

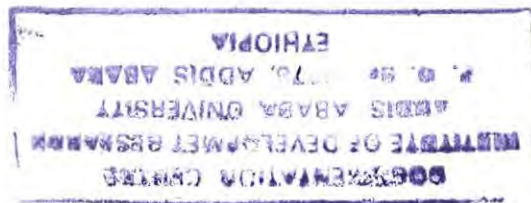
**Addis Ababa University  
School of Graduate Studies  
College of Development Studies**

**Assessment of Agriculture and Industry Linkage in  
Ethiopia**

*The case of Selected Agro Industries in Ada'a Woreda*

**In Partial Fulfillment of the Requirements for the Degree of  
Master of Art in Development Studies**

**Addis Tekle**



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**ADDIS ABABA UNIVERSITY  
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COLLEGE OF DEVELOPMENT STUDIES  
(CDS)**

*Title*  
***Assessment of Agriculture and Industry Linkage  
in Ethiopia. The Case of Selected Agro Industries  
in Ada'a Woreda.***

**By  
Addis Tekle**

**DEVELOPMENT STUDIES**

APPROVED BY THE BOARD OF EXAMINERS:

SIGNATURE

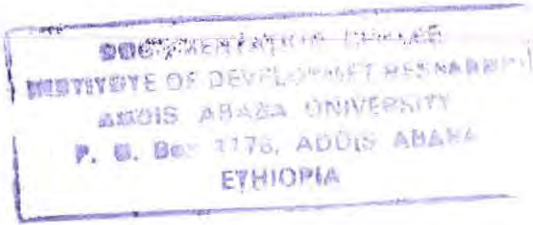
**Dr. Workneh Negatu**  
INSTITUTE DIRECTOR



**Dr. Workneh Negatu**  
ADVISOR



**Dr. Degefa Tolossa**  
INTERNAL EXAMINER



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2010

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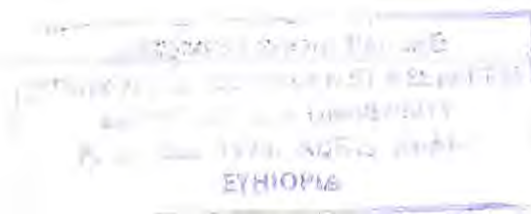
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## **Acronyms**

ADLI	Agricultural Development Led Industrialization
CSA	Central Statistics Authority of Ethiopia
GDP	Gross Domestic Product
LMSFP	Large and Medium Size Food Processing
LMSMI	Large, Medium Scale Manufacturing Industry
MoFED	Ministry of Finance and Economic Development of Ethiopia
UNIDO	United Nations Industrial Development Organization
EtB	Ethiopian Birr
UN	United Nations
ISIC	International Standard Industrial Classification
DPPC	Disaster Prevention Preparedness Commission
KM	Kilo Metter
SMU	Small Milk Unit
DAs	Development Agents
HICE	Household Income Consumption Expenditure
CBOs	Community Based Organizations
MoTI	Ministry of Trade and Industry
IFSA	International Food Standards Agency
UNDP	United Nations Development Program-
FTCs	Farmers' Training Centers
SNNPRS	Southern Nations, Nationalities and Peoples Regional State/Ethiopia
UNERC	United Nations Emergency Relief Coordinator

## Abstract

*This study was conducted to assess the situation of agriculture and industry linkage and factors that affect the linkage in Ada'a Woreda in particular reference to agro industries and rural farm households. The assessment used production, consumption, labour, technology, institutions and capital as a pillar to assess the situation. To generate appropriate data, sample survey, key informant interview and observation were employed. Using random sampling a total of 115 farm households were drawn based on their distance from Bishoftu town. Similarly, purposive sampling method was employed to draw 6 food processing agro industries that are found in the area. A total of 15 key informants from government organizations, agro industries, and business firms (mainly traders) were also addressed. The data was collected through survey questionnaires, key informant interviews and observations. This study elicited important insights in the understanding of agriculture and industry linkages found in the study area. Accordingly, it was observed that there were long established linkages between agriculture and industry. Most of the linkages are also recognized as indirect in the market process. It is also identified that low agricultural production due to small land holding and low application of modern agricultural inputs, distance of industrial establishments from farm households, indirect participation of agro industries in the local agricultural marketing system as well as dominance of wholesalers and brokers in the local agricultural marketing system are found as the main causes for low linkages of agriculture and industry in the area. Therefore, considering the existing situation of individual sectoral development and linkages of the sectors in the study area, increasing agricultural production and strengthening the agricultural marketing system are found paramount to enhance the local linkages of agriculture and industry.*



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## CHAPTER- I: INTRODUCTION

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### 1. Background

Agriculture has been considered the hallmark of the first stage of development, while the degree of industrialization has been taken to be the most relevant indicator of a country's progress along the development path. Moreover, the proper strategy for growth has often been conceived as one of a more or less gradual shift from agriculture to industry, with the responsibility of agriculture to finance the shift in the first stage. Such industrial prescription rested on the supposedly weak production linkage between agriculture and the rest of the economy. In his words, "agriculture certainly stands convicted on the count of its lack of direct stimulus to the setting up of new activities through linkage effects - the superiority of manufacturing in this respect is crushing" (Hirschman, 1958, cited in Alemayehu et al, 2007). This view contributed to a common neglect of agriculture, particularly during the 1960's.

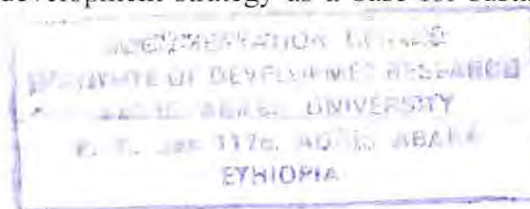
Yet in spite of Hirschman's confident assertion, import substituting industrialization strategies broadly failed to stimulate broad-based economic growth (Bruton, 1990, cited in Alemayehu et al, 2007). As a result, many development specialists have come to believe that early investments in agricultural productivity constitute a necessary precondition for overall economic growth. For without rising farm productivity, the transfer of labour and capital from agriculture will lead to falling agricultural output, rising food prices and growing poverty (Ibid).

Indeed, apart from a handful of city-states and small island countries such as Mauritius, the vast majority of large economies worldwide have initiated growth through agriculture. According to the World Bank (2006), over the last fifteen years, Nepal's annual economic growth rate has averaged about five percent. This growth has largely been derived from the non-agricultural sector that has strong linkage with the agriculture, particularly from export of garments, carpets and others, which now contributes about 60 percent of GDP compared to a mere 40 percent 15-20 years ago. Similarly, in Indonesia, the agricultural and non-agricultural sectors in rural areas are closely linked. Hence, growth in one sector will induce growth in the other and vice versa. In

Nepal's economy, the share of agriculture in Gross Domestic Product (GDP) has been continuously declining over time, falling from around 22% in 1990 to 15% in 2003 (Suryahadi, Surayadarma, Sumarto and Molyneaux, 2006). The case is also similar for India, China and other South East Asia countries that have been dependent only on agriculture (Ibid).

With this regard, Myint said that, "... in agrarian economy, the manufacturing sector does not continue to expand for long without a balance expansion in the output of agricultural sector" (Cited in Admit, 1990). Moreover, Baren (Cited in Admit, 1990) described it as "...there can be no industrialization without an increase of agricultural output and surplus, and there can be any modernization of agriculture without industrialization." These show us, separate sectoral development approach, with weak information system and self-centered egoistic personality, will end up nowhere except widening gap of isolation among sectors. Impediments and imposition on sectoral integration should be overruled. No law or legal notice or proclamation shall limit its level or by whom it is to be directed and sponsored. Therefore, an integrated approach should be initiated (Admit, 1990).

Currently, Ethiopia follows development pattern, which agriculture lead the economic growth. The country has formally adopted Agriculture Development Led Industrialization (ADLI) as a development strategy in 1994. The policy aimed on agricultural productivity in order to increase farm output and income, thus generating growth for both farm inputs and consumer goods. This strategy has been justified because agriculture is the largest sector in its production output, employment and means of foreign exchange. Moreover, the bulk of the poor people live in rural areas practicing agriculture. In the country considerable gap exists among rural and urban areas across key dimensions of including health, education and infrastructures. Whereas, there is substantial potential to increase agricultural productivity by introducing modern technologies and inputs further (MoFED, 2002). The industrial development strategic plan that adopted in 2003 also recognized agriculture led development strategy as a base for sustainable industrialization process.



## **1.1 Statement of the Problem**

Development of industry has significant relation and benefit for agriculture and other economic sectors. Especially the development of agro-industries has many beneficial feedback effects on agriculture. The most direct one is, of course, the stimulus it provides for increased agricultural production through market expansion (UNIDO, 2000). The agriculture sector serves as a source of capital accumulation, employment and raw material for the industry, whereas, the industry serves as supplier of labour saving technologies, infrastructural devices and consumer supplies for agriculture.

The performance of agriculture severely controls the pace of industrialization. Agriculture is expected to supply excess surplus for investment, raw material for industry, food for the urban and market for industrial products. It is also expected to boost export and earn foreign exchange (Admit, 1990). If the agriculture is weak in progress, the hope of industrialization will not be bright; and if no hope for industrialization, agriculture will remain weak. The predicament also comes to be circular (Ibid).

In Ethiopia, the intrinsic feature of the peasant sector retarded not only the pace but also the evolution of industrialization. This is because; the peasant community that comprises the majority of the population is culturally complex, religiously tied with that of conservative pattern of living. Production is only for short run consumption, no need to produce beyond the biological needs and no sense of surplus. What was beyond and above had been squandered on lavish consumption, no accumulation, no extended production. It simply proceeds with the same technique from one generation to another (Admit, 1990).

For many years, due to the reasons mentioned above and natural factors, agriculture remained weak in Ethiopia. This is also partly because of low policy attention and realistic approach. No separate effort on agriculture, through specific autonomous and isolated entity, will bring about modernization in agriculture. It is synchronized effort made on agriculture and industry that breaks the circle of poor performance of the sector (Admit, 1990). Therefore, low focus on agriculture and its linkage with industry, which has been intensified during late 1970's and early

1980's, severely-retarded the pace of industrialization. This neglect made agriculture less productive to supply surplus for further investment, food for urbanites, to provide raw materials for industries, market for industrial products and to boost foreign exchange earnings.

However, since mid of 1990s, the national development policy considered agriculture as engine of the economy and earmarked importance of industrial growth in conjunction with agriculture to ensure accelerated economic growth. Exploiting and strengthening the bondage between agriculture and industry also got primacy to such end (MoFED, 2002). Consequently, since the adoption of the policy and strategies, both sectors are scoring relative growth. However, both sectors are still experiencing challenges to fill the gap of domestic demand. If we see the agriculture, it could not feed the entire nations' population, where there is still 9% food insecure population (UNERC, 2009). This also caused problem on effective linkage of agriculture and industry.

However, even if the two sectors are by any means linked locally or in distance, it is crucial to assess the situation of the linkage exists, given its importance for accelerated economic growth and sustainable development. Moreover, before the commencement of the study, it is discovered as there are limited studies on the linkage of these two sectors, which requires prime importance for rural and national development of the country. This research, therefore, makes every effort to analyze the situation of agriculture and industry linkage and factors that affect the linkages considering agro processing industries as a bridge in Ada'a Woreda. This also let the study to contribute a lot to fill the existing gap on linkage of the two sectors.

This study targeted Ada'a Woreda since it is one of the few woredas that has the agriculture and industry sector in considerable level. It has sizeable number of industrial establishments. The industrial establishments are also varied in size and type. There are industries that process primary inputs as well as others that process and finish secondary industrial products. Therefore, since the Woreda has both economic sectors with considerable level and size, it is possible to see the linkage of the two sectors at regional level.

The study also needs to observe the linkage among the two sectors through production, consumption, labour supply, technology, institution and capital transfers. The national data reflects that the linkage situation of the two sectors is also similar at local level. However, presence of such linkage among the two sectors, is also believed that, contributes for sustainable regional and local development.

## **1.2 Objectives of the study**

The general objective of the study is *to assess the situation of agriculture and industry linkage in Ada'a Woreda*<sup>1</sup>. The study further addresses situation of the following specific linkages:

1. Production and consumption linkage of agriculture and agro industries.
2. Labour supply, capital, technology and institutional linkage between the two sectors
3. Factors that affect agriculture and agro industries linkage
4. Contribute to fill the information gap that exist on the linkage of these two sectors

## **1.3 Research Questions**

Using the methodology and techniques the research addresses the following research questions;

1. Do rural households produce agricultural raw materials for the agro industries, and how much do the agro industries utilize these products?
2. Do farm households of the area purchase and utilize industrially processed foods for household consumption?
3. Are there any products of industry that serve as agriculture inputs?
4. To what extent agro industries utilize the labour force from agriculture/ rural population of the study area.
5. How much are the agriculture and industry sector of the area linked through capital, technology and institutional transfers?
6. What Factors that affect linkage of the agriculture and agro industry in the study area?

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<sup>1</sup> **Woreda:** Is an administrative unit which is found below Zone administration and above Kebele Administration Unit under Ethiopian' Federalism Structure.

## 1.4 Scope and Limitations of the Study

### 1.4.1 Scope of the Study

The study assesses situation of backward and forward linkage of the agriculture and industry sectors. It reviewed production, consumption, labour supply, capital technology and institutional linkages, and factors that affect the linkages. The mainly study focused on primary data obtained from sampled rural households and selected milk and wheat processing upper-stream<sup>2</sup> and downstream<sup>3</sup> food-processing industries found in Ada'a Woreda. The selected agro industries have also large and middle level capacity. The study used agro industries, particularly food processing industries, to assess situation of agriculture and industry linkage since agro industries serve as a direct bridge for the two sectors.

### 1.4.2 Limitation of the Study

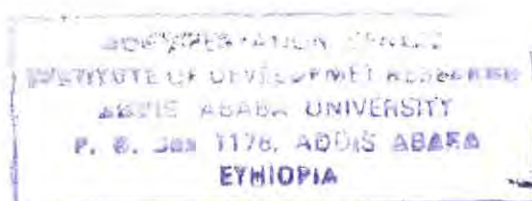
Geographically, Ada'a Woreda has twenty-seven (27) rural kebeles<sup>4</sup> and one big urban center, i.e. Bishoftu, with 9 kebeles and 3 special sub town administrative units. Since the study focuses on farmers, the sampling framework of the study did not include farmers engaged in urban agriculture in Bishoftu town. Similarly, the rural kebeles have about 20,099 households and such a large size may require large sample size to be taken in order to have the real picture of the situation. However, due to time and budget constraints and partly assuming the rural households have more or less similar socio-economic conditions, the study confined itself only on 115 farm households found distant from and near to Bishoftu town, where most of the agro industries are located.

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2 **Upper-stream Industry:** Industrial firm that process direct raw materials in to basic substance in its natural, modified, or semi-processed state as it used as input to a production process for subsequent modification or transformation of finished products (UNIDO,1979 cited in UNIDO, 2000).

3 **Down-stream Industry:** Industrial firm that process the output of other firm, which is at the previous level of material processing into a finished or different products(UNIDO,1979 cited in UNIDO, 2000).

4 **Kebele:** Is the lowest and smallest administrative unit at grass root level and is found below Woreda Administration in Ethiopia's federalism structure.



Agriculture and industry linkage is a broad concept. Full understanding of this concept requires intensive analysis of all of its components with identification of specific indicators to measure production, consumption, labour supply, technology, capital and institutional linkages. However, due to time and limited financial resource as well as difficulty of measurement, this study analyzed linkages of agriculture and industry at local level using logically verifiable and measurable indicators and by tightening the scope of selected targets. Therefore, the study did not use time series data.

### **1.5 Organization of the Thesis**

This study report contains five chapters. The first chapter deals with study background, statement of the problem, objectives and scope of the study. The second chapter attempts to depict related findings pertinent to the study objectives as well as definition of concepts and related components, and conceptual framework. Research methodology and research design along with description of the study area are presented under chapter three. Chapter 4 also deals with results of the analysis of the study. Finally, conclusion and recommendations of the study is presented in chapter five.

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## CHAPTER-II: REVIEW OF LITREATURE

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### 2.1 Concept of Agriculture and Industry Linkages

A degree to which one economic sector's ability to generate demand for products of other economic sectors is known as linkage (UNDP, 2000, cited in UNIDO, 2000). Similarly, Tacoli, (2004) puts the concept of agriculture and Industry linkages as "Interrelationships between agricultural and nonagricultural sectors during the process of economic development". In an interdependent economy, he puts the concept of linkages as a relationship of a sector with the other through its direct and indirect purchases and sales. Cai1 and Leung (2002) also interpreted the concept of agriculture and industry linkages as follow:

*"In an interdependent economy, a sector is linked to other sectors by its direct and indirect purchases and sales. A sector's linkage through its direct and indirect purchases is called its backward linkage. As opposed to backward linkage, a sector is forward linked to other sectors through its direct and indirect sales to it."*

In the process of backward and forward linkages, both sectors will have their own contribution towards own development and their linkages. A study of USAID on Agro industry Development in United States of America (2008) described the idea that backward and forward linkages of agriculture and industry need horizontal interfaces rather than hierarchical to obtain prosperous end. Horizontal linkages (interfaces) are also longer-term cooperative arrangements among categories that involve interdependence, trust and resource pooling in order to accomplish common goals through bounded value chains.

According to USAID (2008), horizontal linkage can help reduce transaction costs, create economies of scale, contribute to increased efficiency, competitiveness, production quality, facilitates collective learning and risk sharing among the sectors. It described such linkages as it can be obtained only through competitive and free market system, where both sectors have equal importance to each other. This connotes that command and over utilization of a sector against the other affects cyclic growth and reliability at the end.

Strong horizontal linkage, which promotes cooperation rather than competition, helps the sectors to achieve economies of scale, encourage innovations, upgrades production quality and overcome common constraints to pursue opportunities (USAID, 2008). Moreover, it described weak horizontal linkage, where buyers conspire on pricing or producers operate through government impositions and without commercial purpose, would undermines creativity, productivity and causes under development.

According to Colman David (1975) (Cited in Amaha, 1990), there are two models of agriculture and industry linkages. These models are known as 'Traditionalist' and 'Modernist'. The 'traditionalist' model of linkages assumes that industry will be treated independently and will not have influence on agricultural activities. The implementation of one industrial unit will, however, depend on input supply form agriculture, which will not be affected by large modification. This implies that dependence on small farming system and traditional methods of farming that have high product wastage provide constant supply of inputs for the industry without any further intervention on the agriculture.

"Modernist" model of linkages, however, takes place in the form of agro-industrial complex (Colman David (1975), cited in Amaha, 1990). According to him, agro-industrial complex is an autonomous entity that comprises a farm and industrial units with a single management apparatus. It conducts the agricultural production, industrialization and marketing of agriculture and industrially processed agricultural products with relative velocity. The industrial units are also needed to be established near the farm units. These demonstrate that the agriculture is responsible to supply all the necessary inputs for the industry. This managerial integration at policy and organizational level ensures high agricultural productivity through reduction of production costs of intensification, proper mechanization, irrigation, fertilization, and modern farming methods. At the same time it facilitates rapid industrialization process (Ibid).



### 2.1.1 Areas of Agriculture and Industry Linkages

According to Law of Comparative Advantage<sup>5</sup> there is negative links between agricultural productivity and industrialization (Millar, Cited in Amaha, 1990). According to this view, the manufacturing sector competes with the agricultural sector for labor. In open economy, low productivity in agriculture creates an abundant supply of “*Cheap Labour*”, which the manufacturing sector can exploit.

However, according to the Traditional Economic Development view<sup>6</sup> there is a positive link between agricultural productivity and the industrialization process (Todaro, 2009). According to this view, in positive linkages, while the agriculture grows, it stimulates series of economic linkage with the rest of economic sectors. The raise in the productivity of agriculture makes possible to feed the growing population in the industrial sector with less labor pay/price. Consequently, the agricultural sector is able to release more labour for the manufacturing (Ibid). This indicates that the increased number of workers in the manufacturing sector enlarges the domestic market for industrial products. This also enables to obtain productivity on use of economic resources to bring economic transformation and sustainable economic growth.

However, the traditional development view shows the linkage between agriculture and industry linkages is broadly leveled at macro level (Todaro, 2009). This explains that most of the indicators that measure the linkages of agriculture and industry are showed at macro level. Therefore, this study focuses on specific areas to assess the linkages both qualitatively and quantitatively. Accordingly, assuming the existence of free market system and participation of different actors in the market system, the following areas are used to assess the situation of agriculture and industry linkages.

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<sup>5</sup> **Low of Comparative Advantage:** It is a scientific marketing strategy of having the comparative relative benefit one product/sell over the other (Todaro, 2009)

<sup>6</sup> **Traditional Economic Development View:** An economic development, which agriculture has been assumed to play positive role. Its prior purpose was to provide sufficient low priced food and labour to the expanding industrial economy, which was thought to be the dynamic “*leading sector*” in any overall strategy of economic development (Todaro, 2009).

### **2.1.1.1 Production Linkage**

Production linkage includes *forward* linkage of agriculture to processors of agricultural raw materials as well as *backward* linkages that use as industrial input for agriculture. Karshenas (1999) described the concept of production linkage as it includes transfer of inputs such as equipment, pumps, fuel, fertilizer and repair services that make the work force exist in the agriculture and industry productive. According to him, the linkage process involve agricultural producers, suppliers, input dealers, grain traders, processing industries and transporters of agricultural products, inputs and manufactured goods.

According to Suryahadi, Surayadarma, Sumarto and Molyneaux (2006), in the production linkage, *distribution* linkage is refers as an intermediary between the two sectors. This shows the agriculture may supply its output directly to a food-processing industry, but it may also sell its output to a trader who then re-sells it to the food-processing industry. In this case, the trader plays the role of *distribution linkage*. In general, a distribution linkage provides location and time values. First, it provides location value added by transporting a good from one place to meet its demand in another place. Second, it provides time value added by storing a good to meet its demand in the future (Suryahadi, Surayadarma, Sumarto and Molyneaux 2006).

### **2.1.1.2 Consumption Linkage**

Conventionally, consumption linkage of agriculture and industry mainly includes the spending of the farmers on locally produced consumer goods and services. This is also indicated as it is the amount of farmers' farm income spending on non-farm goods, services as well as industrially processed food items and perishable agricultural commodities like milk, fruit and vegetables (Mellor and Lele, 1971, cited in UNIDO, 2000). They further described consumption linkage that comes from growing farm income can induces sizable second round rural growth via increased consumer demand for processed agricultural and non-agricultural products. This shows that following an initial spurt in farm productivity and incomes, production and consumption linkages together can induce second round demand-led growth.

According to Suryahadi, Surayadarma, Sumarto and Molyneaux (2006), consumption linkage boosts economy growth through increases of agricultural sector outputs. They supposed an exogenous technological improvement is introduced in the process to the agricultural sector, which then results in an increase in farm productivity. This explains that boost in income increases the households' demand for industry goods, which it also enhances the total income of the economy.

### 2.1.1.3 Labour Linkage

According to Lewis (1954) (cited in Todaro, 2009), supply of labour is unlimited in rural areas. New industries can be set up and the existing ones can be expanded without limit at the low wage rate. This entails growth of labour productivity, which is typically faster in agriculture than in other sectors of the economy. This also contributes to the release of labour and hence its availability for other sectors.

Classical Development Theory<sup>7</sup> describes that at early stage of development, agriculture accounts the major part of GDP, labour force, resources for taxation and capital formation. However, when the contribution of agriculture declines, transfer of labour towards the industry sector becomes increased (Barter, 1966). According to his explanation, the gradual shift in the structure of the economy creates sustainable and cheap labour supply for the industry, increases income of agricultural households and brings towards capital accumulation, which can be reinvested on agriculture and then to the industry. Moreover, according to Weber's discussion on industrial location (1909 trans. 1929), labour is an extra 'Pull' for industrial location. A cheaper or more efficient labour is more than offset of increased in transport costs. This is because extra price of the wage bill is calculated in point of production.

In another direction, with increased need of agricultural productivity, well-trained and skilled labour force that acquainted with modern technology and went through series of innovations

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<sup>7</sup> **Classical Development Theory:** A theory that view the process of development as a series of successive stages of economic growth through which all countries must pass that had historically been followed by the more developed countries ( Todaro,2009).

gradually start to assist the agriculture (Barter, 1966). This demonstrates that skilled labour force support the agriculture sector through designing and producing modern farm tools and inputs, providing trainings, establishing infrastructures, providing better services and institutions.

#### **2.1.1.4 Technology, Institutional and Capital Linkage**

Innovation of a new technology includes new production, processing and distribution systems, new ways of operation in market, and new management practices and organizational structures. In the process of innovation, research is a key source for development for new technologies and institutions, especially in agriculture sector. Food processors and distributors also play increasingly important roles in agricultural innovation process (Gijsbers, Innovation Policy Group and TNO, 2008).

Technology linkage broadly involves transfer of new practices and way of doing from one sector to the other. Through innovation tradition, "*Packages of Technology*" are then transferred to other institutions such as extension agencies, public seed companies and others for its implementations (Radosevic, 1998 cited in Gijsbers, Innovation Policy Group and TNO, 2008). This has insight that technical innovation needs to go hand-in-hand with institutional innovations. New technologies that transferred from the industrial sector often require new rules (institutions) and organizational arrangements.

Institution involves laws, rules, regulations, incentives as well as the organizations that are responsible for its implementations (Ackermann, Abrham, Schlauderer, Vegricht & Kovásová, 2006). This idea involves that important institutions like policy and strategies, marketing system, trade and investment regulations, property rights, patent rights, quality and safety standards, and others are important for technological development and the linkages between the sectors. Therefore, like Radosevic, Nelson (2008) (Cited in Gijsbers, Innovation Policy Group and TNO, 2008) stressed the role of institutions for innovation and economic growth arguing technical and institutional changes (physical and social technologies) need to go hand in hand. He also further explained the importance as follow:

*“...institutional change and its influence on economic activity are much more difficult to direct and control than technological changes. Hence prevailing institutions often are drags on economic productivity and progressiveness. Coevolving networks and technologies are appropriately seen as socio-technical systems, in which the networks and the technologies continuously shape each other”*

Like technology and institutions, capital formation is one of the basic factors to increase agricultural production. Capital formation is more important in developing countries that faced with the task of increasing production to feed the increasing population and demand of economic growth (Indian Ministry of Agriculture, 2003). According to the Ministry (2003), capital helps for judicious use of natural resources for sustainable production of agriculture, adoption of advanced technology, development of infrastructure facilitates, making agriculture a profitable commercial activity and assist industrialization process of a national economy. The linkage process is also more institutional and has relative long term effect on development process.

### **2.1.3 Importance of Agriculture and Industry linkages**

According to Kuznets (1969) (cited in Amaha, 1990), increase of agricultural output is very decisive for industrialization and economic development. According to Kuznets (1969), efficiency in the agricultural sector can be translated in “*Marketed Surplus*”. Moreover, agriculture maintains “*Labour Surplus*” with high social opportunity cost and zero marginal productivity (Goyal, 2005). In supporting the industrialization process, agriculture become responsible to supply food for the entire population and finance the industrialization process. Thus, food supply for the population that happens due to urbanization, immigration from rural areas and enhancement of other non-agricultural activities becomes perhaps the major portion of the sector’s responsibility.

Industrial wage depends upon food prices, the cost of industrialization largely depends substantially upon low labour price and expansion of the industrial sector will allocate these labour resources for better economic uses (Goyal, 2005). He further explained as agriculture

plays a crucial role on expanding the size of home market for industrial products by enlarging real income of peasants and the industrial expansion.

Traditionally, agriculture and industry have been viewed as two separate sectors in terms of both their characteristics and their role in economic growth. However, better-identified and measured linkages of the two sectors thus led to the recognition of agriculture as a potentially powerful engine of economic growth (Admit, 1990). Therefore, separate sectoral development approach (i.e. agricultural on agriculture, industrial on industry, producer on production, and trader on trading) is unfruitful in many occasions. According to Admit (1990), the approach makes the information flow system to be weak and not go in pace with other sectors need. The sectors are also never known what the other really demands and supply.

Based on the above discussions made on the interdependence of the two sectors, and value adds of the two sectors on economic growth and structural transformation<sup>8</sup>, the following two leading importance are identified;

### **2.1.3.1 Increases in Agricultural Productivity**

Processing agricultural outputs adds new value in the economy, and market solvency for industrially processed agricultural products. This also contributes for efficiency and profitability of agricultural sector (Todaro, 2009). This makes the agricultural sector to increase its productivity by employing host of modern inputs like skilled human power, fertilizers, pesticides, herbicides, etc from the industry sector. According to him, supply of consumer goods for the agricultural sector is also an incentive for industrial expansion. Moreover, demand of consumer goods is satisfied by local industries utilizing domestic resource helps to saves foreign exchange and transforms the economic structure (UNIDO, 2000).

Therefore, according to Nelson (2008:2), egoistic personality and unresponsiveness of sectors causes acute bottleneck to an economy. Nevertheless, well link of the two makes the sectors to be

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<sup>8</sup> **Structural Transformation:** A process in which underdeveloped economies transfer their domestic economic structure from having emphasis on traditional subsistence agriculture to a more modern, more urbanized and more industrially diverse manufacturing and service economy (Todaro,2009).

more responsive and productive. The agriculture also uses improved technologies and institutions from the other sector to maximize its productivity. For instance, industrially manufactured agricultural tools, fertilizers and marketing systems that the agro industries provide have significant role for agricultural development (Ibid).

Agricultural products are shaped by trainings, technologies, market preferences, nutrition and health demand, and the environment (UNIDO, 2000). Therefore, according to Suryahadi, Surayadarma, Sumarto and Molyneaux (2006), linkage of agriculture and industry is far more relevant to shape agricultural development.

### **2.1.3.2 Facilitates the Industrialization Processes**

The industrialization process is revealed by secular decline on the relative weight of the agricultural sector vis-à-vis non-agriculture. The relative decline is possible when there is a fall on the share of agricultural value added on employment, trade and per output consumption (UNIDO, 2000).

In developing countries, linkage of agriculture and industry helps to utilize full capacity of local resources, save foreign exchange, minimize production cost and burden of agricultural sector to create capital for investment on other sectors (Admit, 1990). According to him capital accumulation and raw material supply from agriculture are very important aspects for the industrialization process. Similarly, according to UNIDO (2000), the interpenetration of agriculture in industry helps to save foreign exchange, ensure sustainable supply of raw materials and increases sectoral profitability. This implies that well coordinated agriculture and industry linkage can create road for investment and reinvestment on industrial sector.

## **2.1.4 Factors Affect Agriculture and Industry Linkage**

### **2.1.4.1 Policy (Institutions) and Agricultural Production**

Policies and strategies especially on resource endowments affect development of different economic sectors and their interfaces in many ways. According to Tegegn (2005) (Cited in Mewal, 2008), land tenure policy and size of land holding have significant impact on rural urban linkage. He argued that; type of land tenure system creates possibility for mobility of resource owners and diversification on job opportunities. Similarly, small land holding limits production surplus and investment on use of modern agricultural inputs that affect surplus production that end up by low rural urban linkage of agricultural resources (Bajarcharya, 2006, cited in Mewal, 2008).

Like the guiding policies on resource ownership, market is a major institution that has increasing importance for agriculture and industry linkages (Tigegne, 2005, cited in Mewal, 2008). He also noted the role of market in economy as follows:

*“....the market acts as a national gauge of development. At the same time expanding together with the economy, the market itself exerts a serious influence on industrialization and economic growth.”*

However, according to Chowdhury (2005) ( Cited Mewal, 2008), a market system that intervenes in fixing grain prices, restricting regional grain movements and participation of private sectors through preventive license to exploit the sector affects growth of both the agriculture and industry sectors and their linkages. This also influences spatial opportunities to transfer grain from the surplus regions to regions in shortage and from rural to urban areas.

Seasonal agricultural production affects continuous supply of raw material for agro processing industries and food for industrial population. Therefore, according to Tigegne (2005) (Cited in Mewal, 2008), agro-industry vis-à-vis other industrial subsectors are largely relied on the biological nature of agricultural raw materials. Agricultural production system, which is highly dependent on nature, makes supply of agricultural raw materials for the industry sector to be inconstant. This also affects linkage of the two sectors.

#### **2.1.4.2 Rural Infrastructure**

Industrialization is viewed as a process of restructuring the economy, which inevitably leads to greater division of labour on a national economic scale. According to Okpala (2003), some of the major indicators of the process are development of infrastructures, the power industry and productive services. In this context, he described that infrastructural construction itself can be regarded as one of the stage of industrialization that promotes restructuring of the economy.

Infrastructural development such as roads, communication services, market centers, irrigation farms, storage facilities, energy/ electricity, water supply are pillars to establish linkage among the two spatials that agriculture and industry are identified (Okpala, 2003). Both explained that establishment of local, regional and national road networks, communication infrastructures (Telephone, Radio, Television, Postal service and others) and human capitals like education and health services profoundly affect flow of people, goods and services from rural-urban and vice versa.

Building of modern industrial enterprises, that requires free movement of work force, raw materials, equipment and finished goods, largely depends on the size of available infrastructure (Tyagunenko, 1973). Building infrastructures, therefore, should aim on extending inter- regional economic ties that accelerate formation of strong domestic market and the linkage of the rural areas with big markets.

Therefore, according to Bajracharya and Chowdhury (2006; 2005) (Cited in Mewal, 2008), rural towns play significant role in facilitating linkages between agriculture and industry. Rural areas that are close rural towns have better access of these infrastructures to be engaged in the linkage.

#### **2.1.4.3 Industrial Location**

Significance of industrial location varies depending on the extent to which economic considerations are made for basic inputs, market and infrastructures. Many industries mainly focus on minimum transportation costs of raw materials and final product to determine their location. Therefore, industries that are at early stages of production cycle and use local raw

materials directly from farms or queries should consider their proximity for the raw material as a major aspect for their location (Ree, 1969). This is to say that location of down-stream manufacturing industries should be determined by location of the upper-stream manufacturing industries.

However, according to Weber (1909, trans. 1929), market pull is a root for expression of the cost of commodity movement. He explained that when transportation charges for sending finished goods to market is relatively low out of the total value of the good, and then location of the industry near to consumers, mostly around urban center, is obvious.

Generally, these viewpoints on industrial location let us to see location of industry can be determined by where they can find quality and quantity raw materials by low price and transportation cost. Therefore, by any means, both ideas show as location of industry affects direct and indirect linkages of the two sectors.

## **2.2 Definition and Types of Agro Industry**

### **2.2.1 Definition of Agro Industry**

A common and traditional definition of agro industry refers to the subset of manufacturing that processes raw materials and intermediate products derived from the agricultural sector (UNIDO, 2000). Agro industry thus means transforming agricultural products of farming, dairy, forestry and fisheries in to other usable forms.

Similarly, Bhattacharya (1980) (Cited in Goyal, 2005) defined agro industry as "*Agriculture - based industries and those have either direct or indirect links with agriculture and non-agricultural industries.*" Agro industry is also defined as a rural industry that has close relationship with the agriculture in terms of raw material it uses, types of product, type of labour it utilizes and its vicinity for rural area by Lim and Harland (2000). According to Goyal (2005), agro-industry is an omnibus expression. It covers several manufacturing and processing of agricultural raw materials and services that are inputs for agriculture. This includes agro-based industries that supply modern agricultural inputs besides processing agricultural products.

Tessema (2001) also defined agro industry as a sub sector of as "... *the dominant manufacturing sub-sectors, which mainly consists food processing factories that has product lines include frozen, chilled and canned meats; pasteurized milk, butter and cheese; canned and fresh fruits and vegetable products; crude and refined edible oil; flour and bakery products, including spaghetti and macaroni; animal feeds; and sugar and sugar confectioner.*"

As a sub sector of agro industry, food-processing industry is an inclusive way that covers all aspects of food production and sale. The International Food Standards Agency (IFSA) (2007) defined food-processing industry as "*Food processing industry may includes farming and food production, packaging and distribution, retailing and catering... But the manufacturing sector of food industry works on processing eatable agricultural products in to nutritive, pasteurized, marketable, simple and portable standards.*"

Market dictates agro industries to be to the first stage in processing agricultural products and to focus on production of fashioned foods. Agro-food processing industries originally came in existence into existence simply to transform surplus agricultural products in the rural milieu (UNIDO, 1986). Later on, worldwide standardized food production had begun and secondary processing took place initially by the service sector to suit the tastes of the final consumers. Finally, this led to establishment and culmination of complete industrial processing (Ibid).

### **2.2.2 Types of Agro Industries**

Despite similarity on definition of agro industry, agro industries are classified in different groups based on their various features. According to UNIDO (2000) the main classifications of this sector are Food Processing and None food Processing. Another useful classification of agro industry is also Up-stream and Down-stream industries.

Up-stream industries are industries that engaged in the initial processing of agricultural commodities and down-stream industries are that undertake further manufacturing operations of intermediate products made from agricultural materials by up-stream industries (UNIDO, 2000). However, based on the production process the classification of agro industries can range from

craft to complex industrial organization. This indicates production process of goods through different level of industrialization like textile, which can be produced through handloom weavers working in their own home to large textile factories that have sophisticated machinery and complex systems of organization.

Similarly, traditional classification of the United Nations (UN) International Standard Industrial Classification of All Economic Activities (ISIC) presents agro-industry under many rigid manufacturing sub sectors. According to this classification, ISIC-3.1 Food, Beverages and Tobacco industries; ISIC-3.2 on Textile, Wearing Apparel and Leather industries; ISIC-3.3 Manufacturer of Wood and Wood Products including Furniture; ISIC-3.4 Manufacturer of Paper and Paper products, Printing and Publishing; and ISIC-3.5 Manufacturer of Rubber products (UNIDO, 1997, cited in UNIDO, 2000). Today, however, it is becoming even more difficult to provide a precise demarcation of what should be considered as an agro-industrial activity. Innovations and new technologies are widening the range of agro-industry (Maiti, 2005).

## **2.3 Industrial Development and its Linkage with Agriculture in Ethiopia**

### **2.3.1. Industry Policies and Growth in Ethiopia**

According Ministry of Industry (1992) (Cited in Degefa, 1993), by 1928 a total of 28 factories were established around Addis Ababa, Dire Dawa, Harar, Asmara and Messewa. Out of these establishments, the four mills, the cement plant and one salt factory were established before 1908. At the time, except for bullet and one of the printing presses, foreigners owned all the remaining factories.

With regard to industrial policies and directives, there is no evidence whether there were industrial policies issued by government or no before 1950. There was also no capital inflow for industrial establishments. Whatever factories established were based on the profit motives of owners. However, since mid 1950s' to early 1970s' various comprehensive industrial strategies and policies were issued in the form of directives and guidelines (Fessehaye, 1990).

During early 1950s, the Emperor Haile Selassie I regime (1930-74) had renewed calls for a transition from a subsistence economy to an agro-industrial economy. With this end, three five years development plans were developed (The Library of Congress Country Studies, 2002). The First Five-Year Plan (1957-61) sought to develop a strong infrastructure. It marked on development of an indigenous cadre of skilled and semiskilled personnel to work in processing industries to help reduce Ethiopia's dependence on imports and accelerate agricultural development. The Second Five-Year Plan (1962-67) signaled the start of a twenty-year program to change Ethiopia's predominantly agricultural economy to an agro-industrial one. The plan's objectives had included diversification of production, introduction of modern processing methods, and expansion of the economy's productive capacity to increase the country's growth rate. The Third Five-Year Plan (1968-73) also sought to facilitate Ethiopia's economic well-being by raising manufacturing and agro-industrial performance (Ibid).

These plans brought significant results on the national economy. According to CSA (1980) (Cited in Fessehaye, 1990), since 1960/61 to 1973/74, the manufacturing sector's growth rate was more than double (from 1.9 percent in 1960/61 to 4.4 percent in 1973/74). However, many projects failed to achieve the objectives since they neglected to identify available resources (personnel, equipment, and funds) and failed to establish the organizational structures necessary to facilitate large-scale economic development (Ibid).

During *Derg* regime (since 1974 to 1991), although it was not incremental plan like the previous regime, it continued to implement industrial development focusing on import substitution and modernization of the country's economy. However, its industrial development plan failed due to various social, economic, political and structural problems (MoTI, 2006).

Since 2003, the current industrial development strategy has become functional. The policy recognizes agricultural development led industrialization as a basis for national economic growth. It also recognized the importance of agricultural growth for sustainable industrial development. The strategy is export-led and at the same time, it emphasizes on the development of physical infrastructures, food security and social sector development (MoTI, 2003). Generally, the policy underscores vitality of the agricultural sector for the overall economic development.

As a result, the relationship between agriculture and industry got emphasis to move in to a new chapter. However, the industrial sector is still characterized by a number of structural weaknesses, which are gradually being addressed by the government (MoTI, 2006).

According to MoTI and UNIDO (2002), the manufacturing sector of Ethiopia is dominated by light industries. Until 2002, there were over 7000 formal and informal industrial establishments employing less than 10 people. More than 1443 medium and large-scale industries<sup>9</sup> were also established until 2006/07. The industries are also not distributed evenly across the country. Bunks of the productive factories (51%) are located around Addis Ababa. Fifteen percent of the total factories are also established in Oromiya Regional State. Tigray, Amhara and SNNPR Regional States are also the subsequent regions by the number of industrial establishments.

The share of the industrial sector to the GDP was also mere 11.2% in 2005 (CSA, 2006/07). However, the contribution of large, medium, small-scale as well as handicraft/cottage industries was only 6.3% to GDP of the 1979/1980 national economy (CSA, 1980/81, cited in Tessema, 2001).

In the industrial sector, the formal manufacturing sub-sector constitutes 76.43% of the total number of manufacturing establishments (CSA, 2000, cited in Tessema, 2001). Large and medium scale food processing industries are accounted about 29% of the gross value of production of the large and medium scale manufacturing industries (LMSMI) (Tessema, 2001). As a dominant manufacturing sub-sector, the food processing industry includes 9 industrial groups that consists 200 factories (26% of the total). They constituted a total paid-up capital of Birr 2.5 billion (44% of the total paid up capital) and 19,000 employees (20%of the total share of the manufacturing sector).

In Ethiopia, agro-industrial sub sector mainly comprises Food processing and Tobacco Industries, Textile and Garments Industries, Leather and leather product Industries as well as Footwear industries (Befekadu, 1990). He explained that food processing industry product lines

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<sup>9</sup> **Large and Medium Scale Manufacturing Industries:** Public and private industrial establishments that use power-driven machineries and have ten and above employees (CSA, 2009).

also includes frozen, chilled and canned meats; pasteurized milk, butter and cheese; canned and fresh fruits and vegetable products; crude and refined edible oil; flour and bakery products, spaghetti and macaroni; animal feeds; and sugar and sugar products.

In development of food processing industry, the relative contribution of the large and medium scale food processing industry to the total value-added of the large and medium-scale manufacturing sector is 38% (CSA, 2000). This indicates that the food processing industry plays an important role in the manufacturing sector of the country. However, efforts launched in recent years have beamed a new ray of hope to reactivate the sub-sector further. Providing adequate raw materials for the industries, industrial research, extension services and upgrading of transport and communication facilities have refocused to bring development in the areas of industry (MoTI, 2006).

### **2.3.2 Agriculture and Agro Industry linkage in Ethiopia**

When industrialization started in Ethiopia some of the first established manufacturing enterprises were agro based. Since then, the economic linkage between the two sectors has been on set (Fesesehaye, 1990). According to him, the agriculture sector had been serving for capital accumulation, market for manufactured out puts and source for labour and raw materials.

During the *Derg* regime, the Agriculture and Marketing Corporation, which was under the Ministry of Domestic Trade, supplied major industrial raw materials. It controls distribution of certain agricultural products like wheat, oil seeds and pulses, cottonseeds, barley, hide and skins and others to the manufacturing enterprises. In principle, the Ministry of Industry passes its annual demand of agro industries to the agricultural sector at the beginning of every fiscal year (Fesesehaye, 1990). According to Ministry of Industry (1990) (cited in Fessehayre, 1990), the domestic production linkage of the two sectors were incremental in five fiscal years starting from 1984/85.

**Table-2.1:** Purchase of Domestic Agricultural Products by Agro industries from their total Purchase in EtB (1984/85 to 1988/89)

Fiscal Year	Local Purchase value in 000 Birr	Change (%)	Production Value in 000 Birr	Change (%)	Share of Purchase to production Value (%)
1984/85	309,399	-	1,761,744	-	17.6
1985/86	343,864	11.1	1,860,119	5.6	18.5
1986/87	394,431	14.7	1,974,327	6.1	20.0
1987/88	340,265	14.0	2,030,934	2.9	16.8
1988/89	363,049	6.7	1,920,009	5.5	18.9
<b>Average Growth Rate (%)</b>		<b>3.7</b>		<b>1.82</b>	<b>18.4</b>

Source: Ministry of Industry, 1990 (Cited in Fessehaye, 1990)

As Table-2.1 shows, the average annual growth rate of local agricultural products purchase by agro industries in 1984/85 was 17.6 % and rose in to 18.4% during 1988/89 fiscal year. The data shows as the agricultural sector provided only one-fifth of intermediate inputs on the industry's production value. The remaining demand of the agro industries were covered by imported goods.

As discovery of CSA (1990) (Cited in Fessehaye, 1990) shows, 13% and 28% agro industries demand of cereals and textile were met by imports, respectively. On average, the imported volume of agricultural products for the industry sector was 12% between the five fiscal years (1984/85 to 1988/89). Generally, during these years, there were substantial amount of import of agricultural products for the manufacturing sector, which could have otherwise been cultivated locally. According to Tesemma (2001), shortage of supply of agricultural products and low quality products were also identified as major causes for small purchase of domestic agricultural raw materials from the industry side. However; price, payment terms and delivery conditions were also described as major causes for the low production linkage form the agriculture (farmer's) perspective.

Like provision of industrial raw materials, the agriculture sector of the country is also a source of labour force. With the very short history of urbanization and 85% rural based population, it is incontrovertible to conclude that current cadre of the industry and service sectors have their origin in the rural parts of the country (Befekadu, 1990). Although it is insignificant, the manufacturing sector were also a supplier of various low level agricultural tools, manufactured goods such as clothing, footwear, and construction materials, which constitute part of the basic needs of the rural population (Amaha, 1990).

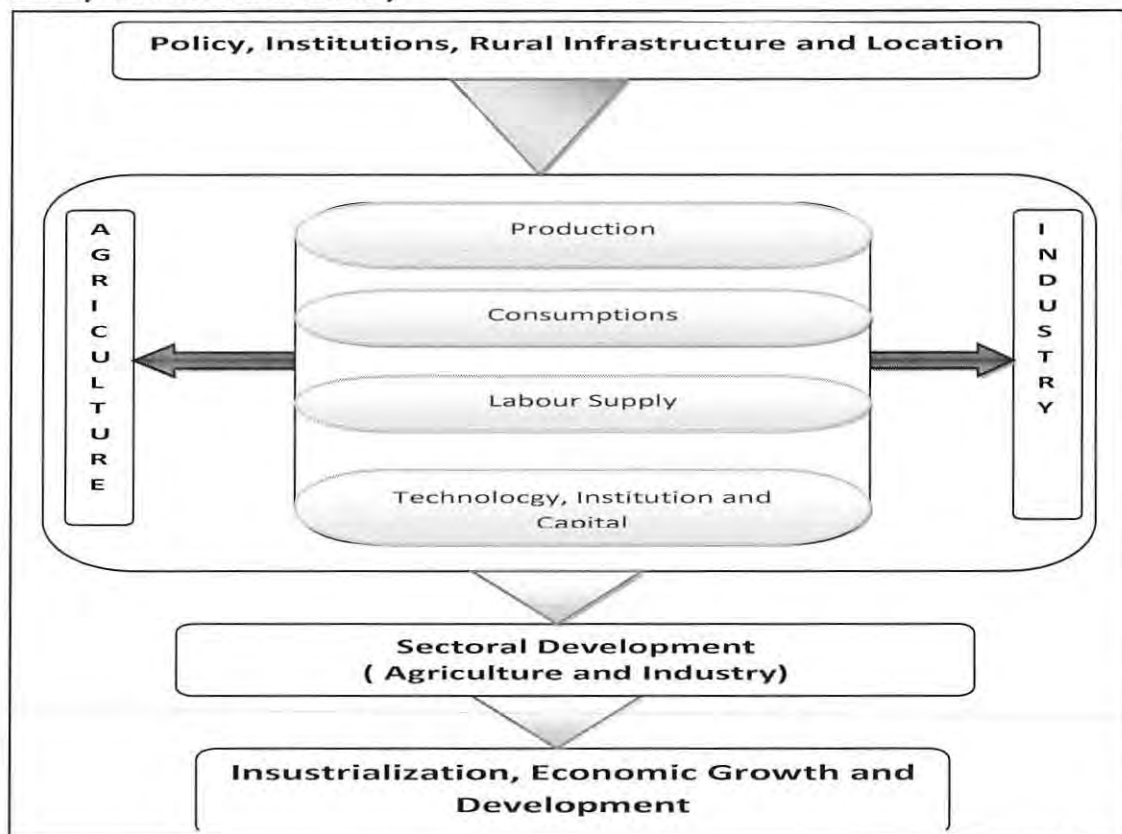
## 2.4 Analytical Framework of the Study

In free market economy, agriculture and industry sectors have strategic production, consumption, labour, technology, institution and capital linkages (The World Bank, 2006). Through the linkage process of these sectors, agriculture provides inputs and opportunities for industrial development and vice versa. Development Policies and strategies, institutions, production systems, presence of rural infrastructure and industrial locations highly determine linkages of the sectors. Best linkage of the two sectors also brings sustainable economic growth and development (Goyal, 2005).

As the previous discussions show, this study analyzes linkages of the two sectors based on four pillars. These pillars are production, consumption, labour, and technology, institution and capital. The study also used agro industry to analyze linkages of the sectors since it is a first line to bridge the sectors.

Based on the previous discussions, the following Analytical framework used to analyze agriculture and industry linkage is also depicted below under Figure-1:

Fig-1: Analytical framework of the study



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## CHAPTER-III: THE STUDY AREA AND METHODOLOGY

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### 4.1 General Description the Study Area

#### 3.1.1 Biophysical, Demographic and Socio-economic Condition

Geographically, area of Ada'a Woreda starts 42 kilometers and ends some 62 Kilometers from Addis Ababa to the East. It is one of the Woredas found in the Eastern Shewa Zone of Oromiya National Regional State and located approximately between  $8^{\circ}43'$  -  $8^{\circ}45'$  N latitudes and  $38^{\circ}56'$  -  $39^{\circ}01'$  E longitudes (Ada'a Woreda, 2001). Gimbiehu Woreda borders it at its South hemisphere, Liben Woreda in the North, Akaki Woreda in the West and Lume Woreda borders it in the East (*See Annex: 5*).

Since 2000, this geographic location falls under Ada'a Rural Woreda and Bishoftu town Administration. According to the study of Ada'a Woreda Rural Administration (2007), the geographic coverage of the rural woreda is estimated to be 91,680 Km<sup>2</sup> (76,517 Km<sup>2</sup> of arable) and Bishoftu town administration bounded under 14,500 Km<sup>2</sup>. The rural woreda has structured under 27 Kebeles. These kebeles have different area coverage and population size. The average distance of the Kebele administrative units from Bishoftu town is also 15.5Km. According to CSA (2007), the total population of the woreda is 132,099 (Female= 59313). It comprised 20,099 agricultural households, which 99% of them engaged on agriculture.

Center of the town is located 47km Southeast of Addis Ababa and 52km northwest of Adama Town. Genda Gorba, Kaliti, and Kurkura Denbi of the rural kebeles border the town on east, west and south parts respectively. The foundation of Bishoftu town was directly relates with the starting of Ethio-Djibouti Rail way in 1925. Previously, the town was called interchangeably by the name of Bishoftu and Debre Ziet. From 1991-2002, the town was the administrative center of Ada Liban District. Currently, among other similar towns of the region, it staged as 1<sup>st</sup> Level City Administration and is administered by a mayor. It is also the administrative seat for Ada'a rural woreda. Currently, the town has structured under 9 kebele administrative units. According to CSA (2007), Bishoftu town's population is 100,014 (Female= 52260). Sixty one percent of the population is also between 15-64 age groups. The population of the town also engaged on urban agriculture, industry and service sectors for its livelihoods.

Generally, the two administrative have 36 kebeles and 232,123 (F=111,573) population. Fifty seven percent of the total population of the area lives in rural areas while the remaining 43% reside in the town. Physically, the area is represented by low relief hills with terraced slopes. It is surrounded by chain of mountains to the north and south. Mount “Yerer” and “Zikuala”, which are the landmark in the vicinity, are found respectively (Ada’a Woreda, 2008/09). In a mountainous tropical country like Ethiopia, altitude is by far the most important factor in controlling the climate. Since Ada’a is surrounded by mountains that ranges from 1600 up to 3100 meters (2200 meters average) above sea level. Due to this fact, the area is classified under “*Dega*” (3%), “*Weyna Dega*” (94%) and “*Kola*” (3%) climatic conditions. The area has 20<sup>0</sup>c annual temperature and 249.2-millimeter mean annual rainfall.

### **3.1.2 Major Economic Sectors of the Study Area**

In the study area, agriculture is the most common and dominant economic activity. Mixed farming, which both crop production and animal rearing are practiced, is dominant in the Woreda. Major cereal crops produced in the Woreda based on their volume of production from the highest to the lowest level are “Teff”, Wheat, Check Peas, Beans, Maize and Sorghum. Central Statistical Authority (2009) described the woreda among the Woredas that have the highest Wheat and “Teff” production in East Shewa Zone. According to 2008/09 production year report, 1372,518 and 641,137 quintals of wheat and *Teff* had harvested. Similarly, 328,952 and 42,345 quintals of check peas and bean had harvested in the Woreda. Generally, 76,517Km<sup>2</sup> of land was cultivated and 2,443,767 quintals of grains and vegetables had harvested in 2008/09 (Ada’a Woreda Rural and Agricultural Development Office, 2008/09).

Similarly, according to CSA (2009) (Cited in Profile of Ada’a Woreda, 2008/09), the woreda has large livestock population. There are 115,088 cattle (cow, ox and calves), 123,071 sheep, 30,288 pack animals, 18,275 goat and 70,942 chicken population. Generally, households of the woreda hold more than 357,661 livestock including chickens.

Following agriculture, industry is the second prominent economic sector in the area. The area is considered as one of the industrial corridors by the Oromiya Regional State. The availability of adequate infrastructures, close market access, and adequate labour force are among the major factors that created conducive environment for establishment of different industries in the area (Ada'a Woreda, 2008/09). Like other areas of the country, the town administration took the lion share from the number of industrial establishments. The town administration has 29 active industrial plants while Ada'a rural woreda has 10 plants. Forty percent of the industrial establishments are also agro processing industries. Among these establishments of the two places, 10 of them are food-processing industries. Generally, the formal industry sector has created employment opportunities for about 2400 population. In addition to these industrial establishments, there are also 8 small and medium scale industries owned by cooperatives and Agricultural Union that have created job opportunity for about 1,269 people in the town.

Tourism and service is the third significant economic sector of the study area. In the area, there are different tourism and service based investments that give significant economic benefit, especially for the Town. This is because of its proximity to Addis Ababa. Apart from this, the area is a home for Bishoftu, Babogaya, Hora Arsedi, Guda, Kuriftu and Chalalka lakes and beautiful topographies. As an instance, of the many service sectors, five big hotels and one lodge have provided employment opportunity for more than 220 workers.

**Picture-2.1:** Settings of different economic sectors in Ada'a Woreda and Bishoftu Town



Generally, according to the reports of Ada'a woreda and Bishoftu town Administrations (2008/09), currently there are 356 registered investment licenses on agriculture, manufacturing, tourism and service sectors in both administrative units. The number of investment registration is also increasing every other year since the past five years.

**Table-3.1:** Number of Registered Investments in Bishoftu town and Ada'a woreda Administrations

No	Registered Investment Sector	Bishoftu town Administration		Ada'a Woreda	
		Total Investments Requests	Active	Total Investments Requests	Active
1	Agriculture	0	0	34	2
2	Non agricultural Industry	19	7	43	6
3	Agro Industry	24	22	11	4
4	Tourism and Service	28	16	14	3
5	Trading	111	89	102	37
<b>Total</b>		<b>182</b>	<b>124</b>	<b>204</b>	<b>52</b>

Source: Bishoftu town and Ada'a woreda Administration Trade and Investment Bureaus, 2009/10

### 3.1.3 Infrastructure and Service Developments

Development endeavor of a nation is directly or indirectly related with the availability and quality of infrastructures. Development of infrastructure has significant impact on development of agriculture and industry sectors as well as their linkage (The World Bank, 2006). The concept is also applicable in study area. In the study area, there are various levels of roads that connect the town with its surrounding rural kebeles and nearby urban centers. The woreda is linked with the zonal capital, i.e., Adama town by 52Km of asphalt road. Similarly, it is connected to the Capital of the country, i.e., Addis Ababa by 45 Km of asphalt road. The town is also accessed to 5.6km railway line that connects Addis Ababa from Dejibuti. Moreover, the Woreda has more than 370 Km gravel and seasonal roads that connect each rural kebeles with the town.

**Table-3.2:** Distribution of road access in the town

No.	Types of road	Length of the road(km)		Total	Percentage
		Bishoftu Town	Rural Kebeles		
1	Asphalt	12.1	0	12.1	2.2 %
2	Gravel	73.5	100	173.5	31.6 %
3	Open and Seasonal Roads	82.1	270	352.1	64.1 %
4	Cobble stone road	11	0	11	2 %
<b>Total</b>		<b>178.7</b>	<b>370</b>	<b>548.7</b>	<b>100 %</b>

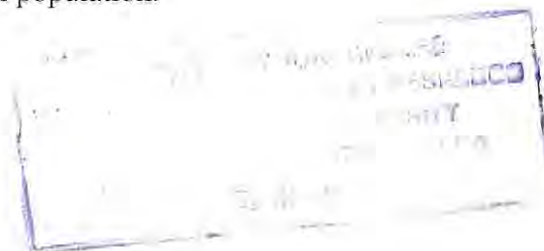
Source: Bishoftu town and Ada'a woreda Administration (2008/09)

Other communication infrastructures like telephone and postal are also available in the study area. For instance, the area has access for digital and mobile phone services. Telephone is one of the most important means of communication used by urbanites, farmers, and businesspersons of the study area.

Education as a major factor for growth, the government plays prominent role in provision of education in the study area. In Ada'a rural woreda there are 39 primary schools (1-8 grade), 1 secondary school (9-10 grade), and 79 farmers training centers (FTCs) that are administered by the government. Similarly, there are 38 (Seven government and 31 privates) Kindergartens, 37 (13 government and 24 privates) primary (1 to 8 grades) schools, 7 (two government and five privates) secondary (9 to10 grades), and one preparatory (11-12 grade) school in Bishoftu town. Moreover, there are one TVET college, one management training institute, one agricultural research center, and addition 4 private colleges. Addis Ababa University College of Veterinary and National Defense Engineering College are also found in the Town.

Like other social development sectors, government has given due attention to meet adequate and quality health facilities in the study area. In Ada'a rural woreda there are two health centers, 27 health posts and 7 rural drug stores. Similarly, there are one government hospital, one government health center, 15 (14 private clinics and one government clinic), one malaria controlling center, 5 (2 government and 3 private) pharmacies and 2 private rural animal drug vendors in Bishoftu town.

Financial institutions like Bank and Microfinance are also available at Bishoftu town. There are five banks (1 governmental and 4 private) and one Microfinance Institute that facilitate financial interaction of the rural and urban population.



## **4.2 Research Methodology**

The methodology of this study is designed in order to arrive at empirical results of agriculture and industry linkages. To reach at the desired goal, some basic research questions that can address the research objectives have been developed. To answer these research questions, sample survey, key informant interview and observation were used together with secondary data source. Due to the complex nature of identifying and measuring *direct* and *indirect, backward* and *forward* linkages of the sectors, both quantitative and qualitative data were collected. Descriptive statistics were also used to interpret the data obtained from primary and secondary sources. The following instruments were also used to collect data for the study.

### **4.2.1 Data Collection Instruments**

Open and close-ended questionnaires that reflect linkages of agriculture and agro industries were used to collect primary data from farmers and agro-industries found in the surrounding area. Key informant interview check list was also employed to obtain data from key personnel found in both sectors. The key informant interview also used for purposely selected agro industries management staffs, raw material suppliers of the industries, staffs from agriculture and industry sectors of the Woreda.

Open-ended questions as interview check list was used to address the key informants. Unstructured observation was also used to address some of the research questions. Secondary data sources like, research findings, publications, relevant reports and plans of different government offices were also consulted to obtain information (data) on the situation of agriculture and industry linkages in general and in the study area.

### **4.2.2 Sampling and Sample Size**

In this study, stratified random and purposive sampling methods were employed. Stratified random sampling was used to select respondents for the sample survey. Stratification of the study population (household) was made on the basis of the distance of the population (households) from Bishoftu town. Most of the agro industries are also found around Bishoftu town within two kilometers radius (from Bishoftu town) along the highway crossing Ada'a woreda leading to Djibuti.

In the study woreda, there are 20,099 farm households. These farm households live within 6Km to 28Km distance from Bishoftu town. The study grouped the farm households in to two groups based on the distance of their kebeles from Bishoftu. It clustered households that live within 6Km to 14Km from Bishoftu in one stratum, and labeled them as *Nearby Farmers* group. Households that live within 15Km to 28Km distance from the town in another stratum and labeled as *Distant Farmers group*. The study used distance to group the rural households since the area has more or less similar biophysical environment, *woinadega*.

The grouping process considered these range of kilometers since the sample population (the study population) lives within 6Km to 28 Km radius from Bishoftu. The distant areas (villages) of the Woreda are also found at and around 28Km from the town. Moreover, rural geographic areas that are found within 0 to 6Km tedious from the town, which is considered as out skirt of Bishoftu town, are also considered to be an *Industrial Zone* by the town’s administration.

Table-3.4: Household and Sample Distribution of the study

<b>Group of the Households</b>	<b>No. of Kebeles</b>	<b>No. of HHs</b>	<b>No. of Samples</b>
Nearby Group (6-14Km)	16	12,623	73
Far Group (15-28Km)	11	7,476	42
<b>Total</b>	<b>27</b>	<b>20,099</b>	<b>115</b>

According to the household data of Ada’a woreda shows there are 27 kebeles in the woreda. Out of the total, 16 of the kebeles are found within 6Km to 14Km distance form Bishoftu town. Nearly 12623 households also live in these kebeles found in near farmers group. The remaining 11 kebeles are found within 14Km to 28Km distant from Bishoftu and 7,476 farm households live in this distance farmers group. Kebele household registration pads were used to take random sample of the farm households from both household groups. Considering statistical proportionality, a total of 115 farm households (*73from Nearby Farmers and 42 Distant Farmers*) were selected from both groups.

Sample size of the farm household groups was determined by the number of households found in the respective household groups. Moreover, time and resource constraints and parallel socio-economic characteristics of the groups are also considered to determine the total sample size.

Similarly, lists of crop and dairy product processing industries that produced by Trade and Industry Bureaus of Ada'a woreda and Bishoftu town were used to sample food processing agro industries. Using the lists, six were selected out of 10 food-processing industries under purposive sampling method. Six management staffs of selected agro industries and four raw material suppliers (wholesalers) of the sampled agro industries also purposively selected. Eight experts who work in Rural and Agriculture Development, and Trade and Investment Offices of Ada'a Woreda were also selected based on the type of job they work.

**Table-3.3:** Distribution of Sample Respondents and Key Informant Interviewees

Type of Organization	Member of KIIs	No of Respondents Addressed by Questionnaire	No of Respondents Addressed by KII
<b>Rural Households</b>	Distant rural households	42	0
	Near rural households	73	0
<b>Ada'a Woreda Rural and Agricultural Development Office</b>	Marketing Extension Department	-	1
	Grain Extension Department	-	1
	Livestock Extension Department	-	1
	Planning, Monitoring and Evaluation Department	-	1
<b>Ada'a Woreda Administration Office</b>	Trade and Investment Department	-	1
	Investment Promotion Department	-	1
	Planning, Monitoring and Evaluation Department	-	1
<b>Agro Industry</b>	Ada'a Flour and Pasta Factory	1	1
	Awash Flour and Biscuit Factory	1	1
	Genesis Dairy Farms	1	1
	Ada'a Milk and Milk Products Processing Co.	1	1
	Bora Dairy Farms	1	1
	Lema Dairy Farms	1	1
<b>Wholesalers</b>	Wholesalers	-	5
<b>Total</b>		<b>121</b>	<b>18</b>

Table-3.3 (above) shows, totally 139 respondents that represent farm households, agro industries and traders and government offices were addressed for the study. The data of 115 farm households were collected through sample survey. Questionnaires were made to be filled by six purposely-selected agro industries at organization level. Four experts from Ada'a Woreda Rural and Agricultural Development Office, three experts from Ada'a Woreda Trade and Investment Office, five wholesalers and six management staffs from each selected agro industries were also addressed by key informant interview.

### **4.2.3 Data Processing and Analysis**

Due to various natures of the instruments used for the data collection, both qualitative and quantitative data analysis methods were used. For quantitative information obtained through survey questions were cleared, organized using and analyzed using SPPSS. Similarly, qualitative and quantitative data obtained from key informant interview were organized in themes (issue) basis to triangulate the survey findings and provide qualitative insights on the themes (issues).

The quantitative data gathered was presented and analyzed using descriptive statistics tools namely, frequency distribution, mean, and percentages. Similarly, tables are used to display the distribution and characteristics of the data and results. On the other hand, the qualitative data collected were analyzed and presented using narratives of expressions, opinions and perceptions.

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## CHAPTER-4: FINDINGS AND DISCUSSIONS

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This chapter deals with the analysis and interpretation of data obtained from different sources. Much of the analysis made in this chapter is devoted on situation of agriculture and industry linkages in the study area. The discussion is made based on the data obtained from sample households, selected agro industries, key informant interviewees and observation. Accordingly, it pursues into the areas of linkage and factors that affect the linkage with the aim to understand the level of linkage between the two sectors in the study area. Discussions of findings on these objectives are also presented in the following four major sections;

### 4.1. Demographic and Socio-Economic Characteristics of Sample Farm Households and Structure of the Agro Industries

#### 4.1.1 Demographic Characteristics of Sample Households

The survey result shows that male-headed households are the dominant sections of the total sample households. Male-headed households constitute 89.6% of the sample respondents, while the remaining are female headed. The distribution is the same regardless of the distance of households from the industrial center, Bishoftu town. As Table.4.1 shows, 85.7% of the near group households, that live closer to the agro-industries, are male-headed while it is 91.8% among far group households. This data shows, only few sample households are female headed. Similarly, the household data that compiled by Ada'a Woreda Rural and Agricultural Development Office (2008/2009) also demonstrates as only 12% of the rural households of the woreda are female-headed.

**Table 4.1:** Gender characteristics of sample household heads

Farmers Group	Gender Characteristics of the Household Heads			
		Female	Male	Total
Near Group	Number of HHs	6	36	42
	Percentage of the HHs	14.3%	85.7%	100%
Far Group	Number of HHs	6	67	73
	Percentage of the HHs	8.2%	91.8%	100%
<b>Total Number of HHs</b>		<b>12</b>	<b>103</b>	<b>115</b>
<b>Total Percentage of the HHs</b>		<b>10.4%</b>	<b>89.6%</b>	<b>100.0%</b>

Source: Own survey data, 2010

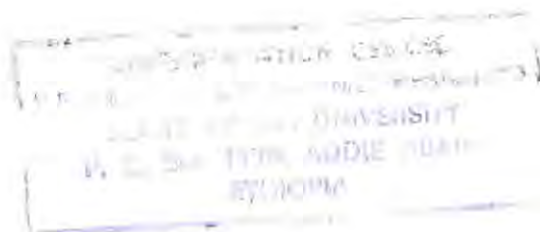
According to the survey result, the average family size of the sample households is 6.54. However, the average size of sample households varies among near and far household groups. It is 6.3 and 6.9 for the near and far household groups, respectively. The data shows that sample households from both groups (near and far) have relatively equal average family size; even though it is slightly smaller among near household group. The average family size of sample households is also above the average family size of Oromiya Regional State as a whole and that of its rural areas, which is 4.8 and 5.0 respectively. The size is also nearly equal with the average size of Ada'a Woreda, 6.57 (Ada'a Woreda Rural and Agricultural Development Office, 2008/2009).

The sample survey shows that the mean age of sample household heads is 41.3 years. The maximum and minimum ages of household heads encountered during the survey were 65 and 23 years, respectively. The age distribution of respondents is also more or less equal among the near and far group households. Seventy two percent of the near household groups and 69% of the far household heads fall within the active working age group, i.e. between 15 and 64 years of age, respectively. Household heads that are between 15 and 30 years of age are 8% and 7% among near and far groups, correspondingly. Household heads that are between the age group of 31 and 45 constitute the highest among the near group (38.3%). However, the proportion of this age group is 18.3% among the far group. This data shows significant proportions of younger household heads that live near Bishoftu town are engaged in agriculture compared to sample respondents in the far area.

**Table 4.2:** Age distribution of the sample household heads

Farmers Group	Statistical Indicators	Age Distribution of Household Heads			Total
		15-30 Years	31-45 Years	46-60 Years	
Near Group	Number of HHs	9	44	20	73
	Percentage of the HHs	12.3%	60.2%	27.4%	100%
Far Group	Number of HHs	8	21	13	42
	Percentage of the HHs	19 %	50%	31%	100%
<b>Total Number of HHs</b>		<b>17</b>	<b>65</b>	<b>33</b>	<b>115</b>
<b>Total Percentage</b>		<b>15%</b>	<b>56.52</b>	<b>28.7%</b>	<b>100%</b>

Source: own survey data, 2010



#### 4.1.2 Socio-Economic Characteristics of the Sample Households

According to the sample survey result, high numbers of illiterate household heads are found in far group households (who live far from Bishoftu town) compared to those who live near to the Town. Table-4.3 demonstrates, household heads that are illiterate and those who can read and write are significantly higher among those who reside far from Bishoftu than those who live near to it. Fifty two percent of the sample household heads that are in the far group are illiterate while the proportion is 36% in the near group. Among household heads that attended primary education (1-8), 87% of them live near Bishoftu. Similarly, 15.7% of household heads that can read and write live near the Town.

Generally, 64.4 % of household heads who reside near Bishoftu have got education. However, only 48% of household heads in the far group got any level of education. This shows that household heads live near and around Bishoftu are young and have better educational background than those who live far from it. This relative better educational background of near household heads could be due to better physical access to schools at the urban center. This data may possibly indicate distance of household from the urban center may negatively relate with educational background of household heads and their household members. This may also implies there could be higher propensity and attitude of individuals in areas that are closer to the urban center to accept new technologies and modern methods of farming.

**Table 4.3:** Educational Level of the sample household heads

Group of Farmers	Educational Level of the Household Heads						Total
	Illiterate	Read and Write	Primary (1-8)	Secondary (9-10)	TVET		
<b>Near Group</b>	Number of HHs	26	18	27	1	1	<b>73</b>
	Percentage	54.2%	15.7%	60%	100%	20%	<b>100%</b>
<b>Far Group</b>	Number of HHs	22	12	4	0	4	<b>42</b>
	Percentage	45.8%	10.4%	40%	0%	8%	<b>100%</b>
<b>Total Number of HHs</b>		<b>48</b>	<b>30</b>	<b>31</b>	<b>1</b>	<b>5</b>	<b>115</b>
<b>Percentage</b>		<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>4.3%</b>	<b>100.0%</b>

Source: own survey data, 2010

Land as natural resources is very important for livelihoods of rural households. This is because; most of their livelihoods drives mainly through agriculture. Since land is a major determinant for agricultural production, its type, size and fertility directly affect household's level of agricultural production, income and food security. Furthermore, availability, quantity, quality and location of the land are important conditions for farming households to carry out productive agriculture as their means of livelihoods (Mewal, 2008).

Like any other farm households of the country, the sample households of the study area also utilize land among other natural resources for their livelihoods to obtain various social and economic benefits. During the sample survey, it was observed that 4 hectares (*16 timads*) and 0.25 Hectares (*1 timad*) were the maximum and minimum land holding sizes respectively. Table 4.4 shows, the average land holding size of sample households is 1.25 hectares (*5 timads*). This land holding size is smaller than the average of Ada'a Woreda, which is 2 hectares (*8 timad*) (Ada'a Woreda Rural and Agricultural Development Office, 2008/2009). However, the average land holding size of households residing far from Bishoftu town was found to be 1.5 hectares (*6 timads*), while it is less than 1.25 hectares (*5 timads*) among households who live near Bishoftu. This data may show the presence of positive relationship between land holding size and distance of households from the urban center of the study area.

Livestock is one of the significant resources of livelihoods in the study area. The sample households live in both far and near areas of the Town have almost equal number of ox and sheep holdings. Their average number of ox and sheep holdings of the households is two and three, respectively. However, the average number of goat holding of distant households is 1.2 while it is 0.9 with households in near areas.

**Table 4.4:** Land and Animal Holdings of Sample Households

Type of Resources	Average HH's Resource Holdings		Total Sample Average
	Near Group HHs	Far Group HHs	
Land ( <i>Timad</i> )	4.4	6	5
Cow inc. <i>Calves</i>	2.11	1.8	2
Ox	2.9	3.19	3
Sheep	2.9	3.23	2.92
Goat	0.94	1.2	1.4
Pack Animals	2.1	2	2

**Source:** Own survey data, 2010

Nevertheless, the average number of cow holding among near households is 2.11, which is slightly greater than those who live in distant areas, 1.8 cows. This relative increase in the number of cow holding of the households among who live near the urban center could be due to better market access for livestock products, mainly milk, better access to animal feeds and productive hybrid cows.

Like ox and sheep holding, households in both groups have equal number of pack animal holdings. Two pack animals are the average holding of the sample households in both groups.

In addition to different resource holdings, the sample households are also accessed for different infrastructural devises. As Table 4.5 (below) shows, 72.2% of the sample households have better access to potable water at their house. However, when we compare the access between the near and far households, those who live near the town have significantly higher (61.4%) access for potable water than those who live far away from the town, 38.6%. This variation on access to potable water among near group could be due to physical access (proximity) to urban center, where the majority of industries are found and service is well provided.

**Table 4.5:** Sample Households' Access to different Infrastructures and Services

Group of Farmers		Household that access and use of Potable water, Electricity and Telephone		
		Potable Water	Electricity	Mobile Telephone
Far Group	Number of HHs	32	6	22
	Percentage	38.6%	21.4%	33.8%
Near Group	Number of HHs	51	22	43
	Percentage	61.4%	78.6%	66.2%
<b>Total Number of HHs</b>		<b>83</b>	<b>28</b>	<b>65</b>
<b>Total Percentage</b>		<b>100%</b>	<b>100%</b>	<b>100%</b>

Source: Own survey data, 2010

Out of the total sample households, 56.5% of them use mobile telephone for communication. Among the total mobile phone users, 66.2 % of sample households live near Bishoftu while the remaining 33.8 % live far from it. This variation on the number of mobile phone users could be

due to network coverage, access to electric power supply, orientation about the service and purchasing capacity, which is better among households near the Town.

The survey result also shows, access and consumption of electric power of the sample households is 24.3%. Among the total sample households who have the access to electric power supply, only 21.4% of them live far from Bishoftu. However, the remaining 78.6% of households live near Bishoftu. Like access to potable water, this could also be due to physical access (proximity) to urban center where industries are found and the service is well provided.

Generally, the data shows that the access and consumption of electric power supply of sample households is lower when it is compared with potable water and mobile phone.

## **4.2 Structure of Selected Agro-industries and Agricultural Marketing System of the Study Area**

### **4.2.1 Characteristics of the Selected Agro Industries**

During the study period 23 working agro industries were found in Ada'a rural woreda and Bishoftu town. Among these industries 10 of them are food processing. Six of these food processing agro industries are also considered in this study. These industries have medium and large scale capacity, and they process agricultural products like wheat and milk as a major raw material. The Agro industries produce wheat flour, pasta, macaroni, biscuit, bottled milk, canned butter, canned cheese, creams and useful byproducts such as *Fursikalo*. Currently, the industries have an estimated investment capital of 12,400,000 EtB and employed 498 persons.

Five of the selected food processing industries were established after 1991 while the remaining one was established in 1972. As the Table-4.6 (below) shows, private investors own five of the Agro industries while Ada'a Woreda Agricultural Union owns the remaining one.

**Table 4.6:** Characteristics of selected Agro industries

No.	Name of Selected Food Processing Industries	Ownership	Capacity	Estimated Investment Capital	Number of Employee		
					Male	Female	Total
1	Ada'a Flour and Pasta Factory	Private	Large	8,000,000	193	99	292
2	Awash Flour and Biscuit Factory	Private	Large	1,000,000	97	44	141
3	Genesis Dairy Farms	Private	Large	1,500,000	1	14	15
4	Ada'a Milk and Milk Products Processing Co.	Cooperative	Medium	800,000	-	-	-
5	Bora Dairy Farms	Private	Medium	600,000	3	14	17
6	Lema Dairy Farms	Private	Medium	500,000	4	13	17
	<b>Total</b>			<b>12,400,000</b>	<b>298</b>	<b>184</b>	<b>482</b>

Source: Own survey data, 2010

As observation made during the study shows, all of the industries have well established production and marketing systems. Three of the Agro industries have factory out lets (product distribution shops) at their respective factory compounds. Moreover, 5 of them have local product distribution shops at Bishoftu town. According to the data obtained from all of the selected agro industries shows, their production mainly focused to meet the domestic market demand and none of them have ever exported their products since establishment.

#### **4.2.2 Agricultural Marketing System of the Study Area**

In the past decades, agricultural marketing system of the country has gone through a number of structural changes and transformations. Like any national policy areas, the agricultural marketing policy environment is highly dependent to the kind of governments and type of economic policies adopted by those governments. However, in addition to government economic policy changes, the agricultural marketing system is under its natural process of change for the past many years.

Currently, since 1993, the agricultural marketing process of the country is under the umbrella of liberal and free market system. Therefore, different actors participate in the market system freely under benefit-oriented spirit. Actors of the agricultural marketing system also exchange different resources like labour, agricultural products, modern and traditional agricultural inputs, and consumable goods as per the market demand and supply.

Under this national agricultural marketing system framework, different market actors of the study area are also exercising free market. Considering economic incentives and personal benefits, participants of the local market also exchange different resources in the marketing process.

In the study area there are five small open local market places at Hidi, Dire, Arb Gebeya (Tulu Dimtu), Bekejo and Godino rural Kebeles. There is also one big market at Bisheft town. In all the market places, producers (farmers), consumers (farmers and urbanites), whole sellers, retailers, grain storage service providers as well as brokers participate actively in the marketing process. In minimum eight well known wholesalers, 5 well-known brokers and at the same time wholesalers, 10 food-processing industries, 4 modern storage service providers, more than 20,099 local farmers, thousands of consumers, retailers as well as in put and service providers participate in the local agricultural marketing process. According to one of the key informants that works on Agricultural Marketing Promotion Extension Department of Ada'a Woreda Rural and Agricultural Development Office, on average, estimated 500,000 and 2,000,000 volume of EtB are exchanged during a weekly market day at small rural and big town market places respectively.

However, according to the observation made for this study, rural storage facilities, transportation and communication services, as well as location of market places and arrangements are inefficient and traditional. At market places, it was observed that the traditional grain storage facility (*Gotera*)<sup>10</sup> used by the local farmers made them to provide low quality grains that fails to meet the quality demand of agro processing industries found in the study area. Moreover, since there is no adequate transportation service most of the farmers used pack animals and own labour to transport their agricultural products to the market places. This makes the farmers in order not to bring adequate amount of their product to market places.

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<sup>10</sup> *Gotera*: Is a traditionally prepared storage that made from woods, mud, animal dung for the purpose of storing grain

### 4.3 Situation of Agriculture and Industry Linkages

#### 4.3.1 Production Linkage

The most commonly cultivated crops of the study area are *Teff*, Wheat, Peas and Beans. Sample households that live far areas from Bishoftu town are mainly engaged in *Teff*, Wheat, Peas and Beans production consecutively. However, those who live near the town produce Wheat, *Teff* and Peas consecutively. Crop production per capita is also varied between households in the near group and far groups. For instance, as Table 4.7 shows, the average wheat production among sample households that produced it is 18.4 quintals/year/ households. The mean average wheat production of farmers who reside near Bishoftu is 21.48 quintal/year/ household while it is 11.56 quintals/ year/ household among those who produce it in far areas. Similarly, the amount of *Teff*, Peas and Beans production per household of the farmers engaged in production these items is higher for those who live near Bishoftu than for those who live far from it.

This shows, although sample farm households that live near Bishoftu have low size farmland holding, there is high wheat production when it compared with households live far from it. This could be due to better access for modern agricultural inputs, agricultural extension services, market and infrastructural devises that help for high production.

Table 4.7: Annual Production of Major Crops of Sample Farm Households (2008/09 Production Season)

Production Items	Far Group				Near Group				Total	
	No HHs	Max Prod (Kg)	Min Prod (Kg)	Mean Prod (Kg)	No HHs	Max Prod (Kg)	Min Prod (Kg)	Mean Prod (Kg)	No HHs	Mean Prod (Kg)
Teff	39	50	2.5	15.15	71	98	3	18.25	110	17.15
Wheat	37	50	2	11.56	68	66	3	21.48	103	18.40
Peas	29	60	0.5	8.4	49	65	1.5	9.9	104	9.35
Beans	18	32	1	7.4	19	13	1	5	31	6.2
Oil Seeds	0	0	0	0	1	1	1	1	1	1

Source: Own survey data, 2010 1466

Like grains, considerable number of the sample households produces livestock products, mainly milk. However, only 25% of the households are intensively engaged in milk production for market purpose. The amount of production is also high by households who live near Bishoftu town. For example, as the Table 4.8 (below) shows, in the last production year, households those who live near Bishoftu produced 463.7 liters of milk /year/ household while it is 432.4 liters of milk/year/ household by sample households that live far from it.

In aggregate, 52,013 liters of milk were produced by the total sample households (33,853 and 18,160 by households found in near and far groups) during 2008/09 production year. The production per capita is also high with households live near Bishoftu town. Like wheat production, this could be due to better access for hybrid milk cows, agricultural extension services, modern animal feeds and high market demand from milk-processing industries found in the study area.

**Table 4.8:** Average Livestock Products of the Sample Farm Households (2008/09 Production Season)

Production Items	Far Group					Near Group					Total no of HHs	Total Mean
	No of HHs	Total Prod	Mean	Max	Min	No of HHs	Total Prod	Mean	Max	Min		
Milk (liters)	42	18160	432.4	5400	90	73	33852	463.7	13950	42	115	452.3
Butter (Kg)	42	200	4.8	70	6	73	452	6.2	262	2	115	5.7
Cheese (Kg)	42	135	3.21	24	6	73	257	3.7	244	6	115	3.4
Egg	42	17331	2.6	3136	115	73	4601	63	1152	25	115	41

Source: Own survey data, 2010

As Table 4.9 (below) explains, out the total sample households' milk product of year 2008/09, 81.3% went for market, while the remaining consumed at home. Similarly, out of the total wheat production, 41.2% of the product went for market by the same year. When we see the amount of production that went for market based on their distance from Bishoftu, households in both distance groups sell more or less the same amount of their milk products in the year.

**Table 4.9:** Milk and Wheat products of Farm Households went for Market

Group of Farmers	Distribution of total Sample Farm HHs Production					
	Milk (liter)			Wheat(Kg)		
	No of HHs	Total Product	Provided for market	No HHs	Total Product	Provided for market
Far Group	42	18160	14530 (80.3%)	42	428	178 (41.5%)
Near Group	73	33852	27780 (82.1%)	73	1459	602 (41.5%)
<b>Total</b>	<b>115</b>	<b>52012</b>	<b>42310 (81.4%)</b>	<b>115</b>	<b>1887</b>	<b>780(41.2%)</b>

Source: Own survey data, 2010

Generally, on average, the sample households of both household groups sold 81.4% of their total milk and 41.2% of their total wheat products of the last production year. However, when we compare the amount of sale of these two products, high volume of the farmers' milk product went to the market. The low volume of wheat product that went to market is might be because of

high demand of the farm households for their own consumption. This is also because of low amount of product per household per year to subsist the farm household.

In contrary, high volume (81.4%) of the total milk product of the sample households went to market. This might be due to less consumption demand of milk at home and its perishable nature to store unlike wheat. Moreover, it could be because of high market demand and good price pay by milk processing industries found in the area. For instance, if we see the total volume of sold out milk of the sample households, 66.3% of it was sold directly to agro-processing industries. The remaining 33.3% was sold for Kebele level Small Milk Units (SMUs), which are run by Ada'a Woreda Farmer's Union to collect farmers' milk product for market. These SMUs also deliver the collected milk for the agro-processing industries, especially for Ada'a Milk Processing Industry.

However, the data obtained from selected Milk Processing Agro industries shows, the volume of milk produced by both the rural farmers and urbanites that engaged in dairy production is not sufficient to run the industries of the area with their full capacity. Milk producers of the rural and urban areas cover only 60-75% of the industries' fresh milk demand. On average, these industries pay more than 24,940 EtB per day for farmers that supply milk through out grower agreement. The selected milk processing industries pay such amount to purchase more than 4,300 liters of milk per day, which is 85.4% of their total daily fresh milk demand.

According to one of the key informants from the milk processing industries, the milk supply is very low to meet the whole demand of the industries to produce expected pasteurized milk and other related products. This fact also made Milk and Milk Product Processing Industries to function less efficiently in the market. Therefore, according to him, some of the industries are planning to extend investment on own dairy cows to obtain sufficient milk as per the market demand. One of the industries has also reported that it had made investment on dairy production in order to get milk as per the processing industry's' demand. But no flour, pasta and macaroni industries have their own wheat farm.

Table 4.10: Major Buyers of Wheat and Milk products of the Sample HHs

Distance of the HHs	Major Market Actors who Buy the Products					
	Milk		Wheat			
	Small Milk Units	Agro Industries	Wholesaler	Retailer	Cooperatives	Consumers
Far Groups	33.3%	-	10.7%	22.7%	-	1.3%
Near Groups	0%	66.7%	54.7%	36%	8%	-
<b>Total</b>	<b>33.3%</b>	<b>66.7%</b>	<b>34%</b>	<b>28%</b>	<b>8%</b>	<b>1.3%</b>

Source: Own survey data, 2010

According to Table.4.10, among the total sample households who sold out their wheat products, 28.7% of them sold it for retailers, 34.4% of them sold for wholesalers, 8% to cooperatives and the remaining sold it directly for consumers. The data obtained from key informants from Ada'a Woreda Agricultural Development Office shows that agricultural cooperatives and the union purchase only the improved wheat products to distribute it as improved seed to their other members. The retailers also purchase the wheat to sell it direct to consumers (urbanites of Bishoftu town and others found in the nearby).

Table 4.10 (above) demonstrates that wholesalers buy significant proportion (55.4%) of wheat product of the sample households. However, according to the data obtained from the wholesalers, they sale only 50 % of their stock for agro industries found in the study area and around Addis Ababa. They auction only the good quality wheat that meets the standards for the agro industries. They sell the remaining directly for consumers (urbanites). This shows, though different actors including agro industries participate directly and indirectly in the market process, majority of the farm households have strong direct market relationship with retailers and wholesalers respectively. The selected agro industries also do not directly participate in the local agricultural market process.

As indicated in Ada'a Woreda Rural and Agricultural Development Office Annual Report (Ada'a Woreda, 2008/09), a total of 1,372,518 quintals of wheat was produced in the whole woreda during 2008/2009 production year. Considering the trend of the sample households, 41.2 % (576,457quintals) of the total Woreda's wheat product might be sold out. Similarly, considering the market linkage of the market actors and major buyers of the wheat product of

sample households, only 27% (158,525 quintals) may reach to food processing industries through the wholesalers. This may prove that only small proportion of the total wheat production of the study area goes to agro food processing industries.

Similarly, the data obtained from agro processing industries indicated that agro industries purchase only 30-40 % of their wheat demand from local wholesalers. They buy the remaining significant volume from other suppliers found in Arsi and Bale Zones of Oromiya Regional State. This is mainly since the local production is not adequate to subsist the demand of the agro industries. If we consider the data of Ada'a Flour and Pasta and Awash Flour and Biscuit Factories as an example, they milled 53,218 and 20,100 quintals of wheat in 2008/2009 production year, respectively. However, out of the total wheat milled, the two factories used only (31%) 16,501 quintals and (50.7%) 10,200 quintals of local wheat product in the same year, respectively. In aggregate, these industries purchased local wheat product to meet only 36.7% their total wheat demand of 2008/2009 production year.

The industries also purchase the locally produced wheat from the wholesalers. According to the key informants from agro industries, on average, the wholesalers keep 50 to 200 EtB profit margins per quintal of wheat while selling the wheat for the industries. In some occasions the wholesalers may act as broker to maximize their profit margin. These high profit margin and double act in the market process may also loosen production linkage of the agriculture and agro industry.

Generally, Milk-processing industries have relatively better production linkage through direct market relationship with local milk producing farmers. However, Flour, Biscuit, Pasta and Macaroni processing industries have low direct production linkage with wheat producing local farmers. This better production linkage could be due to existence of surplus milk for market, low household milk consumption, perishable nature of milk to store, and direct market relation of milk processing industries. In contrary, low surplus wheat product, its high demand for household consumption by the farm households and urbanites might be the factors for existence of low production linkage between farmers and wheat processing agro industries in comparison

with milk. Indirect market participation of wheat processing agro industries might be also another factor for existence of such level production linkage.

### 4.3.2 Consumption Linkage

Consumption of industrially processed food items by agricultural households is one of the areas of linkage between the agricultural and industrial sectors. The data obtained from sample households indicate that sample households sell only 42.2% of their total products and use the remaining for household consumption, seedling or other purposes. The sample households spend the money earned from selling of their agricultural products mainly for payment of different social services and purchase of different goods including varied types of additional food items.

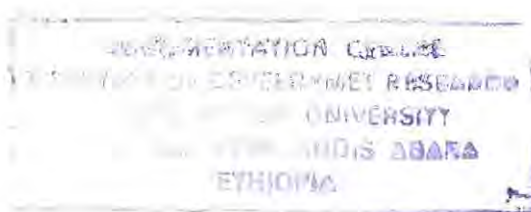
As the data obtained from the sample survey demonstrates, 72 % of sample households who live at both distant and near areas from the Bihsotu town purchased additional industrially processed food items for household consumption one month before the date of field work to meet the household's food demand. Ninety percent of sample households found in the near group and 83% of sample households found in the far group purchased additional industrially processed food items in the past one month. Out of the total monthly expenditure of the sample households, 14.3% of the expenditure was allocated for purchase of additional food items. This low amount of monthly expenditure spent for purchase of additional food items could be since the sample households consume significant proportion of their own products.

**Table 4.11:** Monthly Expenditure on Food Purchase and other Items

Distribution	Monthly Average Expenditure of the sample HHs						Total (EtB)
	Food Items	HH Utensils	Consumable Goods	Medication/ Schooling and others	Different Services and Facilities	Others	
No of HHs	115	93	103	65	76	31	
Mean Exp. (EtB)	275.5035	445.9570	1,018.7476	413.11	218.2039	123.1935	1959.49
<b>Total Exp. (EtB)</b>	<b>31,682.90</b>	<b>41,474.00</b>	<b>104,931.00</b>	<b>26,852</b>	<b>16,583.50</b>	<b>3,819.00</b>	<b>225342.4</b>

Source: Own survey data, 2010

As table 4.11 shows, on average, the sample households spend 1,959.49 EtB per month since the survey period for payment of different services and purchase of goods including additional food items. The sample households spend 1,018.74 EtB of the total expenditure for purchase of



consumable goods like clothing, shoes and 275.5 EtB for additional food items. The households also made 218.2 EtB for payments of service and facilities like electricity, mobile phone, membership fees. These three expenditures took the highest proportion of the monthly payments of the sample households in succession.

When we observe the consumption level of industrially processed food items, sample households used considerable amount of their payment to it compared with the total amount of their additional food item purchase. On average, the sample households spent 275.5 EtB per month for purchase of additional food items during the last one month since the survey period. Out of this total average spending on purchase of additional food items, 90.2 % (248.5 EtB) of the money went for purchase of industrially processed food items. The spending on purchase of industrially processed food items also constitutes 12.7% of their total monthly expenditure.

**Table 4.12:** Monthly Expenditure on Processed Food Items

Distribution	Amount of Monthly Expenditure on different industrially processed food Items											Total
	Milled Flour	Biscuits/ Breads	Pasta /Macaroni	Sugar	Spices	Edible Oil	Butter	Cheese	Meat	Vegetables	Fruits	
No of HHs	14	23	77	100	29	98	16	2	57	19	16	
Mean Exp. ( EtB)	48.71	25.00	42.94	59.85	34.42	55.25	67.28	31.00	142.28	32.89	32.81	248.45
Total Exp.	682.00	575.00	3,307.00	6,644.00	998.40	5,967.00	1,076.5	62.00	8,110.0	625.00	525.0	28571.9

Source: Own survey data, 2010

As indicated in Table 4.12, among the industrially processed food items, the most commonly used items were Meat from Butchers, Sugar, Edible Oil, Pasta and Macaroni in sequence. . Sugar, Milled Flour, Pasta and Macaroni took much of the monthly expenditure that allocated for purchase of industrially processed food items by the sample households. Canned Fruits, Biscuits and Breads are also the least used food items. Out of the total processed food items indicated under Table 4.12, Edible oil, Pasta and Macaroni, Bread and Biscuits, and Milled flour can be processed by agro industries found in the area. These food items also constitute 84% of the total industrially processed food items that purchased by the sample households.

Generally, sample households total purchase of processed food items is higher out of the total expenditure allocated for purchase of additional food items. This may also imply that there is high demand and consumption of industrially processed food items by the sample households.

According to Suryahadi, Surayadarma, Sumarto and Molyneaux (2006), consumption of industrially processed food items is likely to increase with the increase of household's food expenditure and income. He explained that, if the household income increases, the household expenditure for additional food items also increases until it reaches to its marginal limit. This also demonstrates the likelihood of increase in demand and consumption for industrially processed food items by the sample households.

Table 4.13: Distribution of suppliers of Purchased Food Items

Food Items	Supplier of the Processed Food Items for the HHs		
	Retailers	Wholesalers	Total
Milled Flour	14 (100%)		14 (100%)
Biscuit and Bread	23(100%)		23(100%)
Pasta and Macaroni	77 (99.1%)	1(.9%)	(108%)
Sugar	107 (96.6%)	4 (3.4%)	111(100%)
Spices	29 (100%)		29 (100%)
Edible Oil	102 (94.6%)	6 (5.4%)	108 (100%)
Butter	16 (100%)		16 (100%)
Cheese	2 (100%)		2 (100%)
Meat	57 (100%)		57 (100%)
Canned Vegetable	18 (99.1%)	1 (0.9%)	19(100%)
Canned Fruit	16(100%)		16(100%)
<b>Total</b>	<b>462 (97.4%)</b>	<b>12 (2.6%)</b>	<b>474 (100%)</b>

Source: Own survey data, 2010

When we observe the market relationship (channel) of both the agricultural and industrial sectors, 97.4% of the sample households purchased their additional food items directly from retailers while the remaining purchased it from the wholesalers. According to the data obtained from key informants, this is because retailers work near all market places that the farmers frequently visit. Moreover, farm households prefer to purchase their daily consumptions from the nearby market places rather than from wholesalers' stores and factory out lets, which demand high quantity purchase at a time. Therefore, these factors made the consumption linkage of agriculture and industry indirect in the market process.

One of the key informants who is a wholesaler and at the same time a retailer of food items also described the situation as follows;

*We sell much of our industrially processed food items for farmers. I believe, this is because we are always around the markets where the farmers visit frequently. Recently, the farmers buy industrially processed food items, especially Pasta and Macaroni more than ever though the price of the item is increasing. Most of us (retailers) take 0.4 to 5 EtB profit per a kilogram of these food items. However, even when we take high profit margin, they prefer to buy from us rather than going to wholesalers and factory outlets found in Bishoftu Town.*

Like processed food items, sample households have also used significant amount of agro-industries' byproducts to use it as agricultural input. According to the data obtained from the sample survey, 76% of the sample households purchased byproducts of the food processing industries for the purpose of animal feed in the past one month since the survey period. However, unlike the food items, they mostly visited wholesalers' stores to buy the byproduct (*Mainly fnuriscalo and Nug Cake*) rather than factory outlets or retailers. This is mainly because the food processing industries distribute the byproducts through the wholesalers. Akin to industrially processed food items, the farm households have considerable indirect consumption linkage with agro processing industries. Wholesalers are also the channel in the linkage process.

### **4.3.3 Labour Linkage**

Labour supply is one of the major areas where agriculture and industry links. Especially, since agro industries need intensive labour and are close to agriculture, their linkage with agriculture through supply of labour is significant. According to Befekadu (1990), the fact that the agricultural sector is the source of the labour force of other sectors is indisputable. He also added that the very short history of urbanization in Ethiopia and the high rural base population make it incontrovertible to conclude that the current technical, managerial, financial and other experts as well as lower level workers of the industries all have their origin in the rural parts of the country.

In Ethiopia, the amount of labour force that engaged in the industry sector has been increasing since 1995(CSA, 2009). According to CSA, the amount of labour force that engaged in the industry sector has reached more than 134,963. Between 2002 and 2007, the amount increased by 33%. The increment made is significant compared with the total labour force that was engaged in the sector in 2002, which was 101,404. The inflow of labour force to agro industries is also 21,823, which is increased nearly by 30% between 2002 and 2007. The increment of labour force among food-processing industries is also 15,510 (50.7%) between 2002 and 2007. This could be mainly due to increment in number and size of industrial establishments (growth in the industrial sector) from 2002 to 2007.

Geographically, many of the newly established medium and large scale industries are also found in Addis Ababa and Oromiya Regional States, mainly at peripheral part of Addis Ababa (CSA, 2009). These increased industrial establishments and increasing labour force on the industry sector may also contribute for increase in labour transfer from the agriculture sector. However, there is an assumption that there could be some work forces who claim their urban origin, which is only to remember the folk stories and memory left to them by their parents whose origin was unquestionably rural (Befekadu, 1990)

The study area is one of the well known industrial areas found in Ethiopia, especially in Oromiya Regional State. Recently, the area is considered as a part of the industrial chain, which starts from Addis Ababa to east of the country. The Woreda has also a number of industries that employed thousands of work forces at various skills and responsibilities.

Table 4.14: Number of Employees in selected Agro industries

Selected Agro industries	Number of Employees in the industries		
	Male	Female	Total
Genesis Dairy Farms	1	14	15
Bora Dairy Farms	3	14	17
Lema Dairy Farms	4	13	17
Ada'a Flour and Pasta Factory	193	99	292
Awash Flour and Biscuit Factory	97	44	141
Ada'a Milk and Milk Products Processing Co.	11	5	16
<b>Total</b>	<b>309</b>	<b>189</b>	<b>498</b>

Source: Own survey data, 2010

As Table 4.14 (above) demonstrates, there are 498 (Female=189) employees in the selected agro industries. Out of the total employees that were employed in these industries, majority (65 %) of them work as daily laborer. Technical staffs constitute only 26 % of the total while the remaining were middle and top-level management staffs. The data obtained from key informant interviewees from agro industries also demonstrates, majority of the employees of the selected agro industries are urbanites. Bishoftu is also a source for many of the employees that work under different job categories of the industries. According to them, however, many of the top-level management staffs of the industries are from Addis Ababa. One of the key informants also explained origin of many of the employees at his industry as follows;

*Most of our management level staffs of our factory are from Addis Ababa. In fact, we have some from Bishoftu town. However, our factory does not have compiled previous work attachments of the daily laborers. However, I believe, not more than 3% of the employees were farmers before they join our factory.*

Similarly, as the sample survey demonstrates, 10% (15 individuals) of the total sample households had a family member that engaged in additional non-farm livelihood activities in and around Bishoftu town. The data shows, the household members who engaged in additional livelihood activities work as a daily labourer, security guard and technical jobs at market places and industries in the nearby. Among the total individuals who had engaged in additional non-farm livelihood activities, 80% (12 individuals) of them were used to work in the nearby industries. The entire households that their family members had been working in the industry are also found among near group. All the individuals who work in industries had been working as daily labourer (50%), and security guard (50%).

To strengthen the data demonstrated above, another key informant from the other selected agro industry also illustrated the proportion rural labour force and work in the industry where he works as follows;

*“All of the management and some of the technical staffs of our factory are from Addis Ababa. The daily labourers are, however, from Bishoftu Town and surrounding Rural Kebeles. During recruitment, the factory gives high emphasis for well-trained managerial and technical personnel. Mostly, it finds such experienced staffs from Addis Ababa, where there are many similar industries found. However, when we hire daily labourers we give emphasis for local people who have interest to work. We give this opportunity because the labour price is relatively low and since we took their land for the plant establishment. Due to the recruitment opportunity, some farmers work in our factory though the number is very small. Urban youth mostly look for job in the factory than the farmers. I believe the farmers have less clues about the jobs in the industries around. Therefore, they prefer to stay on their farm works.*

Generally, these data indicate that industries are the best alternatives for additional livelihoods for individuals found near group sample farm households. Distance of industries from farm households may also have direct relationship with the engagement of the rural labour force in the industry. Moreover, since it is believed that most of the employees of the industries have close ties with the rural area (agriculture). Therefore, although it is low, the data lets us to infer that there is labour linkage between agriculture and industry in the study area.

#### **4.3.4 Technology, Institution and Capital Linkage**

##### **4.3.4.1 Application of Modern Agricultural Inputs**

Application of modern agricultural inputs has a prime importance to increase agricultural production. Modern agricultural inputs are also innovation and products of agro industries that are designed to increase agricultural productivity. Farm households of the study area also use improved seeds, manufactured fertilizer, pesticide, animal feed and modern farm tools to increase their agricultural productivity. As shown on Table 4.15, 85 % of the sample farm households used manufactured-fertilizer in the last farm season. Moreover, more than 80% of the households used pesticides, 59.1% of them used modern animal feeds and 47% of them used improved seeds in the last farm season. Relatively low number of sample farm households used modern farming tools (27%) and hybrid milk cows (17.5%).

**Table 4.15:** Application of Modern Agricultural Inputs by Sample Farm Households

Type of Modern Agricultural Inputs	Near HHs		Far HHs		Total	
	No of HHs	Percentage	No of HHs	Percentage	No of HHs	Percentage
Improved Seeds	37	32.2 %	17	12.2%	54	47%
Fertilizer	58	50.4%	40	34.8 %	98	85.2%
Pesticides	62	54.4 %	32	28.1 %	94	81.7%
Modern Farming Tools	25	21.9 %	6	5.3 %	31	27%
Hybrid Milk Cows	14	12.5 %	6	5.4 %	20	17.4%
Modern Animal Feed	47	41.2 %	21	18.4 %	68	59.1%

**Source:** Own survey data, 2010

Sample farm households who reside near Bishoftu town used modern agricultural inputs better than those who reside far to it. For instance, 32.2% of sample farm households live in the near group used improved seeds in the last farming season while it is 14.8 % by households who live far to it. Fifty percent of sample farm households who live near Bishoftu town used fertilizer in the last farming season, while it is 34.8% for households in a far group. The case is also similar in application of other modern agricultural inputs.

One of the key informants from Ada'a Woreda Rural and Agriculture Development Office also described its perception on the modern agricultural inputs application practice of the local farmers' as follows;

*"Recently, most of the farmers in our Woreda learned to use modern agricultural inputs, especially manufactured-fertilizer. Development Agents (DAs) show them how they should use the modern inputs in their farming. The farmers find these inputs from their respective kebeles and agricultural producer's cooperatives. According to our observation, farmers who have better income and live around Bishoftu Town are the ones who use the inputs better. However, only some households who live in distant kebeles of the woreda use modern agricultural inputs. This might be due to low awareness of the farmers, income, and lag in the distribution of the inputs during farm season."*

These data show that sample farm households who live near Bishoftu town are more acquainted in application of modern agricultural inputs than those who live in distant areas. Among other things, this could be due to the accessibility of modern agricultural inputs and better orientation about the inputs by the nearby farmers. Moreover, this could be due to better, agricultural services and big market places to access and buy the inputs easily.

**Table 4.16:** Sources where Farm Households find Modern Agricultural Inputs

Sources where Farm HHs find Modern Agri inputs	Improved Seeds	Fertilizer	Pesticides	Modern Farming Tools	Hybrid Milk Caw	Modern Animal Feeds
Kebele/ Woreda Agriculture Development Office	27 (51%)	31 (31%)	17 (18.5%)	16 (40%)	3 (15.8%)	3 (4.3%)
Agricultural Productive Cooperatives	19 (35.8%)	67 (68%)	56 (60.8%)	22 (55%)	7 (36.8%)	1 (1.4%)
Agro Industries	-	-	1 (1.1%)	-	1 (5.2%)	10 (14.5%)
Neighborhoods/ Relatives	-	-	-	-	5 (26.3%)	-
Model Modern Agricultural Input Shops	-	-	1 (1.1%)	-	-	-
Merchants	3 (5.6%)	2 (2%)	15 (16.3%)	1 (2.5%)	-	53 (76.8%)
From other sources	4 (7.5%)	-	2 (2.2%)	1 (2.5%)	3(15.8%)	2 (2.9%)
<b>Total</b>	<b>53 (100%)</b>	<b>100 (100%)</b>	<b>92 (100%)</b>	<b>40(100%)</b>	<b>19 (100%)</b>	<b>69 (100%)</b>

Source: Own survey data, 2010

While examining where the sample households access modern agricultural inputs, it is possible to observe that considerable numbers of sample farm households had accessed the inputs from their respective Kebele administrative offices and agricultural producer's cooperatives. For instance, out of the total sample farm households who used fertilizer in the last farming season, 67% of them accessed the fertilizer from agricultural producers' cooperatives. Twenty seven percent of the sample households also got it from their respective kebele agricultural development offices. The source is also similar for improved seeds. 23.5% and 16.5% of households found improved seeds from agricultural producers' cooperatives and kebele agricultural development offices, respectively. Forty eight percent of pesticide users also accessed it from agricultural producers' cooperatives. Similarly, 19.1% of sample farm households that used modern farming tools in the last farm season found the tools from agricultural producers' cooperatives. However, the sources are different in case of hybrid milk cows and modern animal feeds. Sample farm households those used these two modern inputs accessed them from agricultural producers' cooperatives and agro industries, respectively.

It is found that agro industries found in the study area provided very few types of modern agricultural inputs for the farm households. The industries have also low relationship with local farm households in accessing of modern agricultural inputs. According to the data from sample farm households, only a small number of households have linkage with agro-industries with regard to modern agricultural inputs. Out of the total households, only 10.4% of them had accessed modern agricultural inputs from agro industries. Eighty-three percent of the modern

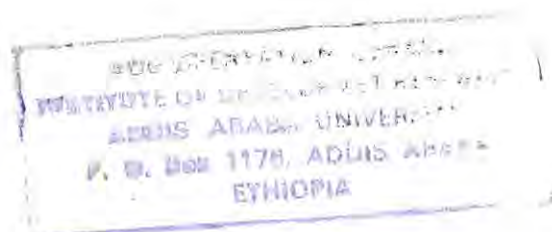
agricultural input that agro industries provided was also modern animal feeds. However, these industries don't sell the byproducts and other modern agricultural inputs that could bring agricultural productivity for local farmers, which could increase supply of raw materials for agro industries in return, directly to the farm households.

Like modern agricultural inputs, quality agricultural product is one of the important dimensions that brings agriculture and industry linkage. In this regard, farm households' knowledge of quality standards that agro-industries demand for agricultural raw materials is also one of the indicators of local farmers and agro industries linkage. However, as it is observed in this study, high proportion of sample households do not know the quality standards of agricultural products that agro industries of the study area require. Out of the total sample households, only 18.3 % of them know about quality standards that are required by different agro industries in their respective localities.

Among the respondents that know the quality standards that are required by the agro industries, 70.5 % of them live near Bishoftu town, where most of the agro industries found. Proximity of these households to the urban center also helped them to be better acquainted with the quality standards of agricultural inputs that agro industries demand than those who live in distant areas.

However, out of these respondents, only 14.7% of them got orientation from the agro-industries, while the remaining acquainted themselves by own effort. Similarly, although all of the selected agro industries have quality control expertise, none of them have had gave trainings or orientations for local farmers on quality standards of agricultural inputs that their respective industry require.

Generally, as the data shows, significant number of sample households used modern agricultural inputs in the last farming season. Significant number of sample households also does not have the knowledge about the quality standards required by agro-industries found in the area. Sample farm households that reside near Bishoftu town have relatively better linkage with agro



industries through accessing of modern agricultural inputs and being oriented of quality standard of the agro industries than who live in distant areas.

#### **4.3.4.2 Institutions that Serve Agriculture and Industry Linkages**

Development and adoption of different institutions are one of the key elements in the development process. According to the data obtained from primary and secondary sources, there are different rules and regulations that facilitate the linkage of the two sectors found in the study area. Among these institutions, the following two are identified as important in the development and coordination of the respective sectors at woreda level;

1. **Rural and Agriculture Development Office:** This institution facilitates the rural development through agricultural and infrastructure development. It works on food security, crop and livestock production, promotion of modern farm technologies, skills and market system, rural infrastructure development.
2. **Trade and Industry Bureau:** This institution promotes investments in agriculture, industry, trade and services. As a basic area of work, it identifies prime industrial investment opportunities/areas, promotes and registers private and public investments, facilitates safe industrial work environment and marketing.

Beside encouraging other small institutions that facilitate growth and linkages of the two sectors, these two institutions address resource ownership and security by providing ownership certification for resource holders and facilitates property right and peaceful industrial environment among industries in the study area. Property right and ownership certification also contribute for development of the two sectors and the linkages. In addition to these two prominent institutions that represent the two sectors, there are one agricultural union, seven agricultural producers' cooperatives, one microfinance institute, five banks (private and government), one electric power supplier ( ELPA), one communication service provider, five small open local and one big town local market places that facilitate the linkages of the two sectors in the study area.

The farm households and agro industries participate in these important institutions that facilitate linkages of the two sectors further. Both are engaged in agricultural cooperatives, agricultural unions, local market processes and legal modalities of out grower agreements in one way or another. For instance, when we see farmers' membership in agricultural cooperatives, 97% of the sample households are a member at least in a cooperative found in their locality. Among these respondents, 71.3% of the sample households are members of agricultural producers' cooperatives. Twelve percent of the households are also a member of saving and credit cooperatives. However, out of the total cooperatives that farm households have membership, only one has direct working relationship with agro-industries. Nevertheless, the agricultural union that most of the agricultural producers' cooperatives are a member has different working relationship with agro-industries.

The agricultural union also facilitated market relationship between the milk processing industry owned by it-self and milk producing farmers through out-grower agreement. Similarly, according to the data obtained from sample farm households shows, 10% of the total sample households had out grower agreement with different milk processing industries including the Union. The data obtained from selected milk processing industries also shows as they have 485 out growers that live in rural and urban areas.

Generally, these data imply that the agro-industries have indirect production linkage with farm households through agricultural cooperatives and union. Moreover, they have also direct linkage with the farm households through out-grower agreements in the market process.

#### **4.3.4.3 Capital Linkage through Saving and Loan**

Capital accumulation contributes important role for development of agriculture and industry sectors and their ties. Presence of capital enhances agricultural growth and fastens the industrialization processes. Therefore, saving of money that obtained from surplus production and profits strengthen the linkages of the two sectors through transfer of capital from one sector to the other.

Saving and capital accumulation of households mainly relates with their level of income and cost of basic needs that are important for living. According to the 1999/00 HICE survey of MoFED, there is difference in cost of basic needs among regions and place of living (rural and urban areas). Poverty line set for the regions by MoFED shows, 988.22 EtB is a minimum amount of money needed for rural areas of Oromiya region to cover the cost of food and non-food requirements of households (MoFED, 2002). This figure also becomes 1195.75 EtB when it is adjusted by 17.5% inflation rate that was prevalent during the study period (The Library of Congress Country Studies, 2002).

**Table 4.17:** Regional poverty line

Region	Rural	Urban	Total	Adjusted poverty line (inflation) for the rural study area
Tigray	919.80	1150.29	954.29	-
Afar	964.82	1163.71	1022.68	-
Amhara	917.17	1155.10	939.27	-
Oromiya	988.22	1269.52	1017.39	1195.75

**Source:** Adapted from Development and Poverty Profile of Ethiopia, (MoFED, 2002)

As the data shows, 43.4 % of the households spent more than the adjusted line of poverty (1,195 EtB) of Oromiya Region for additional expenses per month. Despite other factors, this data can let to infer that there is a possibility that the sample households can make saving. Similarly, according to the data obtained from sample households, 67% of them save money. Among those who save money, 61% of the households live near Bishoftu. Sixty one percent of households that spend above 1,195EtB, the Oromiya regional adjusted line of poverty, per month are also live near Bishoftu town.

The data shows, significant proportion (46%) of the households save money in banks, while 39.3% of them save in ‘Saving and Credit Cooperatives’. Thirteen percent of the households save money at home and the remaining save through informal institutions (Iddirs<sup>11</sup> and Iqubes<sup>12</sup>).

<sup>11</sup> **Iddir:** Is one of the community-based organizations that the community establishes it in its respective locality with neighborhoods for maintaining social benefits among members and neighborhoods at funeral process.

In resembling of saving, loan is another channel of capital transfer that can show capital linkage of agriculture and industry sectors. With this context, despite informal institutions, there are banks, microfinance institutions, and saving and credit cooperatives from which households find loan in the study area. According to the data, 33% of the sample households have taken loan from formal financial institutions to run their livelihoods during 2008/09. Out of these respondents, a significant proportion (94.8%) of them took the loan from saving and credit cooperatives.

**Table 4.18:** Experience of farmers taking loan from financial institutions

Source of Loan	Farmers Loan Experience				
	Far Group		Near Group		Total
	No of Respondents	Percentage	No of Respondents	Percentage	
Bank	2	12.5%	0	0%	2(5.2%)
Save and Credit Cooperatives	14	87.5%	22	100%	36(94.8%)
<b>Total</b>	<b>16</b>	<b>100%</b>	<b>22</b>	<b>100%</b>	<b>38(100%)</b>

Source: Own survey data, 2010

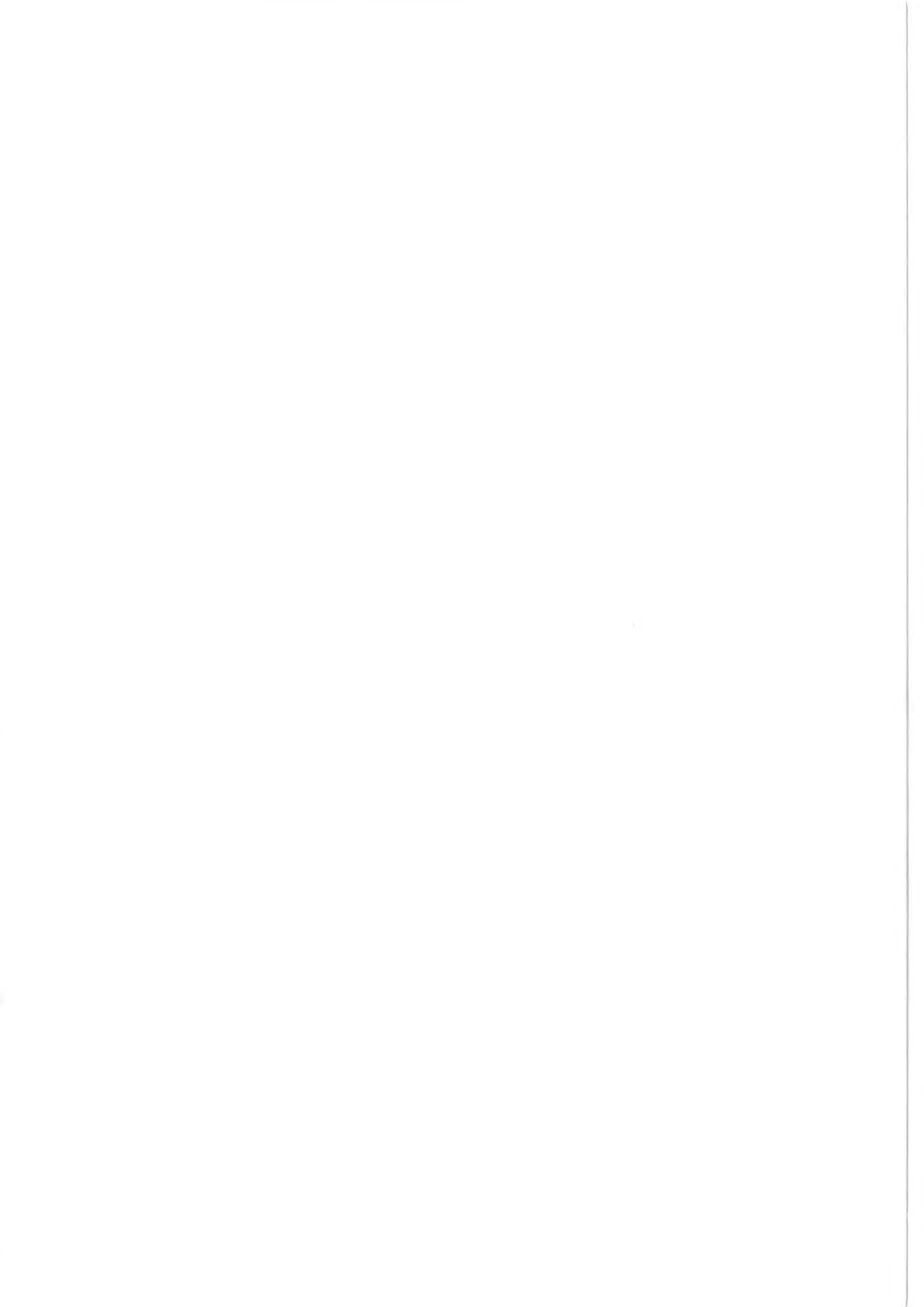
Generally, rural households' saving creates capital accumulation in the agriculture sector. This accumulated capital is also a prime input for investment in agriculture itself, the industry and other economic sectors. This also creates economic linkages between the two sectors indirectly through saving, loan and investment.

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<sup>12</sup> **Iqub:** Is one of the community-based organizations, which is mostly established by neighborhoods and peoples that have common interest to save money regularly for the purpose of their social benefit.

**Note:** *Iqubs* have involved in saving and credit since they have got orientation from an NGO called *ACORD* couples of years to extend their service from funeral process in to other common business like saving and credit as well as small business.

Note: The high number of saving by rural households is revealed, since most of the farm households are a member of Oromiya Cooperative Bank, which holds hundred thousands of Oromiya farm households as a member.



#### **4.4. Factors that affect Agriculture and Industry Linkage**

Different literatures discussed in chapter two shows that agricultural production, rural infrastructures, institutions and location of the industry are some of the major factors that affect linkages of agriculture and industry.

As the data obtained through the sample survey shows, although it is not like the urban areas, significant number of the sample households have access and use different rural infrastructures like road, electricity, and mobile telephone, especially households live near Bihoftu town. The sample households also have access to potable water, education and health services. The rural and urban areas of the study are also connected through these basic infrastructures and services. This implies that rural infrastructure is playing its role for better linkages of the agriculture and industry sectors in the study area. It is assumed that there is open economic system that goes across the study area. However, the study observed that the following are the major factors that are affecting linkages of the two sectors at the local level;

##### **4.4.1 Low Agricultural Production**

As findings of the study demonstrates, milk processing industries got 85.4% their total milk demand from local farmers at rural and urban areas during 2008/09 fiscal year . Similarly, wheat processing agro industries got only 36.7% of their total demand from the local farmers in 2008/09 fiscal year. This is because significant volume (60%) of the sample farm households' wheat production was used for own household consumption. Moreover, even out of the total product that went to market, the highest proportion of it was sold for urbanites (consumers) through retailers and wholesalers. This shows that there is no enough agricultural product that can go beyond subsisting the farm household and urbanites household demand to meet the order of agro industries in the area.

According to the data obtained from sample households, the low agricultural production is mainly due to low small size of farmland holding and low application of modern agricultural inputs. For instance, as the data from the sample households shows, volume of wheat production by the sample households has strong relation with the application of improved seeds, fertilizer

and size of land holding respectively. These modern agricultural inputs and resources had 0.32, 0.29 and 0.20 correlation with volume of household wheat production, respectively. The volume of sample households' milk production is also related with modern hybrid cows the farm households have and application of modern animal feeds.

Generally, the data obtained from both agro industries and farm households shows that the volume and quality of agricultural production is low to fill the total demand of agro industries besides meeting the farm households and urbanites food consumption. Therefore, existence of low agricultural product is affecting the production linkage of agriculture and industry.

#### **4.4.2 Local Agricultural Marketing System**

Different institutions play different roles for development and linkage of the Agriculture and Industry sectors of the study area. The previous chapter discussions also revealed that a market system is one of the major institutions that have significant impact on the development and linkage of the two sectors.

The data obtained for this study shows, direct participation of agro-industries in the local market process is insignificant. All selected wheat processing agro-industries indirectly participate in the local agricultural market system through the wholesalers. Similarly, all of the sample households that produce wheat sell their products to wholesalers, retailers, cooperatives and consumers respectively.

However, high proportions of sample households that produce milk sell their products directly to agro-industries. Milk processing agro industries have better direct participation in the local marketing system. Some of the industries also have established out grower agreements with milk producing farmers. Nevertheless, the tie made through out grower agreement didn't reach all milk producing farm households. For instance, out of the total sample households, only 10% of them have had out grower agreement with milk processing industries, while the remaining deliver their milk product to the industries indirectly through Small Milk Units.

Type of participation and modalities exist in the market process of the study area shows the existence of high dominance by wholesalers and Small Milk Units to bridge the farmers and agro

industries in the local market system. Moreover, direct market linkage of the agro industry with the local farmers is very low, especially in case of local wheat market. Therefore, marketing system of the study area and low participation of the agro industries in the marketing process is affecting production linkage of the two sectors.

#### **4.4.3 Distance of Farm Households from Industrial Establishments**

Distance of industrial establishments from the rural households has direct and indirect influence on the linkages of the farm households with agro industries. As the previous discussions of the study finding show, location of industrial establishment is highly influenced by infrastructural facilities and services, supply of labour, availability of agricultural inputs and institutions.

Rural infrastructures as a basic facilitator of agriculture and industry linkages, the study has found that 72.2% of sample households have access for potable water, which more than 61% of them live near Bisheftu town. Similarly, 78.6% and 66.2% of sample households that have access for electricity and mobile telephone live near the town, respectively

When we analyze agricultural production, like the infrastructural devices, there is higher volume of wheat and milk production among households live near Bishoftu than those who live in far areas. It is known that both sample groups falls more or less similar biophysical zone. However, production of wheat per household/ year is varied among the two groups. It is 21.48 quintal/year while it is 11.56 quintals/ year in near and far group households, respectively. Similarly, milk production is 463.7/year among households those who live near Bishoftu town while it is 432.4 litters/years among households live far to it. This is because; households who live near Bishoftu find agricultural extension services easily and significant number of them use modern agricultural inputs than those who live far to it. This is also similar among households that produce milk.

Similarly, location of the industry affected rural labour force participation in the industry sector. This study also found out that all households that their family members work in the nearby industries live in near Bishoftu. Similarly, 70.5% of sample households who know different agro industries' quality standards requirements of agricultural raw material also live near Bishoftu.

Similarly, significant numbers of households that save and take loan money from formal institutions also live near the Town.

Generally, since much of the industries are concentrated in and around Bishoftu town, the agro industries' linkage with distant farm households is not as it is with households that live near the Town. Despite infrastructural factors, the low linkage of agro industries with distant farm households is mainly due to the distance that exists between the two.

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## CHAPTER-V: CONCLUSION AND RECOENDATION

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### 5.1 Conclusion

This study was conducted to examine the situation of agriculture and industry linkages and factors that affect the linkages with reference to agro industries. The driving reason for this study is to attempt what many of the previous studies that have analyzed different characteristics of the agricultural and industrial sectors have failed to see the linkages that exist between them. Hence, this study is made to fill the above stated gap by broadly analyzing the local linkages between agriculture and agro industry. It analyzes situation of the linkages through four pillars: production, consumption, labour supply, and technology, institutions and capital. Moreover, the study has tried to analyze factors that determine the linkages of the two sectors of the study area to understand how the factors limit and improve the linkages.

Findings of this study shows, the two sectors have established local production linkages in the study area. For example, milk-processing industries utilized 85.4% of their milk demand from the local farmers in 2008/09 fiscal year. Similarly, flour, biscuit, pasta and macaroni producing industries also filled 28% their wheat demand from the local farmers in 2008/09 fiscal year. This implies that, although the degree of production linkages varies among different of agro-industries, the sectors have local production linkage. However, it is observed that in some cases the production linkage of the two sectors is indirect, especially in case of wheat processing industries. Agro industries participation in the local market for purchase of wheat was mostly through wholesalers. In some case milk was also provided for agro industries through SMUs established at Kebele level. The major suppliers of wheat for agro industries are also wholesalers than the local farmers themselves.

According to Mellor and Lele (1971), (cited in UNIDO, 2000), the amount of farmers spending of their farm income on non-farm goods and services as well as processed food items and other perishable agricultural commodities indicates consumption linkage of farmers with industry. Similarly, it is found out that 72% of sample farm households are consumers of industrially processed food items. On average, sample households spend 248.5 EtB/ month for purchase of industrially processed food items. The sample households mainly consume industrially processed

edible oil, bread and biscuit, wheat flour, pasta and macaroni, that can also produced by agro industries found in the study area. However, like the production aspect, the linkage is indirect. Significant proportion (93%) of households purchases the food items from retailers that work at local market places. Generally, the finding shows that the farm households have consumption linkage with agro industries. The linkage is also considerable when it compares with the production linkage of the two sectors.

According to Lewis (1954) (cited in Todaro, 2009), new industries can be set up and the existing ones can be expanded without limit at the lull wage rate. This is because the agriculture has surplus labour that can contribute to other sectors. In the same way, this study found out that the agriculture sector of the study area has provided labour force for the industry sector. Accordingly, nearly 3% of sample rural households' members were employed in industries found in the study area. It is also believed that the remaining employees from urban area also have tie with rural households. This may also indicates as an indicator that the industry is utilizing surplus labour force of the agriculture in the study area. However, unlike the agriculture, the industry was not sharing its skilled labour through trainings, orientations and marketing supports to the agricultural sector.

In agriculture, there is a long tradition to support agricultural research organizations to develop new technologies. These "*Packages of Technology*" are then transferred to other organizations such as extension agencies, public seed companies and others (Radosevic, 1998 cited in Gijsbers, Innovation Policy Group and TNO, 2008). The idea of Radosevic demonstrates that the farmers would have the chance to benefit from new technologies through application of it. With this context this study found out that significant number of farm households use modern agricultural inputs to increase their agricultural productivity. Accordingly, sample farm households use manufactured fertilizer, improved seeds, pesticides, hybrids livestock, modern animal feeds and others. The farm households also find these modern agricultural inputs mainly from government office or cooperatives. Only few of the households found any of the upper mentioned modern agricultural inputs from agro industries found in the area.

Moreover, there are different social and economic institutions that assist the development and linkages of the two sectors of the study area. Through some of these formal institutions, the study found out that the farm households save money that could possibly use for investment on agriculture itself or other sectors. Similarly, considerable proportion (33%) of sample households took money loan to run their livelihoods better.

In aggregate, as the finding of this study shows, there is a linkage between agriculture and industry sectors in the study area. Both sectors have long lived production, consumption, labour, technology, institution and capital linkages. However, the level of linkage varies among the sectors.

Market, rural infrastructures fasten backward and forward and backward linkage of agriculture and industry. Models Infrastructure development, with a focus on rural roads, potable water supply, and rural energy are the more conventional to build strong linkage between agriculture and industry (The World Bank, 2006). With this regards this study found out that 72.2% of households have an access for potable water. Similarly, 24.3% and 56.5% of the sample households have access for electricity and mobile telephone respectively. As the profile of the study area shows, the households also have access for education and health services. However, the access of these infrastructures and services also varies according to the household's distance from Bishoftu town. When we see these infrastructures coverage of the area, it is possible to deduce as there is a potential to strengthen the existing agriculture and industry linkage of the area further.

Marketing system as a major determinant of agriculture and industry linkage, there are different size market places that are frames the agricultural marketing system of the study area. Although it is varied, different actors also participate in the agricultural marketing process of the area. According to this study finding, the local agricultural marketing system of the area is dominated by wholesalers. Agro industries of the area are also the least participating market actors in local grain marketing process. This may shows that there is agricultural market monopoly, which could affect linkage of the Agriculture and industry in the study area.

According to Ree (1969), industrial location significantly affects linkages of agriculture and industry. This is to say that industries at early stages of production cycle use raw materials directly from farms or mines, where unprocessed commodities are primary input-source, characteristics of raw materials upon which they are based are important determinants of their location. Location of industries also affects agricultural productivity as well as development of rural infrastructures. This study also out lined that agricultural production and access to rural infrastructures varies between near and far group households from where most industries are found, Bisheftu town. For instance, according to the finding shows, 61.4% of the households who have access to potable water live near Bisheftu. Similarly, among those who accessed electricity and mobile telephone, 78.6% and 662% of them live near the Town. When we analyze agricultural production, there is also higher volume of wheat and milk production, which can be used as input for agro industries, among near households than who live in far areas. This might be due to better access of households live near Bihoftu for rural infrastructures, market, technology and institutions than households live far from it. Generally, the study shows that distance of households from industrial areas (urban centers) or location of industries is determinant factor for household agricultural productivity (production) and linkages of the Agriculture and industry sectors.

## **5.2 Recommendations**

With the major findings of the study and conclusions drawn, the following recommendations are forwarded to consolidate the agricultural and industrial linkages through increasing agricultural production and enhancing the agricultural marketing system of the study area;

### **Promoting Local Agricultural Production:**

Agro-industry vis-à-vis other industrial sectors lays on agricultural origins, where large part of its inputs found. Local agriculture, which can be a main supplier of raw materials to agro-industry, is just a potential for agro-industrial development of the study area. Therefore;

- It is important to promote of modern agricultural inputs that can maximize household agricultural productivity of the study area.

- Rural and Agricultural Development Offices of the Woreda and Zone should device alternative ways to promote modern agricultural inputs and farm tools through Farmers Training Centers to increase farmers' application of modern agricultural inputs.
- Agro-industries that are found in the surrounding area need to give emphasis on accessing of possible technological innovations, trainings for local farmers to increase agricultural productivity of the local farmers.

### **Improve Local Agricultural Marketing System:**

According to the study finding, different actors play different roles in the local agricultural marketing system. The study also revealed that the market system is one of the major institutions that have significant effect on the linkages of the two sectors in the study area. Therefore;

- Enforce competitive agricultural marketing system that participates all market actors.
- Introduce and strengthen modern agricultural marketing system that update the timely local market situation for market actors of the area.
- Set up and induce up-to-date agricultural quality standards for agricultural products, modern storage facilities, modern financial transaction systems and communication channels.
- Strengthen the capacity of the existing agricultural marketing department of Ada'a Woreda Rural and Agricultural Development Office. This is mainly to increase market orientation of local farmers and strengthen grower agreements between local farmers and agro industries.
- Finally, since the concept of agriculture and industry linkage is broad, further studies (researches) are important to assess the situation at local, regional and national level.

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## Annexes

### Annex-1: Questionnaire used for Selected Agro industries

#### 1. Questionnaire used for Selected Agro industries

##### I. Profile of the responding factory

1. Name of the agro processing industry: \_\_\_\_\_
2. Date of establishment: \_\_\_\_\_
3. Type of factory's ownership
  1. Private
  2. Public/ government
  3. Share
  4. Cooperative
4. Type of the food factory
  1. Dairy products processing factory
  2. Flour Factory
  3. Oil Factory
  4. Biscuits Factory
  5. Spaghetti and Macaroni Factory
  6. Food complex
5. Total amount of the investment/ capital of the factory: \_\_\_\_\_
6. Number of employee : \_\_\_\_\_ Male: \_\_\_\_\_ Female: \_\_\_\_\_ Total: \_\_\_\_\_
7. Major factory product out put
  1. Flour
  2. Edible oil
  3. Bottled milk, butter and cheese
  4. Biscuits
  5. Spaghetti and macaroni
  6. Useful bi products
8. Position of the person(s) who filled this questionnaire
  1. Owner of the factory
  2. General manager
  3. Plant manager
  4. Operation head
  5. Administration and Finance

##### II. Questions on agriculture and industry linkages

1. What are your major production expenses in 2001E.C production year? Please, level the inputs in the following table accordingly.

Type of inputs	Amount of expenditure of production	Level of the input ( Please use the amount of payment for leveling and consider '1' is the highest, and 2 <sup>nd</sup> , 3 <sup>rd</sup> etc are preceding)
Machineries and maintainace		
Agricultural raw materials		
Building and other facilities		
Electricity and water		
Management personnel		
Middle level personnel		
Technical Staffs		
Daily laborers		
House rent		
Tax and other payments		
<b>Total</b>		

2. How many employees do your factory currently has? Please fill number of employee according to their position of work in the following table.

Type of Employment	Number of employee				
	Management (Top levels)	Supervisors (Middle levels)	Technica l Staffs	Daily Labourers	Total
Permanent					
Temporary					
<b>Total</b>					

3. How is the level your employee's educational background? Please, fill number of your employees according to the educational level in the following table.

Educational Level	Number of employee				
	Managers	Supervisors	Technical staffs	Daily Labourers	Total
Illiterate					
Primary education (Grade 1-8)					
Secondary education (Grade 8-10)					
Preparatory school (Grade 10-12)					
TVET / Certificate holder					
Diploma holder					
Degree holder					
MA degree and Above					
<b>Total</b>					

4. Where do the top and middle- level management personnel of your factory live permanently? Please fill their place of residence accordingly in the following table.

Place of residence	Number of employee		
	Male	Female	Total
Addis Ababa			
Gelan Town ( Oromiya)			
Dukem Town ( Oromiya)			
Bishoftu Town ( Oromiya)			
Modjo Town ( Oromiya)			
Ada'a Rural Kebeles ( Oromiya)			
<b>Total</b>			

5. Where do the technical staffs of your factory live permanently? Please fill number of technical staffs according to their place of living in the table below.

Place of residence	Number of employee		
	Male	Female	Total
Addis Ababa			
Gelan Town ( Oromiya)			
Dukem Town ( Oromiya)			
Bishoftu Town ( Oromiya)			
Modjo Town ( Oromiya)			
Ada'a Rural Kebeles ( Oromiya)			
<b>Total</b>			

6. Where do the daily labourers of your factory live permanently? Please fill number of daily labourers according to their place of living in the table below.

Place of residence	Number of employee		
	Male	Female	Total
Addis Ababa			
Gelan Town ( Oromiya)			
Dukem Town ( Oromiya)			
Bishoftu Town ( Oromiya)			
Modjo Town ( Oromiya)			
Ada'a Rural Kebeles ( Oromiya)			
<b>Total</b>			

7. What is the previous main occupation of your factory employees before they employed in your factory? Please, fill their occupation in the following table.

Possible previous occupations	Management staffs	Supervisors	Technical Staffs	Daily Labourers	Total
Professional					
Civil servant					
Self employee					
Trained job seeker					
Factory employee					
Farmer					
Daily Labourer					
Soldier					
Student					
Other					
<b>Total</b>					

8. Does your factory give privileged recruitment opportunity for local farmers and people from the nearby towns?

1. Yes
2. No

9. If your answer to question number 8 is 'Yes', what is your reason to give priority?: \_\_\_\_\_

10. Have you ever faced shortage of daily labourers to employ?

1. Yes
2. No

11. If your answer to question number 10 is 'Yes', in which season do you face the shortage?

1. Major farming season
2. A season between the major farming and harvesting
3. During the harvesting season
4. A season after harvest
5. All the year long

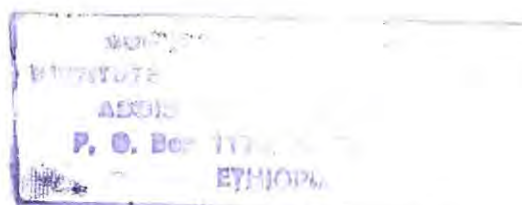
12. If your answer to question number 10 is 'Yes', what is your finding on the major reason? \_\_\_\_\_

13. What are the major agricultural raw materials your factory uses?

1. Wheat
2. Milk
3. Oil Seeds
4. Others (*Specify*): \_\_\_\_\_

14. How many quintals/ liters of agricultural raw material did your factory used in 2001E.C production year?

Type of agricultural raw materials	Amount of input used ( Use quintal for cereals and liters for milk for measurement)
Wheat	
Milk	
Oil seeds	
Others	
<b>Total</b>	



15. From where did you have the agricultural raw materials in 2001 E.C production year? Please, describe the sources and amount of inputs accordingly.

Type of agricultural raw materials	Sources of the Inputs <i>Quintals for cereals / Liters for milk</i>								Total
	Local Farmers	Whole sellers/retailers of the local market	Local producer cooperatives	Farmers of neighboring Woredas	Farmers of distant places	Whole sellers/retailers of distance places	Producers cooperatives of other places	Imported or purchased from importers	
Wheat									
Milk									
Oil seeds									
Others									
<b>Total</b>									

16. Does your factory use wheat produced by the local farmers?

1. Yes
2. No

17. If your answer to question number 16 is 'Yes', how many quintals did your factory purchased in 2001E.C production year from the domestic market?: \_\_\_\_\_

18. If your answer to question number 16 is 'Yes', how did you get the wheat?

1. Directly from the farmers
2. Whole sellers in the local market
3. Retailers of the local market
4. Producers cooperatives around the factory

19. How many quintals does your factory purchased wheat from the local market in the 2000E.C production year?: \_\_\_\_\_

20. If the 2001E.C production year local market purchase of wheat by your factory is varied from the 2000E.C, what do you think the reason is? \_\_\_\_\_

21. If your answer to question number 16 is 'No', what is your reason not to use the local wheat?

1. Lack of enough supply
2. Poor quality of the wheat
3. High market price
4. Need of different bride of wheat than the local wheat
5. Marketing system of the factory
6. Others (*Specify*): \_\_\_\_\_

22. If your answer to question number 16 is 'No', from where do you get wheat for processing?

1. Farmers of neighboring Woredas
2. Farmers of distant places
3. Whole sellers form other places
4. Producers cooperatives of other places
5. Importing/ from importers

23. Does your factory use milk produced by the local farmers?

1. Yes
2. No

24. If your answer to question number 23 is 'Yes', how many liters of milk does your factory purchased in 2001E.C production year?: \_\_\_\_\_

25. If your answer to question number 23 is 'Yes', how did your factory gets the milk?

1. Directly from farmers
2. Whole sellers in the local market
3. Retailers of the local market
4. Producers cooperatives around the factory

26. How many quintals does your factory purchased milk from the local market in the 2000E.C production year?: \_\_\_\_\_

27. If the 2001E.C production year local market purchase of milk by your factory is varied from the 2000E.C, what do you think the reason is? \_\_\_\_\_

28. If your answer to question number 23 is 'No', what is the reason not to use the local milk?

1. Lack of enough supply
2. Poor quality (ingredient) of the milk
3. High market price
4. Marketing system of the factory
5. Others (Specify): \_\_\_\_\_

29. If your answer to question number 23 is 'No', from where did you get milk for processing?

1. Farmers of neighboring Woredas
2. Farmers of distant places
3. Whole sellers from other places
4. Producers cooperatives of other places
5. Importers of milk powders

30. Does your factory use oil seeds produced by the local farmers?

3. Yes
4. No

31. If your answer to question number 30 is 'Yes', how many quintals does your factory purchased from the local market in the 2001E.C production year?: \_\_\_\_\_

32. If your answer to question number 30 is 'Yes', how did your factory gets the oil seeds?

1. Directly from farmers
2. Whole sellers in the local market
3. Retailers of the local market
4. Producers cooperatives around the factory

33. How many quintals does your factory purchased oil seeds from the local market in the 2000E.C production year?: \_\_\_\_\_

34. If the 2001E.C production year local market purchase of oil seeds by your factory is increased from the 2000E.C, what do you think the reason is? \_\_\_\_\_

35. If your answer to question number 30 is 'No', what are the reasons not to use locally produced oil seeds?

1. Lack of enough supply
2. Poor quality (Ingredient) of the oil seeds
3. High market price
4. Marketing system of the factory
5. Others (Specify): \_\_\_\_\_

36. If your factory does not use oil seeds produced by the local farmers, from where did you get oil seeds for processing?

1. Farmers of neighboring Woredas
2. Farmers of distant areas
3. Whole sellers from other areas
4. Producers cooperatives of other areas

37. Does your factory import/ used imported agricultural raw materials? If you uses imported agricultural raw materials, what is the reason?: \_\_\_\_\_

38. How many quintals / liters of produces did your factory fashioned in 2001 E.C fiscal year?

Type of products	Amount of Production (please use quintal, or liter)
Flour	
Bottled milk	
Butter	
Cheese	
Oil	
Biscuits	
Spaghetti and Macaroni	
Useful bi products	
<b>Total</b>	

39. Does your factory have factory out let at its compound?

1. Yes   
 2. No

40. If your answer to question number 39 is 'Yes', what type of goods does it sells?

1. Processed factory's products   
 2. Factory bi-products   
 3. Agricultural inputs   
 4. Other factory's products   
 5. Other goods

41. If your answer to question number 39 is 'Yes', who are the customers of the outlet? Please, fill the following table based on the past two weeks sells.

42. Does your factory have product distributors at local market where your factory found?

Type of customers <input type="checkbox"/>	Number of customers				
	Processed Foods	Bi Products	Agri. In puts	Other goods	Total
Farmers of the surrounding area					
People from the nearby towns/ town					
Employee of the factory					
Employee of other factories around					
<b>Total</b>					

1. Yes  
 2. No

43. If your answer to question number 42 is 'Yes', please, fill the amount of products distributed during 2001E.C and 2000 E.C production year in the local market through the distributors.

Type of products	Amount of distributed Products( please use quintal, Kg or liter)	
	2001E.C Production Year	2000E.C Production Year
Flour		
Bottled milk		
Butter		
Cheese		
Oil		
Biscuits		
Spaghetti and Macaroni		
Useful bi products		
<b>Total</b>		

44. Does your factory export its product in 2001 E.C production year?

1. Yes   
 2. No

45. If your answer to question number 44 is 'Yes, how many quintals/ liters does it exported in 2001 E.C production year? \_\_\_\_\_

46. Which of the following modern agricultural inputs does your factory provide for farmers directly or through Agricultural Research Institutions and Woreda Rural and Agricultural Development Department?

Type of modern agricultural inputs	Provisions ( Please, mark the inputs your factory provided)
Fertilizer	
Pesticide	
Animal feeds	
Farming materials	
None	

47. Does your factory have standard for agricultural raw materials it processes?

1. Yes   
 2. No

59. If you gave the support, what is / are the area of the support?
1. Application and distribution of commercial fertilizers and pesticide
  2. Application and distribution of selected seeds
  3. Quality production and storage facilities
  4. Standards of agricultural products
  5. Resource management, Land use and water harvesting
  6. Marketing system/ and promotion

60. Did your factory give technical and financial support for Agricultural Research Institutes found in the area?

1. Yes
2. No

61. If your answer to question number 60 is 'Yes', what is / are the area of the support?

1. New farming systems
2. Standards of agricultural products
3. Resource management, Land use and water harvesting
4. Research funds
5. Marketing system/ and skills

62. What is/are the study results/ reasons that forced the owner and top-level management to establish the factory in this area?

1. Availability of good infrastructure and facilities
2. Low transportation cost to transport factory products to the market
3. Availability of adequate agricultural raw materials in the area
4. Availability of cheap labour force in the area
5. Potential of the area for product marketing
6. Potential of the area to produce agricultural raw materials
7. Low land lease, tax and construction costs
8. Investment security

63. Does your factory have adequate road access to transport raw materials from local markets and factory products from factory to consumers/ market places?

1. Yes
2. No

64. Does your factory have consistent electricity and water supply for the past one month (30-production days)?

1. Yes
2. No

65. Which communication devices do your factory uses?

(Please, mark the devices your factory uses)

Fixed Telephone	Mobile	Fax	Post	Email	Other
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

66. Does your factory have well trained marketing personals?

1. Yes
2. No

67. If your answer to question number 66 is 'Yes', are they orientated with types of agricultural products and marketing system of the local area?

1. Yes
2. No

68. If your answer to question number 66 is 'Yes', do they have close relation with the Out growers of the factory and agricultural cooperatives found in the area?

1. Yes
2. No

48. If your answer to question number 47 is 'Yes', did you give orientation for the Local farmers, Woreda Rural and Agricultural Department, Extension workers, and Agricultural Research Institutions about the Standard of agricultural raw materials?

1. Yes
2. No

49. Does your factory have out growers that supply their agricultural produces?

1. Yes
2. No

50. If your answer to question number 49 is 'Yes', how many out growers? \_\_\_\_\_

51. If your answer to question number 49 is 'Yes', what kind of support does your factory provides for the Out growers based on the bilateral agreement?

Type of support	Provision ( Please, mark the support your factory provided in terms of EtB)
Selected seeds	
Commercial fertilizer	
Pesticide	
Animal feeds	
Farming materials	
Credit service	
Marketing security/ opportunity	
Crop insurance	
Other	

52. Does your factory give credit service for promising farmers who work in your factory temporarily in seasonal basis?

1. Yes
2. No

53. If your answer to question number 52 is 'Yes', how much money did it provided in 2001E.C production year?: \_\_\_\_\_

54. Did your factory give trainings for local farmers on their farming since it established?

1. Yes
2. No

55. If you gave support, what are the area of the supports?

1. New farming methods/ systems
2. Application and distribution of fertilizers and pesticide
3. Application and distribution of selected seeds and animal feeds
4. Land use and resource management, and water harvesting
5. Quality harvest and storage facility
6. Marketing approach
7. Other off farm support

56. Did your factory give technical and financial support to strength agricultural cooperatives found in the area?

1. Yes
2. No

57. If your answer to question number 56 is 'Yes', what is / are the area of the support?

1. Application and distribution of commercial fertilizers and pesticide
2. Application and distribution of selected seeds
3. Quality production and storage facilities
4. Standards of agricultural products
5. Resource management, Land use and water harvesting
6. Marketing system/ and skills

58. Did your factory give technical and financial support for Zone/ Woreda Rural and Agricultural Development Department since it established?

1. Yes
2. No

**Annex-2: Questionnaire used for Rural Farm Households**

**1. Questionnaire used during Sample Survey to address Rural Farm Households**

**I. Profile of the household**

1. Sex of the household head: Male  Female

2. Age of the household head: \_\_\_\_\_

3. Marital status of the household head:

- 1. Never married
- 2. Married
- 3. Divorced
- 4. Widowed
- 5. Separated

4. Educational background of the household head:

- 1. Illiterate
- 2. Primary school graduate
- 3. Secondary school graduate
- 4. High school graduate
- 5. TVET / Certificate graduate
- 6. Diploma graduate and above

5. Family size of the household:

Male: \_\_\_\_\_ Female: \_\_\_\_\_ Total: \_\_\_\_\_

6. The level your household member's educational background? Please, fill in the table below.

Educational Level	Number of the household members			Status Remarks
	Male	Female	Total	
Illiterate				
Primary education				
Secondary education				
TVET / Certificate level				
Diploma level				
egree level and above				
<b>Total</b>				

7. Does the household use potable water for household consumption?

1. Yes

2. No

8. Does the household use electric power for the household consumption?

1. Yes

2. No

9. What types of communication devices does the household use?

*(Please, mark the devices you use)*

Fixed Telephone	Mobile	Post	None

10. Which information device the family frequently uses?

*(Please, mark the devices you use)*

News Letter	Radio	Television	Satellite - TV	None

## II. Employment situation of the family

1. Did you go to other places for work in year 2001 E.C?

1. Yes

2. No

2. If your answer to question number '1' is 'Yes' for what kind of work?

1. Daily labor

2. Craft works

3. Guard

4. Shop Keeping

5. Technical works

6. Others

3. If your answer to question number one is 'Yes', please, describe where did you, how long and how much you earned from the 2001E.C employment?

No.	Place of Work	How many months did you work in the year											Total amount of earning		
		12	11	10	9	8	7	6	5	4	3	2		1	
1	Construction works in the nearby town														
2	Urban households														
3	Nearby agro industries														
4	Market places														
5	Others														
	Total														

4. Did any other member of the household go to other places for work in year 2001 E.C?

1. Yes

2. No

5. If the answer for question number 4 is 'Yes', please, list who went where for how long and where they work?

No.	List of the family member	Where do she/ he work?	How many months did she \ he worked per year											Amount of total earning from the employment		
			12	11	10	9	8	7	6	5	4	3	2		1	
1																
2																
3																
4																
5																

6. If you ever been work in agro industries around, what did you benefit from working there rather than income? \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_

### III. Questions on production and supply of agricultural raw materials

1. What types of crops you produced in the 2001E.C farming season? Please, outline the crops you produced in the following table.

Type of crop	Produced amount(kg)	Distribution of the Produced Amount			
		Consumption	Sale	Seed	Other
<b>Total</b>					

2. Please, describe your livestock holdings.

Type of animal	Number
Oxen	
Cows	
Sheep and Goat	
Pack animal	
Poultry	
Other	
<b>Total</b>	

3. Have you produced animal products in 2001E.C production year?

1. Yes
2. No

4. If your answer for number 4 is 'Yes' please, fill out your production in the table below.

No.	Vegetable	Purpose of production (Kg/ No.)			
		Consumption	Sale	Both	Others
1	Milk				
2	Butter				
3	Cheese				
4	Egg				
5	Meat				
6	Others (Specify)				
<b>Total</b>					

5. Were the agricultural products 2001 E.C production year enough for your household consumption?

1. Yes

2. No

6. Have you sold any of your 2001E.C agricultural products?

1. Yes

2. No

7. What are the major products you sold from your 2001E.C agricultural products?

1. \_\_\_\_\_

2. \_\_\_\_\_

3. \_\_\_\_\_

4. \_\_\_\_\_

8. If you sold any of the 2001 E.C agricultural products, please describe the amount of sell, your major buyer and amount of earning in the table below.

*Identified major buyers: Consumers, Agro industries, Cooperatives, Whole sellers, Retailers, exporters and others*

Type of agricultural products	Buyers of the product	Amount sold (Kg/No)	Income earned from sales (Birr)
<b>Total</b>			

9. If you sold your agricultural product 2001 E.C production year, where did you sale your agricultural produces?

1. Village market

2. Nearby town

3. On the farm land

4. Other places

10. If you sold much of your 2001 E.C production for agro industries, what is your reason to sell for agro industries? \_\_\_\_\_

11. If you did not sale your 2001E.C agricultural products, what is your reason?

1. Lack of surplus

2. Lack of market

3. Others

12. If your answer for question number 12 is lack of surplus, what is the reason that made you not to produce surplus products? \_\_\_\_\_

**IV. Questions on consumption linkages**

1. Do you purchase additional food items for household consumption?

1. Yes

2. No

2. If your answer for question number one is 'Yes', how much do you spend for food purchase per month? \_\_\_\_\_

3. Do you purchase any processed food for your household consumption?

1. Yes

2. No

4. If your answer for question number 3 is 'Yes', please, describe the type of foods, amount of expenditure and the source of purchase you made in 2001 E.C in the table below

Food items purchased	Total amount of expenditure (birr)	Source of purchase			
		Wholesalers	Retailers	Agro Industries	Cooperatives
Cereal Flours					
Biscuits/ Bread					
Pasta and Macaroni					
Sugar					
Processed spices					
Edible Oil					
Bottled Milk					
Butter					
Cheese from supermarket					
Meat from butchery					
Canned Vegetables					
Canned fruit juice					

5. If your answer for question number 3 is 'No', what is the reason for not using processed foods?

1. Low preference for processed foods

2. High cost of processed foods

3. Lack of money to buy processed foods

4. Lack of access to buy processed foods

5. Not knowing well about the processed foods

6. Others

6. Have you ever been in agro industries found around your place?

1. Yes

2. No

7. If your answer to question number 4 is 'Yes', why did you go there?
1. For work purpose
  2. To make relationship
  3. To make business deal
  4. To purchase processed foods
  5. To purchase agricultural inputs
  6. For other purposes
8. What did you learnt from the nearest agro processing industry since it established? \_\_\_\_\_  
 \_\_\_\_\_
9. What did you benefit from the agro industries established around so far? \_\_\_\_\_  
 \_\_\_\_\_

**Technology, capital and institutional transfer**

1. Did you ever get credit service from any organizations to undertake your living activities in 2001E.C production year?
  1. Yes
  2. No
2. If your answer to question number one is 'Yes', which organizations provided you the service?
  1. Bank
  2. Service cooperatives
  3. Agro industries around
  4. Other factories around
  5. Others
3. Do you make financial savings ?
  1. Yes
  2. No
4. If your answer to question number 3 is 'Yes', where do you make your saving?
  1. At home
  2. Bank
  3. Saving and Credit cooperative
  4. Workers association at the factory/ work place
  5. Informal Institutes ("Iddirs"and "Iqubs")
5. Do you have an "Out grower agreement" with ago processing industry or others?
  1. Yes
  2. No
6. If your answer to question number 5 is 'Yes', what is your commitment with the other party of the agreement? \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

7. If your answer to question number 5 is 'Yes', how is your relationship with the other party of the contract? \_\_\_\_\_
- 
8. Did you use selected seeds or new hybrids during the 2001E.C farming season?
1. Yes
  2. No
9. If you used the selected seeds or new hybrids, where did you get it?
1. Kebele Agriculture Development Office
  2. Producers' cooperatives
  3. Nearby agro processing industries
  4. Model agricultural inputs shop
10. Did you use commercial fertilizers during the 2001E.C farming season?
1. Yes
  2. No
11. If you used the Commercial fertilizers, where did you get it?
5. Kebele Agriculture Development Office
  6. Producers' cooperatives
  7. Nearby agro processing industries
  8. Model agricultural inputs shop
12. Did you use pesticides during the 2001E.C farming season?
1. Yes
  2. No
13. If you used the Pesticides, where did you get it?
1. Kebele Agriculture Development Office
  2. Producers' cooperatives
  3. Nearby agro processing industries
  4. Model agricultural inputs shop
14. Did you use modern farming tools during the 2001E.C farming season?
1. Yes
  2. No
15. If you used modern farming tools, where did you get it?
1. Kebele Agriculture Development Office
  2. Producers' cooperatives
  3. Nearby agro processing industries
  4. Model agricultural inputs shop
16. Did you use modern animal feeds during the 2001E.C farming season?
3. Yes
  4. No

17. If you used modern animal feeds, where did you get it?
1. Kebele Agriculture Development Office
  2. Producers' cooperatives
  3. Nearby agro processing industries
  4. Model agricultural inputs shop
18. Do you know about the standard and quantity of agricultural products agro industries in your area need?
1. Yes
  2. No
19. If your answer for question number 18 is 'Yes', have you ever got orientation/ training from agro processing industries about standard and quantity of agricultural products they need?
1. Yes
  2. No
20. Did you ever get training on modern farming system from agro processing industries found in your area?
1. Yes
  2. No

**V. Questions on factors affecting the linkage**

1. How many Hectare/"Timad" is your farm size? \_\_\_\_\_
2. How many times did you produce crops per year in 2001 E.C agricultural season?
  1. Once
  2. Twice
3. Do you have a road and communication access to transport agricultural inputs and product, and to access market situation around?
  1. Yes
  2. No
4. In which of the following cooperatives do you have membership?
  1. Production cooperative
  2. Service cooperative
  3. Consumers cooperative
  4. Saving and Credit cooperative
5. If you are a member of any of the above cooperatives, have your cooperatives work relationship with agro processing industries around?
  1. Yes
  2. No

**Questions and counter check lists used for Key Informants**

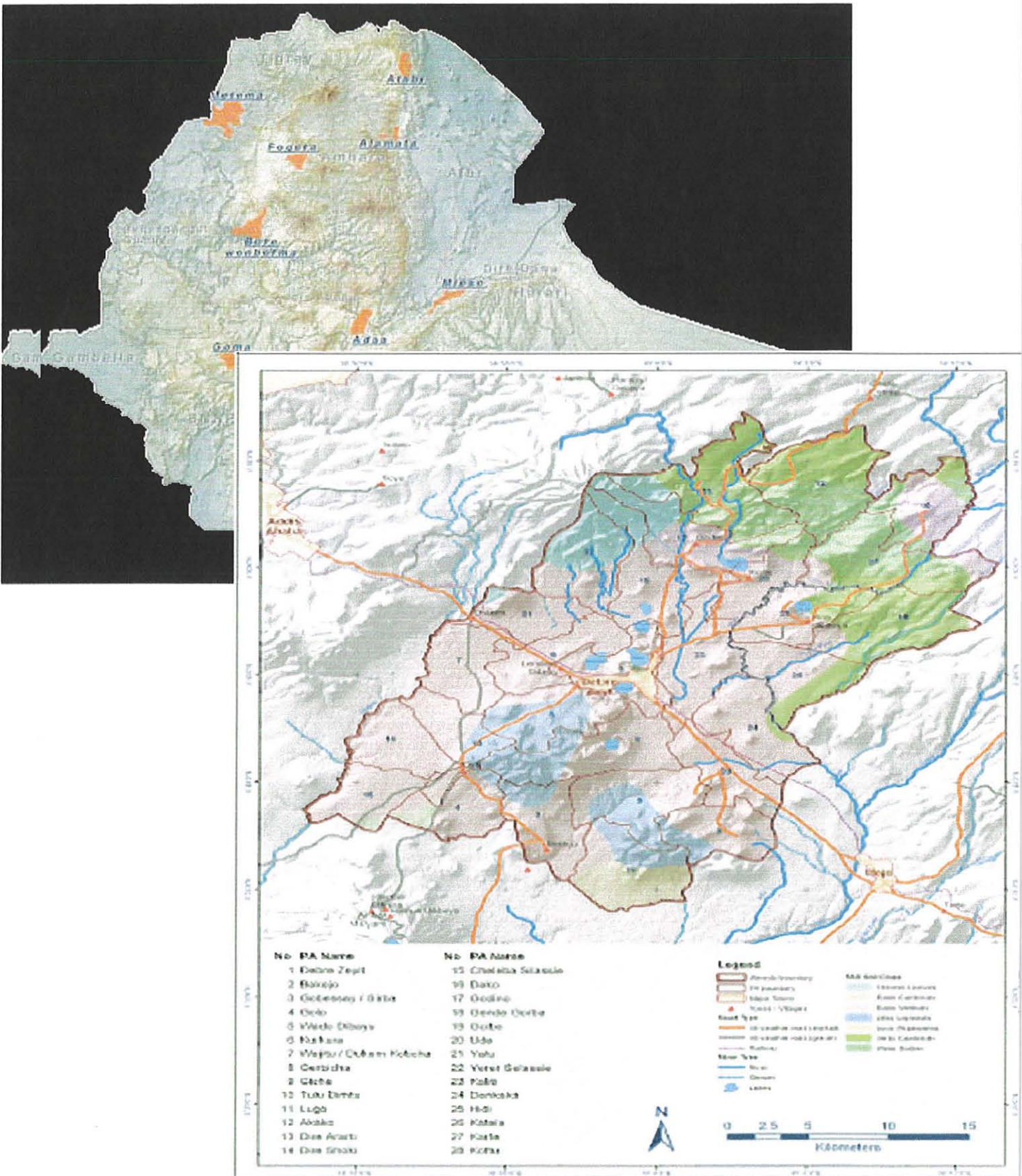
1. What do you think the contribution of agriculture and agro industries linkage to bring development on agriculture and industry, and the sustainability in the Woreda?
2. Have you ever organized any information exchange session between Farmers, Agro industries, Rural and Agricultural Development Department and Agricultural Research Institutions around to establish partnership and network between stakeholders?
3. Does the agricultural sector of the Woreda has adequate and quality production to supply for agro processing industries?
4. Do you think the agriculture sector of the Woreda is providing cheap labour for the industry sector?
5. How do you find the capacity and potential of the rural population to consume processed foods?
6. How do you find the contribution of the existing marketing system for the agriculture and agro industries linkage at local level?
7. Are there any attempts made so far by the Agro industries, Farmers, Cooperatives, Rural and Agricultural Development Department and Agricultural Research Institutions to establish and strengthen agriculture and agro industries linkage in the Woreda?
8. What are the major factors that do you think affect the links between agriculture and agro industries in Ada'a Woreda?
9. What opportunities do you think are there to establish and strengthen the linkage between agriculture and agro industries in the woreda
10. Is there any kind of interventions you made so far to establish strong linkage through production, consumption, labour supply, capital and technology transfer between agro industries and farmers in the Woreda?
11. What measures do you think should be taken so as to bring strong local linkage between agriculture and industry?

**Annex-4:** Name of Kebele administration and Population Distribution of Ada'a Woreda

No.	Name of Kebeles	Distance from Bishoftu ( Km)	No.of Households (Heads)			Total Population		
			Male	Female	Total	Male	Female	Total
1	Kajima	6	676	139	815	2037	1695	3732
2	Ganda Gorba	10	1077	115	1192	4129	3849	7978
3	Lugoo/ Keteba	12	593	119	712	2068	1870	3938
4	Yerer Silase	15	731	15	746	2654	2050	4704
5	Godino	12	714	174	888	2136	1370	3506
6	Hidi	11	688	44	732	2991	3128	6119
7	Golo/Dertu	16	502	15	517	2379	1610	3989
8	Wagitu	11	825	167	992	2397	2862	5259
9	Dire-I	12	657	75	732	2985	3017	6002
10	Katila	20	735	88	823	4884	2060	6944
11	Koftu	11	781	35	816	4902	3481	8383
12	Denkaka	10	875	161	1036	2795	2204	4999
13	Golbo	25	438	97	535	2028	2828	4856
14	Garbicha	10	562	113	675	1569	2550	4119
15	Giche Garababo	10	355	58	413	2113	882	2995
16	Akakee/Ambelta	17	1003	89	1092	3190	2682	5872
17	Dire-II/ Shoki	17	669	45	714	3489	3078	6567
18	Cheleba Silase	25	622	23	645	2922	2281	5203
19	Kurkura Denbi	10	447	109	556	1884	1696	3580
20	Tulu Dimtu	29	554	102	656	1863	1638	3501
21	Bakkajo	26	658	65	723	2778	2405	5183
22	Dako	28	484	56	540	2007	1437	3444
23	Karfee	20	753	25	778	3406	2590	5996
24	Udee	12	603	160	763	1996	1871	3867
25	Yatu/ Tedecha	12	534	102	636	2914	552	3466
26	Kaliti	8	589	108	697	2349	1833	4182
27	Gobesa	20	564	111	675	1921	1794	3715
<b>Total</b>			<b>17689</b>	<b>2410</b>	<b>20099</b>	<b>72786</b>	<b>59313</b>	<b>132099</b>

Source: Ada'a Woreda Rural and Agricultural Development Office

**Annex-5: Map of the Study area (Ada'a Woreda)**



Source: IPMS, Map of Ethiopia, 2008

**Annex-6:** Amount of Labour force Engaged in the Industry Sector (Ethiopia)

Division of ISIC Rev. 3	Major Industrial Group	Year (E.E.Y)				
		1995	1996	1997	1998	1999
		Number of Employees				
15	Manufacture of Food Products and Beverages	30,570	31,359	31,693	35,660	46,080
16	Manufacture to Tobacco Products	792	785	697	755	799
17	Manufacture of Textiles	21,938	22,900	20,701	22,100	21,702
18	Manufacture of Wearing Apparel, Except Fur Apparel	4,278	3,806	2,606	4,099	7,604
19	Tanning and Dressing of Leather; Manufacture of Footwear, Luggage and Handbags	7,232	7,665	7,913	7,914	8,351
20	Manufacture of Wood and Products of Wood and Cork Except Furniture	1,669	1,616	1,563	1,759	2,010
21-22	Manufacture of Paper, Paper Products and Printing.	6,405	6,940	7,507	8,059	8,161
24	Manufacture of Chemicals and Chemical Products	5,094	5,071	5,975	5,668	7,030
25	Manufacture of Rubber and Plastic Products	4,424	4,410	5,673	6,899	7,619
26	Manufacture of Other Non-Metallic Mineral Products	7,835	9,138	9,047	10,093	11,137
27	Manufacture of Basic Iron and Steel	1,466	1,699	1,762	2,122	1,923
28	Manufacture of Fabricated Metal Products Except Machinery and Equipment	3,412	3,453	3,828	5,796	3,517
29	Manufacture of Machinery and Equipment N.E.C	244	256	221	400	186
34	Manufacture of Motor Vehicles, Trailers and semi-Trailers	1,019	1,130	1,232	1,456	3,131
36	Manufacture of Furniture; Manufacturing N.E.C	5,026	5,153	8,732	5,688	5,713
	<b>Total</b>	<b>101,404</b>	<b>105,381</b>	<b>109,150</b>	<b>118,468</b>	<b>134,963</b>

Source: Central Statistical Authority (CSA), 2009

**Annex- 7: Distribution of LMSMI by Regional States and Major Industrial Groups of Ethiopia (2002/03-2006/07)**

Major Industrial Group	Regional States										Total	%
	Tigray	Afar	Amhara	Oromya	Somalia	SNNP	Gambella	Harari	Addis Ababa	Dire Dawa		
Number of manufacturing industries												
Manufacture of Food Products and Beverages	26	-	38	71	5	31	1	3	190	16	381	26.4
Manufacture to Tobacco Products	-	-	-	-	-	-	-	-	1	-	-	0.07
Manufacture of Textiles	3	3	5	-	-	4	1	-	24	1	41	2.84
Manufacture of Wearing Apparel, Except Fur Apparel	1	-	-	4	-	-	-	-	26	1	32	2.22
Tanning and Dressing of Leather; Manufacture of Footwear, Luggage and Handbags	1	-	7	16	-	1	-	-	47	-	72	4.99
Manufacture of Wood and Products of Wood and Cork Except Furniture	-	-	2	10	-	4	-	1	24	-	41	2.84
Manufacture of Paper, Paper Products and Printing.	4	1	2	6	-	1	-	1	99	4	117	8.11
Manufacture of Chemicals and Chemical Products	1	-	-	10	-	1	-	-	52	-	64	4.44
Manufacture of Rubber and Plastic Products	1	-	-	17	-	-	-	-	46	-	67	4.44
Manufacture of Other Non-Metallic Mineral Products	75	3	33	54	-	27	-	3	88	1	284	19.68
Manufacture of Basic Iron and Steel	1	-	-	1	-	-	-	-	11	1	13	0.90
Manufacture of Fabricated Metal Products Except Machinery and Equipment	7	-	4	4	-	3	-	1	37	1	57	3.59
Manufacture of Machinery and Equipment N.E.C	-	-	-	-	-	-	-	-	4	1	5	0.35
Manufacture of Motor Vehicles, Trailers and semi-Trailers	8	-	2	3	-	2	-	1	26	-	42	2.91
Manufacture of Furniture; Manufacturing N.E.C	28	-	43	26	4	47	-	11	64	6	229	15.87
<b>Total</b>	<b>156</b>	<b>6</b>	<b>136</b>	<b>222</b>	<b>9</b>	<b>121</b>	<b>2</b>	<b>21</b>	<b>739</b>	<b>31</b>	<b>1,443</b>	<b>100.00</b>
	<b>10.81</b>	<b>0.42</b>	<b>9.42</b>	<b>15.38</b>	<b>0.62</b>	<b>2.96</b>	<b>3.59</b>	<b>.85</b>	<b>9.73</b>	<b>31.29</b>	<b>100.00</b>	

Source: Central Statistical Authority (CSA), 2009

## Declaration

I, the undersigned, declare that the thesis is my original work, has not been presented for a degree in any other university and that all sources of material used for the thesis have been duly acknowledged.

### Declared by

Name: Addis Tekle

Signature:  \_\_\_\_\_  
*Candidate*

### Confirmed by

Name: Workneh Negatu (PhD)

Signature: \_\_\_\_\_  
*Advisor*

