1. INTRODUCTION

1.1 Background of the Study

Agriculture is the mainstay of the majority of Ethiopians, with an estimated more than 80 percentof the labor force engaged in this sector. It is the backbone of the national economy constituting 43percent of Gross Domestic Product (GDP), and 80percent of export value, and provides basic needs andincome to more than 90% of the population.

Agriculture is also a key driver of Ethiopia‘s longtermgrowth and food security because of its role incapital accumulation. But due to the small landholdings by the farmers, low level of technologicalinputs and environmental fluctuations particularly therainfall pattern and distribution the sector is notproviding the anticipated growth for capital accumulation in the last couple of years (Geremew, 2000).

The sector is dominated by small-scale farmers, whohave been adopting low-input, low-output, rain fedmixed farming with traditional technologies. Onaverage, small-scale farming accounts for 96 percentof total area under crop and more than 90 percent oftotal agricultural output. In addition, small-scalefarmers produce 97 percent of food crops and 98percent of coffee (MEDac 1999).

Among these agricultural activities floriculture industry is one of the emerging sectors of the Ethiopian economy and is contributing to the country’s national income. Compared to other industries, the floriculture industry attracts large amount of foreign direct investment. In addition, the industry has created job opportunities for many people who would otherwise be jobless due to the underdevelopment of the Ethiopian economy.

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

The Ethiopian floriculture industry was started in the early 2000's. It created job opportunity for about 25,000 workers and whenthe 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 inexport of products to European markets. Atthe beginning of March 2005, it was reported that 176.1 ha of land was covered with greenhouses (ILO, 2006).

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 2005/2006 to32 million stem in 2007/08. In valueterms, the increase was from 382,346 USD in 2005/2006, to 2.9 million USD in 2007/08, to 5.1 million USD in 2009/10 and 21.9 million USD in 2011/2012(ILO, 2012).

Following this labour productivity in flower farm in Ethiopia underwent problems of unemployment, public sector down-sizing, low employment generation capacity, government contradictory discretionary policies, physical capital, human capital, infrastructure, economic scale and a sort of mismatch between labour demand and supply. The demand for labour is derived from production and distribution activities in the goods and services sectors. As a result, its size and shape are sensitive to what happens in the national economy [Bloom and Humair2010)]. However, available data on the Ethiopia labour productivity indicates that the demand for labour has been poor and volatile at best. As a result, majority of workers are engaged in the informal economy [Iwayemi and Jerome (1995)]. An analysis of the Ethiopia labour force by sector shows that the service sector accounted for an estimated 24.4 percent of gross domestic product and employed 20 percent of labour in 2007. While industry accounted for 48.8 percent of gross domestic product and employed only 10 percent of the labour force, agriculture employed 70 percent of the labour force and contributed only 26.8 percent to GDP. Recently, the Ethiopia labour force is estimated to be 35.13million [CIA World Fact Book (2009)]. This seemingly qualifies it as the largest workforce in Africa. However, most of the Ethiopia labour force is lost to brain drain as the country ranked 128out of a total of 134 in the just concluded global brain drain analysis. This is major challenges of labor productivity in the mentioned flowers farms.

1.2 Statement of the Problem

The newly emerging flower industry in Ethiopia undeniably can mitigate the prevalent unemployment problem in its own way. However, there may be problems which workersface such as physical capital, human capital, in both internal and external, overtime payment, morale and attitude. The flower production uses different chemicals like pesticides and insecticides that can potentially cause harsh problems on employee. The chemicals can cause skin problems and other reproductive illnesses, which can be risky to employee's lives. Particularly worker may fear that if they become pregnant, the chemicals may have a side effect on their babies. In addition, female flower farm workers may not have adequate pregnancy and maternity leave and can suffer from lackof health and safety insurances.

According to Mena (2005) to employee flowerfarm 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 equallycompetent as men. Therefore, anemployee will choose to work even in worsened conditions than to leave their job that may affect the life of their families too.

Flower workers are not organized in trade unions. This limits their right to bargain and stand for their rights (UWEA, 2006:6). If they are not organized under unions, they will lose their collective bargaining powers that may enable them to stand for their rights in adverse working conditions they are likely to face.

This paper attempts to examine the determinant of labour productivity in flower farm in case of Bishoftu i.e. Joy Techand Dugda Flowers.

Most of previous studies are failed to consider which labour productivity is the most determinants of the labour productivity in flower farm. Some of them are focused on gender or income and few of them are on export of flower products. Off these, all are focused on the total flower productivity which is not appropriate enough to measure the labour productivity; others are focusing on the income diversification. Therefore, this study tries to fill this gap and considering the labour productivity measurement to indentify through which indicators, affects the selected flower farm labour productivity.

1.3. Research Question

The research was attempted to address the following questions:

1. What is farm specific impact of physical capital on the labour productivity?
2. Does rapid farm growth and expansion affect the labour productivity of the flower farm?
3. Is there a relationship between human capital and labour productivity?
4. Is there relationship between price of the innovation and labour productivity of the farms?
5. Does the competition among the flower farm scarce resource has effect on labour productivity?
6. What is the impact of government policy effect on labour productivity?

1.4 Objectives of the Study

1.4.1 General objective

The main objective of the study is to examine the impact oflabour productivity factors on flower farm in Bishoftu.

1.4.2 Specific objectives

Specific objectives of thestudywereaimed:

1. To examine whether the relationship between labour productivity and physical capital will exist or not.
2. To evaluate if there will be a relationship between labour productivity and human capital.
3. To analyze the impact of price of the innovation and labour productivity.
4. To examine whether the competition among the flower farms will affect the labour productivity, or not.
5. To assess whether the flower farm resources can affect the labour productivity or not.
6. To examine how government policy affects labour productivity.

1.5 Limitations of the Study

This study investigates some aspects of the working conditions of flower farm workers in the Ethiopian flower industry with a focus on labour productivity flower farm workers. For this purpose, two flower farms were selected and studied. This in itself becomes a source of difficulty to generalize about flower farm workers by a mere inspection of the selected flower farms only.

The other challenge was that the problem of accessing flower farm workers for interview due to the difficulty of gaining permission to enter to the farms as an inquirer because of the suspicion by flower farm owners that this would disclose their companies' secrets.

Therefore, the researcher was forced to conduct interviews outside of the farm areas. That is, in their homes or in other places. Furthermore, some of the workers especially work appeared reluctant to tell their real experiences, abuses and harassments in fear of losing their jobs and other possible reasons. The other problem was that although the researcher planned to conduct focus group discussions, because of the sensitive nature of the topic workers were reluctant to tell their problems in front of their collogues. In addition, though the researcher aimed to conduct interview the flower farm owners, some employers were not willing to participate in the interview.

As this research was the first of its kind, it was intended to give an insight into the conditions of flower farm workers focusing on work flower farm workers, who constitute the majority. It was hoped that with this study as a background, future researches can be initiated along similar or related lines of inquiry.

1.6 Significance of the Study

This research was hoped to contribute to the understanding of the experiences of flower farm workers in Ethiopia. Especially, the study tries to explore the situation of flower workers by raising the concerns of flower farm workers. In addition, further effort should be made to understand the dimension and complexity of the problem.

This study was increase the awareness about problems that flower farm workers face and was given an insight into whether the floriculture industry in Ethiopia is operating according to the standards set by the International Code of Conduct (ICC). The findings of the study may

encourage concerned bodies and farm owners to be more conscious of the issue and it can initiate the formation of a National Code of Conduct that governs working conditions at flower farms and their productivity. Flower workers will benefit from the research since the proposed recommendations allow workers to address the existing problems and help find solutions so that their conditions will be improved.

A feminist research should be action oriented otherwise it cannot be said feminist (Reid,2004:175). In line with this, the aim of this research is to assess determinants of flower farm labour' productivity.

1.7 Scope of the study

This study was limited to flower farm specific determinants of labour productivity of the flower farm operate in Bishoftu though other flower farm specific and macroeconomic factor have a huge impact on flower farm productivity. Thus the study was not explored other flower farm specific and macroeconomic factors determining flower farm labor productivity.

1.8 Organization of the thesis

The study was organized to have five chapters. The first introduces the background of the study, the research objectives and research questions. Besides, it encompasses significance of the study, the scope of the study, limitation of the study, and methodology of the study. The second chapter presents both theoretical and empirical review of the related literatures. The third chapter dealt with methodology of the study. The fourth chapter mainly concerned with the analysis of data collected. The last chapter which is chapter five presents the conclusion and the recommendation drawn from findings of the data in addition with implications for further research.

2. LITERATURE REVIEW

2.1 The Concepts and Theories of Labour Productivity

Labour productivity means the quantity of production obtained per unit of labour, which can be represented by the number of hours worked, the number of employees or the number of employed persons (employees plus other categories). In general, the number of hours worked is the most used de-nominator (Ovidiu et al. 2011). In this sense, labour productivity can be expressed as the product of working hour productivity and average working hours per capita. It rises with increasing labour productivity per hour and decreases with reduced working hours (Hinterberger et al. 2013). Labour productivity can be determined for total production (e.g. GDP) or gross value added.

Capital productivity measures the level of output (in €) obtained for each euro invested in manufactured capital. Capital productivity indicates how well this capital type is used in providing goods and services. An increase of capital productivity means that for a given level of production less capital is needed.

To estimate the capital stock used in a production process, the literature and empirical analyses recommend several methods: the flow of productive ser-vices provided by an asset in the production process, the gross stock of capital obtained by cumulating the investment flow, adjusted by the rate of removal from service of capital goods, or the net stock of capital obtained by correcting the gross stock of capital (Ovidiu et al. 2011).

Total factor productivity (TFP) covers different production inputs (or fac-tors) and thus enables the identification of distinct contributions of labour, capital, intermediate consumption and technology/efficiency to the final product. It measures productivity more comprehensively; however, it is also more difficult to calculate (Hinterberger et al. 1999).

2.1.1 Brief History of Ethiopian Floriculture

Floriculture is commonly defined as the cultivation and management of ornamental and especially flowering plants (Getu, 2009:240; Atkure, 2011:11). Floriculture industry falls under the agricultural industry and is frequently used interchangeably with ‘flower industry’ (KHRC, 2008:1). Flowers are delicate and, once harvested, highly perishable, requiring careful

management of growing conditions and postharvest handling to ensure product quality for consumers (Whitaker and Kolavalli, 2006: 337).

World consumption of flowers is growing at a rate of 6 to 9% per year, compared with only 2% for staple crops (Gioè, 2006:17; Trade matters, 2007:4). Traditionally, flower production was dominated by North America, Europe and Japan (Whitaker and Kolavalli, 2006: 335; Rikken, 2010:21). But, in recent years, new flower producers such Colombia, Kenya and Ethiopia because of their comparative advantages in growing climate, land and labor costs, have challenged the historical dominance of North America, Europe and Japan as producers of floricultural products (Whitaker and Kolavalli, 2006: 335; Tewodros, 2010:11). In addition to the availability of cheap labour and land, production by the traditional methods used in the developed countries entailed the use of heaters and coolers which are naturally available in the new countries (Taylor, 2011:56).

The inception of flower production in Ethiopia dates back to early 1980s (Diriba, 2007:23; Embassy of Japan in Ethiopia, 2007:2) while others take it to mid-1990s (Mulu and Sonobe, 2011:4). The first private floriculture company, Ethio–flora, started activities around 1997 on a few hectares of land (Embassy of Japan in Ethiopia, 2007:2; Getu, 2009:240). In 1999, Golden Rose – a foreign owned firm and so-called pioneer – started rose production (Taylor, 2011:66; Mulu and Sonobe, 2011:5). In 2002, the industry has organized itself into an association called the, Ethiopian Horticulture Producers and Exporters Association (here after EHPEA) which is helping the sector (Getu, 2009:242). In 2004 there were six growers that regularly exported to the Netherlands (Taylor, 2011:66). From 2005 onward Ethiopian floriculture industry becomes the fastest growing in the world and to overtake Ethiopia's traditional hard currency earner – coffee - and brings new employment opportunities for the unemployed (Tewodros, 2010:11; Taylor, 2011:66; EHDA, 2012:18).

2.1.2 The Rapid Growth of Floriculture in Ethiopia

Floriculture was first developed in Ethiopia around early 1980s (Diriba, 2007: 23; Daniel, 2009:14; Gebre, 2011:48). Within this short time, Ethiopia grew to second largest exporter of cut flower in Africa (GHOWERN, 2010:10). Why has this success happened? The combination of favorable climatic conditions (Gebre, 2011:49), the availability of land, low labour costs, a

favourable investment climate (Mulu and Sonobe, 2011:5; Altenburg, 2010:24-25), availability of a world-class airline of Ethiopian (Gray, 2007:13), the shift of production sites from Kenya to Ethiopia (Mano et al, 2010:10) and a relatively shorter distance to the European market than other exporters (Mulu and Sonobe, 2011:5) are the reasons for the success of the sector in Ethiopia.

2.1.3 Characteristics of Ethiopian Floriculture Industry

Currently, the floriculture industry of Ethiopia can be divided into three groups: roses under greenhouse, cuttings under greenhouse and summer flowers (Ayelech and Helmsing, 2010:44). About 80% of the total production area is covered by roses (Taylor, 2011:67; Gebre, 2011:49).

In Ethiopia, the flower industry – and especially innovation in it – is largely driven by foreign investors (Altenburg, 2010:24-25). As of 2012, the ownership of flower farms in Ethiopia is as follows: 30 % of the investors were known to be nationals, 61 % are foreign and the rest are joint venture undertakings (EHDA, 2012:16). According to the Oakland Institute (2011:43), as of June 2009, 251 foreign investors had been registered in the floriculture industry of which 61 are operational, 21 are in the implementation stage, 134 in pre-implementation, and 36 cancelled.

In Ethiopia, floriculture industry is an export-oriented sector (Mano et al., 2010:11; Tewodros, 2010:11). Almost all exports of floriculture are destined for Europe, with the Netherlands receiving the largest share followed by Germany (EHDA, 2012:12). The Netherlands, which has a strong position in the global flower market, is the largest producer of cut flowers but also has the status of importer and exporter, serving as a channel for third world country exports, as well as distribution to importers (Trade matters, 2007:4; Sepúlveda, 2009:6). And the cut flower industry in Ethiopia is characterized by a dominant role of Dutch foreign investors. Dutch trade auctions which dominate the export trade, and the Dutch development cooperation which plays an important role in the development of the sector (Ayelech and Helmsing, 2010:35).

2.2 Development of the Flower Industry in Ethiopia

Although flower production as a commercial undertaking is relatively new to Ethiopia's economy, within a short period of time it emerged as one of the main sources of foreign exchange for the country. The origin of the sector in Ethiopia can be traced back to the military

government. In 1980, the military government established the Horticulture Development Corporation with the primary objective of generating foreign exchange earnings. The corporation had the mandate to coordinate production and marketing of horticultural products including flowers. In line with this, production and export of summer flowers was started for the first time in 1981/82 on state farms with high subsidy from the government. However, the inefficient production did not stay long (Joosten, 2007). After the fall of the Derg regime, the industry re-emerged in the mid-1990s as a result of private initiative. Two local companies named Ethioflora and Meskel Flower pioneered production (open field) of summer flower. The two companies were able to export flowers. However, they were not as such successful mainly due to the unfavorable investment climate, their limited experience and knowledge about the business (Gebreeyesus&Iizuka, 2010).

However, the embryonic effort of the two companies was able to attract attention from international actors such as the EU, the UK and the Netherlands who saw the flower industry as a potential sector to be nurtured. The EU collaborated with the Ethiopian government to commission preliminary production in the late 1990s on half a hectare of land. The objective was to investigate the available inputs and climatic conditions and thereby develop marketing strategies for large scale commercial undertakings. In the same way, the UK's Department for International Development (DfID) conducted a number of feasibility studies aimed at locating potential flower production areas to supply to the UKs' supermarket chains. Similarly, a business delegation from the Netherlands visited Ethiopia to examine the potential of growing flowers that would be supplied through the Dutch auction system to the European market (Taylor, 2011). The involvement of these foreign governments contributed to the international awareness of the Ethiopian flower industry. Subsequently, a number of foreign investors began to set up flower farms in Ethiopia. Golden Roses, a subsidiary of RINA Investment - an Indian family business based in the UK, is the first foreign firm to enter Ethiopia in 1999. It was able to produce roses for export under wooden greenhouses the same year and by 2000, it expanded its production scale using modern greenhouse technology (Taylor, 2011; Taylor, 2010). In spite of the effort by the pioneering Meskel Flower and Ethio-Flora to lay the foundations for flower production in Ethiopia, Golden Rose is considered as pioneer within the Ethiopian flower

industry by many industry players, mainly because it introduced modern technology such as steel greenhouses (Gebreeyesus&Iizuka, 2010).

In 2002, after years of struggle, the Ethiopian Horticultural Producers and Exporters Association (EHPEA) was formed as a non-profit organization representing growers. The association was instrumental in lobbying for government support in terms of infrastructure, loan and logistics services for the industry (EHPEA, 2014). Despite the early efforts of the association, the government's role was limited until the mid 2000s. Indeed, the government was unaware of the sector's potential and thus, it did not mention the flower industry among the extended list of priority sectors in the export promotion strategy it adopted in 1998 (Gebreeyesus &Sonobe, 2011). Following the recommendation of the EU and other international consultants, the government started to make efforts ranging from creating conducive investment environments to granting incentives to attract foreign investors. In addition, the government also enhanced its effort to initiate international cooperation in matters relating to the flower industry (Taylor, 2011).

2.3 Productivity

2.3.1 Productivity Basics

According to HM Treasury, (2001) productivity is the main determinant of living standards. Raising productivity is the key to raising long-term prosperity. Productivity is a commonly used term that is defined in many different ways. Handa and Abdalla

(1989) suggested that the simplest definition of productivity is the ratio of outputs of goods and/or services to inputs of basic resources, e.g. labour, capital, technology, materials and energy. It is calculated as a ratio of the quantity of outputs produced to some measure of the quantity of inputs used. Productivity can also be defined as the relationship between results and the time it takes to accomplish them. Time is often a good denominator since it is a universal measurement and it is beyond human control.

The less time it takes to achieve the desired result the more productive the system.

Eatwell*et.al,* (1991) defined productivity as a ratio of some measure of output to some index of input use. In other words, productivity is simply the arithmetic ratio between the amount

produced and the amount of any resources used in the course of its production. Overall, productivity could be defined as the ratio of outputs to inputs

Where, outputs could be in units or monetary value of product or service, revenue generated or value added. Input could be in units relating to cost of labour, equipment, materials, capital, so it is very important to specify the inputs and outputs to be measured when calculating productivity.

Productivity is usually regarded as a measure of an organization's efficiency and can be measured at the national, organizational, project or the task level. Productivity measured at the national or macro level is used to make international comparisons and to track national industrial trends, whilst productivity at the task or micro level is used to inform management decisions. At the organization level or the project level productivity may be measured to compare either inter- or intra- organizational performance. Horner, (2006) state that productivity is important as it is the common link between cost and time and that its improvement is key to improving performance. Drewin (1982), however, suggests that productivity is not the same as performance. Many workers perform strenuously but have a low productivity due to ineffective work methods. The productivity may be high, however, with low performance, due to use of automatic machinery, which controls the work. Quite often productivity is measured and identified as labour productivity. This fact implies that industries characterized as labour intensive may not be treated equally in relation to less labour intensive industries (Pekuri, *et al.*, 2011).

Partial factor productivity

Partial factor productivity is the ratio of output to one type of input. For example, labour productivity (the ratio of output to labour input) is a partial productivity measure.

Similarly, capital productivity (the ratio of output to capital input) and material productivity (the ratio of output to materials input) are other examples of partial productivity.Partial productivity measures are easy to understand, easy to obtain data for, and easy to use to compute productivity indices. They are thus widely used and industry wide data are available, but, they can be misleading when used in isolation.

Total Factor Productivity

Total Factor Productivity is the ratio of total output to the sum of all input factors (Sumanth, 1998). Thus, a total productivity measure reflects the joint impact of all inputs in producing the output. In all the above definitions, both output and input(s) are expressed in 'real' or 'physical' terms being reduced to constant monetary currency of a reference period (referred to as base period).

Total factor productivity has the advantage of considering all inputs although quantification of these remains a major disadvantage of this measure which makes it impractical. Some of these measures may use different values in different situations depending on the purpose of the analysis, type of process, and ease with which data and information can be obtained.

Total productivity

Total productivity is the ratio of net output to the sum of associated labour and capital inputs (Sumanth, 1998). Net output is the total output minus the intermediate goods and services purchased. In this case, the denominator of this ratio is made up of labourandcapital input factors.

Total productivity, has the advantage that data is available mainly at corporate level and is easy to compute. However, as the factor does not capture all inputs, a full picture is still lacking leading to the possibility of misguided decision making. The value added approach to defining output is not common at corporate or project level.

2.3.2 Labour productivity in flower farm

Labor productivity is a notion used by theoretical economists: Neoclassical, Keynesians or Radical economists. The Marxist theory of labor value informed this study. The Marxian theory of labor value propounded in Marx's masterpiece, Capital (1867) is a major pillar of traditional Marxist economics. The theory's basic assertion is that the value of a good can be objectively measured by the average amount of labour hours required to produce that good. Marx suggested that productivity is the reciprocal of the value of goods. This idea has re-emerged in various Marxist authors, such as Gouverneur (2002), and Valenzuela (1986). David Ricardo originally setforth the idea that both directand indirect labor are spent in producing each good, presented in input-output analysis, when he referred to incorporated labor and by Karl Marx when he spoke of abstract labor.The Marxist meaning of productivity suggests that a rise in the

efficiency in manufacturing of a good has a profound effect on production of many other goods, and may as well affect the entire production system. The Marxist concept of abstract labor emphasizes that: every single good is strictly the result of using a part of social labor and not only of the labor process that immediately appears as its origin. Marx correctly noted that not only does each production process use a multiplicity of inputs, but also because an increase in the efficiency with which a means of consumption is produced enables an increase in consumption of all goods. Higher productivity in the production of means of production leads to a greater consumption of the means of production and of all the commodities employing it.

According to Leibenstein (1997) workers' productivity is assumed to be positively determined by real wage paid. He stressed the relationships among wages, nutrition and health in developing countries. According to him, firms in developing countries get healthier and more productive workers if they pay higher wages. Solow (1999) formulated similar model for developed countries which states that higher wages boosts workers' morale and thus directly improves productivity by raising work effort by workers.

The Labour Turnover Model (Lawler 1996) asserts that workers are expected to be more hesitant to leave employment owing to the greater salary paid by the present employer and the poorer the opportunities in the outside labor market. If firms must endure part of the costs of labor turnover and if exit rates are a decreasing function of wages paid, firms have motivation to pay high salaries to reduce high labor turnover.

According to Sociological Model (Akerlof&Yallen 2002), labourers' effort in work primarily hinges on the degree to which they feel they are being treated justly by their companies. The alleged fairness of the salary may affect worker productivity if performance levels are related to worker motivation and feelings of allegiance to the firm. The Functional Theory (Pylee& Simon 1996) suggests that a person who is cheerful and in good physical shapeis a better, more productive worker. Here, well-being is used as a means to attain, protect and improve the efficiency and productivity of labor. Approaches to any answers, particularly those involving the employees and the management should involve negotiation and an accepting of one another's perspective. This will guarantee submission by both parties to agreements that have been reached.

2.4 Factors Affecting Flower Farm Labour Productivity

2.4.1 Physical Capital

The productivity of a worker will obviously be related to the quantity and quality of capital with which he or she works. More capital and more modern technology should translate to greater output; a worker with a brace and bit will get a lot fewer holes drilled per hour than one controlling a battery of computer-assisted drill presses. This means that we must include a measure of capital stock in each metro area as an important variable in our model. It is not surprising that most studies of productivity focus on capital as a crucial determinant of output. Indeed, it would be surprising if capital didn't play a key role. For example, Kitson, Martin, and Tyler (2004) emphasize the role of physical capital in building regional competiveness (p. 995). Schreyer and Pilat (2001) identify capital as one of the required variables for measuring productivity (p. 142). Audretsch and Keilbach (2005) found capital—both physical and entrepreneurial to play an important role in German regions, and Christopolous and Tsionas (2004) found it important in Greek regions. Deno (1988) documented the impact of public capital in 36 American metro areas, and Ezcurra et al (2005) found similar results for Spain. Primont and Domazlicky (2005) measured the importance of private capital across American states. And Abel and Gabe (2010) found capital to be an important determinant of productivity for 290 U.S. metro areas, although they found equipment to play a larger role than structures. In the current research stream, Kurre (2004), Kurre and Miseta (2008), Brunot and Kurre (2012), and Kurre and St. Andrews (2013) all found capital to play a significant role in explaining productivity across metro areas.

Unfortunately there appears to be no good measure of capital stock at the metro level. However, the Economic Census itself includes data on total capital expenditures—i.e., investment—in 2007. While this flow measure is not the variable that we would most prefer (total capital stock), it does give us at least a proxy for the effects of capital on output. The data on investment from the Economic Census cover expenditures on new and used capital, including buildings and equipment, at existing operations and plants under construction.

Since the dollar amount of the 2007 capital expenditure will vary with the scale of the metro area, we chose to use "change in capital stock per production worker hour" as the variable in

our models to eliminate the scale effect. (Effects of scale on productivity will be included in the population variable, as explained below.) Without this adjustment, we would be testing whether places with more capital in total are more productive, rather than asking whether places with more capital per unit of labor (per worker hour) are more productive—and the latter question is the more appropriate one. And, as explained above, we think it makes more sense to focus on production worker hours in a study of manufacturing productivity than simple numbers of workers without regard for their type (production, nonproduction) and how many hours per week they work.

2.4.2 Human Capital

Just as important to production as physical capital is human capital. The literature emphasizes this often. For instance; Bronzini and Piselli (2009) use human capital as an independent variable for measuring total factor productivity and find a significant positive relationship (p.193). Education is commonly used as a measure of human capital, the argument being that education increases the skills of laborers and their ability to adapt. This drives growth as workers make better use of existing technology and implement new technologies. While human capital may be developed in other ways, education is easily measured and commonly considered the most important part of human capital.

Many studies of productivity include discussion of the effects of education. At the sub-national level, Beeson (1987), Beeson and Husted (1989), Moomaw and Williams (1991) and Brock (2001) all introduced education variables into their state-level studies of productivity differences, and education was the primary focus of Iranzo and Peri (2006). Gottlieb and Fogarty (2003) focus on the crucial contribution of education to productivity and its subsequent effect on the growth rates of metro areas. Hunter and Kurre (2003), Kurre (2004), Kurre and Miseta (2008), Brunot and Kurre (2012), and Kurre and St. Andrews (2013) all found education to be an important determinant of productivity at the metro level. And Abel and Gabe (2010) found educational attainment to play a larger role than physical capital or agglomeration economies in their study of 290 metro areas.

While these studies used various measures of education, the variable that showed most promise was percent of the metro area's population that have attained various levels of education:

associate's degree, bachelor's degree, and graduate/professional degrees. Data from the Census Bureau's American Community Survey, three year estimates for 2006-2008, Table S1501, were used for these variables.

Correlation analysis across the 363 MSAs indicates that places with a higher percentages of college graduates also tended to have a higher percentage of those with graduate degrees (r = 0.795), but there was very little correlation with percent having an associate degree (r = 0.085). In fact, percent with an associate degree was mostly uncorrelated with "% grad degrees" (r = -0.050) and with "% bachelor's or higher" (r = 0.023).

Our working hypothesis is that areas with a greater proportion of residents with a bachelor's degree or higher will tend to have higher levels of productivity.

Kurre and St. Andrews (2013) point out that the skill of a worker is not always reflected by education. There may be workers who have plenty of education but little practical skills, or workers with little education but plenty of skill. Demographic variables may capture some of these effects. The percent of workers in certain age ranges (such as the 25-34 range) may be correlated with productivity. Kurre and St. Andrews find a significant positive relationship between this variable and productivity in their study of regional productivity (pp. 14-16). To address the two different forms of human capital discussed here, both education levels and the percent of the population that is in different age ranges will be tested as determinants for productivity.

One approach may be to use age of workers as a proxy for experience, and perhaps skill. For this project we considered those at each end of the age spectrum: those in the 25-34 age group, not long out of school, and those in the 55-64 age group, those contemplating retirement.

Signs reflecting the impact of these variables on productivity are not immediately clear a priori. For the younger group, we might expect them to have higher productivity because they are not long out of school where, if they made good education choices, they learned the latest techniques. They can bring a fresh viewpoint to old problems, along with the vigor and enthusiasm of youth and a greater integration of technology into their work lives. On the other hand, they are probably inexperienced and will have to suffer through beginner's mistakes as they engage in some amount of on-the-job training. And just maybe they spend more work-time

on their personal digital devices. These competing forces can have opposite impacts on productivity.

For the older group, the opposite story can be told. These workers have a lot of years under their collective belt, and have learned their craft through decades of applied training. They literally know the tricks of the trade, and that helps them be productive. But they may or may not have kept up with the newest techniques and software, and they may be winding down a bit physically compared to their earlier days, which may have the opposite effect on their productivity.

We have no a priori theoretical expectation about the signs of these two variables, but previous work for the whole manufacturing super sector found the older workers to have a positive and significant effect on productivity, while the younger worker variable exerted a negative—though not statistically significant—effect (Brunot and Kurre, 2012). We might expect this effect to vary by industry though. In the higher-tech industries, recent education and technological savvy might have a major effect on output, while a less-technical old-line industry may rely on skills won through decades of hands-on experience.

Data for the age variables came from the American Community Survey, Table S0101, using the 3-year estimates covering 2006-08. The two age variables reflect the percent of total population in the 25-34 or 55-64 age groups. The percent of younger workers averaged 13.3% over the 363 MSAs, and varied from 10.1% in Punta Gorda FL and Weirton-Steubenville WV-OH to 18.6% in Hanford-Corcoran, CA. The percent of older workers averaged 10.9% and ranged from 6.0% in Hinesville-Fort Stewart GA and Provo-Orem UT to 14.4% in grayer Santa Fe NM. The two variables are inversely correlated ($r = -0.702$) across the 363 MSAs, so metro areas with a higher percentage of 25-34 year-olds tend to have fewer 55-64 year-olds.

2.4.3 Resource of the Flower Farm

The literature review focuses on the indicators resource productivity as well as resource efficiency. Although these two terms are often used synonymously, they do not mean the same thing.

Resource efficiency focuses typically either on augmenting economic out-put with a given resource input (increasing resource productivity), or on minimizing resource input with a given

economic output (decreasing resource intensity); or sometimes on both (as in the case of Factor x). Besides the amount of resource use, resource efficiency also covers the consumption of natural resources in relation to economic benefits and environmental im-pacts. This is reflected in "A resource-efficient Europe – Flagship initiative under the Europe 2020 Strategy"(EC 2011), which aims at both decoupling resource use from GDP growth as well as decoupling environmental impacts from resource use (AMEC/BIO 2013).

Resource productivity is the efficiency of using natural resources to pro-duce goods and services within the economy (Bleischwitz 2010). In analogy to labour productivity it describes the relation between economic outputs in monetary terms and a physical indicator for material or resource inputs (OECD 2010). The monetary component refers to the economic gains achieved through efficiency.

While the definition of resource productivity in general includes among others water, land, biodiversity and ecosystem services, in this scoping study resource productivity is defined as material productivity. Materials/material resources comprises biotic materials/biomass (from agriculture, forestry, fishery and hunting as well as biomass products) and abiotic material resources (metal ores and metal products; non-metallic minerals and mineral products; fossil energy materials/carriers used for energetic and non-energetic purposes) that are used in production processes or for energy production. As fossil fuels are also materials, they are also part of this scoping study.

Depending on the scale of interest, resource productivity can be calculated at different levels. At the macro level (for whole economies), for example, GDP (Gross Domestic Product) is usually applied as the economic variable, while at the meso-level GVA (Gross Value Added) is most commonly used.

In general, economy-wide material flow analysis (MFA) is applied to quantify the level of material and resource use. Thus, for representing the physical indicator for material or resource inputs different MFA indicators can be used. Physical and monetary input-output tables are used to relate the economy-wide resource requirements to sectors and/or to different categories of final use that are responsible for material use (Bleischwitz et al. 2007).

On the micro level, where resource productivity can either be quantified by a product-based or a company-based approach, resource productivity is not always related to economic output but

can also be connected to the use (service units, mechanical output) of the produced goods and services (Ble-ischwitz et al. 2007). Data on the level of firms is typically not available on a MFA basis.

There are also several related indicators that are commonly used. The con-cept of the ecological rucksack measures the hidden material use of a product expressed in tons of any material, which is extracted, processed, transported or deposited during production of the given product and its transport to the point of sale (Schmidt-Bleek 1999, Lettenmeier et al. 2010).

The material footprint (MF) provides a measure of the cradle-to-cradle material input needed to generate a service or benefit (Lettenmeier et al. 2010), while at the macro level the MF is defined as "the global allocation of used raw material extraction to the final demand of an economy. In contrast to indicators of standard economy-wide material flow accounting, which are based on apparent physical consumption the MF does not record the actual physical movement of materials within and among countries but, instead, enumerates the link between the beginning of a production chain (where raw materials are extracted from the natural environment) and its end (where a product or service is consumed)" (Wiedmann et al. 2013).

2.4.4 Innovation

To the extent that increased productivity comes from adoption of new, improved techniques in production, it would be logical to conclude that places that are active in creating new techniques would also be beneficiaries in the form of higher productivity. Freeman (2002) emphasizes the importance of innovation systems of sub-national regions. Freeman refers to an area's ability to institute change and implement new technologies as a key determinant of regional productivity. This argues for inclusion of some measure of creative activity relevant to production. One obvious candidate is the number of patents issued to residents of the metro area.

The patent data are from the U.S. Department of Commerce, United States Patent and Trademark Office. We used data for "utility" patents, the most common kind of patent.8 The Patent Office issues reports on the residence of the first named patent holder, which adds the spatial dimension needed for this study. They note that this is probably an imperfect indicator of the location where the patent work was actually done, since in some cases the first-named patent holder might live in a different place than the location of his/her employer where the work was

actually done. But given that this study uses metro areas as the basic geographic unit, and metro areas are intended to be labor markets, this is not expected to be a major problem. We do recognize that more people are telecommuting, however, and that could introduce some error into the analysis. But perhaps this is less important for research and development, where a lab may be required.

The patent reports that provide location data are issued only on an irregular basis. The Patent Office issued such a report in 2010; the previous one was in 1999. The 2010 report gives data for the years 2006 through 2010, so our target year of 2007 is included. However, they use the 2009 MSA definitions to aggregate the data, and these vary somewhat from the December 2006 MSA definitions that are used for the other variables in the study. To rectify this problem, we aggregated their county-level patent data to the December 2006 MSA definitions.

To prevent this variable from being a scaling variable (larger places will naturally have more patents than smaller places, ceteris paribus), we use patents per 100,000 residents as the explanatory variable here, using 2007 population of the metro area as the denominator. In 2007 patents averaged 22 per 100,000 residents across the 363 metro areas, but varied from zero in three small MSAs (Danville IL, Goldsboro NC, and Hinesville-Fort Stewart GA) to 399.7 per 100,000 in innovative San Jose-Sunnyvale-Santa Clara, CA. Of course, patent data are not the only way to measure innovation. Bronzini and Piselli (2009) point to a slightly different idea of innovation--examining the importance of research and development spending in regional productivity. That study finds a positive relationship between research and development and regional productivity in Italian sub-national regions. Audretsch and Keilbach (2005) use the number of employees engaged in research and development. In their study of three manufacturing industries, Drucker and Feser (2012) explore use of both R&D expenditures and patents per capita. They find mixed results for the former, but find patents to have an important positive impact in all three industries. In fact, they say the effect is large enough to consider it as "a possible route for local or regional policy measures to influence productivity." (p. 7)

Our working hypothesis is that more patents issued per capita in a metro area will lead to greater productivity there.

2.4.5 Government Policy

Begg (2009) points out how governance and policy can both hinder and support a region's productivity. With wise investments in infrastructure, a government can improve productivity in its jurisdiction. This would be captured in the public capital determinant discussed earlier. On the other hand, by having high corporate taxes or making it difficult to open or operate a business through over-regulation, a government can hinder its region's productivity. Begg (2009) points to ownership of decision-making power as a factor in competitiveness. By measuring corporate taxes, or the cost to open a business, or number of days it takes to open a business, it may be possible to examine the effects of regulation on regional productivity. The proxy variable discussed for public capital may capture some of these effects, as well as variables to measure business taxes.

Our working hypothesis is that the higher the tax rate per worker in a metro area's state, the lower the productivity in that metro area.

2.4.6 Competitiveness

An additional distinction that needs to be made is between economic efficiency and competitiveness. The former is an absolute measure of the economic performance of the farm whereas the latter compares this performance to that of their competitors. In other words, a farm can be economically inefficient but competitive because other farms are even less efficient. Reciprocally, an economically efficient farm is not necessarily competitive if all the other farms are also economically efficient. Competitiveness also goes beyond the price/cost performance and extends to the features attached to the output or to the producing firm (or sector, country), such as quality attributes, both true and perceived. For example, a firm can have comparatively high unit costs but may benefit from a high "non-price" competitiveness, which allows it to sell its products at a higher price.

A more precise definition is given by Porter (1990), who differentiates competitiveness according to the geographical scale:

- At the local level, "competitiveness is the ability to provide products and services more effectively and efficiently than relevant competitors and to generate, at the same time, returns on investment for stakeholders";

- At national or regional level, “competitiveness is the ability of enterprises to achieve sustainable success against their competitors in other countries, regions or clusters” (Porter, 1990).

Competitiveness is most often measured using economic indicators, such as gross or net margins (often per unit of land), and comparing the performance of farms (or farming systems) based on these measures. Competitiveness and productivity are closely related: higher productivity can lead to a greater competitiveness of the enterprise (or sector) because more is produced out of the same amount of resources. This means that, with all things being held equal, the cost of production per unit of output is lower, and that margins per unit of output are higher. Productivity is a necessary precondition for competitiveness, but not a sufficient condition. Indeed, a multitude of factors affecting the competitiveness of an enterprise has been identified in the literature. Competitiveness is the result of a combination of factors, both national and international:

- Nationally, resource endowments, technology, productivity, product features, fiscal and monetary management and finally the trade policy are seen to be the most important factors that determine the competitiveness of an industry and/or business. Productivity is, therefore, seen as one of the national (domestic) determinants of competitiveness;
- Internationally, the most important factors are exchange rates, international market conditions, the cost of international transport and the preferences and settings between different countries (Porter, 1990).

2.5 Conceptual Framework of the Study

The below figure shows the conceptual frame work concerned with the determinants of labour productivity dimensions such as human capital, physical capital, government policy, innovation, resource of the flower farm and competition among flower farm as an independent variable on flower farm labour productivity especially on labour productivity as a dependent variable.

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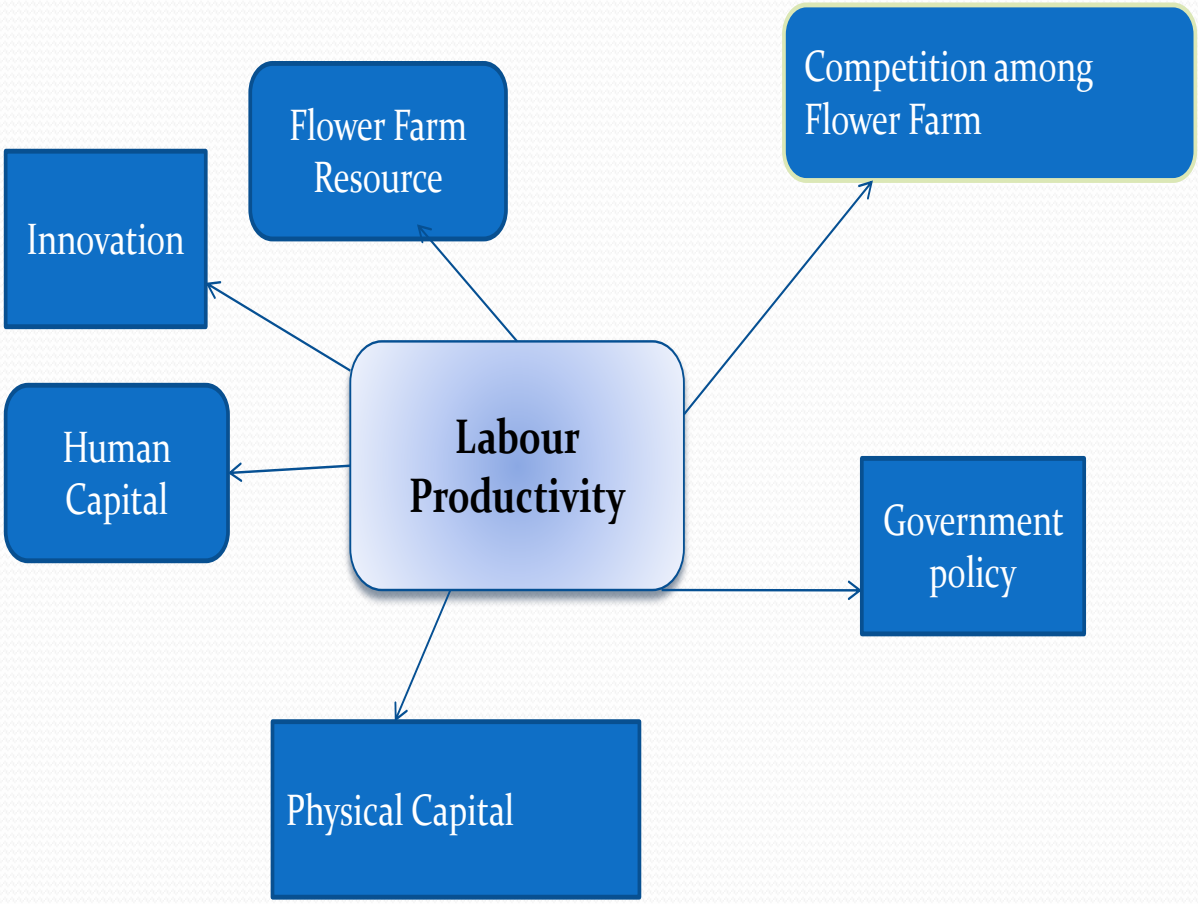
Conceptual Framework of Study



3. RESEARCH METHODOLOGY

3.1 The Study Area

The study was conducted in Oromia Regional State,East Shoa Zone, Bishoftu town is situated 45 km inland from the capital city. The area lies within the humid tropical rainforest zone with two distinct seasons, wet and dry season. The annual precipitation ranges from 2000-3000mm per annum. The area is located between latitude 20171 and 20271 N and longitude 20271 and 20581 E and covers an area of approximately 20 hectors. Bishoftu is a fast evolving metropolis with considerable governmental, civil and commercial activities with a very rich potential for agriculture.

3.2 Research Design

A research design was a plan on how the study undertaken (Berg, 2005). The design indicates the type of information was collected and kinds of data collection methods.

The research design indicates whether to use one type of data collection method or a combination of two or more methods-triangulation method. Accordingly, this study has used both qualitative and quantitative research methods and to the extent possible the research was informed by a feminist perspective.

3.2.1. Population and sampling

The study was conducted to assess the level of two flower farmers' workers towards labour productivity of Dugda and Joy Techflower farms.

The target respondents for the study were 144workers'from two flower farms those work experience at least 3year and more. According to the twoflower farms annual report for the fiscal year ended June 30, 2015/16, a total of 500workers are identified from both; among those the sample size of the study targeted those more than 3 years experienced. Workers who got work experience for at least 3 years are believed to have a reasonable evaluation of the labour productivity of the flower farms. This was consent to identifying and narrowing along the key factors and the related items comprising the factors which are expected to explain labour productivity in flower farm industry.

3.2.2 Sampling Technique

The respondents for the study were selected purposely as flower farm employees who have had the at least 3 year in work experience particular flower farm. This is due to the more years experienced employee of the indicated farm is known by the researcher. Therefore, the researcher was used non-probability sampling.

3.3 Data Sources

In gathering relevant data, the study has utilized different sources of data, inducing primary and secondary sources. These are described below.

Primary Sources

The researcher had used both qualitative and quantitative type of data. The Data that would be collected from sample survey through questionnaire that describes numerical figures were the quantitative data types that have been used in this study, whereas data that have been collected from interview and the like have been the qualitative data types of this study. The quantitative type of data that we collected was nominal, ordinal and/or interval type. Both qualitative and quantitative data was from primary and secondary source of data.

Secondary Sources

Available books, research reports, journals, articles, newspapers, electronic materials another publication related to the issue are used as secondary sources of data. In addition, unpublished documents are also referred.

3.3 Methods of Data Generation

For the purpose of this research, qualitative and quantitative data gathering tools were use to get in-depth information about flower farm workers. The use of qualitative and quantitative approaches encourages data triangulation – use of multiple data collection technique (DeVault, 2006:35). In addition, feminists resist the division of qualitative and quantitative methodologies. Reinharz (2002) indicated that there was no single method of doing feminist research and there was very little elitism of methodologies.

Qualitative Method

In qualitative research, the researcher is an important element of the research process; the researcher enters into the lives of the participants (Marshal and Rossman, 2005:59).

Qualitative research is aimed at discovering new experiences.

According to Berg (2005) qualitative research closely examines the social setting and the participants. It therefore investigates the relation between a given natural setting and its inhabitants. Qualitative research helps the researcher to deeply explore and understand the experiences of the participants. Olson (2005) identifies qualitative research as it is holistic, contextual and it uses the involvement of the object of the research. The separation between the researcher and the respondent is minimal where the object becoming active participant in the knowing process. In the same way, this research has made the participants active participants.

In addition, qualitative methods provide rigorous, reliable, verifiable data which helps to test an empirical hypothesis Olson (2005). Qualitative research tries to explain a phenomenon that occurs in a natural setting through the eyes of the participants.

Qualitative research is described as discovery research– trying to explore the working conditions and experiences of work flower farm workers.

Qualitative methods are preferred since they provide a way to study a phenomenon in its natural setting. In addition, qualitative research involves a set of empirical documents such as personal experience, case studies, observation and life history (Thomas, 2003).

Qualitative research involves interpreting a certain phenomenon in a naturalistic way (Cresswell, 2008). In addition to this, Marshal and Rossman (2005) stated the good side of a qualitative approach is that it is flexible and opens a way for the researcher to explore and discover a phenomenon. Two qualitative methods are employed here. These are interview, case study and participant observation.

In-depth Interview

From the perspective of feminist research, interview is a tool by which both the researcher and the researched assume to have an equal status for at least the time being (Fontana, 1994).Interviewing by a worker researcher has advantages. This kind of situation presents a work-to-worker talk and makes the interview process friendly (Reinharz, 1991). This semi-

structured interview used pre-prepared interview-guide containing the topics and issues the researcher wished to find out. The interview was conducted in an informal and conversational way by adjusting the questions to each interviewee's situation. Bernard (1994) noted that semi-structured interview fits best when the researcher does not get more than one chance to interview the participants.

Berg (2005) indicated that semi-structured interview is effective when the researcher uses probing. Probing provides the interviewee to speak out more so that the interviewer would be successful in getting more detailed answers. In this research, the investigator used probing method to let the participants speak more about their experiences.

The semi-structured interview consisted of open-ended questions. This helped the researcher to widely investigate the experiences of the work. Open-ended questions are mainly used in exploratory researches where the researcher cannot predetermine the responses that will be given (Remenyi, 1998:152).

Using semi-structured questions, in-depth interviews were conducted with 144 informants (91 women work and 53 men).Marshal and Rossman (2005) explained the nature of qualitative depth interviewing in terms of conversation rather than formal interviews that require precise response.

The researcher has also utilized observation as one research instrument for gathering relevant information. Using observation as one data gathering tool, the researcher was able to watch how workers in the flower farms accomplish their tasks, the protective tools available for them and the overall working conditions of workers.

Case Study

There are many flower farms in Ethiopia. Some of them have gone operational in the last10 years. However, for the purpose of this research two flower farms located in Oromiya regional state are selected based on their geographical proximity. Two of them are from Bishoftu (Dugda and Joytech).

Some workers working in the selected farms were research targets for this study. The target groups consisted of work and men who are working in the two flower farms. As this study was informed by feminist perspectives, diversity in gathering data was encouraged. Accordingly,

diverse groups of work and men were included. For example, work having different ethnic and religious backgrounds was part of the study.

For an in-depth treatment, two case studies of flower farm workers would select and present. Reinharz (2002:164) described feminist case studies consisting of sole description of an event, person or group. In addition, feminist case studies help to explore untouched issues by starting with a limited case.

Quantitative Method

Quantitative methods enable the researcher to put facts in numeric terms. Quantitative data puts human behaviors in numerical terms so that there is an accurate measurement

(Jones, 2005). It is a way of putting a specific aspect of a phenomenon in numerical measurement by reducing personal involvement with the research subjects.

In this study also the quantitative method is applied through questionnaire survey, as described below. The researcher tried to present existing facts in flower farms in numerical terms

Questionnaire

According to Marshal and Rossman (2005) the aim of administering a questionnaire is to gain knowledge about the quantitative distribution of characteristics, attitudes and beliefs.

With questionnaires, the reliability of the information gathered depends upon how accurately the responses of the participants are given.

According to Thomas (2003:66) there are two major intentions to undertake questionnaire survey: To get facts and opinions. Facts are reflections of the participants' knowledge while opinions are expressions of attitudes.

In this study a total of 150 flower workers (75 from each of the two flower farms) have been selected for the administration of survey questionnaire. Out of the 150 questionnaires, 144 were filled and returned. The group consisted of 91women and 53 men working in two flower farms, namely Joy Tech and Dugda, The purpose of collecting quantitative information was to complement the qualitative data gathered through in-depth individual interviews.

The structured questionnaire is intended to provide numerical information about rights, work conditions, experiences and safety situations regarding flower farm workers.

Remenyi (2008:150) noted that the use of questionnaire survey helps to get opinion and attitude information not easily observed or is not already available in written or computerized form.

3.4. Method of Data Analysis

Recording and Processing Data

The data was analyzed with the help of SPSS package. The primary sources of data that was collected from survey were carefully coded and checked for consistency and entered into the SPSS spreadsheet.

Descriptive statistics was used to analyze data and the results were tested with Pearson correlation coefficient and linear regression to investigate both the correlation and relationship between dependent variable (labour productivity) and the independent variables in flower farm factors (physical capital, human capital, resource of flower farm, competition among flower farm, innovation and government policy). Besides, measures of central tendency (mean, standard deviation) were used to analyze the questionnaire survey result.

In general, the summarized data was interpreted vis-à-vis hypotheses and research question designed based on literature review of the study to arrive at meaningful conclusion, to interpret data and to forward recommendation.

3.5 Fieldwork and Study Setting

Fieldwork

This study was conducted between March and June 2017. The researcher spent a total of 30 days in the field collecting both qualitative and quantitative information.

Study Setting

This study is conducted among flower farm workers located in Oromiya regional state, in Bishoftu areas. These sites are selected because of accessibility and proximity issues.

Two flower farms are included in this study. These are Dugda and Joy Tech. Each of these farms is briefly described below.

Dugda Farm

The Dugda floriculture development was established in January 2005. Ato Adugna Bekele, the owner, established the farm with an initial capital of 35 million Birr. It is located in East Shoa

Zone Ada Liben Woreda. The farm has a general area of 20 hectares where 14 hectares are covered by green house and buildings and green area cover the remaining 6 Ha. There are different varieties of flowers grown on the farm like: High Society, Kiwi, N-joy, Olympia, Top-Sun, Tucan, Wana-Hava and Kalhari, Valentino.

Dugda farm exports its flowers to Holland- Amsterdam, Germany-Berlin, Japan-Tokyo and Russia-Moscow. The farm created employment opportunities for 467 people. There are 38 men and 146 women permanent workers while the number of temporary workers is 47 men and 112 women. In addition, there are 51 men and 73 women daily laborers.

Joy Tech P.L.C

Joy Tech flower farm is found in Bishoftu town. It is a share company between an Israeli and Ethiopians. There are 600 workers where the 400 are permanent and temporary while 200 are daily laborers. The company started operation with an initial capital of 48 million Birr. The total hectare of land in the farm, which is under operation, is 13 Ha while the farm is currently doing a construction work to expand its production.

The company provides about 15 different flower types and it exports its products to Holland, Germany, England and Russia. The farm produces about 22,500,000 stems of roses yearly.

4. RESULTS AND DISCUSSION

This chapter presents the results of the study organized into three sections. Section 4.1 presents the descriptive statistics. Section 4.2 presents the correlation analysis among the dependent and independent variables. Section 4.3 presents the regression results.

4.1. Descriptive Statistics

The study used five point Likert –scales to measure each determinate of labour productivity with variables involved in the regression models. This was generated to give overall description about data used in the model and served as data screening tool to spot unreasonable figure. The mean of labor productivity ratio is 4.489 percent, whereas the minimum, maximum and standard deviation are – 4.65, 37.31, and 7.328517, respectively. The standard deviation exceeds its mean value. This reveals that there was a significant variation among flower farm institutions over the observation periods on cost per borrower has 5.372 percent and 9.392, respectively. There was also a significant variation on this variable across flower farm institutions and over observation periods. The maximum value is 37.31 and the minimum value is -4.65.

Table 4.1. Descriptive Statistics

Variable	Mean	Std. Dev.	Minimum	Maximum
Labor productivity ratio	4.489	5.956	-4.65	26.3
Physical capital	9.392	5.372	1	26.78
Human capital	396000	817000	479546	549000
Resource of flower farm	4.900	5.989	-.1	26.3
Competition among flower farm	9.392	5.372	1	26.78
Innovation	9.784	24.832	.2	122
Government policy	1.386	14.972	-50.8	27.5
Observation 144				

Source: Stata output result for descriptive statistics.

The mean of physical capital is 9.392, whereas the minimum, maximum and standard deviation are 5.372 percent, 22 percent and 4.334, respectively. The mean shows that on average, the sampled flower farm institutions had recorded 3.739 percent of portfolio at risk over 90 days over 2005 to 2014. It is low when compared to labor productivity rate, government policy.

Resource of flower farm has mean value of 4.900 and 5.989 standard deviation. In comparison the mean, the standard is high which indicate existence of a significant variation on this variable. The sampled flower farm institutions have birr 396,000 average human capital and birr 817,000 standard deviation. It implies that existence of significant gap of human capital among flower farm institutions over observation periods. The maximum human capital is birr 549,000 and the minimum is birr 479,546. The maximum value of competition among flower farm as deflated by innovation is 26.78 percent and the minimum value is -.1 percent. Its mean value and standard deviation are 9.392 percent and 5.372 respectively.

The mean value of age is 9 years while the maximum age is 15 years and the minimum is 3 years. This implies that flower farm institutions have long physical capital. On average, the firm has around 48 percent of competition among flower. This figure reflects how much the flower farm institutions emphasis on worker in providing financial services to them. The Government policy mean value is 24.408 percent whereas the minimum and the maximum are .1 and 250 percent, respectively. The mean of gross labor productivity to total holiday (GLP /TA) is 69.912. The mean value of gross labor productivity to total holiday is 69.912 percent, the minimum value is .64 percent and maximum is 133 percent. Innovation has 9.784 mean, .2 minimum value and 122 maximum value. The maximum value indicates highly leverage flower farm institution and the minimum value shows low leverage. On average, the sampled flower farm institutions are not highly innovation.

4.2 Correlation Coefficients

The correlations obviously show direction and strength of association between variables and it is a precondition to run regression, although correlations do not highly support whether there is a causal effect between variables or not because variables that are not theoretically correlated and have no causal effect might reveal significant association.

Table 4.2 presents correlation coefficients for all models in which physical capital, human capital, resource of flower farm, competition among flower farm, innovation and government policy are used as proxies for labor productivity. The positive significant correlation among dependent variables argues that a firm with higher physical capital would have high labor productivity. Natural logarithm of competition among resource negatively and strongly related

to all dependent variables (Physical capital, Human capital, Resource of flower farm, Competition among flower farm, Innovation and Government policy (P< 0.01). It implies the larger firms are more likely to reduce productivity risk because they have more resource of flower farm, hiring qualified employees and strong control over its labour products.

As can be observed in Table 4.2, human capital has a positive relationship (P < 0.01) with labor productivity rate, indicating that the order flower farm might relatively face labor productivity than the young one. One of the reasons may be due to that the older flower farm focus on expansion to reach more harvest hard currency. As a result, increase on hard currency raises the collection problems, which in turn results into higher default rates (Coleman (2007). Physical capital to competition negatively and significantly related to only labour productivity. There is a positive and negative association between human capital and competition among farm (P < 0.05). resource of farm and competition is negatively and significantly correlated to human capital and government policy only.

The coefficient on natural logarithm of resource of farm shows a positive and significant association with all dependent variables (physical capital, human capital, resource of flower farm, competition among flower farm, innovation and government policy). It indicates that a flower farm with higher on resource of flower farm would more have labor productivity. This is linked to diversification concept that a firm with resource of flower farm would have more diversified payment, which helps to significantly reduces portfolios risk (Ledgerwood, 1999). Government policy significantly and strongly related to labour productivity indicators (Competition among flower farm and Resource of flower farm). Government policy is a proxy for firm labor productivity; therefore, firms that are more profitable would significantly reduce labour productivity risk because they have a competitive advantage, relatively use available technology and strong systems related to labour.

Table 4.2. Pearson Correlation coefficients

	Variables	1	2	3	4	5	6	7
1	Labor productivity ratio	1						
2	Physical capital	0.597	1					
3	Human capital	0.329	0.44	1				
4	Resource of flower farm	0.986	0.58	0.331	1			
5	Competition among flower farm	-0.34	-0.25	-0.23	-0.31	1		
6	Innovation	0.073	0.072	0.22	0.018	-0.69	1	
7	Government policy	0.33	-0.23	0.038	-0.29	0.61	-0.12	1

Note: a. Bolds denote significant at the 1% level b. Italics denote significant at the 5% level

From macroeconomic variables, changes in innovation has negative associate with only on competition among flower farm, showing that the overall growth in economic conditions may provide reliable information to flower farm in providing financial services to low income group societies, which in maximize labor productivity. There is a positive significant relationship between inflation and labor productivity. Overall, the correlation coefficient among the independent variables is not sufficient to bias the result because multicollinearity is not a concern.

4.3Multicollinearity

The degree of multicollinerity among variables is measured based on variance inflation factors (VIF) suggested in the rule-of - thumb. As per this usual threshold, if the variance inflation factor on each variable is less than ten and 1 / VIF exceed 0.1, multicollinerity is not a serious problem (Field 2009).

Table 4.3: Degree of Multicollinearity for Variables.

Variables	VIF	1/VIF
Physical capital	5.07	0.197
Human capital	3.28	0.3051
Resource of flower farm	3.02	0.3307
Competition among flower farm	2.15	0.4647
Innovation	1.9	0.5262
Government policy	1.72	0.5807
Mean VIF	2.18	

A vif> 10 or 1/vif< 0.10 indicates trouble.

Here the variance inflation factor (VIF) for all variables is significantly less than 10 and the 1/VIF is significantly exceeds 0.1. Therefore, the researcher concluded that multicollinearity is not a serious concern.

4.4 Regression Results

Regression analysis is a statistical method to deal with the formulation of mathematical model depicting relationship amongst variables which can be used for the purpose of prediction of the values of dependent variables, and given the values of the independent, Kothari (2004). Linear regression estimates the coefficients of the linear equation, involving one or more independent variables that best predicts the value of the dependent variable. Multiple linear regressions were conducted to identify the relationship and to determine the most dominant variables that influenced the labour productivity of flower farm industry. Moreover, multiple regression analysis in this research was conducted to test the effect of the independent variables (Physical capital, Human capital, Competition among flower farm, Resource of flower farm, Innovation, Government Policy) on labour productivity. The reason for using multiple regression analysis was to examine the direct determinate of labour productivity on flower farm industry and the output was given in the table below. In order to indicate the determinant that each factor has on the dependent variables, the study checked the standardized coefficients.

Table 4.4 Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.940a	0 88.4%	0.876	0.33204	0.884	119.23	7	110	0

Source: Survey outcome and own computation (2017)

a. Predictors: (constant), Physical capital, Human capital, Competition among flower farm, Resource of flower farm, Innovation, Government Policy.

As indicated in the model summary of the analysis in the above table 4.20, R (.940a) indicated correlation of the ten independent variables with the dependent variables (labour productivity) affecting approximately 88 %(R Square) of the variance of labour productivity and the remaining percent (12%) was explained by other factors. This result also viewed that there may be other variables that could have been discussed by this study in predicting labour productivity.

Table 4.5: *Coefficients: Regression Results for determinant of flower farm industry labour productivity*

Variable	Unstandardized Coefficients		standardized coefficients	
	β	t-value	t	sign.
Constant	36.949	3.03	-12.177	(0.003)***
Physical capital	-1.279	-2.11	-0.605	(0.038)**
Human capital	-0.458	-2.27	-0.202	(0.026)**
Resource of flower farm	0.152	2.95	-0.052	(0.004)***
Competition among flower farm	-0.027	-0.11	-0.248	-0.913
Innovation	0.0105	0.43	-0.024	-0.667
Government Policy	(-.623)	-3.46	-0.18	(0.001)***

F(11 70) = 6.74
Prob> F = 0.0000
R- squared =.5880
Root MSE = 4.3613

R –squared = .4889
Wald chi2(11) =104.93
Prob> chi2 = 0.0000

R –squared =.4035
Wald chi2(11) =429.30
Prob>chi2 = 0.0000

F (11 61) = 6.82
Prob> F = 0.0000
R – squared = .6376
Root MSE= 4.1207

Obs =144 Obs year 2005 -2014 FLOWER FARMS s = 2

Note: Numbers in parentheses under the coefficient (β) and t-value or z-value are robust standard errors and p-values, respectively. *, **, and *** indicate statistical significance at the 10 percent, 5 percent, and 1 percent levels, respectively.

The coefficient for operating expenses as measured by (physical capital divided by competition among flower) shows a negative and significant influence on labour productivity (P< 0.01, 0.01 and 0.05, respectively). The physical capital provides the best indicator of the overall efficiency of a flower farm and thus, it measures the institutional cost of operating farms. The result argues that the less efficient flower farm more likely to reduce labor productivity. Gonzalez (2007) provides also similar evidence that physical capital have a negative and significant relationship with flower farm labor productivity as measured by holiday and Public capital/Infrastructure. However, Obsa (2012) finds a positive relationship between physical capital and labour productivity risk as measured by Public capital/Infrastructure. The study finds insignificant relationship between government policy and physical capital.

Innovation has positive and significant impact on only labour productivity (p < 0.01). The result suggests that flower farm with high holidays have more labor productivity. This might be because of strong procedures in screening, monitoring and collection of labour portfolios. When a firm engages in providing various labour products to its clients but with smooth polies and

procedures, the firm might face problem to get back the money. In addition, the older flower farm institutions may acquire knowledge and experience about the market, better operational strategies, financing sources, customer needs and have learned ways to overcome completion constraints in the market. Gonzalez (2007) argues that the older flower farms have more experience in screening, monitoring and collection practices than flower farms at an infant level. This holds reliable if the flower farms have strong policies and procedures. However, most of flower farm institutions provide infrastructure to labour productivity. The evidences provided by Coleman (2007)

As shown in Table 5, the coefficient for the ratio of economic scale within the total overtime shows a significant ($p< 0.1$) positive relationship with labour productivity. However, the sign is not statistically strong, human productivity positively and significantly influences labour productivity at ($P < 0.01$, 0.01 and 0.05, respectively). High ratio of labour productivity implies asset to the institution. In other labour productivity institution with high volume of production would have more capacity to provide flower. Virtually, flower farm institutions engaged export variety of flowers. While providing labour, flower farms require the labour to save a specified number of workers on certain frequently basis. Accordingly, the workers should get benefit some amount of money, which may limit their capacity to run the business as well. Therefore, obligatory benefit at early stages may reduce the workers' investment capacity and thus, increase the probability of productivity risk. Usually a farm incurs losses at the early stages of operation because of high amount of set up costs and marketing costs. The negative and significant coefficient on labour productivity to total holiday payment with shift work and public capital argues that flower farms with more diversified flower varieties is higher likely to have labor productivity. A flower farms with high proportion of flower varieties to its total holidays payment is more likely to have higher labor productivity because the magnitude of labour productivity increases with the size of diversified varieties.

Table 4.5 reveals that natural logarithm of public capital negatively and significantly related to and labor productivity, meaning that an institution with higher amount of worker turnover would more likely to reduce labor productivity. This result is linked to worker diversification because if the flower farms employee a number of workers and motivate them, it would have more productive, which help to significantly reduces turnover risk (Ledgerwood, 1999). The

result suggests that raising motivation practices with labour diversification concept could appear as one mechanism to boost products quality. Government policy has significant and negative impact economic scale, public capital, human capital and physical capital. It depicts that a flower farms with higher Government policy more tends to have higher labor productivity. Since the government policy is a proxy for labor productivity, therefore, a profitable flower farms has capacity to reduce absenteeism and turnover via hiring qualified employees, using the available technology, in designing an effective control over flower products and continuously follow up its clients. A human capital is also adversely related to government policy but it is not statistically strong ($P < 0.1$).

As shown in Table 4.5, from macroeconomic variables, changes in innovation found that negatively and significantly affects labour productivity ($P< 0.05$). This argues as resource flower farm increases, labor productivity of the flower farms. This result is consistent to Gonzalez (2007) findings that when the overall economic conditions increase, flower farms productivity risk could reduce. A stable and increase economic condition trend would help flower farms to make reliable prediction about their flower. The study did not found significant coefficient on the Resource of flower farm. Generally, on balance the hypotheses linked to Physical capital, Human capital, Competition among flower farm, Resource of flower farm, Innovation, and government policy were accepted. Nevertheless, the hypotheses related to innovation were rejected and the hypothesis related to resource of flower farm were some somewhat supported.

5. CONCLUSIONS AND RECOMMENDATION

5.1. Conclusion

This study examines determinants of flower farms labor productivity as measured by Physical capital, Human capital, Competition among flower farm, Resource of flower farm, Innovation, from the analysis carried out of 2 flower farms workers of 144. Based on the regression model and random effects generalized least squares, the study finds an institution physical capital is negatively and significantly influences, government policy, human capital and innovation. It implies that flower farms operate at high expenses due to scale and scope of economies advantages, possess a larger pool of qualified human capital and have a greater chance for strategic diversification. The result suggests that flower farms with more low physical capital have more labour productivity. This might have strong procedures in screening, monitoring and motivating of workers and expenses management.

Human capital positively and significantly influences competition of, government policy, resource among flower farm. High ratio of product to labour implies liability to the institution. In other ways, an institution with high labour production volume would have more capacity to provide product. While providing products, flower farms require the motivate labour to provide a specified number of product on frequently basis. Accordingly, the labour should save some amount of money, which may limit their capacity to run the daily life as well. The negative and significant coefficient on physical capital to innovation with staff turnover and public capital argues the flower farms with more diversified labour would high likely to have profitable. The natural logarithm of innovation is negatively and significantly related to human capital, government policy, and resource of flower farm, meaning that employees with higher amount of innovation would more likely to higher labor productivity risks. Physical capital has significant and negative impact innovation, government policy, competition and human capital. It depicts that a flower farms with higher government policy more tends to have higher labor productivity. This argues as resource of flower farm increases, labor productivity of flower farms increase.

5.2. Recommendation

The major objective of flower farm institutions is the production varieties of flowers and provide to domestic and international markets. Particularly the institutions reduce unemployment rate, earned hard currency for the country. To do so, the labour productivity should be secured in order to reach corporate strategy set by concerned governmental organ and owner of the farms. Unless the flower farm institutions act accordingly, it could not product available to the market as expected. With this fact in mind, the researcher forwards the following recommendations based on the findings.

First, natural logarithm of the total holiday's payment found as important determinant labor productivity of flower farms. The result shows that larger flower farms have more capacity to generate more profit (Table 4, pp.38).

Therefore, the study recommends that the flower farm institutions should give considerable attention to their labor as human capital increase to get the advantage of more benefit. The physical capital the proxy for efficiency appeared as important determinant. The lower ratio implies more efficiency and vice versa, but the regression result shows a positive sign means as the ratio gets up, the productivity risk will rise (Table 4.5, pp.42). With this regard, the study recommends that the institution should take into attention to increase physical capital and see its effects on labor productivity.

Second, the study found the strong effect of productivity to labour benefit and total production to human capital on labor productivity. Competition among flower farm show negative coefficient suggesting that as the ratio increases, the labor productivity would also decrease. One of the reasons might be non- financial service, repeat follow up byflower farms, and cost of fund. Practically, a business incurs losses at the early stages because marketing cost would high; therefore, if the workers should save back a specified amount of money at an interval time, they may feel lack of enough capital to run their life as well and thus, in short period they will liquidate the daily life. Therefore, the flower farmsshould due enough emphasis while setting the amount and interval period for worker benefits. Gross labour productivity to physical capital reflect worker diversified which recommended in increasing labor productivity. This is the

advisable device in labor productivity management so that flower farms could have a diversified their labour and motivate them which would significantly reduce risks and increase production.

Finally, natural logarithm of physical capital, resource of flower farm, human capital and also competition among flower farm thought as major determinants of labor productivity. Innovation shows a negative coefficient arguing that having higher volume of innovation could reduce the labor productivity. Innovation is recommended to have diversified workers than other (Ledgerwood, 1999). Based on this notion, the study recommends that flower farms should work more on human capital, physical capital which would in turn reduces labor productivity. The coefficient on the resource of flower farm is also hope giving to increase labor productivity. Therefore, working more to decrease physical capital assists to increase labor productivity. Overall, innovation and competition among flower farm were not found as major determinants but flower farms should not ignore them.

There are important determinant variables suggested in literature but not included in the models of the study, for example, method of worker association, management related factors (internal control over labour benefits), technology, etc. Therefore, further study would use these variables and see their effects on labor productivity.

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