ST. MARY'S UNIVERSITY

SCHOOL OF GRADUATE STUDIES

DETREMINANTS OF WOMEN LABOR PRODUCTIVITY IN FLORA-CULTURE INDUSTRY: THE CASE OF SEBETA AREA, ETHIOPIA

BY

ASFAW GETACHEW JEBESSA

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A THESIS SUBMITTED TO ST. MARY'SUNIVERSITY SCHOOL OF GRADUATE STUDIESIN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF SCIENCE IN AGRICULTURAL ECONOMICS

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As member of board of examiners of the MSC thesis open defense we certify   that we have read and evaluated the thesis prepared by Asfaw Getachew Jebessa, we recommended that the thesis be accepted since it fulfills the thesis requirement for the degree of Master of Science in Agricultural economics.

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This thesis has been submitted to Saint Mary's University, School of Graduate Studies for examination with my approval as a university advisor.

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DEDICATION

I dedicate this thesis to my adored parents, especially for my brother, Teshome Getachew Jebessa who sacrificed his life while following my steps in struggle for democratic practice and respect of basic human rights and the rule of law to Ethiopia and who tending me with affection, respect and love in all steps of my life.

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ACRONYMS

EHP   Environmental Health Perspectives

ILO   International Labor Organization

MoTI   Ministry of Trade and Industry

WID   Women in Development

WAD   Women and Development

MGE   Mainstream Gender Equality

NGO   Non- governmental Organization

EHPEA   Ethiopian Horticulture Producers and Exporters Association

DBE   Development Bank of Ethiopia

EHSC   EthioHorti share Company

ENHP   Ethiopia Netherlands Horticulture Partnership

EHDA   Ethiopian Horticulture Development Agency

EIA   Ethiopian Investment Agency

FFP   Flower Fair Plants

UNCTAD United Nation Conference on Trade and Development

ITC   International Trade Center

ABSTRACT

Over the past few decades, relocation of global flower production from traditional hubs in Western Europe and North America towards developing countries has become recurrent in the global flower industry.The floriculture industry currently employs about 190,000 people throughout the developing world and every year, about 30 billion dollar is generated from the International flower industry. In line with this trend, Ethiopia has emerged as one of the hot destination for flower production. Ethiopian floriculture industry was started in the early 1990's. It created job opportunity for about 25,000 workers .Among these more than 65% of the works are women.The overall objective of this study is to analyze the determinants of women labor productivity in flora-culture industry in Ethiopia Sebeta area. In this research Cross-sectional survey data was conducted with 170 household's workers using two stage simple random sampling techniques. The researcher used both Primary and secondary data. Descriptive statistics and econometric model were applied for analyzing quantitative data. Cobb-douglas frontier model were employed to analyze determinants of women productivity on flower farm industry. From 15 hypothesized variables, eight variables (Age, Marital, Technology, income, additional income, distance, and training) are identified as statistically significant at 5% level of significant. This research work identify the most relevant factors that improve the productivity of women labors in floriculture industry that any government and non-governmental stake holders can make use of this determinants to enhance production and productivity of women employees in flora culture industries.

CHAPTER ONE

INTRODUCTION

1.1. Background

Floriculture can be defined as "a discipline of horticulture concerned with the cultivation of flowering and ornamental plants for gardens and for floristry, comprising the floral industry." It can also be defined as "the segment of horticulture concerned with commercial production, marketing, and sale of bedding plants, cut flowers, potted flowering plants, foliage plants, flower arrangements, and noncommercial home gardening" (Getu, 2009, as cited in Gudeta, 2012).

The flower industry is currently expanding all over the world. According to Environmental Health Perspectives (EHP.org (2002) The floriculture industry currently employs about 190,000 people throughout the developing world and every year, about 30 billion dollar is generated from the International flower industry

The Ethiopian floriculture industry was started in the early 1990's. It created job opportunity for about 25,000 workers and when the total licensed floriculture development projects between July 1992 and July 2006 become operational, the total number of employees is expected to be 72,000. Eighty-three of the proposed flower farms are at the pre-implementation stage, 23% at implementation stage while 17% are reported to be operational. Fifty farms are fully operational and over 30 are fully engaged in export of products to European markets. At the beginning of March 2005, it was reported that 176.1 ha of land was covered with greenhouses (ILO, 2006).

The floriculture industry is one of the newest and fastest growing sectors in the Ethiopian economy and has given the country's export sector an alternative export commodity to the traditional predominant export of coffee. Floriculture has shown dramatic expansion since the turn of the new millennium. In 2002, there were only five floriculture farms in the nation. However, by 2008, this number had risen to more than a hundred, according to the report of the Ethiopian Horticulture Producers and Exporters Association. The same source also reported that the export earning of merely 1.5 million US dollars in 2002 had risen to 125 million US dollars by 2008. Furthermore, the flower farm sector, alone, was a source

of employment for more than 139,000 citizens (Tewodros, 2010; Chala, 2010). This newly flourishing industry has created a new hope of income generation for the majority of young females in the country, who have been largely ignored by the system for a long time (Tewodros, 2010).

According to the report of the Export Promotion Department of Ministry of Trade and Industry (MoTI), flower export has generated 42.5 million USD. The export volume has increased from 1.6 million stems in 1999/2000 to 32 million stem in 2003/04. In value terms, the increase was from 382,346 USD in 1999/2000, to 2.9 million USD in2002/2003, to 5.1 million USD in 2003/04 and 21.9 million USD in 2005/2006 (ILO, 2006).

There are no known studies that have been done to determine the productivity of women in flora culture development in Sebeta area. Thus, this study was carried out to establish the labor productivity of women in flower farms and factors affecting the productivity of women labour in flower farmers. Results from this study were used to establish the productivity of women labour in flora- culture development in Sebeta area.

1.2. Statement of the Problem

It is generally true that new industry sectors provide valuable input into a nation's economic progress, as they enable revenue to be generated and create new employment opportunities for citizens. In the context of this study, the non-traditional horticultural sector has had a tremendously positive impact on allocating jobs – particularly for women, who had not been benefiting from the country's previous economic activities. This is believed to have affected women's socio-economic status in their communities.

However, in reality, the determinants of women's productivity in socio-economic spheres have not been well-researched. Rather, published and unpublished studies have focused on the physical effects on women working at the flower farms. Moreover, it is very difficult to assess the effect women labor productivity in this newly emerged sector, which is a combination of both foreign direct investment and domestic investment, without a critical assessment of its ground level socio-economic impact, modification and planning for better usage.

According Mena (2005) to Female flower farm workers are burdened with heavy workloads that affect their physical and mental health condition. They have to try to keep

their jobs by showing that they are equally competent as men. Therefore, a woman will choose to work even in worsened conditions than to leave her job that may affect the life of her families too.

This paper attempts to examine the determinant factors that affect women labor productivity of women workers and analysis of flower farms inSebeta area.

1.3. Significance of the Study

The study on determinantsofwomen labor productivity in floriculture in Sebeta, Ethiopia provides some new empirical evidences that may help us to understand factors andconditions under which women labor productivity influenced in Ethiopian floriculture industries. The findings of this research may provide an immense contribution to our understanding on factors affecting women labor productivity and socio-economic impact of the flower farm industry as a whole and its contribution to flora Culture Company, stimulation for local market situation and contribution towards the entire national economic growth aswell.   Prior research in this area has focused on the environmental, physical and labor rights effects of the work condition on the women. However, as far as the researcher's knowledge is concerned, no researcher has attempted to look at to find out determinants of women labor productivity   at least in the context of this particular study area. Therefore, this studyis significant and attempted to address in identifying factors that affect women productivity and there by productivity increased and at the same time women will be benefited as an income increased as their productivityenhanced.

1.4. Research Hypothesis

Null Hypothesis (Ho): There are factors that determine women labor productivity in flora-culture industries.

Alternative Hypothesis (H1): There is nofactors that determine for women Labor productivity   in flora-culture industry.

1.5. Research Questions

Presuming that there are factors affecting women labor productivity in the flower industry, four key questions, expected to be answered while conducting this study, these are

1. What are the determinants of labor productivity?

2. How do we measure or evaluate these determinant factors?

3. How did these determinant factors affectwomen's socio- economic life improvement?

4. How dowe assess the contribution of these factors for the development of the entire industry as well as the national economic growth (GDP).

1.6. Objectives of the Study

1.6.1 General objective

The major objective of this study is toidentify the determinant factors that affect women labor productivity in flora culture industries in Ethiopia

1.6.2. Specific objectives of the study are:

- To address factors contributing .for the improvement of women socio-economic status in their communities as well as in their house hold situation.
- To determine   the contribution of women labor productivity factors towards women strategic and productive gender needs.

1.7. Scope of the Study

This study will contribute to the understanding of determinate factors women labor productivity in flora-culture industry.. This study will focus on women labor productivity in flower sector with particular reference to flora-culture projects and women employees in flora-culture industries in Sebeta area. It assess to find the determinant factors of women labor productivity in flora-culture industry, specific to Sebeta area in Ethiopia and to identify problems encountered in the sector with regard to labor productivity and to draw recommendation for this specific economic sector and particular flower production area in Sebeta .

1.8. Organization of the Study

This thesis is divided into five chapters. Chapter one constitutes background and rationale, statement of the problem, research questions, objectives, research methodology, scope, significance, and limitations of the study. The second chapter presents literature review that provides theoretical and empirical framework to the research. The Third chapter constitutes the discussion of the methodology used in the research. The fourth chapter is the main body of the research that comprises data analysis, interpretation and findings. Finally, the fifth chapter presents conclusion and recommendations.

CHAPTER TWO

LITERATURE REVIEW

2.1. Theoretical Literature

2.1.1 World Cut-flower Industry

People all over the world realize that flowers enhance the quality of life and influence human feelings more than words or other gifts. Globalization, cultural exchanges, and celebrations enhancing fraternity such as New Year, Valentine's Day, Memorial Day, Mothers' Day, Fathers' Day, Christmas, and weddings have induced people globally to use flowers as a means of sharing their feelings. Above all, these celebrations have acquired one-to-one pairing with flowers in some cases, e.g. roses to Valentine's Day and carnations to Mother's Day. Increased use of flowers and ornamental plants makes marketing of flowers a lucrative business (Belwal and Chala, 2008).

According to Hamrick (2004), the Netherlands is the world's largest producer of cut flowers and foliage valued at USD 3.6 billion, followed by Germany and Italy. In addition, The Netherlands plays a major role in setting the global standard for daily prices through its computerized clock auction system and acts as the logistical distribution center for Europe. South American countries Colombia and Ecuador as well as Israel, are the major producers of carnations and roses. An increasing investment has also been witnessed in Kenya and other African countries.

The share of the developing countries in the total trade has consistently been around 20 percent during the last five years. There has been a growth in the number of producing countries particularly among the developing nations in Asia, Africa and Latin America (http://www.fao.org). In the African continent, Kenya leads cut flower exports, expanding annually at 10 to 15 percent per year, followed by Zimbabwe. Flowers are becoming the driving force in the growth of Kenyan agricultural exports (Hamrick 2004). According to Hamrick (2004) export of roses (comprising 75 percent of flower export by weight) from Kenya was up by 19 percent in 2003 to The Netherlands auction market and increased the competition. Existing farms are being expanded and newer ones are being created in countries such as Tanzania, Uganda, Ethiopia, Malawi, Zambia, and Namibia. However,

established flower producers have found investing in more than one African country helps spread the risks.

According to Belwal and Chala (2008) some countries are both producer as well as consumers. In Israel, Africa and South and Central American countries, cut flowers have been a product produced mainly for export with no thought of a potential domestic market. On the other hand, in Asia, whereas cut flowers were initially produced for export, the market potential has rapidly changed to include opportunities for supplying to the local market as well. This unique development is on account of the rapid strengthening of economies in the region, high population densities, and the changing consumer's perception towards importance of flowers in their lifestyle (http://www.fao.org). If we take the case of Ethiopia, it is only recently that the mere concept of flowers as a gift emerged. Thus, the domestic market is not yet mature. Notwithstanding, Ethiopia has attracted several foreign investors in recent years, for exporting cut flowers mainly to European markets.

2.1.2. Ethiopian Floriculture Industry

In recent decades, the global demand for cut flowers has grown considerably. This growth in market demands and its diversification value has attracted increasing numbers of developing countries to the global fresh flower trade. These reasons seem to make Ethiopia come in to the picture of this business. But some people say that Ethiopia gives attention for this sector because the European production cost skyrocketed. European cut flower growers (especially Netherlands) have been looking to other continuities for more affordable conditions as experienced other East African countries like Kenya, Tanzania and Uganda (Laws, 2006).

Though floriculture development in Ethiopia blooming in recent years, it started for commercial purpose in 1980/81 which is now twenty six years ago. The first fresh cut flowers production was commenced in 1981 /82. The *Derge*regime had established Horticulture development corporations where government was responsible both for regulation and production even for marketing of horticultural products including flowers. During that time the production and export of cut flowers in Ethiopia was not established

with well-plannedand aiming of profit seeking but foreign exchange earnings (Ethiopian Horticultural Strategy, 2007).

As a result of this, the industry was one of the highly subsidized sub-sectors during the *Derge*regime (Habte, 2001). Floriculture was started to show modest increase in 1990s by 2-3 % from the agricultural output of the country. In 2001 it contributed $ 4.7 million to the country's foreign currency earnings. But it was not as such significant enough to say it was important sector to develop the country's economy. In five years the total export earnings increased at least five times that figure. (Ethiopian Horticultural Strategy, 2007).

2.1.3. Women Labor Productivity

At the individual-level, women's labor allocation is primarily determined by the opportunity cost of working relative to earnings in productive employment, "unearned" income, preferences for different types of employment (which may be dictated by cultural norms and religious beliefs3), as well as other household members' characteristics and labor allocation. The opportunity cost of working is inter alia determined by the presence of children in the household and returns to working, which in turn depend on women's human capital and the income-earnings opportunities available to them. Literature from developed countries furthermore suggests that entrepreneurship is often inter generationally transmitted; children of entrepreneurs are significantly more likely to become entrepreneurs themselves (Parker, 2008, 2009).

Studies of gender differences in entrepreneurship in developing countries are scarce. Existing studies are predominantly based on the World Bank's Enterprise Surveys and typically find that female entrepreneurship is inversely correlated with firm size;firms run by female entrepreneurs are smaller in terms of employees, sales and capital stock. However, gender differences in total factor productivity, profitability and capital-intensity become insignificant once firm characteristics are controlled for (Bardasi and Sabbarwal, 2009), except for the very smallest firms (Bruhm, 2009).5 Thus, gender differences manifest themselves primarily in terms of scale, rather than differences in profitability, technology or capital intensity. However, Hallward- Driemeier and Aterido (2009) point out that it matters how a female firm is defined; using definitions based on decision making authority, rather than (partial) participation in ownership as is done in the studies cited

above, results in substantial gender differences, even after firm and manager characteristics have been controlled for.

2.1.4 The WID, WAD and GAD Approach on Gender Development

Over the years development programs have been criticized for ignoring gender roles and the impact it has on women in the global south. However we see a shift to integrate women into development programs in hopes of eradicating poverty and low social economic status. The six main theoretical approaches are: "(1) the welfare approach; (2) women in development (WID); (3) women and development (WAD); (4) gender and development (GAD); (5) the effectiveness approach (EA); and (6) mainstream gender equality (MGE). Martinez tries to understand the various outcomes and effectiveness of all 6 development theories.

Despite the effort to reinforce gender mainstreaming into society we still see a vast number of gender inequality especially in the developing world. Women make up the 70% of individuals living in poverty and in sub-Saharan Africa 57% of HIV infected individuals are women. This also includes the disproportionate ratio of women to men in the job market and at leadership position, low level of education among women, and low socio-economic status among women.

The term "Women, Gender and Development" could be seen a discipline much like ever other area of knowledge. However, what sets it apart from various disciplines is that, its major contributors are individuals that raise issues and concerns, concerning women, gender and development. These are academics, feminist activists and development practitioner.

In 1972 Ann Oakley, was able to distinguish the difference between sex and gender. Gender refers to one's sexuality based on masculinity and femininity and sex refers to the biological features of one physiology. With the rise and popularity of the term gender, came with its misusage of its actual meaning. For example, as Most development agencies and NGO's supported its terminology, however they used it as a reference point when talking about mainly women issues. Today the term gender has become more popularized, that it is usually linked to a wide range of sectors like politics, economics, environment and health.

Social assistance or the "welfare approach" originated back 1950s to the 1970s during the era of decolonization and political transitioning in most African and Asian countries. The welfare approach was a response to most of the newly independent countries outcomes of inequalities among the local elites and the common man in each nation.

Most international development agencies applied a very western approach towards helping these nations develop. Some of these theories where the modernization theory, and the Malthusian theory (Population vs. Resources). These brought about a negative impact and outcome towards most developing nations development and it also help to further impede on its progress.

Women in development (WID) approach, was originated as a result of three major feminist moments/waves concerning feminine conditions. The first two were due to the feminist waves. The first wave also known as women's suffrage movement, originated in the North America back in the late 19th century, when women fought for the equal right to vote and participate in politics. The second-wave of feminism sought to deal with the remaining social and cultural inequalities women were faced with in everyday affair i.e. sexual violence, reproductive rights, sexual discrimination and glass ceilings. The second wave was very controversial however the women's movement was very influential that the UN organized the first global conference on women back in 1975 at Mexico. The conference sought to address nations role on fighting gender inequalities and support women's right. The third was influenced by Ester Boserup (1970) publication on "Women's Role in Economic Development". "The book sent a shock wave through northern development agencies and humanitarian organization" (pg 93). She states and gave empirical results of how increasingly specialized division of labor associated with development undermines or neglects the value of women's work and status especially in the developing world. As it explains why women were being deprived an equal share among men in social benefits and economic gains. Boserup book had an influence on making women more visible in development approach and as a specific category when addressing women in development. In 1973, the US congress implemented a bill, which required the USAID to include women in development programs. The WID approach helped to ensure, the integration of women into the workforce and increase their level of productivity in order to improve their lives.

However some have criticized this approach as being very western. Since it is a perception of the global south from global north perspective, as it fails to acknowledge the collective and cultural concerns of women in the developing world. It approach has been tagged as being rather cumbersome on women, as it fails to understand the dynamics of the private sphere but focus solely on the public sphere.

The women and development (WAD) approach originated back in 1975 in Mexico city, as it sort to discuss women's issues from a neo-Marxist and dependency theory perspective. Its focus was to "explain the relationship between women and the process of capitalist development in terms of material conditions that contribute to their exploitation" (pg 95). WAD is often misinterpreted as WID, however what sets it apart is that, WAD focuses specifically on the relation between patriarchy and capitalism. The WAD perspective states that women have always participated and contributed towards economic development, regardless of the public or private spheres.

In the 1980s, the gender and development approach originated by socialist feminism. It served as a transitioning point in the way in which feminist have understood development. It served as a comprehensive overview of the social, economic and political realities of development. It origin relates back to the Development Alternatives with Women for a New Era (DAWN) network, when it was first initiated in India. The DAWN program was then officially recognized in 1986 during the 3rd UN conference on women in Nairobi. The conference brought about activist, researcher and development practitioners globally. As the conference discussed about the achievements made from the previous decade's evaluation of promoting equality among the sexes, and a full scope of the obstacles limiting women's advancements, especially in the developing world. The forum discussed about the effectiveness of the continuous debt crisis and structural adjustment program implemented by the IMF and the World Bank, and how such concept of neo-liberalism tend to marginalize and discriminate women more in the developing countries. The diversity of this approach was open to the experiences and need of women in the developing world. Its two main goals were to prove that the unequal relationship between the sexes hinders development and female participation. The second, it sort to change the structure of power into a long-term goal whereby all decision-making and benefits of development are distributed on equal basis of gender neutrality. The GAD approach is not just focused on

the biological inequalities among sexes: men and women, however on how social roles, reproductive roles and economic roles are linked to Gender inequalities of: masculinity and femininity.

The Effectiveness Approach (EA) originated in the 1980s. Its ideas are linked to the concept surrounding WID, which was the inequalities women faced and how societies fail to acknowledge the impact of women in economic development. However EA sort to not just include women into development projects but also reinforce their level of productivity and effectiveness in the labor market. So this required the development of infrastructure and equipment that aided to increase women's earnings and productivity (especially women in the rural areas).

Mainstreaming Gender Equality (MGE) approach also commonly referred to, as gender mainstreaming is the most recent development approach aimed on women. Gender mainstreaming ensures that all gender issues are address and integrated in all levels of society, politics, and programs. It originated in 1995 at the 4th UN conference on women in Beijing, China. At the forum, 189 state representatives agreed that the inclusion of both women and men in every development project was the only way to succeed and progress in a nation economic growth and development. The WID approach had been drop by various aid agencies like CIDA, due to it negative interpretation from supporters as being too feminist and brought about hostility from men towards such programs. So basically organization like CIDA now has to include men and women in their annual development report concerning the allocation of fund's spent towards education, health care, and employment of both sexes.

2.1.5. Women in development (WID): the Anti-poverty Approach

The concept of 'women in development' (WID) traces its origin to the influential work of the Danish Economist Esther Boserup, titled *Women's Role in Economic Development* (1970). The term was first used by a Washington-based network of female development professionals, who criticized the development theories of the time on the basis of Boserup's findings and their own experience (Tasli, 2007).

Considering the existing function of the economy, Boserup concluded that economic development negatively affects women's status and situation in terms of the sexual division

of labor (Tasli, 2007). Boserup's work, showing the regressive impact of development on women, provoked the advocacy of liberal feminists for the active involvement of women in the economic production process (Visvanathan et al., 1997). Boserup also tried to include Third World women in economic development discourse for the first time, showing that women's involvement in the agricultural sector had resulted in a positive outcome on production and women's increased status in their relations with male counterparts (Tilsaa, 2007; Razavi& Miller, 1995).

2.1.6. Economic Globalization and Women Employment

As already stated, the relocation of export-oriented factories and manufacturing firms from the developed to least developed nations has resulted in the creation of gendered employment opportunities. The main target of such export-oriented firms has been young women in the Third World. The single significant and visible motivating factor behind this trend has been the cheap labor of women, relative to their male counterparts (Nison off, 1997). Economic transformation has resulted because globalization factors have led to the 'feminization of the labor force,' wherein women workers have become actively involved in the global economy through paid work in different corners of the world (Kabeer,). According to Kabeer, the feminization of labor can be understood from two points of view:

- A change in the percentage of women working who are either economically active or seeking a job. In other words, it means the upwards scaling up of female labor participation.

- A change in women's economic participation rate, as compared to men. In other words, the percentage share of women workers, compared to total women.

Similarly, the cut flower industry, also known as the non-traditional agricultural sector, is a sector with a high proportion of female labor. Flower farming is often compared with child nurturing. As a result, women are considered the best choice for flower farm work, particularly for tasks in the greenhouses. More than 75% of the total labor force in the Ethiopian flower farm industry is female (Tewodros, 2010).

2.2. Empirical Studies

The majority of cut flowers are produced in countries with dedicated infrastructure having facilities for airlifting to major distribution centers. The Asia/Pacific region leads in flower

production with a total production area of 244,263 hectares followed by Europe (54,815), Central/South America (45,980), North America (26,135), Africa (5,697) and the Middle East (3,845). The AIPH report estimates a global area of 360,000 hectares dedicated to world flower and plant production involving USD 60 billion in value terms and 100,000 companies (Belwal and Chala, 2008). According to Belwal and Chala (2008) in 2001, the UN International Trade Centre estimated the global area of 200,000 hectares dedicated to cut flowers commanding value of USD 27 billion. In terms of total area of production, Asia and the Pacific cover nearly 60 percent of the total world area. The key markets for flower are Western Europe, North America and Japan. The EU is the world's leading importer of flowers. The other largest importers are Germany, the USA, the UK, France, The Netherlands and Switzerland accounting for nearly 80 percent of global imports.

2.2.1. Empirical Studies Conducted in Ethiopia

Floriculture in Ethiopia

The Ethiopian Floriculture is showing a rapid growth in the recent years. The industry grows mainly roses. According to ILO (2006), the floriculture industry is being one of the investment sectors that are growing rapidly. The industry has started in the early nineties. Until June 2006, the total number of licensed projects was over 235 with an aggregate capital of 7.5 billion Birr out of which 171 floriculture projects with an aggregate capital of 5.3 billion Birr are owned by foreign investors and 64 projects with an aggregate capital of 2 billion Birr are owned by local investors.

Ethiopia exports most of its flower products since there is little domestic need. The Export Promotion Department of Ministry of Trade and Industry, (MoTI) reported that in the past four years Ethiopia has generated 42.5 million USD from flower export. The export volume has increased from 1.6 million stems in 1999/2000 to 32 million stem in 2003/2004. In value terms, the increase was from 382,346 USD in 1999/2000, to 2.9 million USD in 2002/2003, to 5.1 million USD in 2003/04 and 21.9 million USD in 2005/2006. Major export destinations have increased from two in1996 to ten destinations by 2003/2004, mainly in EU and the Middle East, and also Djibouti (ILO, 2006).

The Ministry of Trade and Industry indicated that the floriculture industry has created employment opportunity for more than 25,000 people and is experiencing annual flower

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production increment rate of 4.8. Up to June 2006, the land covered by greenhouse is about 519 ha, with over 35 farms exporting their products to different countries, mainly to the Netherlands. Flower farms are expanding in Oromia regions particularly in Holleta, Menagesha, Awash, Melkasa, Adama, Sebeta and Zeway. There is also a move to expand flower production to the South and other areas (WondimuGeda 2006).

Government of Ethiopia formulated a comprehensive development strategy for the period 2005/06 – 2009/10 called 'Plan for Accelerated and Sustained Development to End Poverty' (PASDEP) to attain the Millennium Development Goals (MDGs) by 2015. Under this PASDEP it set program target an intensification of the recently initiated flower production in areas with altitude between 1,600 – 2,600 meters above sea-level. Accordingly out of the total of 2,031 ha of land leased to investors, the land covered by greenhouses is expected to reach 1,600 ha; an additional 400 ha of land will be put under green house shelter. The area under flower production (roses, cuttings, summer flowers) would thus increase from 519 ha in 2005/06 to 2,000 ha in 2009/10. In terms of employment generation the policy objectives is to increase the number of employees from well over 21,000 in 2005 (64.4% female workers) to a total of 70,000 in 2009/10 (Ethiopian Horticultural Strategy, 2007).

The fact of the matter is that Ethiopia is still in the beginning stages of floriculture industry and there are a number of challenges that must be resolved to continue the development of the sector with the present rapid speed. Among the challenges include social and environmental impacts of the sector which can create pressure on the sustainability and market acceptability of flower industries.

According to recommendation given on the "Development strategy for the export-oriented horticulture in Ethiopia" based on the stakeholders discussions at the workshop on February 9th, 2007, Ethiopia needs development of a conducive legislative framework and pesticide registration system which is felt under responsibility of Government especially Ministry of Trade and Industry and Ministry of Agriculture and Rural Development as well as development of a Code of Conduct at sectoral level to demonstrate compliance with general standards (environment, workers' welfare, etc) with responsibilities of Ethiopian Horticultural Producers and Exporters Association (Ethiopian Horticultural Strategy, 2007).

Indeed, the nascent floriculture industries benefited the economy of developing nations. Today, nearly one-third of cut-flower trade on the world market originates in the developing nations where flower production started only 35 years ago. From 20.8 % in 1990 the market share increased according to the international trade Centre of United Nation Conference on Trade and Development (UNCTAD) to an estimated 28.4% in 1995.

Although at a lower level, this tendency is continuing. In 1999 the percentage of the South of worldwide export of cut-flower had exceeded 30%. Generally, developing countries' share in world exports has been risen an average annual growth rate of 7 percent (ITC, 2001) and they have increased their income with an average growth rate of 32 percent per year (PANUPS, 2002).

 If one takes into account that the majority of the products from the third world are roses and carnations; in these segments the percentage of the developing nations especially in winter times is much higher. According to international trade center in the US and in many European countries from December to April at least every second rose is coming from Africa or Latin America (ITC, 2001).

Some literatures like Frank and Cruzl (2001) see this job opportunity creation with its shortcomings. Even if the floriculture industry which created many jobs during the last 30 years in developing countries, the industry is an element of the international partition of labour with economic advantages for the North, and social and environmental disadvantage for the South , but important gains in the generation of employment.

Bindlish and Evenson (1993) had undertaken studies in Kenya and Burkina Faso using a total of 675 households for Kenya (241 were female) and 2336 households for Burkina Faso (173 were female). The results of these studies indicated that coefficient of gender dummy (1=female headed household; 0=otherwise) in the pooled data was insignificant indicating, in general, male and female farmers are equally efficient as farm managers. In this study, the coefficient of primary education was negative but insignificant.

Udry et al. (1995) examined gender based productivity differences in Burkina Faso using CD production function. The data were drawn from a four-year panel study (1982-1985) of 150 households. They found that output per hectare was lower on plots controlled by women. However, such differences in productivity cannot be taken as indicative of

production inefficiency. The authors noted that the gender yield differential, apparently, is caused by the differences in the intensity of input use on plots controlled by men and women rather than by differences in the efficiency with which these inputs are used. The estimates of the parameters imply that, on average, households could increase output of crops (those crops grown by both men and women) by about 10 percent, by reallocating labour and manure used on men's plots to women's plots (Udry et al., 1995).

Another study conducted by Addis et al. (2000) on gender differentials in agricultural productivity among smallholders in east Shoa using cross sectional data from 180 households in 1996/97 concluded that male headed households had more land, labour, capital particularly livestock and access to formal education compared to female headed households. The gross value of the output was 1.3% higher for the female headed households if the average values of inputs from male headed households were used. This suggests that no significant difference would exist if female headed households had equal access to inputs as male headed households.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1. Description of Study Area

Sebeta town is situated on a fertile area known for natural resources. The area is surrounded by different chain of hills and mountains like Wachacha, Hoche and seasonal marshy plains including Furi-Gara-Bello, GejjaBallachis and Jammo(OUPI, 2008). Sebata is the capital town of SebataAwasWoreda located in Special Central Zone SuroundingFinfinne of Oromia Regional State. It is situated at 24km west of Addis Ababa along Jimma road. Sebata town is located within approximate geographical coordinates of 8 0 53'58.50''N_80 59'58.17''N latitude and 380 35'11.91E_380 39'33.75E longitude.

With regard to relative location, it shares common boundaries with Addis Ababa in North, North east and east, Burayu town in the north, and rural villages of SebataAwas district to the south and west (ibid). The total area that is covered by the current topographic map of the town is estimated to be 7.41 sq Km (CSA, 2010). The town has five Kebeles which includes Sebeta (01), Alemgena(02), Walete(03), Furi(04) and Dima(05). The population and housing census of CSA of 2010 estimated the total population of Sebata town to be 61,461. However, the report obtained from Sebata town Finance and Economic Development Office indicate that the total population of the town and rural village administrated under municipality is 114,674 (FEDO, 2011).

3.2 Historical background of Sebate Town The present Sebata town encompasses three major neighborhood entities; Sebeta 01, Alemgena, and Walate that were previously developed as separate centers, even though Alamgena and Walate did not have municipality of their own. However, they are highly interconnected through socio-economic activities and administrative structure (OUPI, 2008). 29 Therefore, since the town encompasses three centers that developed separately, understanding of the towns' history requires looking each of them separately. Sebata 01 emerged as a town before invasion of Italian in 1935. Its foundation can be traced back to Menelik period. Menelik II attracted by the areas fertility, cool and attractive climate when he took rest while returning back from the Walaita campaign in 1894. Hence, he made a temporary encampment at the place called 'Qarsa Ana' and finally obtained a plot of land from local leader.

On the other hand, an established a Liquor factory around Sebata area by Turksh people paved the way and the base for emerge Sebata town (ibid). The construction of a palace around 1942 was also another event which marked the development of the area into the town. For the construction of this palace Haile Sillassie dislocated local people called 'WaraFatu'. Meanwhile the palace become transformed to Nunnery (SebataGetsemanyBetedengelTebabat) in 1960 by EtegeMenenAsfew, the wife of Emperior H/Sillassie for this service. Sebeta got municipal status in 1953/4. It was after that period that the town began to serve as a seat of Alemgena district. Prior to that period the seat of Alemgena district was Alemgenatown(OUPI, 2008).

Alamgena also emerged as a separate settlement just before the Italian occupation. During Italian occupation (1936-41), Alamgena took more urban character as a result of occupying Italian force in the area and hosted as a truck repair shop. This became a base for the Imperial Road Authority Trainning Center which was established in 1956. Hence, this village town has been chosen as a district seat even after the time of liberation until Sebata took this position at the end of 1950th .

Walate was a rural peasant settlement area with small scale commercial transactions all through the 1950s, 1960s and 1970s as the area is very close to Addis Ababa and nearby the main road from Jimma to the capital (OUPI, 2008). It was under the administration of ManageshaAwraja, Alemgana district.

The development of settlement gradually made the area a centre of the villages called Karabu, Qorke and Raphi. During the revolutionary period it began to take a suburban character and intensive settlements took place. Since in 1990s, Walate has characterized as a full-fledged urban area that is part of Sebata town (ibid). 3.3 Factors contributes for the towns' Expansion 3.3.1 Demographic factors 30 Growth of urban population is determined by several factors which includes increasing tendency towards natural demographic growth of urban population, the migratory movements from more or less remote areas towards the cities, the development of small rural towns into the status of urban centers and finally the absorption of rural settlement on the edge of growing towns (WORLD HABITAT, 1996).

Natural increase due to the combination of increased fertility and decreased mortality is probably the greatest numeric to urban growth. Hence, global life expectance during the

last 50 years increases from 46 to 66 reflects a major reduction in infant mortality and extension of the normal life span. However, in cities where more female are educated and enter the work force the fertility rate is decreasing which balance this figure. On the other hand, migration motivated by perceived economic opportunities, economic or climatic problems in country side, political program of resettlement, and perceived excitement of city life has been the key sources of urban growth. In addition, reclassification of land from rural to urban is also a real process of urbanization. Many cities are rapidly growing at their fringes, engulfing former villages and farm lands, transforming them into dense, industrial areas, shanty towns or less-dense suburban developments (PERNC, 2004).

Urbanization and urban growth in Ethiopia was dominated by primate city development. It is a situation where the capital city dominates other centers in terms of population size and attracting people for various reasons. For instance, in1994 Population and Housing Census indicate that Addis Ababa has 28.4 percent of the national urban population and is twelve times larger than the second largest city, Dire Dawa (Feyere, 2005). Although Addis Ababa is still the primate city, its functional primacy is diminishing in recent years.

Addis Ababa's relative decline in primacy could be attributed to the emergence of regional capitals as competitors (Teller and Assefa, 2012). For instance in 2007 Population and Housing Census, Addis Ababa takes a share of 22.9 of total urban population of the country and is eight times larger than the second largest city, Dire Dawa. On the other hand, many small towns are registering faster growth rates than medium-sized towns, and both are witnessing a much faster increase than Addis Ababa (ibid). Particularly those towns located in Oromia Special Zone Surrounding Addis Ababa which includes Burrayu, L/Tafo, Sululta, Dukem, Sebate, Sendefa, Holeta, and Galen are growing tremendously in terms 31 of population and physical size. Hence these eight towns accounted 228,420 population sizes by themselves. Generally, three factors; natural increase, net migration and reclassification contributed for the population increase where net migration takes a lion share (BoFED, 2010).

Table 1 Total urban population projection of OSZSF (2007-02015)

Name	2007	2008	2009	2010	2011	2012	2013	2014	2015
Burayu	63,873	66,526	69,293	72,180	75,191	78,333	81,610	85,030	88,598
L/tafo /Town/	0	0	12,686	13,270	13,880	14,518	15,186	15,885	16,616
Sululta-/town	12,452	13,025	13,624	14,251	14,906	15,592	16,309	17,059	17,844
Dukem Town	6,669	6,976	7,297	7,632	7,983	8,351	8,735	9,137	9,557
Sebeta/T own/	56,131	58,713	61,414	64,239	67,194	70,285	73,518	76,900	80,437
Sendafa/ Town/	10,750	11,245	11,762	12,303	12,869	13,461	14,080	14,728	15,405
Holeta Town	30,823	32,112	33,456	34,859	36,323	37,850	39,444	41,107	42,842
Galaan	-	0	9,260	9,686	10,132	10,598	11,085	11,595	12,128
Total				228,420					

Source: Oromia Bureau of Finance and Economic Development, 2010

Sebata town is one of these towns showing tremendous expansion in terms of population and physical size. The population and housing census conducted by Central Stastical Authority and the report obtained from Sebata town administration office considered here to show the trend of the population size of the town. In 1994 population and housing census, the total population of Sebata town was 14,076(OUPI, 2008) and the 2007 population and housing census indicated that the population size of the town was 56,131. Based on 2007 figure, CSA estimated the population of the town in 2010 is 61,461(CSA, 2010). However, the data from the Sebeta town Finance and Economic development Office indicates that population size of town and rural villages recently administrated under the municipality of town is 114,674. Between 1984 and 1994 the population size of the town was growing on the average by 4.11 percent per annum while during 1994- 2007 the growth rate has increase to 4.8 percent per annum. This rate further increased to 5.6 per annum during 2007/2008 (OUPI, 2008).

Accordingly, on the bases of the current growth, it can be possible to compute the doubling time of the population of the town and compare and contrast with the national overall doubling time. Where, r=annual growth rate, and 70= the constant number through exponential progression Hence, the doubling year of Sebeta town (t) =70/5.6= 12.5 year. This indicates that the population of the town doubles itself in every 12.5 years which is relatively high with the country's figure of doubling time which is 24 years. With regard to migration, there is serious in and out-migration, whereby in-migration outshining out-migration.

This is mainly due to the construction and establishment of new industries and residential houses. Many people came as daily laborers from the surrounding rural areas and others as employees for these newly established businesses and for residence. Nearness to the capital Addis Ababa also facilitated to settle there for business and residence (BoFED, 2010). The report produced by CSA present only inward movements of population while it is necessarily to have both inward and outward movements as it is the balance of these two movements that would show us the influence of migration on population size.

Table 2 : Net Migration of the Sebeta Town

Sex	Non-migrants	Migrants	Total population	Percentage of
				migrant population
Both sexes	27,862	27,566	56,131	49.1
Male	13578	13,578	27,862	48.7
Female	13988	13,988	28,269	49.5

Source: Computed from CSA, 2007 census report

According to the report from 2007 CSA, large number of residence of the town are migrant who either move from the rural areas or nearer Addis Ababa and other towns. Accordingly, as indicated in the above table, out of the total population of the town, migrants accounted almost near to half (49.1 %) and most of them are migrated from urban areas 59.1% (CSA, 2007). This Doubling time(t)= 70/r 33 indicates that the town has various pull factors which includes the fast growing of industrial expansion, development and expansion of

social services, good policy direction over access to land plots, and other factors contributes for exacerbating high migration to the town.

Moreover, push factors of Addis Ababa, mainly high demand and low supply of urban land has resulted increase the magnitude of migration (OUPI, 2008). On the other hand, reclassification where horizontal expansion of the town made encroachment of rural villages into urban settlement contributes in increasing of the population of the town Horizontal expansion of the town during the last few years contributed encroachment rural villages and made to administer under the town municipally. For instance, from 2007 onwards the total population of rural villages that come under the town administration is 37,452.

Table 3 Population of rural villages recently engulfed by the town, 2007 census

Name	Both sex	Male	Female	Household size
Jemo	4,147	2,057	2,090	838
KerabuHarbu	11,677	5,841	5,836	3,001
DimaGuranda	3,265	1,655	1,610	737
Korke	7,939	4,321	3,618	1,962
RogeAtebela	6,448	3,253	3,195	1,450
Daleti	3,976	2,026	1,950	863
Total	**37,452**	**19,153**	**18,299**	**8,851**

Source: Computed from CSA, 200
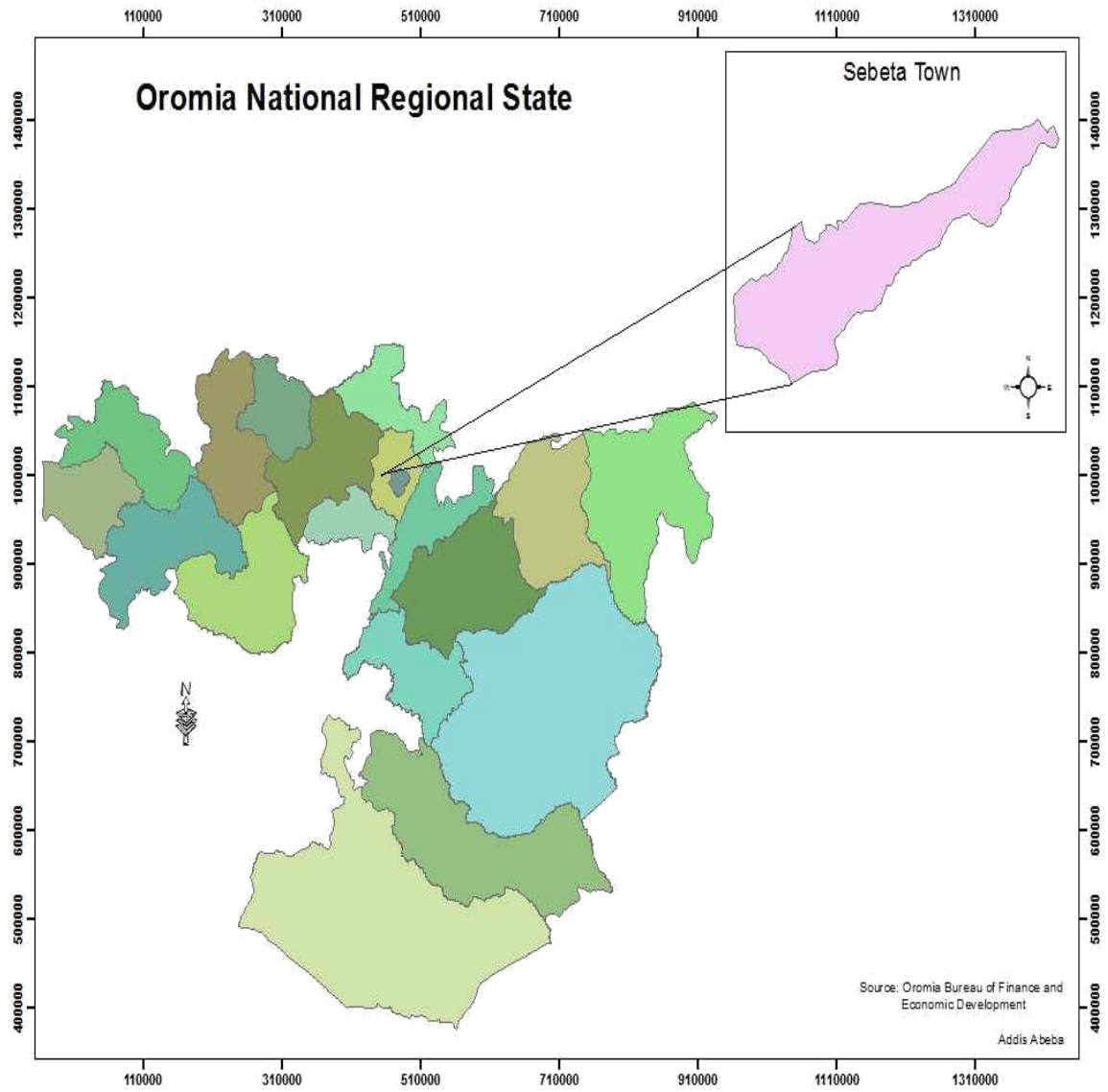
Figure 1 Map of the study area

3.2. Research Design

The design to be used for the study will be a cross sectional descriptive in nature, being designed to find out the labor productivity conditions exercised by floriculture women workers and also to examine the subsequent challenges and risks due to pesticides from a cross section of floriculture farm workers in floriculture industries as per the self- reports to be made by the respondents whom they are supposed to be directly involved in the day to day activities of physical work.

The design will used to answer descriptive research questions during a single contact to be made with the respondents taking a cross-section of the study population which will involve observing and describing of the existing variables. This design is selected on one hand, as it is simple in design where you decide what you want to find out, identify the study population, select sample and contact your respondents to find out the required information.

On the other, as this design involves one contact with the study population, it is comparatively cheap to undertake. However, the biggest disadvantage is that the design cannot measure change, as to measure this it is necessary to have at least two data collection points on the same population (Ranjit, 2005). To have a contact with the study population, the selected four farm officials will be communicated and the researcher will explain its purpose and relevance for the need to contact with the study population. Once permission is given by the officials, the study will be 170 carried out in the floriculture farm compound according to the interview schedule prepared during the time of working hours.

3.3. Sample Size and Sampling Procedure

The research population for this study consisted of female workers in the cut flower industry in Sebeta areas.
There are 9 flower farms in Sebeta Area. Out of Nine flower Farms, seven flower farms are found in sebeta town and the rest two flower farms are found in Sebeta–Awasworeda. The researcher randomly selected four flower farms- three from Sebeta town administrative and one from Awasworeda.

From Awasworeda Eden Rose flower farm were selected and had 171 female workers and from Sebeta town administrative three –Dh. Laftoo Roses, Eth- Highland flower, and Tal flower are selected with their respective female workers of 343,170 and 322 respectively. The total households of these four flower farms were 1006. According to Yemane (1967) the formula to determine and calculate the sample size; at 93% confidence level and precision level of ±7%. The level of precision is the range in which the true value of the population is estimated. The sample size was selected systematically at an interval based on the following formula:

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

Where; n = Sample size
N = the total household heads
e = Level of Precision

Based on the above formula 170 household heads were selected by the researcher. Therefore,

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

$$n = \frac{1006}{1+1006(.07)2} = 170$$

Table 4 . Distribution of Sample

No	Farm's Name	No of female workers	Sample Size	Sampling Technique
1	Eden Rose flower farm	171	29	Proportional
2	Dh. Laftoo Roses	343	57	Proportional
3	Eth- Highland flower	170	28	Proportional
4	Tal flower	322	56	Proportional
Total		1006	170	

Source: own computation and Sebeta town investment office report

3.4. Data Sources and Data Collection Method

The required primary data collected through questionnaires, personal interviews, and observation. To collect the data; a survey instrument (interview schedule) will be developed and translated into Amharic language. A panel of experts will check the questionnaire for face and content validity. Enumerators will be recruited and training will be given to equip them with the necessary interviewing techniques. The questionnaire will be pretested and revised accordingly to evaluate enumerators and to validate the content and method. Finally enumerators will resume collecting data using the survey questionnaire with close supervision of the researcher.

Focus group discussions will also be conducted to collect opinions and qualitative description of the sample households about the research agenda. In addition secondary data will collected from diverse secondary sources including primary flower farm industries, Agricultural Bureau of the region and Sebeta town and Awasworeda investment offices, Customs Office, National Bank of Ethiopia, and IPMS_ILRI. In the collection of secondary information, a well-structured schedule will be used in collecting primary data.

In the process, ten enumerators were used. These individuals will recruit and train on interviewing techniques and the general approach to respondents. Researcher wills closely supervising them during data collection period.

3.4. Data Analysis Method

3.4.1 Descriptive Analysis

Descriptive statistics like mean, variance, standard deviations, frequency distributions, and percentages has been used to assess the socio economic situations of the sample respondents. From the statistical tools, Chi Square test has been used for dummy variables to investigate the difference between the more productive workers and less productive workers.

3.4. 2. Empirical Analysis

3.4.2.1. Cobb-Douglas Production Function

Moreover, CD production function was used to examine the agricultural productivity differences between the female and male headed households. According to Gujarati (1995),the generalized form of the CD production function can be specified as:

$$Y = AX_1^{B1}X_2^{B2} X_3^{B3}\dots\dots\dots\dots\dots\dots\dots X_n^{Bn}e^{ui}\dots\dots\dots\dots\dots(2)$$

Where, Y is gross value of farm outputs in Birr per ha, X_i's are explanatory variables such as land size, livestock holding, education level, fertilizer use, herbicides use, male and female labour; B_i's are coefficients or elasticities of output and indicate how strongly each input affects output; A is efficiency parameter and represents the level/state of technology and i U is disturbance term.

Since the CD production function is a power function, it is impossible to directly use the Ordinary Least Square (OLS) Method. Therefore, logarithmic transformation was made to obtain its linear form and to estimate the parameters. In this study, the natural logarithm was employed.

To examine whether the production functions of male headed (MHH) and female headed households (FHH) are different from each other, Equation (2) was estimated separately for MHH and FHH. Moreover, pooled data set without and with a dummy gender variable was estimated. The respective transformed models are shown as follows:

Production function for MHH:

$$In\ Y_m = In\ A_m\ _{+}B_{1m}\ InX_{1m} + B_{2M}\ InX_{2m} + B_{3m}\ In\ X_{3m}\ ^{+\dots\dots} + B_{7m}\ In\ X_{7m}\ _{+U}{}_m\dots\dots\dots\dots\dots\dots(3)$$

Production function of FHH

$$In\ Yf\ =\ In\ A_f + ^B1_f\ In\ X\ _{If} + B_{2f}\ In\ X_{2f} + B_{3f}\ _{In}\ X_{3f}\ ^{+\dots + B}{}_{7f}\ InX_{7f+}U_f\dots\dots\dots\dots\dots\dots\ (4)$$

Production Function using pooled data:

$$In\ Y_p =\ in\ A_p + B1_p\ in\ X\ _{1p} + B_{2p}\ In\ X\ _{2p}\ + B_{3p}\ InX\ _{3P}\ +\dots + B_{7p}\ InX_{79}\ +U_p\dots\dots\dots\dots\dots\dots(5)$$

Production function using pooled data with dummy gender variable:

$$In\ Y_p =\ In\ A\ _p\ +B_{1p}\ In\ X\ _{1p}\ +B_{2p}\ In\ X\ _{2p}\ +_{3p}\ in\ X\ _{3p}\ +\dots + B_{7p}\ In\ X\ _{7p}\ +DG\ +U_p\dots\dots\dots\dots(6)$$

Where, m =MHH, f =FHH, p =Pooled data set, G=Gender dummy variable (G=1 for MHH; G=0 otherwise) and D is the regression coefficient for the dummy variable and it indicates gender differences in technical efficiency. im B , if B and ip B (i=1, 2, ---,7) are output elasticities of ith input under MHH, FHH and pooled data sets, respectively.

Moreover, MVP of inputs were computed from the coefficients of the regression. MVP of a factor is the additional return from adding one more unit of that factor, holding all other inputs constant. Comparing the MVP of a factor with the prevailing factor cost (opportunity cost) shades some light on the efficiency of resources use. MVP computed at the mean value of inputs may be used to indicate whether disequilibrium in resource use is big or small (Ellis, 1988).

The MVP of the factor can be computed as follows (Ellis, 1988):

$$MVP = B_{1*} \frac{y}{x} \quad \text{...(7)}$$

Where bi is the regression coefficient (output elasticity), Y is the gross value of farm output (geometric mean) and Xi is the geometric mean value for factor i.

Finally, Oaxaca decomposition model of the productivity differential between male and female farmers was used to decompose the productivity difference (Oaxaca, 1973). Although this approach was used to decompose the wage gap, it can also be applied to decompose productivity difference between, say, men and women farmers (Quisumbing, 1995). The decomposition model adopted was presented as follows:

$$Ln\left(\frac{Ym}{yf}\right) = [(B_m - B_{if)} Ln X_{if]} + B_{iM}LNB_{im} Ln\left(\frac{Yim}{yif}\right) \quad \text{...(8)}$$

Where bi is the regression coefficient (output elasticity), Y is the gross value of farm output (geometric mean) and Xi is the geometric mean value for factor i.

Where $_m Y$ and $_f Y$ represent mean output (Geometric mean) of males and females respectively, $_{im}X$ and $_{if} X$ are geometric mean levels of inputs of male and female, $_{im}B$ and $_{if} B$ are estimated output elasticities of male and female headed households as defined earlier.

The model decomposes the overall average male-female output gap into the portion due to differences in the technical efficiency and the portion attributable to differences in input

endowments. In other words, the first bracketed expression on the right hand side is a measure of change in output due to shift in output elasticities of the production functions. The second bracketed term is a measure of difference in output due to difference in volume of input use per hectare.

Estimation Technique and Testing Procedures

The estimation technique employed in this study was OLS. The OLS has very attractive statistical properties that have made it one of the most powerful and popular methods of regression analysis including linearity, unbiasedness and minimum variance (Koutsoyiannis,1997). All the production functions were estimated separately using OLS techniques with the help of Statistical Package for Social Science (SPSS) computer software.

Before estimation of the models, the severity of multicollinearity (the linear relationship) among continuous explanatory variables was checked by computing the Variance Inflation Factor (VIF). VIF shows how the variance of an estimator is inflated by the presence of multicollinearity. Following Gujarati (1995), the VIF_i is given as:

$$VIF_i = \left(\frac{1}{1-R2i} \right) \quad ....(9)$$

Where $R2i$ is the coefficient of determination that is obtained when the continuousexplanatory variable is regressed against all the other explanatory variables. As $R2i$ approaches 1, the VIF approaches infinity. That is, as the existence of collinearityincreases,the variance of the estimator increases and in the limit it can be infinity. If there is nocollinearity between regressors, the value of VIF will be 1. As rule of thumb, if VIF of avariable exceeds 10, that variable is said to be highly collinear (Gujarati, 1995).

In order to test the homogeneity between the parameters of the production functions, the Chow's test was performed. This examines whether the male and female headed household functions differed significantly due to shift in the intercept or/and due to change in the slope of the functions.

The major steps adopted in computing Chow's F-test was as follows: Firstly, estimation of production functions for male and female headed households was made to obtain their residual sum of squares, say, $\Sigma e2\ 1$ and $\Sigma e2\ 2$ with n1-k and n2-k degrees of freedom,

respectively. Where, n1 and n2 are the number of observations in male and female headed households and k is the number of parameters including the constant.

Secondly, the pooled function (Equation 5) was run to obtain residual sum of square, Σe_{2p}, with n_1+n_2-k degree of freedom.
Thirdly, compute F as

$$\Sigma_p^2 e - \Sigma_1^2 e + \Sigma_2^2 e)IK \; _2$$

- . .../...................
.(10)

$$\left(\sum\nolimits_1^2 e + \sum\nolimits_2^2 e\right)/(n1^+2k$$

In the last step, the computed 'F' ratio was compared with the theoretical value of 'F' with k and (n1+n2-2k) degrees of freedom and reject the hypothesis that the separate regression are the same if the calculated F value is greater than the tabulated one (Koutsoyiannis, 1997).

The significance of the calculated Chow's F-statistic implies that there is a shift in the production function between male and female headed. If there is a change in the parameters of the two functions, it can be said that the function has undergone a structural change (Koutsoyiannis, 1997). Structural change may mean that the two intercepts are different or the two slopes are different, or both the intercept and the slopes are different. However, the above test does not tell whether the shift is in scale parameters (intercept term) or slope parameter (elasticity coefficient).

The significance of the coefficient for the gender dummy (D) in Equation (6) implies that there is a shift in the intercept term. If, on the other hand, the coefficient is insignificant, then both production functions have the same intercept term. Again, in order to check whether there is a shift in the slope parameters, the Chow's F-value was computed using residual sum of squares for the pooled production function with a dummy gender (Equation 6) instead of that of Equation (5).

The Chow test does not explicitly show which slope coefficient or intercept term is different from each other in the two production functions, i.e. MHH and FHH. Therefore, in order to check the equality between the coefficients of both the production functions, the

log-linear transform of Equation (2) was estimated with both intercept and slope dummies as follows:

p 1 1p 2 1p 7 7p 8 i 9 i 1p 15 i 7) p lnY=lnC+ClnX +C lnX +.....+.ClnX +CG+C(DlnX)+...+C (DlnX)+U-(

Where Gi is a dummy with a value of one for MHH and zero otherwise; other variables being as defined earlier. If all or some of the coefficients of the slope dummies (C9 to C15) are positive and significant, then the output elasticities of MHH with respect to that particular input is greater than that of FHH, otherwise they are the same.

3.5. Definition and Hypothesis of Variables

The first step in impact analysis is to select appropriate impact indicators. In this study different indicators will be used to assess women labor productivity in flora-culture firm's intervention on their livelihood. Accordingly, these impact indicator variables are discussed below.

3.5.1 Dependent Variable

Productivity: in how many of the labor the productivity increases and also in how many of the labors the productivity no change or insignificant.This is a dummy variable whether a worker is productive or not. It takes a value of 1 if a worker is more productive and 0 otherwise.

3.5.2. Independent (Explanatory Variables)

a.Age of the worker (age): It is continuous variable defined as member's age at the time of interview measured in years. So we expect this variable to have a positive effect on performance. Hence age of the worker will be hypothesized to have positively related to livelihood.

b. Marital status (MARS): - this is a dummy variable whether a worker is engaged in marriage or not. It takes a value of 1 if a worker is married and 0 otherwise. Married individuals are more responsible for their work. Married individuals more responsible to generate income for their family and are more likely than single one`s to be employed in

flower farms. Therefore, in this study marital status is expected to correlate positively when the worker is married.

C. Labor Quality (education) is the ratio of the number of skilled production workers to the number of workers in each firm. Labor quality represents the average skill or educational level of labor force in a given organization (Buckley, 2007). According to Globerman (1979), labour productivity in domestically owned plants is influenced by the educational background and experience of workers.

d. Technology. This is a dummy variable whether a worker face new technology or not. It takes a value of 1 if a worker accessed technology and 0 otherwise. Technology increase productivity if the worker equipped with new technology. Therefore, in this study technology is expected to correlate positively when the worker is equipped.

e. Pregnancy support: This is a dummy variable whether a worker receive special support from the company during pregnancy or not. It takes a value of 1 if a worker obtain special support during pregnancy 0 otherwise. Provide special Support for pregnancy worker increase productivity if the worker received this support. Therefore, in this study pregnancy support is expected to correlate positively when the worker received special support.

f. Income (I): This is a continuous variable that a workers ability to make earning. The hypothesis is that worker's ability to earn is improved if employed in flower farm, as a result of increase in production of the person. Thus, it has a positive correlation with improving the livelihood of the worker.

g. Perception of worker about return or payment offered by the firm: This is a dummy variable taking a value 1 if the flower firm offered for the worker's a similar or better than other marketing agents in the area and, 0 otherwise. The payment effect is one form of industries effect that the firm passes on the worker's economy (chukwu, 1990).

h.Additional income or incentive: This is a dummy variable taking a value 1 if the worker gets other incentives from the firm besides supplying training, products and extending credit, 0 otherwise. Fulton and Adamowicz, 1993; Klein et al., 1997). Other services considered include milling service and educational training.

i. Distance of the workers' residence from the work places: It is a continuous variable measured in kilometres. It refers to the distance of the worker residence from the work places, The proximity of the work places from the worker residence reduces the cost of time, and labour that the worker spent in starting a job and also reduces transportation cost for his / her way. .In addition to this, the worker mainly will not be exposed to hesitate and tiredness. The other advantage is that as the worker is close (near) to his / her working centres, they will have more knowledge about the working condition and its benefit. Therefore, in this study, the distance of worker residence from the working place is expected to influence the productivity of flower negatively.

j. Turn over

This is a dummy variable taking a value 1 if the worker responded high turnover in the organization, 0 otherwise. High turnover usually has a negative effect on the morale of the remaining employees. Whether workers are being laid off or leaving of their own volition, the remaining employees end up being insecure about their own jobs. In addition, many will have to take on additional duties when someone leaves, which can create resentment and lead to lower morale. Low morale tends to make employees less enthusiastic and productive.

k. Institutional Knowledge (experience)

Employees with a long tenure in a company have what is known as institutional knowledge. This means that not only do they understand how the equipment, technology and business process work; they also understand who to talk to in order to get things done. For example, a long tenured employee will know which data in the business process management are important to update and view. A new employee will not have this knowledge. He can only build it up over time and with the help of coworkers.

l. Training

This is a dummy variable taking a value 1 if the worker gets training, 0 otherwise. Training costs can have a big impact on your productivity and profitability. Managers and new employees are busy with tasks that are not directly related to operating the business and producing products, services and sales. Instead, they are being paid for work that will not

benefit the company until the employee is fully trained. The less turnover that you have, the less training expense you will need and the higher productivity you will have.

m. Overtime work:

It is a continuous variable measured in Birr.Employees who work overtime hours can be have many different physical, mental, and social effects. Significant effects include stress, lack of free time, poor work-life balance, and health risks. Employee performance levels could also be lowered. Long work hours could lead to tiredness, fatigue, and lack of attentiveness. As a result of these risks, suggestions have been proposed as to how we can mitigate these risks.

n. cleaning and medical facilities : This is a dummy variable taking a value 1 if the worker gets cleaning and medical facilities, 0 otherwise. Providing different kinds of facilities make the worker more productive than the worker without these access.

o. working hours: It is a continuous variable measured in hours.Employees who work the assigned hours can be productive than who do not work full of the assigned hours. Effective utilization of the assigned hours makes the worker more productive than who do not apply effective utilization of full of working hours.

p. number of children: It is a continuous variable measured in number.Employee who have many children may have responsibilities so, she worked so hard and utilize full of her efforts since she has burden of mandating the children. Worker who has large number of children can be productive than who do not have children.

CHAPTER FOUR

RESULTS AND DISCUSSIONS

4.1. Descriptive Result

Descriptive analysis is used to elaborate and helps to understand the production of women labor and institutional characteristics of the sampled household.

4.1.1. Descriptive Result on Socio-Economic Analysis (for dummy and discrete variables)

a. Marital Status

From more productive workers 28.4%, 56%, 4.3% and 11.2% were single, married, widowed and divorced respectively. Whereas, from less productive workers, 50%, 48.1%, 0% and 1.9% were single, married, widowed and divorced respectively. In general out of the total more productive and less productive workers, 60 (35.3) %, 91(53.5%), 5 (2.9%) and 14(8.2%) were single, married, widowed and divorced respectively. Therefore, in both more productive and less productive status married workers are large in number and responsible that is why they are highly engaged in the farm.

This corroborate with the findings of Olaoye et al., (2012). Which reveals that, Most (97.5% and 95.0%) of the OSAMCA loan beneficiaries and non-beneficiaries were married, respectively. The implication was that more family labor will be available and enhanced production as well as will be more responsible in loan repayment.

Table 5.Productivity of labor * marital status cross Tabulation

		marital status				Total
		single	married	widowed	divorced	
Productivity	1	33	65	5	13	116
		28.4%	56.0%	4.3%	11.2%	100.0%
	0	27	26	0	1	54
		50.0%	48.1%	0.0%	1.9%	100.0%
Total		60	91	5	14	170
		35.3%	53.5%	2.9%	8.2%	100.0%

Pearson chi^2 (5) = 11.5206   Pr = 0.009

Source: Computed from own field survey data

b. Educational level

From more productive workers 12.1%, 30.2%, 15.5%, 18.1%, 5.2% and 19% were able to read and write, primary(1-6), junior(7-8), secondary(9-12), post-secondary, and unable to read and write respectively. Whereas, from less productive workers, 7.4%, 27.8%, 18.5%, 37% , 3.7% and 5.6% were able to read and write, primary(1-6), junior(7-8), secondary(9-12), post-secondary, and unable to read and write respectively. out of the total more productive and less productive workers, 18 (10.6) %, 50(29.4%), 28(16.5%) , 41(24.1%) , 8(4.7%) and 25(14.7%) were able to read and write, primary(1-6), junior(7-8), secondary(9-12), post-secondary, and unable to read and write respectively. In general 145 (85.3%) were literate whereas 25 (14.7%) were illiterate this shows more than 85 % were educated so education is   crucial to increase productivity. The educational background would no doubt help in decision making especially in terms of meaningful managerial

decisions, leadership and investments. This result concurred with the finding of Idrisa et al. (2007) reveals that Education plays important role in creating awareness in farming communities as educated people are better equipped to source information compared to those that are not educated. Minimum threshold in terms of educational qualification is necessary for understanding the scientific and technical nature of modern agriculture.

Table 6Productivity of labor * educational level cross tabulation

		educational level						Total
		able to read and write	primary (1-6)	junior(7-8)	secondary(9-12)	post seconda ry	unable to read and write	
Producti vity	1	14	35	18	21	6	22	116
		12.1%	30.2%	15.5%	18.1%	5.2%	19.0%	100.0 %
	0	4	15	10	20	2	3	54
		7.4%	27.8%	18.5%	37.0%	3.7%	5.6%	100.0 %
Total		18	50	28	41	8	25	170
		10.6%	29.4%	16.5%	24.1%	4.7%	14.7%	100.0 %

Pearson chi^2 (5) = 11.1811   Pr = 0.048

Source: Computed from own field survey data

c. Information access

From more productive labors 3.4%, 35.3%, 57.8%, and 3.4% were obtained information from Media, relative, friends and others respectively. Whereas, from less productivelabors, 5.6%, 35.2%, 59.3%, and 0% were obtained information from Media, relative, friends and others respectively. Out of the total 170 respondents, 7 (4.1) %, 60(35.3%), 99(58.2%) , and 4 (2.4. %) were obtained information from Media, relative, friends and others

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respectively. More than 93% worker was received vacancy information from friends and relatives the remaining 7% obtained vacancy information from media and finding themselves.

Table 7Productivity of labors * information access cross tabulation

		information access of employee				Total
		media	relative	friends	other	
Productivity	1	4	41	67	4	116
		3.4%	35.3%	57.8%	3.4%	100%
	0	3	19	32	0	54
		5.6%	35.2%	59.3%	0.0%	100%
Total		7	60	99	4	170
		4.1%	35.3%	58.2%	2.4%	100%

Pearson chi^2 (3) = 2.2740   Pr = 0.518

Source: Computed from own field survey data

d. Main activities or duties

From more productive labors 31.9%, 29.3%, and 38.8% were engaged in cutting, sizing (measuring) and packing activities respectively. Whereas, from less productive labors, 42.6%, 35.2%, and 22.2%, were engaged in cutting, sizing (measuring) and packing activities respectively. Out of the total 170 respondents, 60 (35.3) %, 53(31.2%), and 57(33.5%), were engaged in cutting, sizing (measuring) and packing activities respectively. Almost all workers are engaged in different activities on value chain development. Women utilized their labor in to three different chains: Cutting, sizing (measuring) and packing from each chain the worker add value to the product. So their contribution to the value chain development is high.

Table 8.Productivity of labors * main duty cross tabulation

		main duty in the farm			Total
		cutting	sizing	packing	
Productivity	1	37	34	45	116
		31.9%	29.3%	38.8%	100.0%
	0	23	19	12	54
		42.6%	35.2%	22.2%	100.0%
Total		60	53	57	170
		35.3%	31.2%	33.5%	100.0%

Pearson chi^2 (3) = 4.6199   Pr = 0.099

Source: Computed from own field survey data

e. Discuss with the management

Out of 116 more productive labors, 100 (86.2%) were freely discussed with the management whereas, the remaining 16 (13.8%) were not discussed with their management. Out of 54 less productive labors, 39 (72.2%) were freely discussed with the management and the remaining 15 (27.8%) were not discussed with their management. In general from the total 170 respondents, 139 (81.8%) were freely discussed with the management. whereas, the remaining 31 (18.2%) were not discussed with their management.

Table 9.Productivity of labors * discussion with the management cross tabulation

		discuss the problem with the management		Total
		yes	no	
Productivity	1	100	16	116
		86.2%	13.8%	100.0%
	2	39	15	54
		72.2%	27.8%	100.0%
Total		139	31	170
		81.8%	18.2%	100.0%

Pearson chi^2 (3) = 4.8331   Pr = 0.028

Source: Computed from own field survey data

e. Training

Out of 116 more productivelabors, 105 (90.5%) were obtained training whereas, the remaining 11 (9.5%) were not obtained training. Out of 54 less productive labors, 41 (75.9%) were obtained training whereas, the remaining 13 (24.1%) were not obtained training. In general from the total 170 respondents, 146 (85.9%) were obtained training whereas, the remaining 24 (14.1%) were not obtained training. But the training provided within the industry were not that much significant because the task required an organized training.

Table 10.Productivity of labors * received training cross tabulation

		have you received training		Total
		Yes	no	
Productivity	1	105	11	116
		90.5%	9.5%	100.0%
	0	41	13	54
		75.9%	24.1%	100.0%
Total		146	24	170
		85.9%	14.1%	100.0%

Pearson chi^2 (3) = 6.4703   Pr = 0.011

Source: Computed from own field survey data

g. Additional income or incentives

Out of 116 more productive labors, 99 (85.3%) were received additional income or incentive whereas, the remaining 17 (14.7%) were not received additional income or incentives. Out of 54 less productive labors, 32 (59.3%) were received additional income or incentive whereas, the remaining 22 (40.7%) were not received additional income or incentives. In general from the total 170 respondents, 131 (77.1%) were received additional income or incentive whereas, the remaining 39 (22.9%) were not received additional income or incentives.

Table 11Productivity of labors * additional income cross tabulation

		additional income		Total
		yes	no	
Productivity	1	99	17	116
		85.3%	14.7%	100.0%
	0	32	22	54
		59.3%	40.7%	100.0%
Total		131	39	170
		77.1%	22.9%	100.0%

Pearson chi^2 (3) = 14.1829   Pr = 0.000

Source: Computed from own field survey data

h. Salary increment

Out of 116 more productive labors, 103 (88.8%) were obtained salary increment whereas, the remaining 13 (11.2%) were not obtained salary increment. Out of 54 less productive labors, 44 (81.5%) were obtained salary increment whereas, the remaining 11 (18.5%) were not obtained salary increment. In general from the total 170 respondents, 147 (86.5%) were obtained salary increment whereas, the remaining 23 (13.5%) were not obtained salary increment. Salary increment is crucial to increase productivity it observed from the data majority of the worker received salary increment so the productivity of the worker increases.

Table 12.Productivity of labors * salary increment cross tabulation

		salary increment		Total
		yes	no	
Productivity	1	103	13	116
		88.8%	11.2%	100.0%
	0	44	10	54
		81.5%	18.5%	100.0%
Total		147	23	170
		86.5%	13.5%	100.0%

Pearson chi^2 (1) = 1.6838   Pr = 0.194

Source: Computed from own field survey data

i. Treatment

Out of 116 more productive labors, 88 (75.9%) were obtained equal treatment within the company. whereas, the remaining 28 (24.1%) were not obtained equal treatment within the organization. Out of 54 less productive labors, 30 (55.6%) were obtained equal treatment within the company. whereas, the remaining 24 (44.4%) were not obtained equal treatment within the company.   In general from the total 170 respondents, 118 (69.4%) were obtained equal treatment within the company. whereas, the remaining 52 (30.6%) were not obtained equal treatment within the organization. Providing equal opportunity leads the worker to be more productive but this was sometimes affected and some workers complain and needed to made some correction in the organization.

Table 13.productivity of labors * equal treatment by the management cross tabulation

		equal treatment by the management		Total
		yes	no	
Productivity	1	88	28	116
		75.9%	24.1%	100.0%
	0	30	24	54
		55.6%	44.4%	100.0%
Total		118	52	170
		69.4%	30.6%	100.0%

Pearson chi^2 (1) = 1.6838   Pr = 0.194

Source: Computed from own field survey data

j. Maternity leave

Out of 116 more productive labors, 6 (5.2%), 107 (92.2%), 2 (1.7%), and 1(0.9%) were responded as maternity leave allowed <12weeks, 12-14weeks, >14weeks and no leave respectively. whereas, out of 54 less productive labors, 2 (3.7%), 52 (96.3%), 0 (0%), and 0 (0%) were responded as maternity leave allowed <12weeks, 12-14weeks, >14weeks and no leave respectively. In general from the total 170 respondents, 8 (4.7%), 159 (93.5%), 2 (1.2%), and 1(0.6%) were responded as maternity leave allowed <12weeks, 12-14weeks, >14weeks and no leave respectively.

Table 14.productivity of labors * women maternity leave cross tabulation

		women maternity leave				Total
		less than 12 weeks	12-14 weeks	>14 weeks	no leave	
Productivity	1	6	107	2	1	116
		5.2%	92.2%	1.7%	.9%	100.0%
	0	2	52	0	0	54
		3.7%	96.3%	0.0%	0.0%	100.0%
Total		8	159	2	1	170
		4.7%	93.5%	1.2%	.6%	100.0%

Pearson chi^2(1) = 0.1772   Pr = 0.674

Source: Computed from own field survey data

k. pregnancy support

Out of 116 more productive labors, 96 (82.8%) were responded as there is pregnancy support within the company. whereas, the remaining 20 (17.2%) were responded as there is no pregnancy support within the company. Out of 54 less productive labors, 41 (75.9%) were responded as there is pregnancy support within the company. whereas, the remaining 13 (24.1 %) were responded as there is no pregnancy support within the company. In general from the total 170 respondents, 137 (80.6%) responded as there is pregnancy support within the company. whereas, the remaining 33 (19.4%) were responded as there is no pregnancy support within the company.

Table 15.Productivity of labors * necessary support for pregnant cross tabulation

		necessary support during pregnancy		Total
		yes	no	
Productivity	1	96	20	116
		82.8%	17.2%	100.0%
	0	41	13	54
		75.9%	24.1%	100.0%
Total		137	33	170
		80.6%	19.4%	100.0%

Pearson chi^2(1) = 0.1772   Pr = 0.674

Source: Computed from own field survey data

l. Cleaning and medical facilities

Out of 116 more productive labors, 96 (82.8%) were obtained access to cleaning and medical facilities within the company. whereas, the remaining 20 (17.2%) were not obtained these facilities. Out of 54 less productive labors, 48 (88.9%) were obtained access to cleaning and medical facilities within the company. whereas, the remaining 6 (11.1%) were not obtained these facilities. In general from the total 170 respondents, 144 (84.7%) were obtained cleaning and medical facilities within the company. whereas, the remaining 26(15.3%) were not obtained these facilities. But during observation the researcher observed that most workers not properly wore the cloths needed to the task, some of the working area is contaminated with pesticide the worker not that much care about that, no awareness given to the worker and no proper health training given to them, the managers not care about the workers health status etc. However, cleaning and washing facilities were properly availed in the organization.

Table 16.productivity of labors * cleaning and medical facilities cross tabulation

		Cleaning and medical facilities		Total
		yes	no	
Productivity	1	96	20	116
		82.8%	17.2%	100.0%
	0	48	6	54
		88.9%	11.1%	100.0%
Total		144	26	170
		84.7%	15.3%	100.0%

Pearson chi^2(1) = 1.0689   Pr = 0.301

Source: Computed from own field survey data

m. Introducing new technology

Out of 116 more productive labors, 26 (22.4%), 28 (24.1%), 50 (43.1%), and 12(10.3%) were responded as very poor, poor, good and very good about introducing technology respectively. whereas, out of 54 less productive labors, 14 (25.9%), 11 (20.4%), 21 (38.9%), and 8 (14.8%) were responded as very poor, poor, good and very good about introducing technology respectively. In general from the total 170 respondents, 40 (23.5%), 39 (22.9%), 71 (41.8%), and 20(11.8%) were responded as maternity leave allowed <12weeks, 12-14weeks, >14weeks and no leave respectively.

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Table 17. Productivity of labors * introducing new technology cross tabulation

		introducing new agricultural technology				Total
		very poor	poor	good	very good	
Productivity	1	26	28	50	12	116
		22.4%	24.1%	43.1%	10.3%	100.0%
	0	14	11	21	8	54
		25.9%	20.4%	38.9%	14.8%	100.0%
Total		40	39	71	20	170
		23.5%	22.9%	41.8%	11.8%	100.0%

Pearson chi^2(1) = 1.2037   Pr = 0.752

Source: Computed from own field survey data

n. Expenditure

Out of 116 more productive labors, 93 (80.2%) were improved expenditure whereas, the remaining 23 (19.8%) were not improved their expenditure. Out of 54 less productive workers, 47 (87.0%) were improved expenditure whereas, the remaining 23 (19.8%) were not improved their expenditure In general from the total 170 respondents, 140 (82.4%) were improved expenditure whereas, the remaining 30 (17.6%) were not improved their expenditure.

Table 18. Productivity of labors * improved expenditure cross tabulation

		improved expenditure	your	Total
		yes	no	
Productivity	1	93	23	116
		80.2%	19.8%	100.0%
	0	47	7	54
		87.0%	13.0%	100.0%
Total		140	30	170
		82.4%	17.6%	100.0%

Pearson chi^2(1) = 1.1948 Pr = 0.274

Source: Computed from own field survey data

o. Turnover

Out of 116 more productive labors, 42 (36.2%) were responded there is high turnover activities within the company whereas, the remaining 74 (63.8%) were responded as there is no high turnover within the company. Out of 54 less productive labors, 10 (18.5%) were responded there is high turnover activities within the company whereas the remaining 44 (81.5) responded as there is no high turnover activities within the company. In general from the total 170 respondents, 52 (30.6%) were responded there is high turnover activities within the company whereas, the remaining 118(69.4%) were responded as there is no high turnover within the company. The researcher observed that there were no other means of income or other work places which is better than the flower industry in the area. Since no work facility better than the flower farm places in the area, the turnover situation is too low. That is why most of the workers were more experienced.

Table 19.Productivity of labors * turnover cross tabulation

		turnover from the organization		Total
		yes	no	
Productivity	1	42	74	116
		36.2%	63.8%	100.0%
	0	10	44	54
		18.5%	81.5%	100.0%
Total		52	118	170
		30.6%	69.4%	100.0%

Pearson chi^2(1) = 5.4299   Pr = 0.020

Source: Computed from own field survey data

Descriptive analysis of the continuous variables

Table 20. Descriptive result of the continuous variables

Variable	Obs	mean	Std.Dev	Min	Max	t
age	170	26.92353	6.181671	18	42	-51.977
No of children	111	1.963964	1.501078	0	10	-4.371
Experience	170	4.976235	3.478666	0.08	14	2.249
income	170	1026.071	319.2586	500	1700	2.166

Source: Computed from own field survey data

Age: the age of the workers were ranging from 18 minimum to 42 maximum. Most of the workers were young and the average age of the workers was approximately 27 which are Young. Young workers are productive they are energetic and devoted to do more than old worker. This finding concurred with the findings of (Gomina, et al 2015).Who reveals that productive and active persons participates more in agricultural and community development activities.

No of children: The numbers of children the worker hold were ranging from 0 minimum to 10 maximum. The average number of children was approximately 2 which are good. The higher the number of children in the single worker may decrease productivity. Because it create stress, worrying and takes the working time etc. Since most of the worker were young, they did not face this kind of problem, so they utilized all the working time for the work.

Experience: The workers institutional knowledge or experienced were ranging from minimum 0.08 years to maximum 14 years. The average years of experience was approximately 5 years which is better experience. Most of the workers were experienced and have more than 5 years of experience. So these more experienced workers improve their productivity by applying different system of production and also undertake the mechanism how they spent the income they earned.

Income: the workers monthly income also ranging from minimum 500 Birr to maximum 1700 Birr. The maximum monthly income were Birr 1700 and the minimum of the same were Birr 500 and the average income of the worker were Birr 1026. There are huge human labors in the area but the job opportunity in the area was not that much available, so

women face in difficulty to get suitable job in their surroundings so that they have no alternative simply they engaged the job not as they want rather they were forced to do.

4.2. Empirical Analysis

Econometric Results and Discussion onDeterminants ofWomen Labor Productivity on flora-culture development

To identify the productivity of women labor, **cobb-Douglas** frontier models were used. Before fitting these models, the problem of multicollinearity among explanatory variables was checked by using variance inflation factor (VIF).

Table 21. Presents the value of VIF and condition index for each continuous and discrete variables. As it is shown in the Table, the problem of multicollinearity was not serious among variables because of VIF value less than 10.

Table 21. Variance inflation factor (VIF) For continuous variables

Variable	VIF	1/VIF
Income	2.78	0.359756
Age	2.32	0.431830
Noofchildren	2.22	0.450404
Additionalincome	1.48	0.898760
hours	1.11	0.898760
distance	1.05	0.951550
Mean VIF	1.83	

Source: Computed from own field survey data

Cobb-douglas productivity, age, marital, labor quality, no of children , return, training, income, additional income, discussion, hours, pregnancy support, facility, technology ,distance, turnover, overtime

Table 22. Estimates of the Cobb-Douglas model

Stoc. Frontier normal/half-normal model   Number of obs =   94
                                                                 Wald chi2(15)   =
8.02e+07
Log likelihood = 6.2704902   Prob> chi2   =
0.0000

Productivity	Coef.	Std. Err.	z	P>/z/	[95% Conf.	Interval
age	0.0102757	0.0051274	2.00	0.045**	0.0002261	0.0203252
marital	-0.0330609	0.0107838	-3.07	0.002***	-0.0541968	-0.0119251
Laborquality	-0.0057457	0.0059354	-0.97	0.333	-0.0173789	0.0058875
technology	-0.451703	0.012686	-3.56	0.000***	-0.0700344	-0.0203063
Pregnancysupport	-0.17040417	0.1197929	-1.42	0.155	-0.1051915	0.0643881
income	0.0002737	0.0001072	2.55	0.011**	0.0000635	0.0004839
return	-0.0607216	0.416697	-1.46	0.145	-0.1423927	0.0209495
Additionalincome	0.2399346	0.1233982	1.94	0.049**	-0.0019214	0.4817905
distance	0.119445	0.0041805	2.86	0.004***	0.0037508	0.0201382
turnover	0.0047516	0.0094164	0.50	0.614	-0.0137043	0.2032075
training	0.0746037	0.0421837	2.19	0.042**	-0.0080748	0.1572823
overtime	0.0001067	0.000148	0.72	0.471	-0.0001833	0.0003967
facility	0.399923	0.440673	0.91	0.364	-0.463779	0.1263626
hours	-0.0041584	0.0040062	-1.04	0.299	-0.0120105	0.0036937
Noofchildren	-0.0395983	0.0092225	-4.29	0.000***	-0.0576741	-0.0215225
_cons	0.7280409	.	.	.	.	.
/lnsig2v	-35.15561	505.3531				
/lnsig2u	-1.584997	0.145865				
	2.32e-08	5.87e.06			1.9e-223	2.8e+207
sigma_v						
Sigma_u	0.4527122	0.330174			0.3924117	0.5222788
sigma2	0.2049483	0.0298948			0.1463556	0.263541
lambda	1.95e+07	0.0330174			1.95e+07	1.95e+07

Source: Computed from own field survey data

*** *significant at 1 percent; * * significant at 5 percent;*
* Significant at 10 percent

The Cobb-Douglas production frontier model identified eight significant variables out of fifteen hypothesized variables the identified variable based on $p > |z| < 0.5$. These variables include Age, marital status , technology, income, additional income, distance,

Training, and Number of children. The interpretation and discussion of these significant variables are presented as follow.

Age : this variable was significant at 5% probability level and positively related with the state of productivity.Positive relationship indicates that the coefficient in favor of the probability of being productivity increases with an increase in the age of the worker since the majority of the worker is young and the average age of the worker is 27.

The coefficient of 0.01028 implies that, other things being constant, the coefficient in favor of being productivity increases by a factor of 0.01028 as the age of the worker increase by one.

Marital status (martial) this variable was significant at 5% probability level and negatively related with the state of productivity. Negative relationship indicates that the coefficient in favor of the probability of being productivity increases with a decrease in the marital status of workers. The coefficient of -0.03306 implies that, other things being constant, the coefficient in favor of being productivity decreases by a factor of -0.03306 as marital status of the worker increases by one.

Technology this variable was significant at 5% probability level and negatively related with the state of productivity. Negative relationship indicates that the coefficient in favor of the probability of being productivity increases with a decrease in technology of the workers . The coefficient of -0.00574 implies that, other things being constant, the coefficient in favor of being productivity decreases by a factor of -0.00574 as technology of the worker increases by one.

Income: this variable was significant at 5% probability level and positively related with the state of productivity. Positive relationship indicates that the coefficient in favor of the probability of being productivity increases with an increase in the income of the worker. The coefficient of 0.00027 implies that, other things being constant, the coefficient in favor of being productivity increases by a factor of 0.00027 as income increase by one. The result indicated that larger income tend to be increase productivity compared to the lower income. But most of the worker utilized all of the income for only home consumption because the wage they received from the flower farm were to small but no other means of

income available in the area so they have no option. No saving habit exercised in the worker since no extra cash remains after home consumption.

Additional Income: this variable was significant at 5% probability level and positively related with the state of productivity. Positive relationship indicates that the coefficient in favor of the probability of being productivity increases with an increase in additional income of the worker. The coefficient of 0.23993 implies that, other things being constant, the coefficient in favor of being productivity increases by a factor of 0.23993 as additional income increase by one.

The result indicated that larger additional income tend to be increase productivity compared to the lower income. But most of the worker utilized all of their additional income for only home consumption because the wage they received from the flower farm were to small but no other expanded means of income available in the area so they have no option. No saving habit exercised in the worker since no extra cash remains after home consumption.

Distance: this variable was significant at 5% probability level and negatively related with the state of productivity. Positive relationship indicates that the coefficient in favor of the probability of being productivity increases with a decrease in the distance of a worker. The coefficient of 0.11945 implies that, other things being constant, the coefficient in favor of being productivity increases by a factor of 0.11945 as distance or residence of the worker from the company decreases by one.

The result indicated that workers near to the farm or the company tends to be increase their productivity compared to workers whose residence is very far from the farm or the company.

Training: this variable was significant at 5% probability level and positively related with the state of productivity. Positive relationship indicates that the coefficient in favor of the probability of being productivity increases with an increase in the training facilities. The coefficient of 0.07460 implies that, other things being constant, the coefficient in favor of being productivity increases by a factor of 0.07460 as training facilities increase by one. The result indicated that larger training facilities tend to be increase productivity compared to without training facilities.

Number of children: this variable was significant at 5% probability level and negatively related with the state of productivity. Negative relationship indicates that the coefficient in favor of the probability of being productivity decreases with an increase in the number of children. The coefficient of -0.03959 implies that, other things being constant, the coefficient in favor of being productivity decreases by a factor of -0.03959 as number of children of the worker increases by one.

The result indicated that workers who have less than 2 children tends to be increase their productivity compared to workers who have more than 2 children.

In general workers increased their productivity and their productivity were expressed with the above eight indicators of variables since the p value of these variables are $p > |z| < 0.05$.

CHAPTER FIVE

CONCLUSION AND RECOMMENDATION

5.1 Conclusion

The floriculture industry is one of the newly emerging industries of Ethiopia. Since its modest beginning in the early 1990s, it has created employment opportunities for a large section of the population. Realizing its capacity to generate employment and foreign exchange, the government is also encouraging investors to invest in the sector. This thesis was intended to assess the determinants of women labor productivity in flora-culture industry,

Both qualitative (e.g. key informant interviews) and quantitative (e.g. questionnaire method) data gathering instruments were used in the collection of qualitative and quantitative data. The survey data has been organized and analyzed using both SPSS and STATA while the qualitative data has been analyzed and interpreted by focusing on thematic issues.

The socio-economic conditions of the flower farm workers indicate that most of them are single, young people (average ages 27) who are active and energetic to perform physically demanding farm jobs. Most of the workers have either completed primary education or dropped out of secondary school and may be currently attending evening classes.

Most of them or more than 68% have more than 3 years of experience in the farm they are currently working and this may indicate the existence of less job turnover in the floriculture industry. Looking at the working environment of workers, results of both qualitative interviews and survey indicate that the workers in the flower farms studied are working in a poor and insecure working, job and wage conditions.

Many workers are employed on temporary basis and have signed contracts with their respective employers. This means that they have better means to exercise their rights, including job security (as they are not vulnerable to arbitrary dismissal from work) and availability of maternity leave for women workers.

On the surface, the length of working hours seems to be fair (i.e., 8 hours per day) but in reality, most of the workers may be required to work more than 8 hours if they have production targets to meet especially during the harvest season. Although flower farm

workers are subjected to heavy workload, they are receiving one of the lowest wages not seen anywhere in the formal sector, especially in an export-oriented sector such as the floriculture industry. Most of the workers interviewed claimed that their wages are not enough to cover monthly food expenses for themselves and for their families. Because of this, they sometimes skip their lunch and lack energy to perform their duties. Yet, employers do not seem to be willing to listen to workers' concerns.

The gender-based division of labor that exists in the flower farms has made men and women workers fit for different type of jobs. As a result of this, women workers usually occupy low paying and exhausting jobs, which are likely to bring meager incomes. The fact that women are responsible for household tasks at home is also another burden, making the working conditions of women flower workers difficult.

Because of their sexuality they are also likely to be exposed to some of the ill effects of chemicals and pesticides as they lack influence and power to challenge some of the relentless demands imposed on them by supervisors, managers and employers many of whom are men.

Most of the four flower farms surveyed are efficient in the necessary facilities and this makes workers' working conditions better. Good clinical and washing facilities were available in the farm. The availabilities of these basic facilities are important and not expose workers to many health risks (e.g. water-borne diseases) associated.

Almost all the flower farms surveyed provide transportation services for their workers but pregnant women and old women are not given priority in getting seats.

The fact that many workers did not receive the appropriate training related to their jobs together with lack of management's support for personal and human development has been major constraints for workers to effectively perform their tasks. There is also the issue of lack of a clear career opportunity in the floriculture industry, making workers worry about their future. Besides, the absence of the right to freedom of association has been a major obstacle for workers to freely express their concerns and grievances. This has resulted in the prevalence of owners' interests over the workers since there are no procedures for addressing workers' concerns from time to time.

In the surveyed farms, most workers responded that there is equality of treatment between men and women on the job. But it is evident that women are assigned to relatively low paying jobs and as a result they are likely to face discriminations against promotions, and getting leadership positions. Moreover, most flower farm workers indicated that women's issues are not given the necessary attention. It was also possible to note that workers do not participate in decision-making processes in the flower farms.

The other issue explored in this thesis is related to workers' health and safety conditions. It is evident that the inadequacy or complete lack of facilities, presence of high temperature in the greenhouse, repeated exposure to chemicals and pesticides are likely to make workers' vulnerable to health risks. It would seem that the management is not willing to regularly checks workers' health conditions, nor is it committed to improve workers' health and safety issues through training. Some of the workers have already experienced ill-health effects (e.g. kidney infection) as a result of too much standing and their poor working conditions.

Problems related to pesticide and chemical use and application were also identified workers do not follow safety instructions all the time and also they are not regularly informed about health risks and the necessary precautionary measures they need to take as a result of coming into contact with chemicals and pesticides. Workers do not usually use protective wears, in addition to their uniforms being too old worn out.

These situations increase workers' exposure to the negative-health effects of pesticides and chemicals. It is absolutely important that workers be informed about the possible negative effects of chemical risks so that they can take precautionary measures, and that workers need to be oriented to the importance of following instructions in the applications of pesticide. There is also a need to provide workers with a translated version of the instruction manuals (using language that workers can easily understand) related to the use and handling of pesticides.

Among 15 hypothesized variables 8 variables are significant at 5% level of significant these variables are age, martial, technology, income, additional income, distance, training, and number of children. The other variables are insignificant at 5% level of significant.

It can be stated that the floriculture industry has created employment opportunity for many Ethiopians. However, there are problems related to employment conditions, fundamental rights at work, safety and health condition of workers and social protection.

The increase in production and profit should not be at the cost of the workers. Therefore, workers' human right and working conditions need to be given due attention.

5.2. Recommendations

Based on the findings of the study, the following recommendations are forwarded for Government stake holders and concerned institutions these includes the following :

1.Minstry of agriculture – this government stake holder is the major stake holder with respect to an emerging flower industry economic sectors which play a significant role in expanding diversifying foreign investment and as well as increasing export oriented product that increasing the country foreign exchange earnings. So as women productivity increase the whole economic activities and returns will be enhanced so focusing on those determinants of women labor productivity are vital and also need to consider environmental issues and chemical pollutions to environment and need to take appropriate mitigation solution.

2. Ministry of Education, as the research result indicate that more knowledge and taring skill will contribute to women labor productivity so the ministry of education as stake holder can play a significant role in facilitating leering and taring facilities and opportunities to empower women through   capacity building program.

3. Ministry of health - this government sector also have significant role in boosting productivity of women in flower farm industry by improving the health facilities and by providing basic health and sanitation awareness education ,family planning and pre disease education and medical treatment services

4,.Minstry of workers and social security this also has significant role in women labor productivity .Towards determining the lowest wage rate and providing important employee guidelines, in establishing employee association and other employee legal benefits issues

5 Ministry of women and child affairs. This also an important stake holder to the flower farm industries since this sector is the first and the largest sector in which women are largely involved in employment opportunity. So a lot of issues can be dealt with this sector especially women strategic gender need as well as women productive gender need will be

addressed with this stake holder. Other institution which have direct or indirect influence can also play role in improving the life situation of the women by improving their productivity by focusing on those determinant factors of women labor productivity. Such activities are mentioned as:

- ❖ Stake holders should encourage workers to use the income they generated from their flower farm not only just to meet their household consumption needs but also to enhance potential income generating capacity together with investing on education and health care requirements. For this, there should be continuous awareness creation schemes though education, training and other means so as to enable them diversify income generation.
- ❖ Flower industries and other concerned organ should provide training to build the capacity of workers in the farm and also introduce new technologies to increase productivity, acquisition of operational facilities and initiating active participation of workers should be given due attention.
- ❖ Providing health and safety training to workers
- ❖ Modest raise in workers' wages so that workers can be able to feed themselves and their families
- ❖ Allow workers to establish their own associations which can represent them in matters dealing with the management
- ❖ Preparing enough protective wears, ensuring workers use them every time
- ❖ Organizing awareness-raising programs for workers about their basic rights in the work place and about principles of human rights
- ❖ Developing National Code of Conduct designed to regulate the activities of the flower farms in the country.
- ❖ Government and other concerned stake holders should provide other means of income besides farm income in the area.

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Appendix I: Instruments

Instrument I – Questionnaire

DEAR RESPONDENT, THIS STUDY IS INTENDED TO EVALUATE WOMEN LABOUR PRODUCTIVITY ON FLORA-CULTURE VALUE CHAIN DEVELOPMENT IN ETHIOPIA. INFORMATION YOU PROVIDED WILL BE KEPT CONFIDENTIAL AND WILL ONLY BE USED FOR ACADEMIC PURPOSES. YOUR CO-OPERATION IN PROVIDING YOUR HONEST VIEW IS VERY MUCH APPRECIATED..

1. Sex: 1. Female 2. Male

2. Age: _____

3. Marital Status:

1. Single   2. Married   3 Widowed   4. Divorced

4. Educational level:

1. Able to read and write   2.Primary (1-6)   3. Junior (7-8)

4. Secondary (9-12)   5. Post-secondary   6. Unable to read and write

5. Number of children: _____

6. Name of farm: _____

7. How long have you worked in the flower farm? _____

8. From where did you get the information of employment?

1. Media   2. Relative   3. From friends   4.Other, specify _____

9. What is your main duty on the flower farm? _____

10. Do you think working on the farm is harder for women than it is for men?

1. Yes   2. No

11. If yes, please explain why? _____

12. Since you have been working on the farm, have you received training?

1. Yes   2. No

13. What is your monthly salary that you are getting from the farm?

_____.

14. Do you think the income that you are getting is adequate to sustain your family?

1. Yes   2. No

15.Is there another payment or incentive in your organization?

1. Yes   2. No

16. Do you have a provident/ pension fund?

1. Yes   2. No

17. Have you got salary increments since you have been employed?

1. Yes   2. No

18. If yes, what was the highest amount of increment you got at once?
_____

19. Do you think women are underpaid compared to men?

1. Yes   2. No

20. Do you think your company has provided its employees with an opportunity for

personal and human development?

1. Yes   2. No

21. Do you think workers have the opportunity to discuss their problems with the
management when problems arise?
1. Yes   2. No
22. When you have issues to be discussed with the management, how do you go about
dealing with such issues?
1. Through the union   2.Individually   3.Through supervisors
4. Through other means, specify _____
23. Do you think women's issues have received enough attention from the management?
1. Yes   2. No
24. Do you think both women and men receive more or less equal treatment by the
management?
1. Yes   2. No
25. If no, do you think women are discriminated in terms of the following (Multiple
answers are possible)?
1. Pay   2. Promotion   3. Leadership positions   4. All of the
above
26. At the time of recruitment, are workers tested for
1. HIV   2. Pregnancy   3. Other, specify
_____
27. How many hours do you work per week? _____
28. Do you think the working environment on your farm is safe for your health?
1. Yes   2. No

29. Does the company undertake a regular check up and monitoring of workers' health and safety situations?
1. Yes   2. No
30. Have you received proper training with regard to health and safety procedures?
1. Yes   2. No
31. How long is the duration of women's maternity leave?
1. Less than 12 weeks   2. 12-14 weeks   3.More than 14 weeks   4. No leave
32. Do women get the necessary support during pregnancy?
1. Yes   2. No
33. Are there cleaning and medical facilities are available on your farm?
Yes   No

34. Does the farm provide you timely and sufficient return (fund) to your labor service?
1. Yes   2. No
38. How do you evaluate the farm achievement in introducing new agricultural technologies?

1. Very poor   3. Good

2. Poor   4. Very good

35. How far is the project you work is from your area?

1. less than 1km   2. 1-4 km   3.4-8 km   4. More than   8 km

36. What purpose did you spend the income received as payment (multiple answers is possible)

1. for personal and family consumption

2. for repayment of debt/loan

3. Deposited in a bank

4. Purchase/building of fixed/capital assets

5. Others (specify) _____

37. Do you think that being a worker of the farm improved your expenditure?

   1. Yes   2. No

38. Is there a difference in weekly working days of male and female workers?__
A. Yes   B. No
39. If yes, what is the weekly working days for female workers?_____
A. 5   B. 6   C. 7   D. Others
(specify)_____

40. If yes, what is the weekly working days for each male and female workers?_____
A. 5   B. 6   C. 7   D. others (
specify)_____
41. If no, what is the weekly working time of the hired workers in hours?_____

A. 24 hrs/week   B. 30hrs/week   C. 35 hrs/week   D. 48 hrs/week

E. Others (specify)_____.

42. Which sex gets more leaves in your organization?

1. Male   2. Female

43. Is there high turnover in your organization? In which group?i.e. youngest, middle,

oldest

1 yes   2. No

44. Have you done any overtime work in your organization ? How much income earn ?

1. Yes   2. No

45. Do you think that your productivity increase since you employed in this company?
    1. Yes   2. No

THANK YOU

Instrument 2: Interview-guide questions for flower farm workers
1. Sex
2. Age
3. Marital Status
4. Educational Level
5. What was your occupation before you work here?
6. Name of your flower farm
7. What is your responsibility in the flower farm?
8. What does your experience in the flower farm look like?
9. Do you have workers' association on your farm?
10. Are men and women equally treated with regard to pay, recruitment, promotion and other issues?
11. How much do you earn monthly? Do you think it is enough?
12. What are the problems you face while working in the flower farm?
13. Do you encounter problems with regard to your health and safety while working in the farm?
14. What do you think are the possible effects of pesticides and chemicals on the workers?
15. What do you think are the possible effects of flower farms with regard to the environment and its impact on the surrounding communities?

Instrument 3: Interview-guide questions for flower farm supervisors
1. Sex
2. Age
3. Marital Status
4. Educational Level
5. Name of flower farm
6. What is your responsibility on the flower farm?
7. For how many years have you served in the flower farm?
8. Do workers have the right to form workers' unions?
9. Is there equal treatment between men and women with regard to pay, promotion and other issues?
10. Do you think the wage that is paid to the workers is enough?
11. Do you think the work environment is safe for the workers' health?
12. Is there any effort undertaken by the company to improve workers' working conditions such as their health conditions and others?
13. Are pregnant women given the necessary maternity leave with pay?
14. What are the problems that you think workers encounter in the flower farms?
15. Do you make efforts to enable workers solve their problems by discussing with the management?
16. How do you see the side effects of pesticides on workers?
17. Are precautionary measures proper application instructions put in practice all the time?