

**ASSESSMENT ON PERFORMANCE OF SMALL SCALE AGRO
INDUSTRIES: IMPLICATIONS OF COFFEE PROCESSING
INDUSTRIES: A CASE STUDY OF BENCH MAJI ZONE, SOUTH
WEST ETHIOPIA**

By

Tekle Gizaw



**MAIN ADVISER: MR. YILKAL WASSIE (ASSISTANCE PROFESSOR)
CO ADVISER: MR. AMSALU DACHNITO**

**A THESIS SUBMITTED TO COLLEGE OF BUSINESS AND
ECONOMICS FOR PARTIAL FULFILMENT OF THE
REQUIREMENTS FOR THE AWARD OF DEGREE OF MASTER OF
SCIENCE IN ECONOMICS (DEVELOPMENT ECONOMICS)**

**May 2019, JIMMA
ETHIOPIA**

JIMMA UNIVERSITY
COLLEGE OF BUSINESS AND ECONOMICS
GRADUATE STUDIES

BOARD OF EXAMINERS
THESIS APPROVAL SHEET

Research Topic:

Assessment on Performance of Small Scale
agro-industries: Implication of Coffee
Processing Industries

Submitted by:

Tekle Gizaw [Signature] 20/06/2019
 Name of the Student Signature Date

Approved by:

1. Yinka Wasie [Signature] 20/06/2019
 Name of Main Advisor Signature Date

2. Ansall D. [Signature] 20/06/19
 Name of the Co-advisor Signature Date

3. Dr. Mekonnen B. [Signature] 20/06/2019
 Name of the External Examiner Signature Date

4. Tesfaye H. [Signature] 20/06/2019
 Name of Internal Examiner Signature Date

5. _____ _____ _____
 Name of Chairperson Signature Date

6. _____ _____ _____
 School of Graduate Studies Signature Date

Yinka Wasie (Ph.D.)
 Head of Business Research Institute

Acknowledgment

I would like to forward the deepest of my appreciation and gratitude to my major advisor Mr. Yilka Wassie (Assistance professor) for his patience and constructive advice throughout the course of the thesis. Not only did he help me with invaluable advice, I have also learned a lot from him. The brotherly treatment he accorded me has served as an inspiration for the completion of this study.

I also would like to forward the deepest of my appreciation and gratitude to my co-advisor Mr. Amsalu Dechnito. Who comments my thesis and creates me to think critical for finalizing of the study. His guidance through brotherly relation inspired me to work hard.

I would like to thank office of Bench maji zone administration, who covers the entire finance of the study and SIL Bench maji zone projects for their material support during the study.

Also I would forward greatest thank to my whole families: my brother Engineer Getnet Gizaw, my wife w/ro Etagegn Assefa, my mother w/o Bayti Sinsbab, my father ato Gizaw Mussa and my sisters Kassech Gizaw and Senait Gizaw, who motivated and rewarded me until the completion of this thesis.

Acronyms

CSA:	Central Statistical Agency
E.F.Y	Ethiopian Fiscal Year
EPRDF:	Ethiopian People's Revolutionary Democratic Front
FDI:	Foreign Direct Investment
GDP:	Gross Domestic Product
GTP:	Growth and Transformation Plan
GVP:	Growth Value Production
SMEs:	Small Manufacturing Enterprises
SSA :	Sub Saharan Africa.
SW:	South West
UNDP:	United Nation Development Program
UNIDO:	United Nation Industrial Development Organization
UNU –WIDER:	United Nation University World Institute For Development Economic Research

Table of Contents

DECLARATION.....	i
Acknowledgment.....	iv
Abstracts.....	v
Acronyms and abbreviations.....	v
Chapter one: Introduction.....	v
1.1 Background.....	1
1.2 Statements of Problems.....	2
1.3 Research questions.....	3
1.4 Objective of the Study.....	3
1.4.1 General objective.....	3
1.4.2 Specific objective.....	3
1.5 Significance of the study.....	4
1.6 Scope of the study.....	4
1.7 Organizations of the Study.....	4
Chapter Two: Review of related literature.....	5
2.1 Theoretical literature.....	5
2.1.1 Definition.....	5
2.1.2 Industrial revolution theory.....	5
2.1.3 Industrial policy.....	6
2.1.4 Coffee processing industry and environmental impact.....	7
2.1.5 Industry from Ethiopia context.....	8
2.2 Empirical literature.....	9
2.2.1 Industries financial performance.....	9
3. Research gap.....	10

4. Conceptual frame work.....	11
Chapter three: methodology of the study.....	12
3.1 General components of methodology section	12
3.1.1 Description of the study area	12
3.1.2 Study design.....	13
3.1.3 Data source	13
3.1.4 Sample size	14
3.1.5 Sampling method	15
3.1.6 Method of data collection.....	15
3.1.7 Method of data analysis.....	15
3.1.8 Variables and model specification	15
Chapter Four: Result and discussion	18
4.1 Data analysis and discussion	18
4.2 Descriptive analysis and discussion.....	18
4.2.1 Respondents.....	18
4.2.2 Family size.....	19
4.2.3 Age structure.....	20
4.2.4 Education level	21
4.2.5 Distance from working place.....	21
4.2.6 Experience	22
4.2.7 Employee satisfaction	23
4.2.8 Working environment	24
4.2.9 Frequency of on work training.....	24
4.2.10 Incentives.....	25
4.2.11 Support from managers	25

4.2.12 Relation between Supply of coffee and output	26
4.2.13 Daily Labor input	27
4.2.14 Absenteeism.....	28
4.2.15 Labor productivity.....	29
4.2.16service year of machine	29
4.3 Econometric analysis	30
4.3.1 Multifactor productivity model.....	31
4.3.2 Logistic model	33
Chapter five: Conclusion and Recommendations	35
5.1 Conclusion.....	35
5.2 Recommendation	36
References	37
Appendices	43
Appendices A: questionnaire (English)	43
Appendices B: questionnaire (Translated Amharic).....	51
Appendices C: multifactor productivity Regression stata output.....	62
Appendices D: logestic regressionoutput stata output.....	63
Appendices E: Industrial office data.....	64
Appendices F: focus group and interview questionnaire	65
Appendices G: observation	67

Tables

Table 1: Sample size computed for ten coffee processing industries.....	17
Table 2: measurement of variables	20
Table 3: summary statistics of respondent’s participation in study.....	23
Table 4: summary statistics of family size	23
Table 5: summary statistics of marital status.....	24
Table 6: summary statistics of age compositions of respondents.....	25
Table 7: summary statistics of educational background of respondents.....	26
Table 8: Summary statistics of distance from work place.....	27
Table 9: summary statistics of work experience of respondents.....	27
Table 10: summary statistics of satisfaction of respondents.....	28
Table 11: summary statistics of satisfaction of working environment.....	29
Table 12: summary statistics of frequency of employees on work training.....	30
Table 13: summary statistics of incentives.....	31
Table 14: summary statistics of monthly support from managers.....	32
Table 15: summary statistics of supply of coffee to industry and output.....	33
Table 16: Summary statistics of per day labor input.....	34
Table 17: Summary statistics daily wages.....	35
Table 18: summary statistics of absenteeism.....	36
Table 19: summary statistics of labor productivity.....	37
Table 20: Regression output of multifactor productivity model.....	39
Table 21: multicollinearity test for regression	39
Table 22: Logistic regression.....	40

Abstracts

The overall aim of the study was to examine the productivity performance of coffee processing industries. Methodologically, total sample size was 294 respondents. To select these sample size from ten coffee processing industry systematic sampling methods were used. for data collection: interview, questionnaire and focus group methods were applied. Moreover, for data analysis both descriptive and econometric methods were used. Furthermore, productivity and logistic models were used to analyze the study. Therefore, the study finding showed that employees working in industries were did not have got incentives. Furthermore, concerning about total productivity of coffee supplied to industry and its output minimum, maximum and average productivity are: 0.32, 0.44 and 0.37 respectively. From productivity comparison between cherry coffee (wet method of processing) and dry coffee (dry method of processing), dry method of processing is more productive than wet method of processing. Therefore, it is strongly profitable, hiring employees those have good education background level or providing continuous on work training for workers those working in coffee processing industries by collaborating with local government, non-governmental organization and coffee processing industry owners.

Key words: satisfaction, productivity, processing

Chapter One

1. Introduction

1.1 Background of the study

Agro-industries were the institutions that transform the raw material of agricultural product to output by adding values in order to satisfy market demands. The significance of agro industry includes: job opportunity creation for unemployed citizens in off-farm activities so as to reduce poverty and stimulating economic growth of the nations. Even though, agro-industries were provide the biggest support for national economic growth the attention provided for this sector is very low. In addition, this sector exports raw material to demanded nations (Ginting, 2015).

Economically, coffee processing industry provide opportunity for coffee producers both in value adding and job opportunity creations. In international market coffee is differentiated by their high value, origin and flavor. The coffee producers can get more value when the coffee is well processed in coffee processing industry and supplied at market. Besides, 60% of coffee quality is assured after postharvest processing in industry (Inma et al., 2015; Ahsan et al., 2018;).

Furthermore, coffee is more demanded crop in society, cultural and sources of national economy of Ethiopia. Despite, the coffee played vital role in income generating for coffee producer farmers and national economy of Ethiopia, the nation's coffee processing industry is challenged by major coffee disease. Besides, coffee growers did not use seedlings that could resist disease. These coffee disease and climatic hazards influence on coffee production. The coffee production challenges encountered in coffee farm created supply constraint for coffee processing industry and the nation's coffee processing industry is at risk (Teferi et al., 2015).

Ethiopia have over 488 coffee processing plants: 273 in Oromiya region, 113 in southern nations and in Gambella region two. Besides, the private sector accounts for 68%, cooperatives 15% and estates 17% of coffee processing industries. Moreover, most of Ethiopian coffee processing industries were sun dried method of coffee processing plants. Comparatively, dry method of coffee processing in coffee processing industry have high quality than washed method of processing. Besides, dry method of coffee processing in industry have got Q1 grade comparing to washed method of processing (Inc, 2010 ; Kassaye et al., 2018;). Therefore, the current study was focused on coffee processing industry in the case of Bench maji zone, south west Ethiopia.

1.2 Statements of problems

Coffee is one of the commodities that generate foreign currency for coffee producing nations. In the international market, the demand for good quality of coffee is increasing. This increment of high quality demand of coffee provides best motivation for coffee producers to increase both quality and quantity of coffee. But there were some factors those decrease the quality of coffee. These factors were: agronomic factors, altitude, genetics, shading, coffee management practice and processing methods in coffee processing industries (Dechassa et al., 2018; Aprianingsih, 2018).

Futhurmore, according to (Daniela et al., 2017) study, comparative study between large and small coffee processing industries showed that these two coffee processing industries have dominant in market share. But, their comparative statistics in profit analysis indicates that small coffee processing industries have more significant profit outcome than large coffee processing industries. Similarly, according to (Syafitri, 2016) comparative study between investing on coffee powder processing industry and unwashed coffee processing industry shows difference. The profitability analysis of both industry indicates that investing on coffee powder processing industry have 3.25 times profitable than unwashed coffee processing industry. In addition, according to (Morjaria, 2015).competition between coffee processing industry was increased the processing cost.

According to (Ferguson, 2017) study, Coffee processing industry have constraint in supply of water during processing of coffee cherry. The main use of water in coffee processing industry was to wash the pulped coffee and deliver this washed coffee in other designed place. The study concluded that unique adaptive strategy is needed to supply water to coffee processing industry.

However, according to (Samson et al., 2018) study, Coffee processing industry have impact on workers those working in industry. The early sign observed on workers those working in coffee processing industry in Ethiopia were sign of lung diseases. The study concluded that the effect of this respiratory disease cause abnormal functioning of lungs.

In addition, according to (DINKENEH, 2017) impact analysis study of byproduct of coffee processing industry, the waste materials released from coffee processing industry have negative impact on pure water quality. This is when the byproduct of coffee processing industry effluents were directly discharged in to downstream rivers. Besides, these rivers have no natural capacity to purify effluents. So, the study indicates that byproduct discharged from coffee processing industry have negative impact on natural environment.

Contrastingly, according to study done by (Asrat et al., 2016), byproduct discharged from the coffee processing have positive impact on economy. This is by reusing the waste released from coffee processing industry. The study indicates the reusing of byproduct releasing from coffee processing industry have significant importance in environment and economic point. The study concluded that effluent discharged from coffee processing industry was used to produce ethanol production. Their finding showed that optimum outcome ethanol of 78% was obtained from sample processed byproduct of coffee processing industry. This indicates that byproduct of coffee processing industry will contribute for alternative energy source as well as environmentally positive impact. Therefore, the aim of the current study is to assess the productivity of coffee processing industry, which is the knowledge gap of the above researchers.

1.3 Research questions

The research questions to be answered at the end of this study are:

- Is the working environment is conducive for workers?
- Did the workers' are productivity?
- What relation is between supplied and processed output?

1.4 Objective of the Study

1.4.1 General objective

The major objective of this study is to evaluate productivity performance of coffee processing industries.

1.4.2 Specific objective

To achieve the general objective the specific objects are:

- To measure employee satisfaction in coffee processing industry
- To examine working environment of the coffee processing industry
- To measure labor productivity of coffee processing industry
- To examine relation between supply and output

1.5 Significance of the Study

At the end of this study finding, those parts of communities and beneficiaries are: Bench maji zone trade and industry departments, policy designers, coffee cooperative unions and associations, researchers and Students. It can also give an input for community based Organizations, NGOs and, stakeholders who in one or another way are engaged in the coffee processing industry.

1.6 Scope of The Study

Since Bench maji zone have totally fourteen coffee processing industries. The study was covered only ten randomly selected coffee processing industries. This is because of limitations of resource scarcity to cover the entire areas of coffee processing industries.

1.7 Organizations of the Study

The study was organized into five chapters. Following the introductory chapter, Chapter two presents the theoretical, empirical literature research gap and conceptual framework. Chapter three provides a methodology and sources of data used in the study and model specification. Then, chapter four expressed data analysis, result discussion and interpretation. The last chapter emphasize on conclusion and recommendation.

Chapter Two

2. Review of Related Literature

2.1 Theoretical Literature

2.1.1 Definition

Industry is the production of goods or related services within an economy and it is any general business activity or commercial enterprise. Division of the industry as large or small scale depends on the rate of production and the number of employees. An industry with a low rate of production and fewer employees is a small-scale industry. Furthermore, Small-scale industries are easy to start and manage given the minimal scale of production. These industries require little starting and operating capital. They require cheap labor that is easily found and their target market is the host community. Such companies also realize a small annual turnover and, as a result, pay fewer taxes. Most governments implement policies that strengthen the small-scale industry sector because of the role the industries play in economic development. The industries help in alleviating poverty through provision of employment and other products (Wikipedia, Business dictionary). In general small scale industries are categories of industry which is characterized by consuming small capital for to begin.

2.1.2 Industrial Revolution theory

The 18th and 19th centuries in England was considered by a time of advancing industrialization and economic progress of its urban areas. It also one of developing social and health difference between the rich and the poor were observed. In addition, in these periods Infant was well-documented as being a point in the life during which the body is mostly sensitive to adverse economic environments (Gownland, 2016).

Furthermore, industrial revolution had transformed the small scale manufacturing to large and mass production. Even though, the revolution had these vital issues, there is some contradiction ideas between current production and the new industrial revolutions. Moreover, most focus is either on smart manufacturing or additive manufacturing to form long tail of new industrial revolutions. These results in ideal production system of industry and importance of both economies of scale and scope (Lin, 2015).

According to (Kim, 2016) study, the fourth industrial revolution is a concept which had fundamental effects on economy of developed countries. The fourth industrial revolution is characterized by different stages of development. These four stages of development include: mechanical production which was powered by water and steam, the mass production powered by electricity in 20th century, IT automatic production lines and electronics and the last was combination of previous industrial revolutions combined physical systems and cyber systems and introduced cyber-physical system as an intelligent network system.

Besides, according to (Khan, 2015) study, the basic issues made the British industrial revolution to advance more sophisticated and benefited the nation was achieved by the individual's ability to solve the encountered industrial problems. For developing nations to day it is costly to invest on specialized human power to brought technological innovation to overcome the problem in developing countries. Therefore, industrial revolution is the summation of economic, social, Political, communication and transportation change. It is the period in which the human being changed from primitive society to early modern.

2.1.3 Industrial Policy

Industrial policy is the strategy to initiate higher competitiveness and the ability to achieve the economy beyond GDP goals. Higher economic growth is based on advanced skills, innovation, supporting institutions, environmental soundness and an activating social and economic policy. In order to achieve economic policy microeconomic management is the first issued to be considered. Besides, horizontal relations between other sector policies were vital to address the whole policy of the economy. Furthermore, to brought the admiring achievement of targeted policy, commitments of government, technological innovations, greater community awareness, research and incentive is crucial (Aiginger, 2014).

According to (Simon *et al.*, 2016) study, place based industrial policy will enhance the effectiveness of industrial policy. Place based industrial policy development were developed based on selecting of special economic zone. Besides, the establishment of special economic zone is based on the level of GDP about 20% growths. The main root for the development of industrial policy based on special economic zone is the parallel with advancement in physical and capital accumulations and so as positive effect on total productivity of industry.

Moreover, according to (Never, 2017) finding, the green industrial policy is best option for developing countries. The nature of green industrial policy is based on focusing green technologies those were environmentally sound and focusing on solar and energy efficiency as environment for green industrial policy. Besides, applications of green industrial policy were vital model for industrial policy achievement.

According to (Fenta, 2014) , the industrial policy formulation in the case of Ethiopia made several changes across the different government regime. During the Dergue regime, the whole economic policy was command economic policy system, which ordered by central government. Furthermore, under Imperial regime the economic policy was foreign dominating industrialization and under EPRDF regime, the economic policy was market oriented economic system. Thus, industrial policy formulation in Ethiopia case pragmatic and not included research and ideology based. The effect of pragmatic industrial policy brought: difference output of industry at national level, hides the unequal distribution of industries across the region, insignificant accumulation of number peoples engaged in industry across the region, difference in wage and salary paid for industry workers and non- parallel relation between horizontal and vertical others sector policy. Thus, effective and sound policy is very basic needed issues for a nation. Without sound policy, not only industrial policy but also other sectorial policy is difficult to achieve. Besides, to achieve the proposed policy, it need to strength the implementation issues and strong government commitment in research based policy formulation.

2.1.4 Coffee Processing in Industry and Environmental Impact

Coffee is one of the known beverages in the current world. The most known process took place after post-harvest were drying in order to formulate color, flavor and tests of coffee bean. Besides, there are two types of drying. These includes: sun drying and mechanical drying. The sun drying moisture contents of harvested coffee have 55-60% and after drying the content will decline to 12%(Ghosh, 2014).

Furthermore, there were multiple factors that affect the quality of coffee. One of the factors is the process staring from pre-harvest to post harvest and handling. Moreover, the factors like microbiological, physical and chemical characteristics, socio-environmental aspects of coffee production, which in turn affect the quality of the final product of coffee bean. There has been some research progress those able to minimize the quality of coffee bean (Carlos José Pimenta *et al.*, 2018).

According to (Nutti, 2017; Stephen R. *et al.*, 2014) study, in contrast to its advantage coffee, coffee processing industry generates liquids and these liquids have negative impact on environment. In

addition, these liquids create agricultural problems. These residues should properly be assessed and must be recycled. Besides, majority of the application recently developed technology used to solve these problems in world.

In addition, according to (Al-Widyan, 2016) study, using these byproduct of coffee processing industries for agricultural composting is low cost and environmentally friendly. Therefore, during designing coffee processing industry, it is better to consider the way in which by product released from coffee processing industry must recycle and environmentally friendly industry.

2.1.5 Industry from Ethiopia context

According to (UNDP, 2017) study, Ethiopia in the past decade has established strong economic growth and admirable social growths. The average Ethiopian GDP growth was 10.9% for ten years. Furthermore, social services like education, health and water and sanitation has been shown increment and the poverty has declined, that is the incidence of poverty has markedly declined from 45.5 percent in 1996 to 29.6 percent in 2011 and estimated to have further declined to 23.4 percent in 2015. Besides, agriculture, the backbone of the economy contributed 41% and that of service sector were 45% in 2014. But the industry sector was 14%. Moreover, FDI accounted for 77% share of the total exports while private domestic investment contributed only 14.5%; the rest, which is about 8.5%. To make the trade and industry linkage good and common policy is needed for these sectors.

In addition, according to (World Bank group, 2015) study, the Growth and Transformation Plan (GTP) seeks to transform Ethiopia towards an advanced industrialized economy and to increase per capita income of its citizens by 2025 and other sectors in the nation. To bring this result, the government has developed a policy focused on the development of the manufacturing sector through the use of industrial parks to attract FDI and to support small scale manufacturing enterprise. But in surprising way, the services and agricultural sectors contributing almost 90% of GDP and GTP has not been able to accelerate structural transformation as assumed in national plan.

According survey done by (CSA, 2014), Persons there were 116,604 small-scale manufacturing establishments in Ethiopian fiscal year (E.F.Y) 2006 (2013/14). Out of the grand total, the biggest in number, or more than 35 thousand or 30.39 %, were grain mills, 25.4 thousand (21.81 %) manufacturer of food products except grain mill service and manufacturing of wearing apparel, dressing & dying of fur establishments numbered 18.12 thousand or 15.61 % of the total, respectively. On the other end, very few small-scale

establishments were invested in chemical, leather and footwear manufacturing, while there were none in the machinery and parts manufacturing, a possible area of focus for policy makers. In the specified year, all the establishments combined involved 1,743,470 people, which is roughly a ratio of 1 to 14.95, i.e., on average 10 small scale manufacturing establishments involved 150 people. Grain mills hired the most: 540,339 (30.99 %), followed by manufacture of food products except grain mill services, 373,171 (21.40 %) and manufacture of furniture, 289,853 (16.63 %), in that order. Furthermore, Gross value of production (GVP) in the quantified period amounted to birr 26.2 billion, out of which Food product manufacturers except grain mills contributed 7.71 billion, which is 29.46 % of the total. Metal manufacturers amounting to 4.85 billion birr, which is ahead of Manufacturers of grain mills GVP reached 4.58 billion. The other notable GVP was, manufacturer of parts and accessories for motor vehicles & their engines' GVP (3.48 million) that of trailed by manufacture of chemicals & chemical products and machinery & equipment manufacturing 16.66 million birr or 0.06% of total gross value of production by small scale manufacturing institutions during the year.

2.2 Empirical literature

2.2.1 Industries financial performance

According to (Lawal et al., 2014) study, It is recommended that firms should use more of equity than debt in financing their business actions, in as much as possible the value of a business can be increased using debt capital. Therefore, firms should launch the point at which the weighted average cost of capital is slight and keep that gearing ratio so that the company's value will not be eroded, as the firm's capital structure is optimal at this point *ceteris paribus*.

Furthermore, according to (Wang, 2011) study, profitability, liquidity, earnings volatility, and tangibility (asset structure) are related negatively to the debt ratio, and firm size is positively linked to the debt ratio. Besides, non-debt tax shields and growth opportunities do not appear to be meaningfully related to the debt ratio. It is reliable with the predictions of the trade-off theory, pecking order theory, and agency theory which shows that capital structure models derived from Western settings does provide some help in understanding the financing behavior of institutions.

Besides, (Nuttaneeya et al., 2012) concluded, for industry managers, it is need to focus on the development of the three capabilities of shared vision, stakeholder management and strategic pro-activity. Such competences can support the effective response to stakeholder pressure for sustainability

in business, and provide a basis for securing the benefits to financial performance that can follow from the acceptance of across its economic, social and environmental dimensions.

Furthermore, (Levratto, 2015) studied that, in order to reduce labor costs and stimulate job creation, many governments implement a large set of devices mainly consisting in reduced rates of social contributions. The evaluation of their effect is still controversial. The effect of the decrease in the labor cost generated by tax rebates mainly benefits fast growing and large formations. Certainly, the change in the number of employees in other establishments is significantly less affected, even though the effect remains positive, by the reduction in social contributions. This is mainly the case for smaller establishments as well as for those whose growth is stagnant or negative. These results lead us to reconsider the importance of large scale policies aiming at reducing labor costs in the same way for all creations, regardless of their size or financial health.

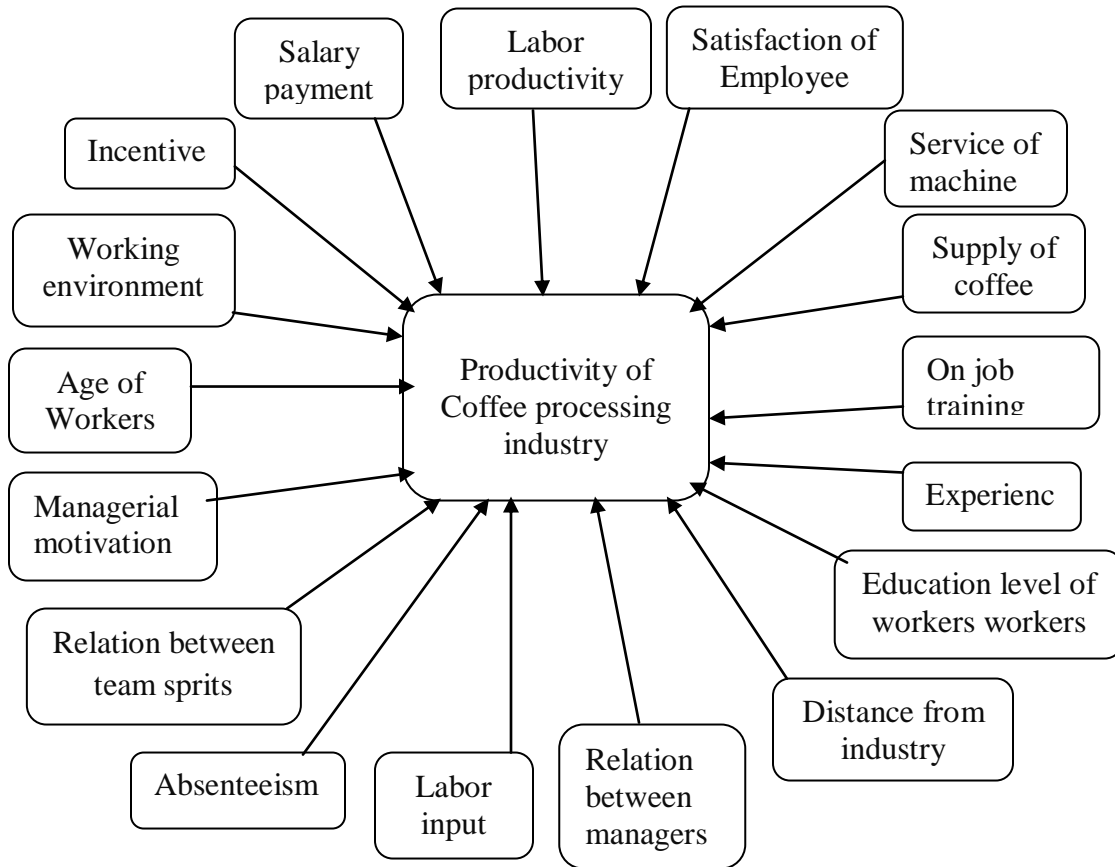
2.3 Research Gap

According to (Dissanayake, 2013) study, due to new inquire of new technological advancement the rem knowledge becomes the old fashion. It creates the model and to solve the problems of community. Besides, the intellectuals bring the nations of understanding the existing phenomenon of the nature. It may either theory development or building of theories. The general truth is, gap identification and formulating a research problem are vital for a research project.

Therefore, in this study a lot of related literatures were reviewed. The mostly reviewed literature in the chapter two includes: theoretical literature and empirical literature. Theoretical literature describes mostly the general theoretical literature about industries. These includes: definition of industry, industrial revolution theory, industrial policy, coffee processing industry and environmental impacts and industry from Ethiopia context. In addition, empirical literatures were the kinds of literature in which the researcher studies empirically. For this study the reviewed empirical literature was industries financial performance. Thus, after reviewing theoretical and empirical literature the research gap was identified. Therefore, for this study the research gap was knowledge gap which is not covered by above researchers.

4. Conceptual Frame Work

Based on the above literature reviewed, the research gap was productivity performance of coffee processing industry. Thus, factors that expected to affect productivity of coffee processing industry was shown in figure as follows:



Source: own computations

From the above cross tabular expression it is obvious that, productivity of coffee processing industry is dependent variable and the independent variables that expected to affect dependent variables were: Age of workers, education level of workers, experience, on job training, Supply of coffee, service of machine, satisfaction of employee, labor productivity, Salary payment, incentives, working environment, managerial motivation, relation between team sprits, relation between managers, absenteeism, distance from work industry labor input.

Chapter Three

Methodology of the Study

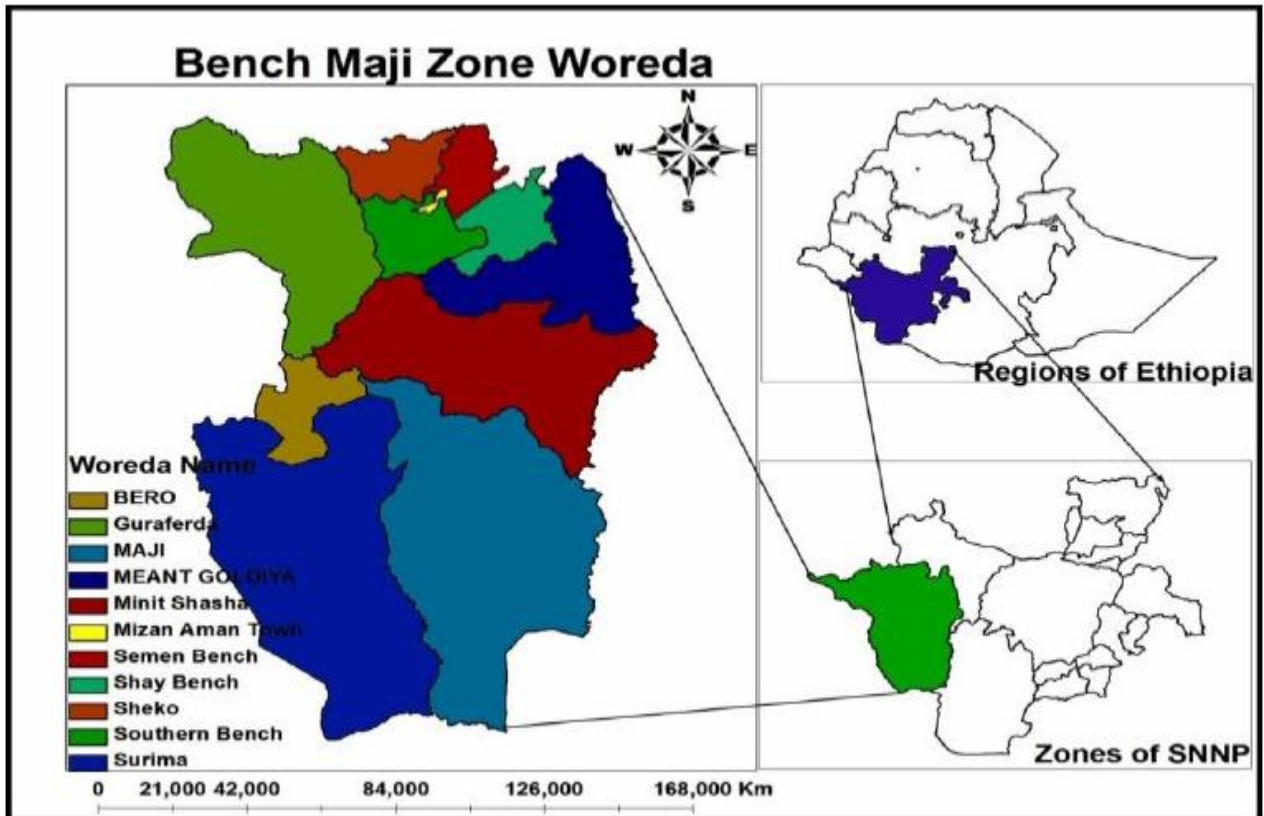
3.1 General components of methodology section

The study is about assessment on performance of coffee processing industries. The main components of this methodology section includes: descriptions of the study area, study design, data sources, Sample size, sampling method, method of data collections, method of data analysis, model specification, hypothesis and model testing method. These components had described below in detail.

3.1.1 Description of the Study area

According to (CSA, 2007) study, Bench Maji is one of the Zones that found in the Ethiopian Southern Nations, Nationalities, and Peoples' Region (SNNPR) states. Besides, Bench Maji is surrounded on the south by the Ilemi Triangle, on the west by South Sudan, on the northwest by the Gambela Region, on the north by Sheka, on the northeast by Keffa, and on the east by Debub Omo. Furthermore, the Omo River defines much of its eastern border with Debub Omo. In addition, administrative center of Bench Maji is Mizan Teferi. The highest point in this Zone is Mount Guraferda (2494 meters). The Omo National Park is located on the western bank of the Omo River. The main food crops in this Zone consumed by dwellers were include maize, *godere* (taro root), and enset, while sorghum, teff, wheat and barley are cultivated to a important situations. Cash crops include fruits (bananas, pineapples, oranges) and spices (e.g. coriander and ginger); honey is also an important local source of income. Based on the 2007 Census conducted by the CSA, this Zone has a total population of 652,531, of whom 323,348 are men and 329,183 women; with an area of 19,252.00 square kilometers, Bench Maji has a population density of 33.89. While 75,241 or 11.53% are urban inhabitants, a further 398 or 0.06% are pastoralists. A total of 157,598 households were counted in this Zone, which results in an average of 4.14 persons to a household, and 151,940 housing units.

Map1: Bench maji zone Administrative



Source of map: YechaleMehiretGeremew, 2012

3.1.2 Study design

The types of study design for current study was descriptive type. Descriptive types of study was covered both qualitative and quantitative method. According to (Uwe Flick, 2015) explanation, qualitative data analysis is the classification and interpretation of linguistic (or visual) material to make statements about structures of material. Qualitative data analysis also is applied to discover and describe issues in the field or structures and processes in routines and practices. In addition, (DurchKlicken, 2001), expressed quantitative data is a kinds data those have evidence in number. Therefore, the current study was included both qualitative and quantitative data analysis method.

3.1.3 Data source

To carry out the study cross-sectional data was used to analyze the study. In addition, secondary data were collected for this study. The primary data was original in character, those which were collected afresh and for the first time and was collect from randomly selected respondents.

3.1.4 Sample Size

The total population of the study was total number of participants under the coffee processing and drying industries. Bench maji zone have totally fourteen coffee processing industries. These industries have totally 1108 workers. These workers were working under coffee processing and drying industries (quarterly report of Bench maji zone, 2019). The sample size for this study was computed using 95% of confidence level or 5% of marginal error. To calculate sample size the formula cited by Yamane’s 1966 formula was used. That is

$$n = \frac{N}{1 + N(e)^2}$$

Here: n = sample size

N = total population

e = error

so, for this study the total samples size was computed as follows:

$$n = 1108 / (1 + 1108(0.05)^2) = 293.89 \sim 294$$

Therefore, sample size was taken from ten randomly selected coffee processing industries. The sample was taken according to the total worker population of each industry. It is calculated in table as follows:

Table 2: Sample size computed for tencoffee processing industry

Industries	Total worker	Shares from total sample size	Sample size For Each industry
Industry 01	85	[85/854] x 100 = 9.95%	0.0995 x 294 = 29 respondents
Industry 02	98	[98/854] x 100 = 11.47%	0.1147 x 294 = 34 respondents
Industry 03	79	[79/854] x 100 = 9.25%	0.0925 x 294 = 29 respondents
Industry 04	96	[96/854] x 100 = 11.24%	0.1124 x 294 = 33 respondents
Industry 05	72	[72/854] x 100 = 8.43 %	0.0843 x 294 = 25 respondents
Industry 06	69	[69/854] x 100 = 8.07%	0.0807 x 294 = 24 respondents
Industry 07	93	[93/854] x 100 =10.88%	0.1088 x 294 = 31 respondents
Industry 08	83	[83/854] x 100 = 9.71%	0.0971 x 294 = 28 respondents
Industry 09	88	[88/854] x 100 = 10.30%	0.1030 x 294 = 30 respondents
Industry 10	91	[91/854] x 100 = 10.65%	0.1065 x 294 = 31 respondents
Total	854	100%	294

Source: own computation; 2018

3.1.5 Sampling method

The sampling method for this study was probability sampling method. Probability samplings have different techniques of sampling method. But for this study, both simple random sampling and systematic sampling method was applied. The sampling procedure was first ten coffee processing industries out of fourteen was randomly selected. At end, from these ten coffee processing and drying industries 294 respondents were selected by systematic sampling method and those respondents were used for this study.

3.1.6 Method of data Collection

The data collection methods for this study were interview, questioner, and focus group discussion. In the case of interview, structured types of interview were used to collect data. Besides, both open ended and close end types of questioner was used. In the last for focus group discussion method respondents a group of 6– 8 respondents was participated. In addition, the questionnaires were tested before directly applied to study. The testing method was carryout by randomly selecting respondents. Then after taking correction the last data collection tool used for data collections. To sum up, the data was collected from coffee processing industry managers, experts and workers by using tested data tools.

3.1.7 Method of data analysis

There were different techniques used for data analysis. For this study descriptive statistics and econometric modeling method was used to analyze data. Descriptive method used were: frequency distributions (charts, graphs), measure of central tendency (mean, median, mode) and measure of dispersion (variance, standard deviations and range). On the other hand, econometrics modeling method of data analysis was first identifying both dependent and independent variables and then regressing the dependent variables on independent variable. The regression was carryout by using stata versions thirteen software. At end the output of stata was interpreted.

3.1.8 Variables and model specification

According to (Shibabawb, 2015) study, the productivity measurement model and analysis should include: operational level, productivity indices, input and output, evaluation and others. In addition, the development of effective measurement system essential for productivity of industries. Assessing the productivity of industries indicates the health of industry. Therefore, for current study, multi factor

productivity (MFP) and logit model was used for measuring productivity of coffee processing industry. Each model was described below as follows.

3.1.8.3 Multifactor productivity model

Multi factor productivity (MFP) model is used to measure the productivity of coffee processing industry. From the above model the dependent variable is the ratio of output to input (productivity) of processed coffee in coffee processing industry. The independent variable that expected to affect dependent variables are: age of workers, education level of workers, experiences of workers, frequency of on job training of workers, absenteeism of the workers from job, total supply of coffee for processing to industry, service year of machine. Similarly, the model was used by (HOUSEMAN, 2007) to measure productivity of industry. Then model will be elaborated as:

$$\ln(y) = \beta_0 + \beta_1 \ln(\text{age of workers}) + \beta_2 \ln(\text{education level of workers}) + \beta_3 \ln(\text{experience}) + \beta_4 \ln(\text{frequency of on job training}) + \beta_5 \ln(\text{absenteeism}) + \beta_6 \ln(\text{total supply of coffee for processing}) + \beta_7 \ln(\text{service year of machine}) + \varepsilon$$

3.1.8.4 Logit model

Logistic regression (logit model) is a kind of model in which the dependent variable had the value of either occur or not (A.K.VASISHT, 2014). Therefore, for this model the dependent variable was satisfaction of employee in the industry. The satisfaction of employee in industry was measures the value either 1 if they satisfied or zero if they were not satisfied. So, satisfaction of the employees in industry had the value of one and zero. The independent variable for logit model were: distance from industry, workers salary, incentive for workers, environmental satisfaction, managerial motivations, relation between team spirit and relation between managers.

$$\text{satisfaction of employee} \frac{(\text{if satisfied}=1)}{(\text{if not satisfied}=0)} = \beta_0 + \beta_1 (\text{distance from industry}) + \beta_2 (\text{salary}) + \beta_3 (\text{incentives}) + \beta_4 (\text{working environmental satisfaction}) + \beta_5 (\text{managerial motivations}) + \beta_6 (\text{relation between team sprits}) + \beta_7 (\text{relation between managers}) + \varepsilon$$

Table 2: measurement of variables

3.1.8.5 Measurement of MFP & Logit model variables

s.n	MFP modelVariables	Measurement Unit
1.	Age of workers	In years
2.	Education level of workers	In years of schooling
3.	Experience of workers	In years
4.	Frequency On job training of workers	In number
5.	Absenteeism	In day
6.	Total Supply of coffee to industry	<i>In Tone (1tone = 1000kg)</i>
7.	Service year of machine	In year
s.n	Logit model variables	Measurement Unit
1.	Distances from the industry	In kilometir
2.	Salary	In Currency (ETB)
3.	incentives for workers	Dummy (1 if yes and 0 if not)
4.	working environment satisfaction	Dummy (1 if ye and 0 if not)
5.	Managerial motivations	Dummy (1 if good and 0 if not)
6.	relation between team spirit	<i>Dummy (1 if good and 0 if not)</i>
7.	Relation between managers	<i>Dummy (1 if good and 0 if not)</i>

Chapter Four

4. Result and Discussion

4.1 Data analysis and discussion

This chapter focused on descriptive and econometrics analysis of data. It is foundation section for arriving at finding of the study. Moreover, the factors those affect productivity of coffee processing industries were discussed and elaborated. Cross sectional data of type was used for this study.

Furthermore, the secondary data from journals, and other sources were used as reference to compare and contrast with the current study findings. In general this chapter mainly elaborates descriptive analysis and its discussion, econometrics analysis and hypothesis testing.

4.2 Descriptive analysis and discussion

Descriptive statistics are coefficients that summarize provided data sets which could either representative of either the whole or sample of the given populations. Descriptive statistics includes: measure of central tendency (mean, median, and mode), measure of variability (standard deviation, variance, the minimum and maximum variables). In general, descriptive statistics, in short, help describe and comprehend the structures of a specific data set by giving short précises about the sample and events of the data(<https://www.investopedia.com>).

For current study, the sample population and variables those in descriptive analysis method analyzed and discussed were: respondents those participated in data collections, family size, marital status, age structure, education level, distance from work place, experience, employee satisfaction, satisfaction of working environment, on work training, incentives, support from managers, relation between supply and output, daily labor input, wages, absenteeism , labor productivity and coffee processing industry. These variables were expected to affect the productivity of coffee processing industry. Thus, they had each described and discussed below as follows.

4.2.1 Respondents

Respondents those participated during data collection from systematically selected ten coffee processing industries in questionnaire, interview and focus group were described in (table 3). Therefore, in questionnaire 38.78% or 114 males and 20.07% or 59 females, in interview 6.80% or 20 males and 12.24% or 36 females, in focus group 9.86% or 29 males and 12.24% or 36 females were participated. Moreover, more males were participated in questionnaire (38.78% and less in interview which is

6.80%. comparatively, more female were participated in questionnaire (20.07%) and for both interview and focus group by chance they have equal, which is 12.24%. The justification for this variation of male and female were because of the respondents was taken from each industry for questionnaire, interview and focus group through simple random techniques. In general totally 163 or 55.44% males and 131 or 44.55% females were participated in the current study.

Table 3: summary statistics of respondent’s participation in study

Industries List	Questionnaire		Interview		Focus group		Total		Grand
	Male	female	Male	female	Male	female	Male	female	Total
Industry 01	12	8	1	2	2	4	15	14	29
Industry 02	12	9	2	4	4	3	18	16	34
Industry 03	10	5	4	3	4	3	18	11	29
Industry 04	17	7	2	1	1	5	20	13	33
Industry 05	10	2	2	3	4	4	16	9	25
Industry 06	11	7	0	6	0	0	11	13	24
Industry 07	9	7	0	7	3	5	12	19	31
Industry 08	11	2	3	4	5	3	19	9	28
Industry 09	11	6	2	4	3	4	16	14	30
Industry 10	11	6	4	2	3	5	18	13	31
Total	114	59	20	36	29	36	163	131	294
In %	38.78%	20.07%	6.80%	12.24%	9.86%	12.24%	55.44%	44.56%	100%

Source: own computations, 2019

4.2.2 Family size

For current study the minimum family size of respondents was 1 and which covers 2.04% of the total family size. Moreover, the maximum family sizes were shown at 7: which covers the total family size of 0.68% and those of highest observed family size were 26.19% which accounts the family size of 3 (table 4). In addition the average family sizes of respondents were 3.8 and the standard deviations of family size were 1.34 (table 4). This standard deviations indicates that the deviations from mean or average was 1.34 implication for productivity.

Table 4: summary statistics of family size

Family size	Frequency	Percent	cumulative		
One	6	2.04	2.04	Total observations	294
two	46	15.65	17.69	Maximum size	7
three	77	26.19	43.88	Minimums size	1
four	57	19.39	63.27	Mean	3.8
five	74	25.17	88.44	Standard deviation	1.34
six	32	10.88	99.32		
seven	2	0.68	100.00		

Source: own computation, 2019

4.2.3 Age structure and marital status of respondents

Age is one of human potential to play its role in economic growth of the nation. When 10% increase in the fraction of the population ages 60+ decreases the growth rate of GDP per capita by 5.5%. Two-thirds of the reduction is due to slower growth in the labor productivity of workers across the age distribution, while one-third arises from slower labor force growth (Nicole et al., 2016). Therefore, for this study the minimum age of respondents was 18 and the maximum age was 50. Besides, the average age of the respondent is 31.56 and the standard deviation of the respondent is 8.

Table 5: summary statistics of age compositions and marital status of respondents

<i>Age composition</i>					<i>Marital status</i>			
<i>Observation</i>	<i>Max</i>	<i>Min.</i>	<i>Mean</i>	<i>Std. Dev.</i>	<i>Observation</i>	<i>Single</i>	<i>Married</i>	<i>divorced</i>
294	50	18	31.5	8.28	294	90	204	0

Source: own computation, 2019

The situations of women naturally vary across Africa, including across geographic areas, urban and rural dwelling, the legal context, income, education levels, ethnic, religious and cultural identity. Some countries are much more urban; some practice polygamy and encourage remarriage following spousal loss, while in others, marriage is strictly monogamous and remarriage may be frowned upon; some have been hard hit by AIDS and/or conflict.. Women's economic means and support including access to productive assets are typically acquired through, and conditional on, marriage. In ten women aged 15 and older are current widows, and 5% are divorced. These numbers obscure the fact that some women remarry after marital dissolution. Among the 15-49 age group for the 20 countries for which such detail is available, 5.3% are ever-widowed and 15% are ever-divorced (Walle et al., 2018). For

current study, the married respondents were more than that of single which were 69.39% and that of single were 30.61%. Surprisingly, there are no divorced respondents in this study (table5)

4.2.4 Education level

Ministry of education must focus on the recent educational development but unless they observe this topic concerning from sustainable situation, the sector would lose some best vital elements of education. The term sustainability of education were unbreakable change and improvement in education. The change in quality of education will enhance social, political, technological environments (Bell, 2016).

Therefore; for this study the educational backgrounds of respondents were 1.02 % (1 female and 2males) degree graduate, 2.38%(3 females and 4 males) diploma graduate and 6.80% (9 female and 11 males) illiterates (Table 6). Furthermore, the most education level of respondent is in primary school which accounts 80.95 % of respondents. This indicates that most of coffee processing industry workers have low educational background.

Table 6: summary statistcis of educational background of respondents

Education Level	sex			In %
	Female	Male	Total	
Degree graduate	1	2	3	1.02
Diploma graduate	3	4	7	2.38
High school complete	13	13	26	8.84
Primary school	122	116	238	80.95
Illiterate	9	11	20	6.80
Total	146	148	294	100

Source: own computations, 2019

4.2.5 Distance from working place

However, the higher job satisfaction and travelling distance of those employees those worked on longer shifts can be interpreted indirectly as a sign for a negative influence of increasing distance on job satisfaction, extended shifts are one option for minimizingtravelling efforts.(SPIES, 2006).For current study, the minimum distance travelling of workers were one kilometer and the maximum were

five kilometers distance between working station and their residence. Furthermore, 83.67% of workers were travelled from 3 - 4.5 kilometers to arrive at work stations. Therefore, most of the workers were far from industry and they travel long distance to arrive at work stations (table 8).

Table 8: Summary statistics of distance from work place

How many kilometers between your home and industry?	sex		Total	In percent
	female	male		
1 kilometer	7	2	9	3.06 %
2 kilometers	10	4	14	4.76 %
3 kilometers	23	23	46	15.64%
3.5 kilometers	24	29	53	18.02%
4 kilometers	35	52	87	29.59%
4.5 kilometers	34	26	60	20.40%
5 kilometers	9	16	25	8.50%
Total	142	152	294	100

Source: own computation, 2019

4.2.6 Experience

According to (Madden, 2017; Ruhm, 2014), the nature of job have meaningless and meangifull. The meangiless have related with temorarily complex work experience. Furtermore, work experience have positive impact on labor market. For current study, 13.26% (18 females and 21 males) of respondents have three month work experience and those with highest work experience were 1.02% (three males). In addition, the minimum, maximum and average work experiences of respondents were 0, 4 and 1.2 respectively (Table 9). To sum up, the workers working in coffee processing industry have in average low work experience

Table 9: summary statistics of work experience of respondents

Experience in year	sex		Total		
	female	male			
0	0	1	1	Minimum	0
0.2	0	1	1	Maximum	4
0.25	18	21	39	Mean	1.2
0.4	0	1	1	Std. deviations	0.78

0.5	14	13	27		
0.6	0	1	1		
0.8	1	1	2		
0.9	1	1	2		
1	42	41	83		
1.25	13	7	20		
1.5	8	14	22		
2	34	35	69		
2.25	2	4	6		
2.5	2	2	4		
3	6	6	12		
3.25	1	0	1		
4	0	3	3		
total	142	152	294		

Source: own computation, 2019

4.2.7 Employee satisfaction

Employee satisfaction is proportional to employee assignment. It creates vital business and enrich productivity and production enhancement. Employee commitment could vary from one country to other. It is important for management to recognize what inspiration their workers and what they require as persons. Poor workers commitment in organization could cause organizations to score lowest profit margins, low customer service, great employee turnover and diminished competitive edge. Strong and committed employees are looking for meaningful job and become ambassadors for their company. Moreover, planning for employee commitment is vital for a organization. Currently, change is required both in worker performance and satisfaction (Shmailan, 2016; Kristin *et al.*, 2014). Thus, for current study, 52.38% of respondents are not happy and 47.628% were happy being working in coffee processing industry (Table 10). Therefore, workers were not satisfied being working in coffee processing industry.

Table 10: summary statistics of satisfaction of respondents

How do you feel by working In this coffee processing industry?	Frequency	Percent	Cumulative
Not happy	154	52.38	52.38
Happy	140	47.62	100
Total	294	100	

Source: own computation, 2019

4.2.8 Working environmental satisfaction

Employee promise has the most vital positive effect on organizational performance. In addition, working environment have also good impact on organizational production and process. The elements those make employment exciting from working environment points of view were: Interior structure, openness, division of space, number and diversity of work location and accessibility of good building. Working environmental satisfaction of employee have arrived at climax in many physical characteristics of working environment. Moreover, working environment partially influence on employee ability to increase production of organization (Setyo et al., 2017; Voordt, 2016).

For current study, concerning about environmental satisfaction: 83.33 % or 245 respondents replied not good, 10.20% or 30 respondents replied good, 3.40% or 10 respondents replied very good and 3.06% or 9 respondents replied excellent (Table 11). Therefore, most of the workers are not satisfied by working environment of coffee processing industry.

Table 11: summary statistics of satisfaction of working environment

How do you evaluate your working environment?	Frequency	Percent	Cumulative
Not good	254	83.33	83.33
Good	30	10.20	93.54
Very good	10	3.40	96.94
Excellent	9	3.06	100
Total	294	100	

Source: own computation, 2019

4.2.9 Frequency of onjob training

The training involvement had positive effects on managers' performance of individual-level and on employees' capacity of organizational-level learning. Employee continuous training has a positive effect on organizational guarantee. Training is a useful tool that many company or organizations use in order to increase skills, knowledge and attitude of their employees so as to increase organizational market competitiveness (Hanaysha, 2016; Henna et al., 2016). For current study, 52.38% of workers did not took on work training, 30.61% of workers took training one times, 12.24% of workers took training two times and 4.76% of workers took training three times (Table 12). Therefore, workers those working in coffee processing industries more than half did not took enough on job training.

Table 12: summary statistics of frequency of employees on work training

How many times have you got on job training?	Frequency	Percent	Cumulative
No training	154	52.38	52.38
One times training	90	30.61	82.99
two times training	36	12.24	95.24
three times training	14	4.76	100
Total	294	100	

Source: own computations, 2019

4.2.10 Incentives

In most case the basic reason in which organizational productivity performance being low is because of due to the absence of financial incentive for employee. Furthermore, employees wished the financial incentives for their efforts to organizations. In addition incentive provision for employee will decrease the employee from being bribery (Teichmann, 2018; Kurah, 2016).

For current study, concerning about incentives 95% or 280 workers did not get incentives and only 14% of workers provided incentives (Table 13).

Table 13: summary statistics of incentives

Have you got incentives?	Frequency	Percent	Cumulative
No	280	95.24	95.24
Yes	14	4.76	100
Total	294	100	

Source: own computations, 2019

4.2.11 Support from managers

Continuous improvements in organization have critical issues in organizational effectiveness. Besides, top managers must learn from their experience and actively follow-up and reward supervisors, co-workers. Supports from the managers have significant effect on both workers and organizational performance (Sophie Op de Beeck et al., 2015; Eirin et al., 2016). For this study, concerning about monthly support from manager: 18.71% were not supported by managers per month, 45.92% were supported one times per month, 27.21% were supported two times per month, 7.82% were supported three times per month and 0.34% were supported the most of all (Table 14) . From these data indicates that most frequent support of managers to their workers is once. Therefore, it will have expected negative impact on productivity of coffee processing industry.

Table 14: summary statistics of monthly support from managers

How many times have you got support from managers?	Frequency	Percent	Cumulative
No support in a month	55	18.71	18.71
One times per month	135	45.92	64.63
two times per month	80	27.21	91.84
three times per month	23	7.82	99.66
Eight times per month	1	0.34	100
Total	294	100	

Source: own computation, 2019

4.2.12 Relation between Supply of coffee and output

For many developing countries coffee is the most traded agricultural commodity that generates significant foreign revenue for the nations. Besides, coffee is the major agricultural export commodity and creates work job opportunity for more than 2.6 million citizens. Moreover, the coffee processing industries had high profile attracting the interest of governments, non-governmental organizations and other development specialists. Based on these sectors interest, there is no-question that coffee processing industry will be forefront of agricultural industries. However, this sector is challenged by farming method, processing infrastructure, environmental deforestations and soil degradations. These challenges contributed for low quality of coffee beans and shrunk international market competitiveness (Sarker et al., 2018; (Quiñones-Ruiz et al., 2017).

For current study, totally 7243814 kilogram (7195281 kilogram of cherry coffee and 48533 kilogram of dry) coffee were supplied to industry for processing. From these supplied coffee to industry totally 101124.76 kilogram (99181.73 kilogram of cherry and 1943.03 kilogram of dry) were obtained as output or processed bean of coffee (Table 15). The relation between supply of cherry coffee and its output were 6.49 kilogram to one kilogram by average and the relation between supply of dry coffee and its processed output is 4.5 kilogram to one kilogram by average. In addition, the minimum, maximum and average productivity of cherry coffee were 0.12, 0.16 and 0.14 respectively while in the case of dry coffee processing minimum, maximum and average productivity are: 0.17, 0.3 and 0.22 respectively. Furthermore, concerning about total productivity of coffee supplied to industry and its output minimum, maximum and average productivity are: 0.32, 0.44 and 0.37 respectively. From

productivity comparison between cherry coffee (wet method of processing) and dry coffee (dry method of processing), dry method of processing is more productive than wet method of processing.

Table 15: summary statistics of supply of coffee to industry and output

Industry Id	Supply of coffee in kilogram (input)			Output				Total	Cherry coffee Productivity	Dry coffee Productivity	Total productivity
	Cherry coffee	Dry coffee	Total supply	Cherry	Ratio of cherry	Dry	Ratio of dry	Cherry+dry Processed coffee			
Ind01	853530	3412	856942	142255	6:1	710.83	4.8:1	142965.83	0.16	0.20	0.36
Ind02	841412	1430	842842	107873.33	7.8:1	332.55	4.3:1	108205.88	0.12	0.23	0.35
Ind03	680120	4855	684975	103048.48	6.6:1	866.96	5.6:1	103915.44	0.15	0.17	0.32
Ind04	794713	2186	796899	132452.16	6:1	420.38	5.2:1	132872.54	0.16	0.19	0.35
Ind05	642126	1681	643807	100332.18	6.4:1	336.2	5:1	100668.38	0.15	0.20	0.35
Ind06	655321	4652	659973	97809.10	6.7:1	1057.27	4.4:1	98866.37	0.14	0.22	0.36
Ind07	712486	7854	720340	114917.09	6.2:1	2181.66	3.6:1	117098.75	0.16	0.27	0.43
Ind08	542567	8489	551056	90427.83	6:1	2070.48	4.1:1	92498.31	0.16	0.24	0.4
Ind09	684354	6412	690766	99181.73	6.9:1	1943.03	3.3:1	101124.76	0.14	0.30	0.44
Ind10	788652	7562	796214	125182.85	6.3:1	1608.93	4.7:1	126791.78	0.15	0.21	0.36
Total	7195281	48533	7243814	1113479.75		11528.29		1125008.04			

Source: own computations, 2019

4.2.13 Daily Labor working hour and wages

Agricultural workers were move from one sector to other sectors due to multiple reasons. The most factor those made the workers moved from one sector to others were: climatic hazard, geographical locations and high wage payment in other sectors (Günther et al., 2018; Colmer, 2018).According to (Fantu et al., 2016) study, Ethiopia have low wages and this initiated investors to invest in the nation in labor-intensive industries. Currently, Ethiopia may slowly narrow the gap between rural and urban: this brought doubt for future lose of cheap labor in the country. Rural wage rate in Ethiopian increased from 27.3 ETB in 2004 to 41.2 ETB in 2015 (with total growth of 54%), while in urban areas the wage rate shown increment from 28.4ETB to 46.5 ETB (total growth of 63%).Therefore, for current study 58.50% of workers in coffee processing industry works 8 hour per day and 41.50% of workers works 9 hour per day(Table 16). In addition, mean daily input of workers were 8.5 hours. In the case of wages

the minimum, maximum and mean wages were: 22, 30 and 26.4 ETB respectively. This indicates that the wage paid for of coffee processing industry workers is below one dollar by average for daily input of 8.5 hour by average contribution.

Table 16: Summary statistics of per day labor input and wages

Payment per day	Per day working hour		Total
	8 hour	9 hour	
22 ETB	0	30	30
25 ETB	91	0	91
27 ETB	31	0	31
28 ETB	0	31	31
30 ETB	0	111	111
Total	122	172	294

Source: own computation, 2019

4.2.14 Absenteeism

Employee being absent from the normal work is both cost and not good for future development of the organizations. Currently, the trend of absenteeism is increasing. The main reason or factor that make the employee forced to unplanned absent from work were: illness and family issues. To mitigate these factor providing incentive for the employee will treat the employee and increase the productivity of organizations. Absenteeism includes 15-20% of payroll of direct and indirect costs (Mehmet *et al.*, 2016). For current study, maximum days of absent from work was 14 days which accounts 1.02% and the minimum days of absenteeism was 2 which accounts 0.34%. But the most frequently absenteeism was 9 days or 23.13% (table 18). Furthermore, the average days of absenteeism was 8.5 day per season of coffee processing.

Table 18: summary statistics of absenteeism

How many days have absent from work?	Frequency	Percent	Cumulative
2 days	1	0.34	0.34
	2	0.68	1.02
3 days			
	16	5.44	6.46
4 days			
	5	11	3.74
5 days			10.20
	23	7.82	18.03
6 days			
	32	10.88	28.91
7 days			
	48	16.33	45.24
8 days			
	68	23.13	68.37
9 days			
	33	11.22	79.59
10 days			
	27	9.18	88.78
11 days			
	19	6.46	95.24
12 days			
	11	3.74	98.98
13 days			
	3	1.02	100
14 days			
	294	100	
Total			

Source: own computation, 2019

4.2.15 Labor productivity

According to (Sauermaun, 2016) study, productivity is the ratio of the measure of output to its input. Thus, the productivity of employee is the ratio of output to its number of working hour or costs of labor. In general labor productivity is developed from total measurement from firm level.

For current study, the maximum labor productivity of coffee processing industry were 1.03% or 0.0103 and the minimum were 0.74% or 0.0076 and the average labor productivity is (0.00862)

0.86%. In general the labor productivity of workers that working in coffee processing industry contributes in average below one percent for industry (Table 19).

Table 19: summary statistics of labor productivity

industries Id	total supply of coffee (tone)	Total output of coffee (in tone)	Total workers	Total labor input (Hr)	labor Productivity =totaloutput /total labor input	labor Productivity in %
industry 01	856.942	142.96583	29	13788	0.0103	1.03%
industry 02	842.842	108.20588	34	14080	0.0076	0.76%
industry 03	684.975	103.91544	29	12008	0.0086	0.86%
industry 04	796.899	132.87254	33	15237	0.0087	0.87%
industry 05	643.807	100.66838	25	11556	0.0087	0.87%
industry 06	659.973	98.86637	24	11097	0.0089	0.89%
industry 07	720.34	117.09875	31	12680	0.0092	0.92%
industry 08	551.056	92.49831	28	11464	0.0080	0.80%
industry 09	690.766	101.12476	30	13545	0.0074	0.74%
industry 10	796.214	126.79178	31	14301	0.0088	0.88%

Source: own computation, 2019

4.2.16 service year of machine

According to (Yao-Chung *et al.*, 2017) study, when the machine have been used for longer of time the machine spare parts became older and then the power consumed by machine will increase and this results to overheat the machine and loss of invisible resources. For current study, the minimum, the maximum and average service years of machine were 16, 39 and 27 years respectively. Moreover, the processing capacity of machine of coffee processing industry had the minimum, the maximum and average value of 0.955, 1.512 and 1.2724 per hour intone.

Table 20: summary statistics of service year of machine

Industry Id	Planting Year	Service year of machine	Total input (in tone)	Total output (in tone)	Capacity of machine processing per hour (in tone)
Industry 01	2002	16	856.942	142.96583	1.436
Industry 02	1994	24	842.842	108.20588	1.245

Industry 03	1999	19	684.975	103.91544	1.512
Industry 04	2001	17	796.899	132.87254	1.269
Industry 05	1989	29	643.807	100.66838	1.023
Industry 06	1991	27	659.973	98.86637	1.324
Industry 07	1986	32	720.34	117.09875	0.983
Industry 08	1982	36	551.056	92.49831	0.955
Industry 09	1987	31	690.766	101.12476	1.511
Industry 10	1979	39	796.214	126.79178	1.466

Source: own computation, 2019

4.3 Econometric analysis

4.3.1 Multifactor productivity model

Multi factor productivity (MFP) model is used to measure the productivity of coffee processing industry. From the above model the dependent variable is the ratio of output to input of processed coffee in coffee processing industry. The independent variable that expected to affect dependent variables are: age of workers, education level of workers, experiences of workers, frequency of on job training of workers, absenteeism of the workers from job, total supply of coffee for processing to industry, service year of machine. Similarly, the model was used by (HOUSEMAN, 2007) to measure productivity of industry. Then model was elaborated as:

$$\ln(y) = \beta_0 + \beta_1(\text{age of workers}) + \beta_2 \ln(\text{education level of workers}) + \beta_3 \ln(\text{experience}) + \beta_4 \ln(\text{frequency of on job training}) + \beta_5 \ln(\text{absenteeism}) + \beta_6 \ln(\text{total supply of coffee for processing}) + \beta_7 \ln(\text{service year of machine}) + \varepsilon$$

$$\ln(P) = -3.69 - 0.106(\text{age of workers}) + 0.31(\text{education level of workers}) + 0.105(\text{experience}) + 0.074(\text{frequency of training}) - 0.011(\text{absenteeism}) + 1.13(\text{total supply of coffee for processing}) - 0.33(\text{service year of machine}) + \varepsilon$$

Based on above hypothesis, the regression output for ten coffee processing industry indicates that 1 year increasing ages of the workers will decline the productivity by 0.106%, 1% increases years of schooling will increase the productivity by 0.31%, 1% increasing in work experience will increase the productivity by 0.105%, 1 times increasing of frequency of on work training will increase the productivity by 0.074%, 1% increasing in absenteeism will decline the productivity by 0.011%, 1% increasing total supply of coffee to industry will increase the productivity by 1.13% and 1% increasing

the service year of coffee processing machine will decline the productivity by 0.33%. Furthermore, the R-squared is 0.99: which indicates that 99% of independent variables explained the variation of dependent variable in the model(stata output appendices c) . .

In addition the value of adusted R-squared is 0.94. This indicates that the percent of only variation in reality in which independent variable affect dependent variable was 94%. Furhtermore, the value Root MSE (mean square error,deviation of the unexplained variance) is 0.033. This indicates that mean error of the model is 0.033, which expains that the model have no more error rather few (table 20).Beside, variance infaltion factor (Vif) was used to test multicollinarty of variables. Thus, the VIF output was 4.49 (table 21), which is less than ten. This indicates that there is no multicollinarty in this MFP model. In addition the output of heteroskedasticity test (Breusch-pagan) test indicates that the p-value of chi2 is 0.1989, whis greater than 0.05. So, the null hypothesi would not be rejected. This indicates that there is no heteroskedastcity problem in model. In general the prediction of the model will be:

$$\ln(P) = -3.69 - 0.106(\text{age of workers}) + 0.31(\text{education level of workers}) + 0.105(\text{experience}) + 0.074(\text{frequency of training}) - 0.011(\text{absenteeism}) + 1.13(\text{total supply of coffee for processing}) - 0.33(\text{service year of machine}) + \varepsilon$$

Table 20: Regression output of multifactor productivity model

Source	ss	df	Ms	Number of observation = 10	
model	0.174099075	7	0.024871296	F(7,2)	= 14.26
Residual	0.001104918	2	0.001104918	Prob>F	= 0.0000
Total	0.175203992	9	0.021900499	R-squared	= 0.9937
				Adj R-squared	= 0.9495
				Root MSE	= 0.03324

Total processed output of coffee	Coefficient	Standard Error	t	p>/t/	{95% conf. Interval}	
ln(age)	_- 0.1067865	0.078044	1.37	0.000	_-0.8848567	1.09843
ln(education)	0.3105241	0.099126	3.11	0.000	_-0.9589858	1.580034
ln(exp)	0.105115	0.0355064	_-2.96	0.000	_-0.5562669	0.346037
ln(training)	0.0741884	0.0534091	1.39	0.002	_-0.604438	0.7528148
ln(absenteeism)	_-0.0113393	0.0170135	0.67	0.000	_-0.2048372	0.2275157
ln(total supply of coffee)	1.134625	0.1536927	7.38	0.000	_-0.818226	3.087476
ln(Service year of machine)	_-0.3385264	0.1158352	_-2.92	0.001	_-1.810352	1.133299

Cons.		_3.696128	2.066221	_1.79	0.000	_29.94995	22.55769
-------	--	-----------	----------	-------	-------	-----------	----------

Table 21: Multicollinearity (VIF) and heteroskedasticity (Breusch-pagan) tests for regression

<i>Multicollinearity test (Variance Inflation Factor)</i>			<i>Heteroskedasticity (Breusch-pagan) tests</i>	
<i>Variables</i>	<i>VIF</i>	<i>1/VIF</i>	<i>Ho: Constant variance</i> <i>H1: No constant variance</i>	
<i>Ln(Service year of machine)</i>	6.74	0.148351	<i>Chi2(1)</i>	= 1.65
<i>Ln(education)</i>	6.13	0.163138	<i>Prob > chi2</i>	= 0.1989
<i>Ln(experience)</i>	5.21	0.192113		
<i>Ln(absentism in day)</i>	4.42	0.226018		
<i>Ln(training)</i>	3.44	0.291087		
<i>Ln(total supply of coffee)</i>	3.38	0.296090		
<i>Ln(age)</i>	2.13	0.468754		
<i>Mean VIF</i>	4.49			

Source: own computation, 2019

4.3.2 Logistic model

Logistic regression is used to obtain odds ratio in the presence of more than one explanatory variable. The procedure is quite similar to multiple linear regression, with the exception that the response variable is binomial. The result is the impact of each variable on the odds ratio of the observed event of interest. The main advantage is to avoid confounding effects by analyzing the association of all variables together (Sperandei, 2014).

For current study, the dependent variable was satisfaction of employee; which is categorial variable. The independent variables that expected to affect dependent variables includes: distance from industry, salary, incentives, working environmental satisfaction, managerial motivations, relation between team sprits and relation between managers. Thus, the output of regression result indicates that: as one kilometir increase in distance from industry will have the probability to decline the employee satisfaction by 9.2%, one unit increase in salaryincreament will have the probability to increase the employee satisfaction by 1%, one unit increase in incentives will have the probablility to increase the satisfaction of employee by 39.75%, one unit increase in environmental satisfaction will theprobability to increase the satisfaction of employee by 22.92%, one unit increase in managerial motivation will have the probablilty to incease the satisfaction of employee by 28.98%, one unit increase in realtion between team sprits will have the probability to increase the satisfaction of employee by 6.87% and one unit increase relation between managers will have the probability to increase the satisfaction of employee by 18.55%. Besides, the chi square test indicates the model is normal, which have 0.000 prob> chi2. In addition the all variables have less than 5% p-value. This indicates that the variables and their coefficient are statistically significant(Table 22).

Source : own computations

Table 22: Logistic regression And the prediction equation will be:

$$satisfaction\ of\ employee\ \left\{ \begin{matrix} satisfied=1 \\ not\ satisfied=0 \end{matrix} \right\} = 1.05 - 0.0929(distance\ from\ industry) + 0.001(salary) + 0.3975(incentives) + 0.2292(working\ environmental\ satisfaction) + 0.2898(managerial\ motivations) + 0.0687(relation\ between\ team\ sprits) + 0.1855(relation\ between\ managers) + \epsilon$$

Logistic regression	Number of observation	= 294
	Wald chi2(7)	= 71.05
	Prob>chi2	= 0.0000
Log pseudo likelihood	= _49.87202	Pseudo R-squared = 0.0225

Satisfaction of employee	Robust				
	Coefficient	Standard Error	z	p>/t/	{95% conf. Interval}
Distance from industry	-.0929002	0.2855188	-0.33	0.000	-0.6525068 0.4667064
salary	0.0010217	0.0007488	-1.36	0.000	-0.00248993 0.0004459
incentive	0.3975204	0.5622276	-0.71	0.000	-1.499466 0.7044255
Working environmental satisfaction	0.2292006	0.1855914	-1.23	0.001	-0.592953 0.1345518
Managerial motivation	0.2898244	0.1292298	2.24	0.000	0.0365386 0.5431101
Relation between team sprits	0.0687709	0.1675764	0.41	0.002	-0.2596728 0.3972146
Relation between managers	0.1855403	0.1568927	1.18	0.000	-0.1219637 0.4930443
Cons.	1.056639	1.080208	0.98	0.000	-1.060529 3.173807

Chapter five

5. Conclusion and Recommendations

5.1 Conclusion

The overall aim of the study was to examine the productivity performance of coffee processing industries. To achieve the major objectives of the study, the specific objectives were: measuring employee satisfaction, assessing working environment, measuring labor productivity and examining coffee supply and its output. Furthermore, to make the study more scientific related literature was analyzed. The literature matrixes analyzed for current study were theoretical, empirical, research gap and conceptual framework. In the theoretical literature section research papers those theoretical in nature were discussed. In the second, the empirical literatures were analyzed. The empirical literatures were the types of literature done empirically. In third based from the theoretical and empirical analysis research gap has shown, the gap that has not covered by other researchers. In fourth section, based on theoretical, empirical and research gap the conceptual framework was developed. In conceptual framework the variables those expected to affect productivity performance of coffee processing industries were shown in arrows.

Methodologically, total sample size was 294 respondents. To select these sample size from ten coffee processing industry systematic sampling methods were used. In addition, for data collection: interview, questionnaire and focus group methods were applied. Moreover, for data analysis both descriptive and econometric methods were used. In the case of descriptive analysis cross tabulations were used to describe the variables. During describing of variables other related literatures were used to compare and contrast with the current study results and discussion was made. Concerning about econometrics both productivity and logistic models were used to analyze the study.

Therefore, the study finding showed that employees working in industries were did not have got incentives. In addition the support from managers was frequently once a month and daily wage paid for employee is by average 27.2 ETB, which is below one dollar. Furthermore, environmentally 83.67% of workers were travelled from 3 - 4.5 kilometers to arrive at work stations. This indicates, most of the workers were far from industry and they travel long distance to arrive at work stations. These outcomes contribute 52.38% of workers dissatisfied working in coffee processing industry.

Concerning about employee contribution, employee contributes by average 8.5 hour per day. Moreover, most of workers absent from work, which is 8.5 days by average per season of processing of coffee. Also, most education level of workers is in primary school which covers 80.95 % and low work experience. This contributed low labor productivity, which is below one percent. In addition, the relation between supply of cherry coffee for industry and its processed out have by average ratio 6.49 kilogram to one kilogram. This indicates that from 6.49 kilogram cherry coffee is when processed the outcome was one kilogram. In addition, the minimum, maximum and average productivity of cherry coffee were 0.12, 0.16 and 0.14 respectively while in the case of dry coffee processing minimum, maximum and average productivity are: 0.17, 0.3 and 0.22 respectively. Furthermore, concerning about total productivity of coffee supplied to industry and its output minimum, maximum and average productivity are: 0.32, 0.44 and 0.37 respectively. From productivity comparison between cherry coffee (wet method of processing) and dry coffee (dry method of processing), dry method of processing is more productive than wet method of processing, which have similarity study done by (Kassaye et al., 2018) on quality grade comparasion between cherry coffee and dry coffee.

5.2 Recommendation

Concerning about education back ground it is strongly profitable, hiring employees those have good education background level or providing continuous on work training for workers those working in coffee processing industries by collaborating with local government, non-governmental organization and coffee processing industry owners. However, the current study have limitations to cover that entire variables those affect the performance of coffee processing industries, rather it assessed on productivity performance of the industry. Thus, further research is needed for variables like: financial performance, quality performance and value chain analysis of coffee processing industries and export performance of coffee processing industry. In addition, in coffee processing industries, the mechanism to control the system of processing was by manual instead of technological. Therefore, it is better to use processes controlling system through technological to add more value for international market arena. In last since the current study is would not be the end of the study further study must be done on the same topic and productivity performance of coffee plantation.

References

- A.K.VASISHT. (2014). Logit Analysis. *India Agriculture statistics research institute*, page 2.
- Ahsan Hameed, S. A. (2018). Farm to Consumer: Factors Affecting the Organoleptic Characteristics of Coffee. II: Postharvest Processing Factors.
- Aiginger, K. (2014). Industrial Policy for a Sustainable Growth Path. *Austrian Institute Of Economic Research*,
- Al-Widyan, H. A. (2016). Evaluating composting and co-composting kinetics of various agro-industrial wastes. *Int J Recycl Org Waste Agricult*,
- Aprianingsih, K. S. (2018). Strategy to Improving Smallholder Coffee Farmers Productivity. *The Asian Journal of Technology Management Vol. 11 No. 1 (2018)*:
- Asrat Gebremariam Woldeesenbet, B. W. (2016). Bio-ethanol production from wet coffee processing waste in Ethiopia. *Open Access*
- Bank, W. (2015). *4th Ethiopia Economic Update: Overcoming constraints in the manufacturing sector*. Addis Ababa: World Bank group.
- Bell, D. V. (2016). Twenty-first Century Education: Transformative Education for Sustainability and Responsible Citizenship. *Journal of Teacher Education for Sustainability*
- Carlos José Pimenta, C. L. (2018). Review: Challenges in coffee quality: Cultural, chemical and microbiological aspects. *Ciência e Agrotecnologia*, 42(4):337-349, Jul/Aug. 2018,
- Center of statistical Agency of Ethiopia (2014), case study small scale industries
- Center of statistical Agency of Ethiopia (2007), populations statistics
- Colmer, J. (2018). Weather, Labor Reallocation and Industrial Production: Evidence from India. *Centre for Economic Performance*,
- Daniela Nuševa, K. M. (2017). THE PERFORMANCES OF COFFEE PROCESSORS AND COFFEE MARKET IN THE REPUBLIC OF SERBIA. *Economics of Agriculture*,
- Dechassa, A. M. (2018). Effect of Altitude, Shade, and Processing Methods on the Quality and Biochemical Composition of Green Coffee Beans in Ethiopia. *East African Journal of Sciences (2018) Volume 12 (2) 87-100*
- Department of agriculture. (2019). *quarterly report on coffee and spices*.

- DINKENEH, D. T. (2017). WET COFFEE PROCESSING EFFLUENT QUALITY AND ITS ENVIRONMENTAL INFLUENCE ON RIVER WATER: THE CASE OF KACHA BIRA AREA, SNNP, ETHIOPIA. *Haramaya University, Haramaya*
- Dissanayake, D. (2013). Research, Research Gap and the Research Problem. *Munich Personal RePEc Archive*,
- Durch Klicken (2001). Qualitative data analysis
- Eirin Lodgaard, J. A. (2016). Barriers to continuous improvement: perceptions of top managers, middle managers and workers. *aSINTEF Raufoss Manufacturing, Box 163, N-2831 Raufoss, Norway*,
- Fantu Bachewe, G. B. (2016). Non-farm income and labor markets in rural Ethiopia. *Ethiopian Development Research Institution*.
- Fenta, K. (2014). Industry and Industrialization in Ethiopia: Policy Dynamics and Spatial Distributions. *European Journal of Business and Management, Vol.6, No.34*.
- Ferguson, J. E. (2017). COFFEE QUALITY, LAND USE, AND PROCESSING IN THE CAJAMARCA REGION OF PERU. *Anthropology, Department of at DigitalCommons@University of Nebraska - Lincoln*.,
- Ghosh, P. (2014). Processing and Drying of Coffee – A Review. *International Journal of Engineering Research & Technology (IJERT)*.
- Ginting, G. (2015). Open Innovation Model: Empowering Entrepreneurial Orientation and Utilizing Network Resources as Determinant for Internationalization Performance of Small Medium Agroindustry. *ScienceDirect: Agriculture and Agricultural Science Procedia*.,
- GOWLAND, S. L. (2016). Dedicated Followers of Fashion? Bioarchaeological Perspectives on Socio-Economic Status, Inequality, and Health in Urban Children from the Industrial Revolution (18th–19th C), England. *International Journal of Osteoarchaeology*.
- Günther Fink, B. K. (2018). SEASONAL LIQUIDITY, RURAL LABOR MARKETS AND AGRICULTURAL PRODUCTION. *NATIONAL BUREAU OF ECONOMIC RESEARCH*, page 35.
- [http://: www.fao.org](http://www.fao.org)
- <https://www.quora.com/>
- <https://www.Business dictionary>
- <https://en.wikipedia.org>

<http://pectcof.com/the-pulp-potential/>

- Hanaysha, J. (2016). Examining the Effects of Employee Empowerment, Teamwork, and Employee Training on Organizational Commitment. *Procedia - Social and Behavioral Sciences*, page 7.
- Henna Hasson, U. v.-M. (2016). Improving organizational learning through leadership training. *Journal of Workplace Learning*.
- HOUSEMAN, S. (2007). Outsourcing, offshoring and productivity measurement in United States manufacturing. *International Labour Review*.
- Inc, C. I. (2010). *ETHIOPIA COFFEE INDUSTRY VALUE CHAIN ANALYSIS*. Addis Ababa: United States Agency for International Development.
- Inma Borrella, C. M.-G. (2015). Coffee Industry: Opportunities, Constraints and the Businesses that are Making it Possible. *Institute of Development Studies*.
- Kassaye Tolessa, L. D. (2018). Analysis of coffee quality along the coffee value chain in Jimma zone, Ethiopia. *African Journal of Agricultural Research*.
- Khan, B. Z. (2015). KNOWLEDGE, HUMAN CAPITAL AND ECONOMIC DEVELOPMENT: EVIDENCE FROM THE BRITISH INDUSTRIAL REVOLUTION, 1750-1930. *NATIONAL BUREAU OF ECONOMIC RESEARCH*.
- Kim, M. C. (2016). The Internet Information and Technology Research Directions based on the Fourth Industrial Revolution. *KSII TRANSACTIONS ON INTERNET AND INFORMATION SYSTEMS VOL. 10, NO. 3, Mar. 2016*.
- Kristin L. Cullen, B. D. (2014). Employees' Adaptability and Perceptions of Change-Related Uncertainty: Implications for Perceived Organizational Support, Job Satisfaction, and Performance. *Journal of Business and Psychology*.
- Kurah, I. T. (2016). The Role of Financial Incentives as a Motivator in Employee's Productivity in Nigeria Electricity Distribution Companies. *International Journal of Research in Business Studies and Management*.
- Lawal Babatunde Akeem, E. T. (2014). Effects of Capital Structure on Firm's Performance: Empirical Study of Manufacturing Companies in Nigeria. *Journal of Finance and Investment Analysis, vol. 3, no.4, 2014, 39-57*.
- Levratto, A. G. (2015). Do labor tax rebates facilitate firm growth? An empirical study on French establishments in the manufacturing industry, 2004–2011. *Small Bus Econ*.

- Lin, X. Y. (2015). Emerging manufacturing paradigm shifts for the incoming industrial revolution. *International Journal of Advanced Manufacturing Technology*.
- Madden, C. B. (2017). Time reclaimed: temporality and the experience of meaningful work. *Work, employment and society*.
- Marco Gaboardi, H. w. (2016). Differentially Private Chi-Squared Hypothesis Testing: Goodness of Fit and Independence Testing*. "Privacy Tools for Sharing Research Data" project based at Harvard, supported by NSF.
- Mehmet C. Kocakulah, A. G. (2016). Absenteeism Problems And Costs: Causes, Effects And Cures. *International Business & Economics Research Journal*.
- Morjaria, R. M. (2015). Competition and Relational Contracts: Evidence from Rwanda's Coffee Mills. *JOB MARKET PAPER*.
- Neumann, D. M. (2017). *The World coffee in 2017*. Germany: Neumann.
- Never, R. K. (2017). Green transition, industrial policy, and economic development. *Oxford Review of Economic Policy*.
- Nicole Maestas, K. J. (2016). THE EFFECT OF POPULATION AGING ON ECONOMIC GROWTH, THE LABOR FORCE AND PRODUCTIVITY. *NATIONAL BUREAU OF ECONOMIC RESEARCH*.
- Nishimwe-Niyimbanira, D. F. (2016). Impact of household size on poverty: Analysis of various low-income township in the northern free state region, south Africa. *African population study* Nuti, M. E. (2017). Valorisation of the Residues of Coffee Agro-industry: Perspectives and Limitations. *The Open Waste Management Journal*
- Nuttaneeya Ann Torugsa, W. O. (2012). Capabilities, Proactive CSR and Financial Performance in SMEs: Empirical Evidence from an Australian Manufacturing Industry Sector. *springer*
- Quiñones-Ruiz, L. F. (2017). Towards a Balanced Sustainability Vision for the Coffee Industry. *Department of Economics and Social Sciences, University of Natural Resources and Life Sciences (BOKU)*.
- Ruhm, C. L. (2014). THE CHANGING BENEFITS OF EARLY WORK EXPERIENCE. *NBER WORKING PAPER SERIES*
- Samson Wakuma Aba Magne Bråtveit, W. D. (2018). Reduced Lung Function among Workers in Primary Coffee Processing Factories in Ethiopia: A Cross Sectional Study. *International journal of Environment Reseach and public Health*.

- Sam Ouliaris (2011). Assumption of economic thoughts
- Sarker, G. N. (2018). Sustainable coffee supply chain management: a case study in Buon Me Thuot City, Daklak, Vietnam. *International Journal of Corporate Social Responsibility*.
- Sauermann, J. (2016). Performance measures and worker productivity. *IZA world labor*.
- Setyo Riyanto, A. S. (2017). The Impact of Working Motivation and Working Environment on Employees Performance in Indonesia Stock Exchange. *International Review of Management and Marketing*.
- Shaliniet, (2001). Definition of hypothesis
- Shibabawb, A. M. (2015). Partial and Total Productivity Measurement Models for Garment Manufacturing Firms. *Jordan Journal of Mechanical and Industrial Engineering*, page 2.
- Shmailan, A. S. (2016). The relationship between job satisfaction, job performance and employee engagement: An explorative study. *Issues in Business Management and Economics Vol.4 (1)*
- Simon Aldery, L. S. (2016). Economic Reforms and Industrial Policy in a Panel of Chinese cities . *University of North Carolina at Chapel Hill, salder@email.unc.edu*.
- Sophie Op de Beeck, J. W. (2015). Effective HRM Implementation by Line Managers: Relying on Various Sources of Support. *International Journal of Public Administration*.
- Sperandei, S. (2014). Understanding logistic regression analysis. *Lessons in biostatistics*.
- SPIES, M. (2006). Distance between home and workplace as a factor for job satisfaction in the North-West Russian oil industry. *Department of Geography, University of Joensuu*
- Stephen R. Hughes &, J. C.-N.-L.-H.-V. (2014). Sustainable conversion of coffee and other crop wastes to biofuels and bioproducts using coupled biochemical and thermochemical and processes in a multi-stage biorefinery concept. *Appl Microbiol Biotechnol*
- Syafitri, W. (2016). The Role of Government in Developing Coffee-based Agro-Industry: Case Study in Pagar Alam, South Sumatra. *Journal of Public Administration Studies*
- Tao, M.-J. L.-Q. (2017). Review of methodologies and policies for evaluation of energy efficiency in high energy-consuming industry. *Applied Energy*.
- Teferi, K. B. (2015). Climatic Variables and Impact of Coffee Berry Diseases (*Colletotrichum Kahawae*) in Ethiopian Coffee Production. *Journal of Biology, Agriculture and Healthcare, Vol.5, No.7, 2015*.
- Teichmann, D. D. (2018). Anti-Bribery Compliance Incentives: A Potential Solution? *Balkan Journal of Interdisciplinary Research*.

- UNDP. (2017). Manufacturing export performance in Ethiopia. *SUMMARY OF COMMISSIONED STUDY*, 5-6.
- Uwe Flick (2015). Descriptive analysis
- Voordt, S. B. (2016). Accommodating new ways of working: lessons from best practices and worst cases. *Journal of Corporate Real Estate*.
- Walle, M. A. (2018). Marital Shocks and Women's Welfare in Africa. *Policy Research Working Paper 8306: world bank Group*.
- Wang, N. A. (2011). Determinants of capital structure: An empirical study of firms in manufacturing industry of Pakistan. *Emerald Group Publishing Limited*
- Yao-Chung, C.-F. C.-C.-Y. (2017). Correlation between use time of machine and decline curve for emerging enterprise information systems. *Enterprise information system: Volume 12, 2018 - Issue 4: Fog Computing and Internet of Everything for Emerging Enterprise Information Systems*

Wikipedia

Appendices

Appendices A: Questionnaire (English)

Dear Respondents;

The purpose of this research is to assess on potentials of small scale manufacturing industries: implications of coffee processing and drying industries, in the case of Bench maji zone, South West Ethiopiapartial fulfillment of Masters of Sciencedegree in Development Economics (M.SC).Your accurate information is valuable to the success of this study. All information you present will be kept confidential and will be used only for academic purpose. furthermore, writing your name on this sheet is not necessary.

Thank You for your voluntariness!

Dear respondents during replying questionnaire please put “x” mark at the blank place & boxes that express you opinion.

- Put the symbol “ x” that express you and write your age and sex

sex		
Male	Female	Age

- Marital status: Put the symbol “ x“ that express you

Married	Unmarried	Divorced

- Total family size: write your family members

Nuclear family		Other relatives		Not relative living with you	
Male	female	Male	female	Male	female

- Do you have your own land? If yes, how much hectare do you have?

yes	No	How much hectare

5. Do you have coffee plantation? If yes, write how much hectare it is

yes	No	Other

6. Education level: put “x” that express you

M.A/M.sc	B.A/B.sc	TVET	High school complete	Other

7. Where do you live? put “x” at 1 if you are near to industry, at 0 if you are far from industry

Near to industry	1	
far from industry	0	

8. In question number 7, if you are far from industry what is the means of transportation?

Put ‘x’ mark at 2 if you are used service and 1 for on foot means of transportations

By service care	2	
On foot	1	

9. How many kilometers between your home and industry? _____ kilo meter

10. When do you employed in this industry? _____

11. Have employed as permanent or temporary? Put“x” mark if you are permanent and 1 if you are temporary worker?

permanent worker	2	
Temporary worker	1	

12. How nay years have you worked in this industry? _____

13. Do you have worked in other industry?

Yes	No	If yes how many years?

14. Have you got training on work? if yes how many times have you got on work training?

Yes	No	Number of on work training

15. Do work uniform is provided? if yes how many times

Yes	No	Frequency of uniform

16. How many hours do you worked in industry per day?

8	9	10	Other	Payment per day

17. Have you absent from work ?

Yes	No	If yes how many days per month?

18. In question number 17 why did you absent from work? Put “ x” mark that express you

sick	4	
Family caring	3	
Work difficulty	2	
Work Place being far	1	

19. Have got salary increment?

Yes	No	If yes how much?

20. Have got salary on time?

Yes	No

If not why?

21. Have you got other incentives (bonus) on work?

Yes	No	If yes list them
		1. _____
		2. _____
		3. _____
		4. _____
		5. _____

22. Do you have other sources of income? if yes list source and amount of income generated from that source.

yes	No	Sources of income	Amount of money obtained from source

23. When this industry is planted? _____

24. Did the pulping machine of industry is changed?

Yes	No	If yes when the machine had changed?

25. How do you feel by working in this industry? Put “ x” mark for Very happy 3, for medium 2, for Not happy 1

Very happy	3	
Medium	2	
Not happy	1	

26. How do you evaluate your working environment? Put “ x” mark for excellent 4, for very good 3, for good 2 and for Not good 1

Excellent	4	
Very good	3	
good	2	
Not good	1	

27. How many times have you got support from supervisors? Put “ X “ mark on one of them

8 times per month	8	
4 times per month	4	
3 times per month	3	
2 times per month	2	
1 times per month	1	
Not	0	

How about the relation between your team spirit? Mark “ x” for excellent 3, for very good 2, for good 1 and for bad 0

Excellent	3	
Very good	2	
good	1	
Not good	0	

28. How about the relation between your managers? Mark “ x” for excellent 3, for very good 2, for good 1 and for bad 0

Excellent	3	
Very good	2	
good	1	
Not good	0	

29. Per month how many times could you make general discussion concerning about work? Put “ x” for only at one of them

4 times per month	4	
3 times per month	3	
2 times per month	2	
1 times per month	1	
Not	0	

30. If there is conflict at work place how did you resolved it?about work? Put “ x” for only at one of them

Bydiscussion	3	
By conflict	2	
Nothing	1	

31. How often do you work extra time? Put “ x” for only at one of them

Daily	3	
Once a week	2	
Once a month	1	
Nothing	0	

32. In question number 31, if you have worked extra time how currency is paid per hour?

_____ ETB

33. In local market how much is the price of one kilogram cherry coffee, washed coffee bean and unwashed coffee bean?

price of Cherry coffee per kilogram	price of washed coffee bean per kilogram	price of unwashed coffee bean per kilogram

34. How many tons of coffee is supplied to industry for processing in season of harvesting? _____ tones.

35. From supplied to industry (question number 34), how many tones were processed in industry? _____ tones

36. How many quintal could the industry machine to process per hour ? _____ quintal

37. How many tone of coffee is supplied both for local market and exported to foreign countries? For local market _____ tones & foreign country _____ tones.

38. How much currency is obtained from both local market and exported to foreign market? From local market _____ ETB & from foreign exported _____ ETB

39. How much is total expenditure of the industry? _____ ETB

40. How much is total profit of the industry? _____ ETB

41. What was the sources of money to start this industry?

Self	4	
Taking credit from private rich man	3	
Taking credit from commercial bank	2	
Taking credit from private bank	1	

42. In question number 41, if the industry is started by taking credit from other sources how many money was its credit _____

Is the credit was paid? Yes ----- no----- if not why?

43. What are other contributions of this coffee processing industry for community existed near to the industry?

44. During the processing what is means to control the process? Put x that fits your opinion

Through computerized technology	2	
By man power	1	

45. How by product released from coffee industry is managed:

Put x that fits your opinion

Piled in one place	4	
Dropped in water	3	
Burnt	2	
Recycled	1	

46. In question number 45If it is recycled for what kinds of purpose it will be used

47. How the coffee is processed in industry? write the steps of processing

48. In which processing location are you working?

49. which processing step is very difficult? _____ why it is difficult?

50. could the coffee bean be stay as it pulped yes ----- no -----

if yes How much hour could the coffee to be stayed as it pulped? -----hour

51. by what method could the coffee dry after it has been pulped?

By sun light ----- by machine -----

If it sunlight method how much hour? ----- hour: if by machine how much hour and how many degree centigrade? ----- hour and ----- degree centigrade

52. Do you did dry method of processing? Yes ---- no----

if yes what are the procedures of dry method of processing?

53. do you have moisture content tester instrument yes ----- no-----

if yes how much percent moisture point did you used during packing of processed coffee -----

- %

54. What are the main problems of this industry?

55. What is your general comment about this industry?

Appendices B: Questionnaire (Translated Amharic)

ለወይዘሮ ቃለ መጠይቅ ማሳሰቢያ

የዚህ ጥናት ዋና አላማ በግንኙነት መጠን ውስጥ ማረጋገጥ ነው። ስለሆነ ጥናቱ ተፈላጊ ወቅት ለሰርዕቱ በብዙ ስና ኢኮኖሚክስ ስለሚኖረው ደብዳቤ ለጥናት ተጠቃሚ ስለሆነው ትምህርት ዘርፍ በሰርዕቱ ለተፈጻሚነት ለሚያስፈልገው ሰለሆነ ማወቅ ቃለ መጠይቅ ማሳሰቢያ ለዚህ ጥናት የእርሶ ትክክለኛ መረጃ ማስጠበቅ ለአገራችን ኢኮኖሚ ደግ ትክክተኛ አስተዋጾ የለውም ሆኖ ቃል ይገባል ብሎ ገና ይከሰታል።

ማሳሰቢያ: ስጥምን በዚህ ወረቀት ማሳሰቢያ አያስፈልግም።

ተክሎግዛው

በጅምቲ ሰርዕቱ በብዙ ስና ኢኮኖሚክስ ስለሚኖረው ደብዳቤ ለጥናት ተጠቃሚ ስለሆነው ትምህርት ዘርፍ በሰርዕቱ ለተፈጻሚነት ለሚያስፈልገው ሰለሆነ ማወቅ ቃል ይገባል ብሎ ገና ይከሰታል።

ወይዘሮ ቃለ መጠይቅ ማሳሰቢያ ይህንን ቅፅ በማሙላት ጊዜ ለእያንዳንዱ ቃለ መጠይቅ ተራ ቁጥር የተሰጠ ሰለሆነ ስጥም የአዎንታ ሐሰብ ሲኖረዎት በተሰጠው በነጠብ (-----) ላይ የ " x" ምልክትን ማስቀመጥ ሳጥን በሚረደበት ጊዜ በእርሶ ማሻ ጎን የ " x" ምልክትን ጽሑፍ በሚያስፈልግ ጊዜ ዳሽ ወይም ባደባታ (____) ላይ ጽሑፍን ይጻፉ።

1. ፆታ ወ ----- ሴ ----- እድሜ _____
2. የትዳር ሆኑ ያገባ ----- ያላገባ ----- የፈታ -----
3. የቤተሰብ ብዛት: ወ --- ሴ ----- ዘመኑ ወ----- ሴ ----- ዘመኑ ያልሆነ ወ ----- ሴ ---
4. የግል ቦታ አልዎት? አዎን ----- የለም ----- አዎን ከሆነ ስንት ሄክታር ነው? _____ ሄክታር
5. የቦና ተክል አልዎት? አዎን ----- የለም ----- አዎን ከሆነ ስንት ሄክታር ነው? _____ ሄክታር
6. የትምህርት ደረጃ : ማስተርስ ----- ደግሮ ----- ዲፕሎማ ----- ሌላ _____
7. የት ይኖራሉ? የሚኖሩት ከቦና እንዳስትራ ቅርብ ከሆኑ በ 1 ጎን፣ የሚኖሩት ከቦና እንዳስትራ ርቀት አካባቢ ከሆኑ በ 0 ጎን፣ በሚኖሩት ሰርዕቱ ላይ የ x ምልክትን ያስቀምጡ

ከቦና እንዳስትራ ቅርብ	1	
ከቦና እንዳስትራ ርቀት አካባቢ	0	

8. በተራ ቁጥር 7 ላይ ከቦና እንዳስትረ ርቀት አከባቢ ከሆኑ በምን ወይ ስራ ቦታ ይሞክሩ?
 የሞግባብ በሞኪና ከሆኑ በ 2 ጎን፣ የሞግባብ በእግር ከሆኑ በ 1 ጎን፣ በሚኘው ሰዓት ላይ የ x ጫካትን ያስቀምጡ

በሞኪና	2	
በእግር	1	

9. በቦና እንዳስትረና በእርሶ ቤት ማከፈል ምን ያህል ኪሎሜትር ርቀት አለው? _____

10. በዚህ በቦና እንዳስትረ ውስጥ ማን ተቀጠሩ? -----

11. የትኩረት ሁኔታ ቋሚነው ወይስ ግዜያዊ? ቋሚ ከሆነ በ 2 ላይ እና ደግሞ ግዜያዊ ከሆነ በ 1 ጎን ላይ የ x ጫካትን ያስቀምጡ

ቋሚ	2	
ግዜያዊ	1	

12. ምን ያህል አሞቶ በዚህ በቦና እንዳስትረ ውስጥ ሰሩ? _____ አሞቶ

13. በሌላ ቦታ በቦና እንዳስትረ ውስጥ ሰርተዋል? አዎን-----አይደለም-----አዎን ከሆነ ---
 -- አሞቶ

14. በስራ ላይ ስልጠና ውስጥ ይሰሩ? አዎን ----- አይደለም ----- አዎን ከሆነ ስንት
 ዘር _____

15. የስራ ላይ ልብስ ይሰጣል? አዎን ----- አይደለም ----- አዎን ከሆነ ስንት
 ዘር _____

16. በቀን ምን ያህል ሰዓት በስራ ላይ ይሰራሉ? ----- ሰዓት ክፍያው ሰንት ብር ነው
 _____ ብር

17. ከስራ ገቢ ቀርተው ያወቃሉ? አዎን ----- አይደለም ----- አዎን ከሆነ በወር ሰንት
 ቀን ይቀራሉ - _____ ቀን

18. በተራ ቁጥር 16 ላይ ከስራ የቀሩበት በምን ምክንያት ነው? በህሞም ከሆነ 4 ጎን፣ በተሰጠ
 በሚከባከብ ከሆነ 3 ጎን፣ ስራው ስለ ከበደ ከሆነ 2 ጎን እና ማገዳ ስለረቀ ከሆነ 1 ጎን የ x ጫካትን ከጎኑ በሚኘው ሰዓት ላይ ያስቀምጡ

በህሞም	4	
በተሰጠ በሚከባከብ	3	
ስራው ስለ ከበደ	2	
ማገዳ ስለረቀ	1	

19. የደመወዝ ጭጭ ያገኛሉ? አዎን ----- አይደለም -----አዎን ከሆነ ስንት ብር አገኙ _____ ብር

20. ደመወዝ በወቅቱ ይከፈላታል? አዎን -----አይደለም ----- አይደልም ከሆነ ለምን ይመስልዎታል?

21. ሌላ ጥቅምም የሚገኙት አለ? አዎን ----- አይደለም ----- አዎን ከሆነ ይዘረዝሩ?

22. ሌላ የገቢ ምንጭ አለዎት? አዎን ----- አይደለም ----- አዎን ከሆነ ይዘረዝሩ

የገቢ ምጫ

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

የተገኘው ገንዘብ ማጠቃለያ

23. ማፍ ነው ይህ የቦና እንዳስትረ የተተከለው? _____ አማኑ በፊት
24. የቦና ማፍ ለፈጠራ ማሻን ተቀይረው ያወቃል? አዎን ----- አይደለም ----- አዎን ከሆነ ማፍ ተቀይረዋል? _____
25. እርሶ በዚህ የቦና እንዳስትረ ውስጥ በመቆራት ምን ያህል ደስተኛ ነዎት? ከዚህ በታች ባለው ሰንጠረዥ ውስጥ የ x ምልክትን እጅግ በጣም ደስተኛ ከሆኑ 3 ጎን፣ ማክለኛ ከሆኑ 2 ጎን፣ እና ደስተኛ አይደለም የሚሉ ከሆኑ 1 ጎን በአንዱ ላይ ብቻ ምልክት ያደርጉ

እጅግ በጣም ደስተኛ ነው	3	
ማክለኛ	2	
ደስተኛ አይደለም	1	

26. እርሶ የሚከተሉት የስራ ቦታ እንዴት ነው? ከዚህ በታች ባለው ሰንጠረዥ ውስጥ የ x ምልክትን ለእጅግ በጣም ጥሩ 4 ጎን፣ ለበጣም ጥሩ 3 ጎን፣ ለጥሩ 2 ጎን እና ለማጣሪያ 1 ጎን ብለው አንዱ ላይ ብቻ ምልክት ያደርጉ

እጅግ በጣም ጥሩ ነው	4	
በጣም ጥሩ ነው	3	
ጥሩ ነው	2	
ማጣሪያ ነው	1	

27. የእርሶ የስራ ሃላፊ ምን ያህል ጊዜ በወር በስራ ላይ ድጋፍ ይሰጣል? አንዱ ላይ ብቻ የ x ምልክትን ያስቀምጡ

በወር 8 ጊዜ	8	
በወር 4 ጊዜ	4	
በወር 3 ጊዜ	3	
በወር 2 ጊዜ	2	
በወር 1 ጊዜ	1	
ምንም ድጋፍ የለም	0	

28. በስራ ቦታ ከእርሶ የስራ ባለደረባ ጋር ያለው ግንኙነት ምን ይመስላል? ለእጅግ በጣም ጥሩ 3፣ ለበጣም ጥሩ 2፣ ለጥሩ1 እና ለሙሉ 0 በጎናቸው ባለው ሰዓት አንዱ ላይ ብቻ የ x ምልክትን ያስቀምጡ

እጅግ በጣም ጥሩ ነው	3	
በጣም ጥሩ ነው	2	
ጥሩ ነው	1	
ሙሉ ነው	0	

29. በስራ ቦታ ከእርሶ የስራ ሃላፊ ጋር ያለው ግንኙነት ምን ይመስላል? ለእጅግ በጣም ጥሩ 3፣ ለበጣም ጥሩ 2፣ ለጥሩ1 እና ለሙሉ 0 በጎናቸው ባለው ሰዓት አንዱ ላይ ብቻ የ x ምልክትን ያስቀምጡ

እጅግ በጣም ጥሩ ነው	3	
በጣም ጥሩ ነው	2	
ጥሩ ነው	1	
ሙሉ ነው	0	

30. በየወቅቱ ምን ያህል ጊዜ አጠቃላይ ተገናኝታቸው ስለ ስራቸው ወይይት ታደረጋላቸው? የ "x" ምልክትን በሚሰጠው አንዱ ላይ ብቻ ያደርጉ

በወር 4 ጊዜ	4	
በወር 3 ጊዜ	3	

በወር 2 ጊዜ	2	
በወር 1 ጊዜ	1	
የለም	0	

31. በጣካላቸው ግጭት በሚረበት ጊዜ ያንን ግጭት እንዴት ነው የግዛታቸው ስርዓት?
 የ "x" ግጭትን ስንት በሚሰጥላቸው አንድ ላይ ብቻ ያደርጉ

በንግግር	3	
በጣካላት	2	
አይወጣ ደም	1	

32. ምን ያህል ጊዜ ከስራ ሰዓት ወጪ ትርፍ ስራ ትሰራላህ? የ " x" ግጭትን እርሶን በሚልጠው ላይ ያስቀምጡ

በየቀኑ	3	
በየሰዓት አንዴ	2	
በየወሩ አንዴ	1	
አልሰራም	0	

33. በተራቁጥር 31 ላይ የትርፍ ሰዓት ማሳሰቢያ ከሆነ በአንድ ሰዓት ስንት ብር ይከፈልዎታል? _____ ብር

34. በገበያ ላይ የታጠበ ፣ ያልታጠበ እና ቀይ (እሸት) በና ዋጋ በካሎ ግራም ስንት ብር ነው?

የታጠበ በና በካሎ ግራም _____ ብር ፣ ያልታጠበ በና በካሎ ግራም _____ ብር ፣ ቀይ (እሸት) በና በካሎ ግራም _____ ብር

35. ስንት ቶን በና በበና ለቀማ ወቅት ለእንዳስትሪ ይቀርባል? _____ ቶን

36. ለእንዳስትሪ ከቀረበት በና ወሳኝ (ጥያቄ 34) ስንት ቶን ይፈለግላል? _____ ቶን

37. የበና እንዳስትሪ ማፈፈያ ማሽን በሰዓት ስንት ከንታል ይፈለግላል? _____ ከንታል

38. ስንት ቶን በና ለማቆላላት ገበያ እና ወደ ወጭ አገር ተላክ? ለማቆላላት ገበያ _____ ቶን ወጭ አገር _____ ቶን

39. ለማቆላላት ገበያ ከቀረበው እና ወጭ አገር ከተላከው ምን ያህል ገቢ ተገኘ?

ከመካከላዊ ገበያ _____ ብር ሲሆን ወጭ አገር ከተላከው _____ ብር

40. አጠቃላይ ምን ያህል ገንዘብ ወጪ ተከፍሎታል? _____ ብር
41. አጠቃላይ ምን ያህል እንዳስተረው አተረፈዋል? _____ ብር
42. እንዳስተረው ስራው ስጀምሮ የገንዘብ ምጫ ከየት ነበረ? የ " x " ምልክትን እርሶን በሚልጠው ላይ ያስቀምጡ

ከራሱ	4	
ከግል ባለሀብት በመጠይር	3	
ከመንግስት ባንክ በመጠይር	2	
ከግል ባንክ በመጠይር	1	

43. ከጥያቄ ቁጥር 41 ላይ እንዳስተረው ስራው የጀመረው ገንዘብ በመጠይር ከሆነ ምን ያህል ገንዘብ በመጠይር ስራው ጀመረ? _____

ብር: : ብድሩ ተከፍሎታል

አዎን ----- አልተከፈለም ----- ካልተከፈለ ምክንያቱ ምንድነው?

44. የቦና እንዳስተረ በአካባቢው ለሚኙ ማህብረሰብ ምን አስተዋፆ አለው?

45. በና በእንዳስትሪ ውስጥ በሚለፈለፈበት ጊዜ ሂደቱን ማው የሚቆጣጠረው? ሂደቱን የሚቆጣጠረው በከፍተኛነት ከሆነ 2 ጎን እና ሂደቱን የሚቆጣጠረው የስውሃይል ከሆነ 1 ጎን የ "x" ምልክትን ያስቀምጡ

በከፍተኛነት	2	
በስውሃይል	1	

46. ከበና ሚልፈራ እንዳስትሪ የሚመጡ የበና ገለባ አያያዝ ምን ይመስላል? በአንድ በታ ተከፍረው የሚቆጣጠሩ ከሆነ 4፣ ወደ ወንዝ ይጣሉ ከሆነ 3፣ የቃጠል ከሆነ 2 እና ተሞልተው ለጥቅም የሚቆጣጠሩ ከሆነ 1 ብለው አንዱ ላይ ብቻ የ "x" ምልክትን ያስቀምጡ

በአንድ በታ ተከፍረው ይቆጣጠሩ	4	
ወደ ወንዝ ይጣሉ	3	
የቃጠል	2	
ተሞልተው ለጥቅም ይቆጣጠሩ	1	

47. በተራ ቁጥር 45 ላይ ከበና ሚልፈራ እንዳስትሪ የሚመጡ የበና ገለባ ተሞልተው ለጥቅም የሚቆጣጠሩ ከሆነ ለምን አይነት አገለግሎት ይወላል?

48. በና በእንደገስትሪ ውስጥ እንዴት ይፈለፈላል? ቀደም ተከተሉን ይጻፉ

49. የእርሶ ስራ ድርሻ በእንዳስትሪ ውስጥ ምን ይሆናል? (በየተኛው የእንዳስትሪ ክፍል ይሰራሉ?)

_____ በና ማህበረሰብ እንዳስትሪ ውስጥ የተኛውን ስራ በጣም ይከብዳል? _____ ለምን የከበደ ይመስልዎታል?

50. በና በእንዳስትሪ ውስጥ ከተፈለገ በኋላ ሳይደርቅ ይቆያል? አዎን ----- አይደለም -----

አዎን ከሆነ ምን ያህል ሰዓት ሳይደርቅ ይቆያል? _____

51. በና በእንዳስትሪ ውስጥ ከተፈለገ በኋላ በምን ይሆናል የሚጠበቀው በጠቅላይ በሆነው -----

በጠቅላይ ከሆነ ምን ያህል ሰዓት ይደርቃል? _____ ሰዓት፣ በሆነው ከሆነ ምን ያህል ሰዓትና በምን ያህል የሚቆይ ማለት ይደርቃል? _____ ሰዓትና _____ ደግሞ ስንተግሬድ

52. በእንዳስትሪ ውስጥ የጀንፈል (የተፈጥሮ) በና ያደርቃል? አዎን ----- አይደለም -----

አዎን ከሆነ የአደረጋችሁት ቅደም ተከተሉን ይግለጹ

53. የቦና የረጥብት ማክኛ ማህደያ ማሳሪያ አልዎት? አዎን ----- አይደለም -----
አዎን ከሆነ ከሞሽጎ በፊት በምን ያህል ፕረሰንት የረጥብት ማክኛ ያሸጋሉ? _____
ፕረሰንት

54. አጠቃላይ በቦና እንዳስትረ ውስጥ እርሶ የታዘቡት ችግር ምንድነው?

55. አጠቃላይ ሰለቦና ማፈራረያ እንዳስትረ ምን አስተያየት አልዎት?

Appendices C: Multifactor productivity model regression stata output

Source	SS	df	MS	Number of obs =	10
Model	.174099075	7	.024871296	F(7, 2) =	14.26
Residual	.001104918	2	.001104918	Prob > F =	0.0000
Total	.175203992	9	.021900499	R-squared =	0.9937
				Adj R-squared =	0.9495
				Root MSE =	.03324

Ln total process ~ f	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
Ln age	-.1067865	.078044	1.37	0.000	-.8848567 1.09843
Ln educ	.3105241	.0999126	3.11	0.000	-.9589858 1.580034
Ln exp	.105115	.0355064	-2.96	0.000	-.5562669 .346037
Ln Frt arining	.0741884	.0534091	1.39	0.002	-.604438 .7528148
abseentiseminday	-.0113393	.0170135	0.67	0.000	-.2048372 .2275157
Ln totalsupply	1.134625	.1536927	7.38	0.000	-.818226 3.087476
Ln serviceyrm	-.3385264	.1158352	-2.92	0.001	-1.810352 1.133299
_cons	-3.696128	2.066221	-1.79	0.000	-29.94995 22.55769

Appendices D: Logistic regression output stata output

```

Logistic regression                Number of obs =      294
                                   Wald chi2(7)   =      71.05
                                   Prob > chi2    =      0.0000
Log pseudolikelihood = -49.87202   Pseudo R2     =      0.0225
  
```

satisfactionofemployee	Robust					[95% Conf. Interval]
	Coef.	Std. Err.	z	P> z		
distancefromindustry	-.0929002	.2855188	-0.33	0.000	-.6525068	.4667064
salary	.0010217	.0007488	-1.36	0.000	-.0024893	.0004459
incentive	.3975204	.5622276	-0.71	0.000	-1.499466	.7044255
workingenvironmentsatisfaction	.2292006	.1855914	-1.23	0.001	-.592953	.1345518
managerialmotivations	.2898244	.1292298	2.24	0.000	.0365386	.5431101
Relarionbetweenteamspirits	.0687709	.1675764	0.41	0.000	-.2596728	.3972146
Relationbetweenmanagers	.1855403	.1568927	1.18	0.002	-.1219637	.4930443
_cons	1.056639	1.080208	0.98	0.000	-1.060529	3.173807

Appendices E: Industrial office data

industries	Id	supply of cherry in kg	(output)processed	cherry	ratio of cherry supply of dry coffee	(output)processed dry coffee	ratio of dry coffee total	supply total processed(output) of coffee in kg	total output	in tone	capacity of machine processing per hour	service	year	
of machine	total labor input(hr)	wage	productivity(output/iinput)											
ind 01	853530	142255	6:01	3412	710.83	4.8:1	856942	142965.83	142.96583	1436	16	13788	30	10.3688592
ind 02	841412	107873.33	7.8:1	1430	332.55	4.3:1	842842	108205.88	108.20588	1245	24	14080	25	7.6850767
ind03	680120	103048.48	6.6:1	4855	866.96	5.6:1	684975	103915.44	103.91544	1512	19	12008	25	8.65385077
ind04	794713	132452.16	6:01	2186	420.38	5.2:1	796899	132872.54	132.87254	1269	17	15237	30	8.72038722
ind05	642126	100332.18	6.4:1	1681	336.2	5:01	643807	100668.38	100.66838	1023	29	11556	30	8.71135168
ind06	655321	100332.18	6.7:1	4652	1057.3	4.4:1	659973	98866.37	98.86637	1324	27	11097	30	8.9092881
ind07	712486	100332.18	6.2:1	7854	2181.7	3.6:1	720340	117098.75	117.09875	983	32	12680	27	9.23491719
in 08	542567	100332.18	6:01	8489	2070.5	4.1:1	551056	92498.31	92.49831	955	36	11464	25	8.0685895

ind09	684354	100332.18	6.9:1	6412	1943	3.3:1	
	690766	101124.76	101.12476	1511	31	13545	22
	7.46583684						
ind10	788652	100332.18	6.3:1	7562	1608.9	4.7:1	
	796214	126791.78	126.79178	1466	39	14301	28
	8.86593805						

Appendices E: focus group and interview questionnaire

1. How much is yours old? _____
2. What is your education level? _____
3. When this industry is planted? _____
4. How many kilometer distances between you home and industry? _____
5. How nay years have you worked in this industry? _____
6. How many hours do you worked in industry per day? _____
7. How many wage is paid per day for you? _____
8. Have got incentive on work? _____ if not why

9. How many times have got on job training? _____
10. How do you feel by working in this industry?

11. How do you evaluate your working environment?

12. How many times have you got support from supervisors?

13. How about the relation between your team spirit?

14. How about the relation between your managers?

15. What are the main problems of this industry?

16.
