 percent) of respondents. Making coffee also serves as a pray for rain during dry season as (7.8 percent) of respondents declared. All the listed spiritual values are practiced by (56.7 percent) of respondents.

3.2. Discussion

The result of this study collected from 90 respondents indicates that the type of land preferred for the production of *Coffeaarabica* was semi forest whereas the most preferable soil was sand soil. From four seasons' summer and spring were preferable by the farmers of the study area for coffee production (Tables 2, 3, 4). This is very similar with the study conducted by [13] The coffee production systems include forest, semi-forest, garden and plantations. Coffee is intercropped with other companion crops and protected from dangerous sun light under leguminous shade trees as low-cost production options to diversify food and cash security. Thus about 90% of coffee production comes from the small holders comes from the smallholders while the rest is produced by large-scale producers. Ethiopian coffee is processed and exported in two processing mechanisms, namely, natural sun-dried about 70% and washed about 30% coffees. The diversity of coffee, soil and climate, among others, enable the country to produce and supply the *de facto* organic coffees [13]. The traditional organic coffee production system is the only viable option to remain competitive in the world market and the only hope for smallholder coffee producers in Ethiopia [14].

Cordia Africana, Croton macrostachyus, Ziziumguaniense and Acacia abyssinica were very relevant for coffea arabica shade. The disease can affect the coffee product yield and the respondents have their own mechanisms to control the disease. They manage the disease by removing the affected part of Coffea arabica tree and burning it, avoiding the material that was used to cut the affected coffee tree in order to prevent contamination (Tables 6, 8).

Majority of the respondents use all methods of harvesting techniques; i.e. picking ripen coffee cherry, spreading the cherry on huge sheet to let it dry in the sun, covering the cherries at night time to protect it from moisture/rain. Techniques of making coffee includes; washing underneath the skin after extracting the bean from the outer layer; roasting on griddles, grinding, boiling, resting to settle then it's ready (Tables 10, 11). Making Buna kala passes through the process of; washing coffee cherries, coddle the cherries in water, adding butter in the coddling cherry and wait till cook well, mixing with other cooked cereals or grains such as beans, peas, barley or wheat (Table 12). This result is very agreed with result reported by [1] the roasting process, which is responsible for the characteristic aroma of the seeds, takes place only in customer country at 200–250°C. This roasting process presents three phases such as an initial drying phase (during this endothermic step, the wet is eliminated and the color is turned yellowish), the roasting phase (based on several complex pyrolytic reactions resulting in many chemical compounds which will confer the coffee aroma and taste, the beans are transformed to dark brown during exothermic and endothermic phases), and the cooling phase (using air or water in order to end the last exothermic process.

Considering economic benefit, income generating takes the 100 percent objective of producing Coffea arabica. Coffea Arabica is also used as traditional medicine; it is known to relieve headache, common cold, diarrhea, wound treatment (Tables 13, 14). The significance of coffea Arabica as a cultural value is positively affirmed by majority of the respondents. One of the coffea Arabica cultural values is social interaction. Celebrating holiday event by making coffee is another cultural value. Accompanying Funeral ceremony with making coffea Arabica is also considered as cultural value. They also use coffee during wedding programs. Coffea Arabica is considered to have a spiritual value among majority of the respondents while some of the respondents respond opposite. Majority of the respondents declared that coffea Arabica has a spiritual value because there is worship service during coffee ceremony. When Lightening disaster occurs, praying by making coffee is another spiritual value stated by many respondents of the study area. Making coffee also serves as a pray for rain during dry season (Tables 15, 16, 17, 18). There is similar study with this result:

Coffea Arabica has been used in Ethiopia as a food and beverage for many hundred years if not thousands, of years. Thus, Ethiopia can be considered as the biological and cultural home of coffea arabica. Today, an estimated 525,000 hectares (5,250 km^2) of coffee are planted to increase coffee production in Ethiopia [15]

Coffee provides Ethiopia with its most important agricultural commodity, contributing around one quarter of its total export earnings [8]. In 2014/15 Ethiopia exported around 180,000 metric tonnes of coffee [6] at a value estimated to be in excess of 800 million USD. Ethiopia is the largest coffee producer in Africa and the fifth largest Coffea arabica exporter country of this world. [6], even though yields (kg/hectare) are low compared to other coffee producing countries. Coffee farming alone provides a livelihood income for around 15 million Ethiopians (16% of the population) [14].

Ethiopia is considered as the oldest exporter of coffee, and in 2005 Ethiopia was the sixth-largest coffee producer and seventh-largest exporter worldwide [11]. These facts indicate the importance of coffee as a commodity, but do not adequately reflect its immense cultural and social significance for Ethiopian people. Coffee preparation and consumption are included in Islamic and Christian religious celebrations. It also serves as a key element in sacred ceremonies and rituals celebrations associated with indigenous religions. In Oromo traditional belief systems, coffee is assigned a ceremonial role and its consumption as part of a ritual meal is thought to bring blessings from the God through invocations and prayers [11].

4. Conclusion and Recommendation

4.1. Conclusion

The type of land preferred for the production of Coffeaarabica was semi forest whereas the most preferable soil was sand soil. Summer and spring were preferable seasons by the farmers of the study area for coffee production. Cordia Africana, Croton macrostachyus, Ziziumguaniense and Acacia abyssinica were very relevant for coffea arabica shade. The respondents manage the disease by removing the affected part of Coffea arabica tree and burning it, avoiding the material that was used to cut the affected coffee tree in order to prevent contamination. The respondents used different methods of coffee harvesting techniques. Making Buna kala passes through the process of; washing coffee cherries, coddle the cherries in water, adding butter in the coddling cherry and wait till cook well, mixing with other cooked cereals or grains such as beans, peas, barley or wheat. Consumption and economic benefit, takes the 100% objective of producing Coffea arabica. At secondary level Coffea Arabica also has cultural and spiritual values. Celebrating holiday event by making coffee, Accompanying Funeral ceremony with making coffea Arabica and during wedding programs are all considered as Coffea Arabica cultural value. Majority of the respondents declared that coffea Arabica has a spiritual value because there is worship service during coffee ceremony. When Lightening disaster occurs, praying by making coffee is another spiritual value stated by many respondents of the

study area. Making coffee also serves as a pray for rain during dry season. Generally the community has great traditional knowledge on coffea arabica plantation, harvesting and consumption.

4.2. Recommendation

1) As indicated in the result part of this study Coffea arabica is used as traditional medicine to relieve headache, common cold, diarrhea and wound treatment traditionally. Any concerning body should make deep study for further investigation.
2) Majority of the respondents used mechanical methods for coffee disease management which is not effective hence any concerned body should provide chemicals to treat their coffee from damaging by fungi, bacteria or bacteria.
3) The respondents replied that they are not well benefited from the coffee they produce, the primarily traders are benefited than the farmers which is unfair. So concerning government body should interfere and make the system correct.

References

[1] Buffo RA, Freire CC. Coffee flavour: An overview. Flavour and Fragrance Journal. 2004; 19: 99–104.

[2] Campa C, Mondolot L, Rakotondravao A, Bidel LPR, Gargadennec A, Couturon E, La Fisca P, Rakotomalala JJ, Jay-Allemand C and Davis AP. A survey of mangiferin and hydroxycinnamic acid ester accumulation in coffee (Coffea) leaves: biological implications and uses. Ann Bot 2012; 110 (3): 595e613.

[3] Davis, A. P., Gole, T. W., Baena, S. & Moat, J. (2012). The impact of climate change on natural populations of Arabica coffee: predicting future trends and identifying priorities. *PLoS ONE* 7 (11): e47981.

[4] Hailu, B. T., Maeda, E. E., Heiskanen, J. & Pellikka, P. (2015). Reconstructing pre-agricultural expansion vegetation cover of Ethiopia. *Applied Geography* 62: 357–365.

[5] IISD (International Institute for Sustainable Development).

2009. Agriculture and Rural Development Day Bulletin, Vol. 170, No. 1, Monday 14 December 2009. Available online at https://www.fanrpan.org/archive/documents/d00791/

[6] International Coffee Organization (ICO). (2015). *Historical Data on the Global Coffee Trade*.

[7] Karakaya S. Bioavailability of phenolic compounds. Crit Rev Food Sci Nutr 2004; 44 (6): 453e64.

[8] Minten, B., Tamru, S., Kuma, T. & Nyarko, Y. (2014). *Structure and Performance of Ethiopia's Coffee Export Sector*. Working paper 66. June 2014. Addis Ababa: Ethiopian Development Research Institute (EDRI) and International Food Policy Research Institute (IFPRI). Pp 30.

[9] Mondolot L, La Fisca P, Buatois B, Talansier E, de Kochko A and Campa C. Evolution in caffeoylquinic acid content and histolocalization during Coffea canephora leaf development. Ann Bot 2006; 98 (1): 33e40.

[10] Novita R., Kasim A., Anggraini T. and Putra D. P. (2018)/ Journal of Ethnic Foods: 5: 286-291.

[11] Petit, Nicolas (2007). "Ethiopia's Coffee Sector: A Bitter or Better Future?" *Journal of Agrarian Change*, Vol. 7, No. 2, 225–263.

[12] Talamond P, Mondolot L, Gargadennec A, de Kochko A, Hamon S, Fruchier A and Campa C. First report on mangiferin (C-glucosyl-xanthone) isolated from leaves of a wild coffee plant, Coffea pseudozanguebariae (Rubiaceae). Acta Bot Gall 2008; 155 (4): 513e9.

[13] Taye, K., Tesfaye, S. and Alemseged, Y. 2004. Adaptation of Arabica coffee landraces along topographic gradients in southern Ethiopia. In: Proceedings of the 20th International Conference on Coffee Science (ASIC), 11-15 October 2004, Bangalore, India, 1046-1052.

[14] Tefera, A. & Tefera, T. (2014). *w*. GAIN Report (number ET1402–13/5/2014). USDA Foreign Agricultural Service. Pp. 11.

[15] Tefera, A. (2015). *Ethiopia: Coffee Annual Report*. GAIN Report (number ET1514–26/5/2015). USDA Foreign Agricultural Service. Pp 6.

[16] Tabachnick and Linda S. Fidell Experimental Design Using ANOVA, Duxbury, Belmont, CA, (2007). Library of Congress Control Number: 2006920045, ISBN 0534405142.