

**ANALYSIS OF POULTRY MARKET CHAIN: THE CASE OF DALE  
AND ALABA 'SPECIAL' WOREDAS OF SNNPRS, ETHIOPIA**

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**Awol Zeberga**

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**ANALYSIS OF POULTRY MARKET CHAIN: THE CASE OF DALE  
AND ALABA SPECIAL WOREDAS OF SNNPRS, ETHIOPIA**

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MASTER OF SCIENCE IN AGRICULTURE  
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**BY  
Awol Zeberga Kerbaga**

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Haramaya University**

APROVAL SHEET  
SCHOOL OF GRADUATE STUDIES  
HARAMAYA UNIVERSITY

As Thesis Research advisor, here by certify that I have read and evaluated this thesis prepared, Under my guidance, by Awol Zeberga entitled "Analysis of poultry marketing chain, The Case of Dale and Alaba ‘special’ Woreda in SNNPRS of Ethiopia” I recommend that it be submitted as fulfilling the thesis requirement

_____	_____	_____
Major Advisor	Signature	Date

As member of the Board of Examiners of the M.Sc Thesis Open Defense Examination, We certify that we have read, evaluated the Thesis prepared by Awol Zeberga and examined the candidate. We recommended that the Thesis be accepted as fulfilling the Thesis requirement for The Degree of Master of Science in Agriculture (Agricultural Economics).

_____	_____	_____
Chairperson	Signature	Date

_____	_____	_____
Internal Examiner	Signature	Date

_____	_____	_____
External Examiner	Signature	Date

## DEDICATION

This Thesis is dedicated to my father Zeberga Kerbaga.

## STATEMENT OF AUTHOR

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Name: Awol Zeberga Kerbaga

Signature: \_\_\_\_\_

Place: Haramaya University, Haramaya

Date of submission: June, 2010

## ACRONYMS AND ABBREVIATIONS

NGO	Nongovernmental organization
IMR	Inverse Mills Ratio
TLU	Tropical Livestock Unit
OLS	Ordinary Least Square
NMM	Net Marketing Margin
GMMp	Gross Marketing Margin of Producers
TGMM	Total Gross Marketing Margin
CM	Concentration Measure
CR	Concentration Ratio
SCP	Structure Conduct and Performance
RMA	Rapid Market Appraisal
CSA	Central Statistics Authority
DZARC	Debrezeyt Agricultural Research Center
ILRI	International Livestock Research Institute
SNNPRs	Southern Nations Nationalities and Peoples Regional State
GDP	Gross Domestic Product
SSA	Sub Saharan Africa
FAO	Food and Agriculture Organization
IPMS	Improving Productivity and Market success

BOARD	Bureau of Agriculture and Rural Development
NMMra	Net Marketing Margin of Rural Assemblers
NMMua	Net Marketing Margin of Urban Assemblers
NMMws	Net Marketing Margin of whole Assemblers
LR	Log likelihood Ratio
HHI	Hirschman Herfindahl Index
NCD	New Castle Disease
ML	Maximum Likelihood
SARI	Southern Agricultural Research Institute

## **BIBLIOGRAPHICAL SCETCH**

The author was born on May 24, 1981 in a small village called Chiro in Geto Woreda of Guragie zone in SNNPRS. He attended elementary school in Dejazimatch Hailu Shawol primary School in Addis Ababa and continued his junior school in Mugo Junior and secondary school in Guragie Zone. He has joined Dejazimatch Wondirad primary and Secondary School in Addis Ababa and attended his Secondary School until he joined Hawassa University in 2003 and Graduated with B.Sc Degree in the year June, 2006 in Agricultural Resource Economics and Management (AREM). He has served in Southern Agricultural Research Institute (SARI), at Areca Agricultural Research Center since October, 2007 as a junior researcher in socio economics Research Division for one year and then Joined Haramaya University School of Graduate Study in September, 2008 academic year in pursuing his MSc degree in Agricultural Economics./

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# **ANALYSIS OF POULTRY MARKET CHAIN, THE CASE OF DALE AND ALABA SPECIAL WOREDA OF SNNPRS, ETHIOPIA**

## **ABSTRACT**

*The purpose of this study was to analyze the poultry marketing chain in Dale and Alaba 'special' weredas of SNNPRS, Ethiopia. The specific objectives include analysis of the structure, conduct and performance of poultry marketing system, production and marketing support services of extension, input supply, credit and marketing. Cost structure and profitability of village poultry keeping were also analyzed. Furthermore, factors that affect farmers' decision to participate in the supply of live birds and egg to the market and volume of birds and egg supplied to the market were identified in the study. Constraints and opportunities of production and marketing of poultry in the study area were also assessed. To address the aforementioned objectives descriptive statistics and econometric models were employed. Moreover, various marketing agents and their roles, linkages and functions in the poultry marketing system were also assessed. Alternative marketing channels and their systematic linkages and relative importance in the flow of birds and egg from the point of production to the end users were identified and mapped. Heckmans' two stage and Tobit econometric models were employed to identify factors that determine the farmers' participation decision and the amount of birds and egg supplied to the market in the year 2007/8 E.C. Village collectors, urban assemblers and whole sellers played crucial roles in the sample markets in the transaction of birds and egg from producers to consumers. Strong oligopolistic behavior is observed in Yirgalem and Alaba egg markets with 98 and 93 percent concentration ratio respectively due to the short and inconsistent supply of egg that inhibits new entrants to engage in the business. Live bird trading in Alaba market also shows modest oligopolistic behavior (59.7% concentration ratio) due to the involvement of whole sellers who transport their birds to Addis Ababa market that comparatively demands high capital and information than the Awassa and Yirgalem poultry market places. Business support services such as credit, extension, input provision and information access in the production and marketing of village poultry are poorly developed or almost nonexistent in the study area.*

*According to the study the production and trading of live birds and egg are profitable in smallholders' production system due to its' low and abundant input requirements such as capital and labor than alternative business activities. From the probit model factors that determine the farmers' participation decision are identified. These includes sex of the house holdhead, family size, total number of birds kept and feed supplementation have highly significantly influences farmers' decision to supply chickens and eggs to the market. According to the result of the linear supply function and Tobit models, the total number of birds that the family kept, feed supplementation, market access, purpose of poultry keeping, producers participation decision in bird and egg supply and Credit use are found to have highly significant impact on the value of volume of birds and egg supplied to the market. The village poultry subsector provides ample opportunities for smallholder farmers since it utilizes resources that are abundant in rural areas and the anticipated rising price and demand in domestic and international markets. The subsector was also constrained by various challenges. According to the market survey, traders face lack of capital, short and inconsistent supply and, poor information and infrastructure development such as storage, packaging and transportation facilities. The production of village poultry was also constrained by diseases (NCD), predation, lack of input and volatile price and demand. Despite the numerous challenges the subsector still remains profitable business for the rural poor.*

# 1. INTRODUCTION

## 1.1. Background

The price of agricultural products particularly livestock products is rising both in domestic as well as international markets due to rising income in newly emerging developing nations and high population growth. Livestock products have very high income elasticity's, and demand increases rapidly with rising income as countries shift from lower to middle income economies. This has led to a 'livestock revolution' in developing countries (Delgado et al., 1999). Increases in poultry consumption have been particularly dramatic and widespread, while changes in beef, pork, and dairy demand vary with cultural differences between countries. Future meat demand is expected to grow at roughly equivalent rates in different developing countries, with very large absolute increases in demand in China leading to large imports (Andrew et al., 2008).

Livestock products have long been a pathway for income generation by the poor. Rapidly growing and changing livestock markets in the developing world provide real opportunities but also significant threats to participation of the poor. This is due to the increasing integration of national and world markets, the changing nature of food demand in cities, and a changing regulatory environment on the one hand, and constraints to smallholders' inability to produce high quality products due to lack of technology, inputs, resources and information on the other hand. High value agricultural products, of which livestock products form an important part, cover a range of goods whose attributes are driven primarily by demand and by the manner and cost of production. Due to demand, markets for traditionally processed, informal and raw products continue to predominate in most developing countries, even while demand for higher quality increases at the higher market end (Gebremedhin et al., 2007).

Delgado et al. (1999) projected that per capita consumption of livestock products will increase by about 50 percent from 1993 to 2020, with most of the increases attributed to developing countries, as a result of population growth, urbanization, and rising incomes. In sub-Saharan

Africa (SSA) total consumption of meat and milk is expected to double between 1997 and 2020 to reach 11.3 and 35.4 million tons (Holloway et al., 2002). This expected increase in demand for animal products has profound implications for food security and poverty alleviation among rural people in SSA. In particular, the expected demand for livestock products presents expanding market opportunities for poor smallholder livestock producers. Therefore, improving access to markets of poor smallholder livestock producers can help them benefit from the rapidly growing demand for livestock products. The International Livestock Research Institute (ILRI) and its partners have identified that encouraging market participation of smallholder livestock producers is a major pathway for getting rural people out of poverty and improving their food security, as livestock contribute to the livelihoods of more than two-thirds of the world's rural poor (Holloway et.al., 2002).

Market access plays an essential role in assuring better income and welfare for smallholder livestock producers. In addition, by creating demand for production inputs and investment goods, markets promote economic growth. Markets also facilitate the accumulation of assets, provide the opportunity for improved nutrition and balanced diets, and, therefore, help alleviate poverty. In Ethiopia the livestock sector contributes about 20% of the total GDP in the country.

Despite such significant contribution to the national economy of the country, the sector has received less than 3% of the recurrent agricultural expenditures in Ethiopia. Livestock markets in Ethiopia function at three levels consisting of primary, secondary, and terminal markets. Solomon et al. (2000) also include a nominal forth tier at the farm gate level, which could hardly be considered to function as a market.

In Ethiopia, rural poultry represents a significant part of the rural economy in particular and of the national economy as a whole. Besides the provision of employment and easily disposable cash income for small-holder farmers, particularly in the off-season from cropping, rural poultry integrates very well into other farming activities as it requires relatively little labor

and capital. However, rural poultry is considered invisible as it is rarely counted in wealth ranking as cattle, sheep and goats are.

There are about 56.5 million poultry of all species in Ethiopia. Local chicken constitutes about 99% of the total poultry population in the small-scale rural farms (Alemu and Tadelles 1997). Poultry are important and relatively cheap providers of eggs and meat as well as being valued in religious and cultural life. The total poultry egg and meat production in Ethiopia is estimated to be about 78,000 and 72,300 metric tons, respectively. Per capita consumption of these products is also very low relative to the world and African standards. Traditionally prepared doro wot is preferred by many people in Ethiopia. Despite this, per capita chicken meat consumption in the country is reported to be about 2.85 kg per annum (Alemu and Tadele, 1997). Chicken meat consumption is more common in urban areas than in rural areas.

The poor rural farmers produce chickens and sell them to earn cash required for various household expenses. There is a growing demand for chicken meat and egg in urban areas due to substantial increase in price of beef and mutton. Therefore, chicken production is likely to play increasing role in supplying animal protein for human consumption in the country. Chicken meat is relatively cheap and affordable source of animal protein (Alemu and Tadelles, 1997). However, at home and restaurants chicken dishes are more expensive than other dishes such as beef and mutton probably due to the way chicken dishes are prepared. Marketing is an important aspect of any livestock production system. It provides the mechanism whereby producers exchange their livestock and livestock products for cash. The cash is used for acquiring goods and services which they do not produce themselves, in order to satisfy a variety of needs ranging from food items, clothing, medication, and schooling to the purchase of breeding stock and other production inputs and supplies.

Analysis of the marketing system for village poultry will help to determine the economic value and importance of local chickens. Branckaert and Guèye (1999) reported that an established market structure for free-range chickens is a prerequisite for developing family poultry. Even in breeding program development, indices require appropriate economic values

that could be derived from such market studies. Market access factors, which refer to the existence of local markets, infrastructure, and adequate transport facilities, are obvious prerequisites for poultry subsector development (Teklewold et al., 2005).

The marketing system for local chickens in most developing countries is described as informal and poorly developed (Branckaert and Guèye 1999; Mlozi et al., 2003). On the other hand, free-ranging local chickens are claimed to be on demand and fetch high market prices in urban markets of Malawi, Nicaragua and many developing countries in Africa and Asia due to preferred attributes such as being tastier than improved broiler strains (Aini, 1990, Kyvsgaard et al., 1999; Branckaert and Guèye, 1999). In Ethiopia information regarding the poultry marketing system and factors that determine farmer's poultry supply to market are lacking. This study attempts to analyze poultry marketing system and identify factors that affect farmers' participation decision in poultry marketing and the volume of poultry supplied to the markets in the study are.

## **1.2. Statement of the Problem**

Marketing systems play a decisive role in vibrant economies as mechanisms for both exchange (necessary for specialization and hence leads to higher economic growth) functions and the proper coordination of the exchange (through price signals) which reflect and shape producer and consumer incentives in supply and demand interaction. If small scale domestic producers are to take advantage of the projected domestic demand growth, then marketing systems in the supply chains linking producers to consumers must be able to support low cost production and timely delivery of the products (Andrew et al., 2008).

Agricultural products particularly livestock products can only be supplied to satisfy the demand through effective and efficient marketing system which links farm and non-farm communities. For a marketing system to successfully coordinate the interaction of the suppliers and consumers of goods and services must be accompanied by efficient marketing system. Both producers and consumers satisfy their conflicting goals regarding the pricing

behavior of a marketing system through such efficient and competitive marketing systems. In parts of the world, rural people often say that one reason they cannot improve their living standards is that they face difficulties in accessing markets.

Market systems do not, however, provide the only mechanisms for ‘coordinated exchange’. In advanced market economies hierarchical relations in organizations (government agencies, firms, and civil society organizations) play a major role both as channels for exchange and in providing institutional services necessary for markets to work (Fafchamps, 2004; Williamson, 1991). However market transactions are normally voluntary (in that both sides have to perceive gains from trade), involve precise terms of exchange (with regard to quantity, quality, space and time), and require wider institutions supporting interaction between trading parties. Now a day the consumption pattern is changing both domestically and internationally toward high quality attributes. Livestock products particularly poultry products have sky rocketing demand throughout the world. It is widely recognized that an inefficient marketing system entailing substantial costs to consumers and less incentives to producers could not provide the mechanism to meet the accelerating demand for high quality food items.

In Ethiopia, information concerning the chicken marketing system is lacking. Despite the high demand for poultry products, producers in Ethiopian are not market oriented and the production system is characterized by its low productivity and scavenging type. This in turn leads to very small supply compared to the high potential the country has in the subsector. Research efforts to increase chicken production and productivity has been underway in Ethiopia. But review of past research works indicate that the research largely concentrated on the biological aspects of poultry production such as supplementary feeding and breeding (Alemu and Tadele, 1997). Increased production, however, needs to be accompanied by efficient marketing system that adds place, form, time, and possession utility to the product along the supply chain. The marketing system for local poultry in Ethiopia, particularly in the study areas is poorly developed. This study was intended to analyzing poultry marketing system, business support services and their role, constraints and opportunities of the sub

sector and factors that affect chicken market participation and volume of poultry supplied to the market to generate information about the entire supply chain of poultry in the study area.

### **1.3. Objective of the study**

The general objective of this study is to analyze the poultry marketing chain in Alaba ‘special’ and Dale Woreda’s of SNNPR state.

The specific objectives of the study are:

1. To analyze the production and marketing support services of extension, input supply, credit and marketing.
2. To investigate the structure of poultry production cost and determines profitability of poultry keeping.
3. To study the structure conduct and performance of poultry marketing system.
4. To identify factors that determine poultry supplied to the market in the study area.
5. To identify constraints and opportunities of poultry production and marketing.

### **Research questions**

The study tried to answer the following major questions:

1. What are the components of production and marketing costs of poultry marketing chain?
2. How poultry marketing and its business support services organized and functioning?
3. What are the major problems and opportunity of poultry production and marketing?
4. What determinants do farmers encounter to supply birds and egg to the market?
5. How poultry market chain organized and what are the alternative poultry market channels?
6. Do farmers and other marketing actors get fair market share from consumer price?

#### **1.4. Significance of the Study**

The result of the study is helpful for farmers, traders and service providers involved in the production and marketing of poultry in the study area. This study also helps development planners and policy makers in designing appropriate policies for the production and marketing of poultry subsector to enable farmers and other participants benefit according to their marginal contribution so that they can stay in the business. Moreover, the information can be provided for potential investors and small and medium enterprises interested in the business so that medium and large scale poultry farms start to emerge.

#### **1.5. Scope and Limitations of the Study**

This investigation is conducted in two woredas and applied information collected from limited sample households and marketing actors involved in the subsector organization in the study areas. Hence, the investigation is limited spatially as well as temporally to make the study more representatives in terms of wider range of commodity, area, and time horizon. The purpose of the study also limits the investigation toward a single commodity and specific geographic location.

## **2. LITERATURE REVIEW**

In this section the basic concepts of market, marketing, marketing system and, market efficiency, market channels, approaches to study marketing system, factors affecting market supply, methods to evaluate the efficiency of agricultural markets, and sample selection biases would be discussed.

### **2.1. Basic Concepts**

#### **2.1.1. Market and marketing**

A market is traditionally defined as a specific geographical area where buyers and sellers meet for exchange of goods and services. The most common way we obtain goods and services we do not produce ourselves is to buy them from others who specialize in producing them. To make such purchases, buyers seek out sellers in markets. Markets are ways in which buyers and sellers can conduct transactions resulting in mutual net gains that otherwise would not be possible (Hyman, 1989).

Modern definition considers market as an arena for organizing and facilitating business activities and for answering the basic economic questions (Kohls and Uhl, 1985) described market as how much to produce? What to produce? How to distribute production? A location, a product, a time, a group of consumers, or a level of the marketing system may define it. The choice as to which market definition to use depends on the problem to be analyzed. Market is an institutional and organizational arrangement to facilitate exchange of one thing for another. The most observable features of a market are its pricing and exchange processes. A market is thought of as a meeting of buyers and sellers: a place where sellers and buyers meet and exchange takes place, an area where price-determining forces (supply and demand) operate, an area where there is a demand for good (Andargachew, 1990). But a market is more than a physical place. It is a mechanism or an institution through which buyers and sellers exchange information and transact. No need to

meet physically for a market to operate especially in today's information and communication technologies.

Another basic concept that is closely related to market is marketing. This term came into use with division of labor and specialization and became common with urbanization and industrialization over many years. The term marketing has been a very debatable concept and defined in so many different ways by different scholars (Chaturvedi, 1959; Purcell, 1979). This is because marketing, or more specifically agricultural marketing, projects different impression to different groups of people in a society, like farmers, traders and consumers (Kohls and Uhl, 1985). The same source also described marketing as the performance of all business activities involved in the flow of food products and services from the point of initial agricultural production until they are in the hands of consumers. The definition of marketing as a process by which individuals and groups obtain what they need and want by creating and exchange products and values with others involves work.

Marketing is also an important aspect of any livestock system. It provides the mechanism whereby farmer's producers/pastoralists exchange their livestock products for cash. The cash is used for acquiring goods and services, which they do not produce themselves, in order to satisfy a variety of needs including food clothing, medication, schooling, the purchase of breeding stock and other production inputs and supplies (Solomon and Nigussie, 1983).

### **2.1.2. Marketing systems**

A marketing system is a collection of channels, intermediaries, and business activities, which facilitate the physical distribution and economic exchange of goods (Kohls and Uhl, 1985). A channel of distribution may be defined as a path traced in the direct or indirect transfer of the title to a product as it moves from a producer to consumer or industrial users. Every channel of distribution contains one or more of "transfer points" at each of which there is always either an institution or a final buyer of the product. In the process of marketing, legal title to the product always changes hands at least once. The concept of marketing system includes

both the physical distribution of economic input and products and the mechanism of process or coordinating production and distribution (cited in Andargachew 1990). Branson and Norvel (1983) define the marketing system in terms of what is otherwise known as marketing channel. In broad terms, marketing system may be defined as the totality of product channels, market participants and business activities involved in the physical and economic transfer of goods and services from producers to consumers. Marketing system operates through a set of intermediaries performing useful commercial functions in chain formations all the way from the producer to the final consumers (Islam et al., 2001).

The system comprises several, usually, stable, interrelated structures that, along with production, distribution, and consumption, underpin the economic process (Mendoza, 1995). A marketing system can be regarded as a multi-layered sequence of physical activities and of transfers of property rights from the farm-gate to the consumer (White, 1995). The efficiency with which a marketing system in an area or country operates can influence the living standards of people and the overall development of a nation and thus it is vital to make improvement in marketing efficiency to trigger economic development.

### **2.1.3. Marketing efficiency**

Efficiency in marketing is the most commonly used measure of market performance. There are two aspects of market efficiency mostly mentioned in agricultural marketing literature are technical (operational) efficiency and pricing (allocative) efficiency. Technical efficiency is attained when goods and services are provided at a minimum average cost that is, when the least cost combination of marketing activities are employed. Technical efficiency is achieved through technical improvement. Pricing efficiency is concerned with the price-making role of the market system. It concerns how accurately, how effectively, how rapidly, and how freely the marketing system makes price, which measure product values to the ultimate consumer and reflects these values through the various stages of the marketing system to the producer (Andargachew, 1990).

Performance is the crucial issue measured by pricing and operational efficiency. Individual producers as well as the public have a stake in this matter because the degree of efficiency attained affects producer's prices and profit, costs to the consumer and thereby their real income and the general resource utilization (John and Saharan, 1988).

Improved marketing efficiency is a common goal of farmers, marketing organizations, consumers and society (Kohls and Uhl, 1985). Higher efficiency means better performance, while lower efficiency denotes poor performance. Most of the changes proposed in marketing are justified on the grounds of improved efficiency. Marketing efficiency as measured by composing output and input values are based on consumer valuation of goods, and input values (costs) are determined by the values of alternative production capabilities (Cramer and Jensen, 1982). Based on this argument, markets are efficient when the ratio of the value of output to the value of input throughout the marketing system is maximized. The output of marketing is the consumer satisfaction with the goods and service and the inputs are the various resources of labor, capital and management that marketing firms use in the process accomplishing particular job without reducing consumer's satisfaction and with the output of improvement is efficiency (Abbot and Makeham, 1981). However, a change that reduces costs but also reduces consumer satisfaction with the end product might actually reduce marketing efficiency.

Effective and efficient marketing system is the one that induces the production of those products and quantities which when sold to the consumer results in maximum returns after the deduction of minimum marketing charges and farm production costs (Kohls and Uhl, 1985). However, consumer's satisfaction cannot be measured directly; changes can be analyzed in terms of "technical" efficiency and "pricing" efficiency.

#### **2.1.4. Marketing channel**

Marketing channels are the sequence of intermediaries through which goods pass from the producers to consumers. They are alternative routes of product flows from producers to

consumers (Kohls and Uhl, 1985). Davar (1996) defined marketing channels of distribution as a series of operations, which physically bring goods into the hands of the final consumer. Most frequently, a physical product transfer is involved but sometimes an intermediate marketing institution may take title to goods without actually handling them (Giles, 1974). Formally, a marketing channel is a business structure of interdependent organizations that reach from the point of product origin to the consumer with the purpose of moving products to their final consumption destination (Kotler and Armstrong, 2003). Market channel of food grain trade activities in Alaba Siraro district was studied by Wolday (1994). The food grain marketing channel among different agents from producer to consumer was studied. Village collectors, wholesalers, agents, and millers are the main agent in this market. The study indicates that smaller proportion of the food grain is dishonored to the market center in the district by village collectors.

#### **2.1.5. Market chain and business support services**

According to Lundy et al. (2004) a market chain is used to describe the numerous links that connect all the actors and transactions involved in the movement of agricultural goods from the farm to the consumer. Supporting these activities are services that enable the chain to operate. Agricultural goods and products flow up the chain and money flows down the chain. The efficiency of the market chain is generally a factor of how well information flows among these actors. Given the many challenges of the marketplace, it is vital to suggest that a practical starting point in developing a marketing strategy is to assist chain actors to visualize their market chain from beginning to end. Market chains operate most competitively when they are supported by dedicated business organizations, both formal and informal, which participate in enabling produce to flow from the farm gate to the final consumer.

## **2.2. Approaches Used to the Study of Agricultural Marketing**

The agricultural marketing study involves mainly three approaches. These approaches are the functional, institutional, and the commodity approaches.

### **2.2.1. Functional approach**

This approach investigates marketing in terms of the various activities that are performed to exchange product from the producer to the consumer. These activities are called functions (Cramers and Jensen, 1982). And this approach helps to compare cost and benefits of different functions. The common functions include are: a) exchange (buying and selling), b) physical (processing, storage, and transportation), and c) facilitating (Standardization, financing, risk bearing, and market information). Most of these functions are performed in the marketing of nearly all commodities.

### **2.2.2. Institutional approach**

Institutional approach examines the activities of business organizations or people in marketing. The institutional approach focuses on the study of the various institutions, middlemen and other agencies which perform the marketing activities. These organizations or market actors are those who perform the operations necessary to transfer goods from the producer to consumer, because of the benefit of specialization and scale that exist in marketing as well as production (Cramers and Jensen, 1982).

### **2.2.3. Commodity approach**

This activity encompasses the above two approaches in the marketing of one or more commodities. This approach focuses on what is being done to the product after its transfer from its original production place to the consumer (Kohls and Uhl, 1985). It helps to pinpoint the specific marketing problems of each commodity as well to develop the market for the specific commodity. The approach follows the commodity along the path

between producer and consumer and is concerned with describing what is done and how the commodity could be handled more efficiently. This approach will be used in this study as the investigation integrates the above two approaches to study the poultry marketing chain. This paper uses the commodity approach that integrates the application of the functional and institutional approach to examine the poultry marketing system in the study area.

#### **2.4. Methods of Evaluating Marketing System**

The development of reliable and stable market system has been an important element in commercialization and specialization in the agricultural sector. In order to evaluate the functioning and performance of the market, there are three different approaches namely traditional, Structure-Conduct-Performance (SCP), and the New Empirical Industrial Organization (NEIO) approaches that integrate SCP with value chain analysis. The SCP approach was developed in the United State as a tool to analyze the market organization of industrial sector and it was later applied to assess the agricultural system and this framework was to evaluate the performance of industries in the USA (Meijer, 1994).

Efficiency factors can be evaluated by examining marketing enterprises for structure, conduct and performance (Abbott and Mekeham, 1979). The performance of a certain market or industry depends on the conduct of its sellers and buyers which, in turn, is strongly influenced by the structure of the relevant markets (Scarborough and Kydd, 1992; Margrath, 1992). Variables relevant in appraising firm's behavior can be put into three general categories: - structure, conduct, and performance related variables (Clodius and Mueller, 1961). But this approach does not consider all efficiency parameters particularly from the firms or sub sector efficiency view point to be considered as efficient marketing system. So that it will be accompanied by value chain analysis that incorporate efficiency parameters in terms of the sub sector organization structure and conduct.

### **2.4.1. The Structure, Conduct and Performance (SCP) model**

Environmental and internal conditions of the firm have an influence on the actions and behavior of the firm. On the other hand, the composite of firm's actions is not equivalent to a complete description of overall market result. Only some important actions and their consequences on performance of the firm are relevant (Andargachew, 1990). SCP model is one of the most common and pragmatic methods of analyzing a marketing system. It analyzes the relationship between functionally similar firms and their market behavior as a group and, it is mainly based on the nature of various sets of market attributes and relations between them and their performance (Scarborough and Kydd, 1992). This analytical method is based on the theory that market structure and market conduct determine the performance of a marketing system.

Efficiency factors can be evaluated by examining marketing enterprises for structure, conduct and performance (Abbott and Mekeham, 1979). The performance of a certain market or industry depends on the conduct of its sellers and buyers which, in turn, is strongly influenced by the structure of the relevant markets (Scarborough and Kydd, 1992; Abbott, 1987; Margrath, 1992). All the three parameters do not have unidirectional movement but rather have an interdependent relationship. Hence, market structure does not only influence market performance but also has an impact on market conduct. Furthermore, performance also affects the development of market structure and market conduct.

#### **2.4.1.1. Market structure**

Market structure includes - a) the degree of buyer and seller concentration, defined by the number of buyers and sellers in the market b) the degree of market transparency which refers to the availability of relevant market information, its distribution among buyers and sellers, and its adequacy in terms of price sharpening, quality comparisons and risk reduction or uncertainty about the future c) the condition of entry to the market referring to the relative

ease or difficulty with which seller may enter the market. This is generally determined by the advantages that established sellers have over potential entrants (Clodius and Mueller, 1961). Thus, from market structure perspective, in an efficient market there should be sufficient number of firms in an industry given the size of the overall market and the firms of appropriate size are needed to fully capture the economies of scale; there should no barriers to entry to the market; and firms should have full market information.

Competition plays a key role in harnessing the rivalry and the profit seeking of the market place in order that it may serve the public interest (Khol and Uhl, 1985). Determining the presence or absence of the requirements of the model of perfect competition can be used indirectly to assess the economic efficiency of markets. Many studies concerned with the efficiency of agricultural markets begin in this form of analysis. Following, three methods of measures of market concentration are discussed.

#### **2.4.1.1.1. Market concentration ratio (measure)**

Considerable attention has been focused on market concentration as a measure of competition in marketing. Concentration refers to the proportion of industry sales made by its largest firms. In general, the more concentrated the industry sales, the more likelihood that the market will be imperfectly competitive (Khol and Uhl, 1985).

Concentration ratio is one of the commonly used measures of market power, which in other words, refers to the number and relative size of distribution of buyers or sellers in a market. Concentration ratio measures the per cent of traded volume accounted for by a given number of participants and is designated by the formula:

$$CR = \sum_{i=1}^r s_i \quad i=1,2,3, \dots, r$$

Where

C= is concentration ratio,

S<sub>i</sub> = is the percentage share of the all firms and

r=the number of the largest firms for which the ratio is to calculated

$$MS_i = \frac{V_i}{\sum V_i}$$

Where

$V_i$  amount of product handled by buyer i

$MS_i$  market share of buyer i

$\sum v_i$  total amount of product handled by the r firms

Khols and Uhl (1985) suggest that as a rule of thumb, a four enterprise concentration ratio of 50 percent or more is indicative of a strong oligopolistic industry; of 33-50 per cent ratio denotes a weak oligopoly, and less than that un-concentrated industry. Despite wide application of concentration ratio as a measure of the ratio of market concentration, there are limitations against the index. Scarborough and Kydd (1992) suggest that calculating and using concentration ratios as a measure of market structure is subject to empirical, theoretical and inferential problems. In most LDCs, where firm records are usually not available publicly, it would be difficult to determine such ratios on anything, but the most local of scales. Furthermore, this single measure doesn't reveal anything about the distribution of sales between the numbers of largest enterprises, nor does it take in to account product differentiation or other possible monopoly elements, and it doesn't allow for the possibility of different degrees of oligopoly through time, space market levels, functions and products.

Another problem associated with concentration ratio is the arbitrary selection of r (the firms that are taken to calculate the ratio). The ratio doesn't indicate the size distribution of r firms. However, when the numbers of participants in an industry is large it will be difficult to organize oligopolistic behavior. Under such local circumstances, the concentration ratio given above can be usefully determined (Scarborough and Kydd, 1992).

#### **2.4.1.1.2. Hirschman Herfindahl Index (HHI)**

The other method of measure of market power commonly used is Hirschman Herfindahl

Index designated by the formula:

$$HHI = \sum_{i=1}^n s_i^2, \quad i = 1, 2, 3, \dots, n$$

Where:

HHI = Hirschman Herfindahl Index,

$S_i$  = the percentage market share of  $i$ th firm, and

$n$  = the total number of firms.

The index takes into account all points on the concentration curve. It also considers the number and size distribution of all firms. In addition, squaring the individual market share gives some more weight of the larger firms, which is an advantage over concentration ratio.

A very small index indicates the presence of many firms of comparable size, whilst one of 1 or near 1, suggests that the number of firms is small and/or that they have unequal shares in the market (Scarborough and Kydd, 1992).

#### 2.4.1.1.3. Gini-Coefficient

Gini-coefficient is a very convenient shorthand summary measure of concentration. It is done based on Lorenz curve and is obtained, by calculating the ratio of the area between the diagonal and the Lorenz curve divided by the total area of the half square in which the curve lies. It is this ratio that is known as the Gini-Concentration ratio or more simply as the Gini coefficient, named after the Italian statistician who first formulated it in 1912.

Alternatively, Gini-Coefficient is computed using the formula:

$$G = \sum_{i=1}^n (T_i - T_{i-1})(F_i + F_{i-1}) \quad i = 1, 2, 3, \dots, n$$

Where:

$G$  = Gini-coefficient

$T_i - T_{i-1}$  = cumulative proportion of traders

$F_i + F_{i-1}$  = cumulative proportion of the product handled by traders

$n$  = number of traders (Bhuyan et al., (1988; cited in Wolday (1994)).

Gini-Coefficients are aggregate inequality measures and can vary anywhere from zero (perfect equality) to one (perfect inequality). In actual fact, the Gini-Coefficient with highly unequal distributions typically lies between 0.50 and 0.70, while with relatively equitable distributions it is on the order of 0.20 to 0.35. However, although Gini-Coefficients provide useful information based on Lorenz curve shapes, a problem arises when Lorenz curves cross. It is problematic whether we can in this special case claim that a higher coefficient means a more unequal distribution. The other problem associated with Gini-Coefficients is that it favors equality of market shares without regard to the number of equalized firms. In other words, the coefficient equals zero for two firms with 50 percent market shares, for three firms with 33.33 per cent market shares each, and so on. This study employ concentration measure to study the structure of poultry marketing in the study area.

#### **2.4.1.2. Market conduct**

“Acceptable conduct” includes the aspects that there are enough firms in the market to create some uncertainty in the minds of firms’ managers regarding whether price changes both up and down; firm manager will be followed by competitors; there is no unjustified price discrimination; there is no collusion among different firms, and there are no pricing or other matters (Wolday, 1994).

Market conduct refers to the behavior that firms pursue in adopting or adjusting the market in which they sell or buy. The major aspects according to Scarborough and Kydd (1992) include pricing and selling policies and tactics, overt and tacit inter-firm co-operation, or rivalry, and research and development activities. According to Abbott and Makeham (1981) conduct refers to the market behavior of all firms. In what way do they compete? Are they looking for new techniques and do they apply them as practicable? Are they looking for new investment opportunities, or are they disinvesting and transferring funds elsewhere? Meijer (1994) said that, “conduct is pattern of behavior which enterprise follow in adopting or

adjusting to the market in which they sell or buy”, in other words the strategies of the actors operating in the market.

The specified structural features of atomistic numbers, homogeneous product, and free entry and exit require a form of conduct such that each firm must operate as if in isolation. The market behavior of firms will determine whether or not they compete and whether they are acting innovatively to improve market efficiency. Informal association between even a small numbers of firms (collusion) can cause price distortions and seemingly independent firms can have joint ownership (subsidiaries) (Staal, 1995).

#### **2.4.1.3. Market performance**

Performance of the market is reflection of the impact of structure and conduct on product price, costs and the volume and quality of output (Cramers and Jensen, 1982). If the market structure in an industry resembles monopoly rather than pure competition, then one expect poor market performance.

Assessment of how well the process of marketing is carried out, and according to Abbott and Makeham (1981) performance is how successfully its aims are accomplished. Is produce assembled and delivered on time and without wastage? Is it well packed and presented attractively? Is its quality reliable and are contract kept? Is the consumption of the products increasing and sales in competitive market expanding? There are such many practical indications of how well a certain marketing system is operating.

As a method for analysis the SCP paradigm postulates that the relationship exists between the three levels distinguished. Suppose a causal relations starting from the structure, which determine the conduct, which together determine the performance (technological progressiveness, growth orientation of marketing firms, efficiency of resource use, and product improvement and maximum market services at the least possible cost) of agricultural

marketing system in developing countries (Meijer, 1994). Market performance can be measured by marketing costs and margins.

#### **2.4.1.3.1. Marketing costs and margins**

A marketing margin may be defined as a difference between the price paid by consumers and that obtained by producers or; the price of a collection of marketing services that is, the outcome of the demand for and the supply of each service (Tomek and Robinson, 1990). Results of analysis of marketing costs and margins are used to determine whether there are excess profits and serious inefficiencies or whether wide margins are due to technical constraints (such as transportation bottleneck). Like in any agricultural marketing, in livestock marketing, there are several participants in the marketing chain; the participants include cattle traders, collectors, fattening enterprises, wholesale dealers and retailers. Both governmental and private fattening enterprises are participating in collecting, wholesaling and fattening activities. The relative share of the different market participants will be estimated using the marketing margin analysis. The total marketing margin in the marketing system constitutes the marketing costs plus profit earned by the different participants in the system. Marketing costs include those incurred for feed, laborers working in the collection and feeding activity, costs of transportation to fattening area and to the market taxes, interest on capital and miscellaneous expenses like licensing and renewal fees considered.

The size of market margins is largely dependent upon a combination of (1) the quality and quantity of marketing services provided; (2) the cost of providing such services; and (3) the efficiency with which they are undertaken and priced (Scarborough and Kydd, 1992). For instance, a big margin may result in little or no profit or even a loss for the seller involved depending upon the marketing costs as well as on the selling and buying prices (Mendoza, 1991). However, under competitive conditions, the size of market margins would be the outcome of the supply and demand for marketing services, and they would be equal to the minimum costs of service provision plus “normal” profit (Scarborough and Kydd, 1992;

Mendoza, 1991). Therefore, analyzing market margins is an important means of assessing the efficiency of price formation in and transmission through the system.

There are three methods generally used in estimating marketing margin. (1) Detailed analyses of the accounts of trading firms at each stage of the marketing chain (time lag method); (2) computations of share of the consumer's price obtained by producers and traders at each stage of the marketing chain; and (3) concurrent method: comparison of prices at different levels of marketing over the same period of time (Scarborough and Kydd, 1992). This paper employs the use of concurrent method due to complexities in data issues in the remaining method.

#### **2.4.2. Supply response and market participation of farm households**

Subsistence agriculture entails large inefficiencies in resource allocation that poor countries cannot afford to fulfill the rising demand for food that might arise from uncontrollable population growth and increase in per capita income. Large numbers of African households remain excluded from participating in the cash economy, and risks and transaction costs far exceed those of any other region of the world (Delgado, 1995). It has for some time been clear that Africa needs to move beyond adjustment to development (Cornia and Helleiner, 1994), and agricultural commercialization has to play a crucial part in this process if it is to result in poverty alleviation and improved food security.

Modeling the decision to enter the output market is potentially important in situations where many households rely on subsistence farming. Simultaneous modeling of marketing decision and amount traded marks a distinct step forward relative to standard empirical approaches adopted in the literature on agricultural supply response. An additional attractive feature of this approach is that it allows detailed breakdown of marginal effects from the regression into a market participation and a quantity (or sales value) component. The challenge for empirical estimation of marketed surplus is to take account of the interrelationships among market participation, production and sales decisions. Supply response analysis will not generate reliable estimates of the true responsiveness to price and other determinants unless movements into and out of subsistence are accounted for. For policy analysis, it is also

important to focus on policies to increase market participation (Sadoulet and de Janvry, 1995). In practice, this is done by estimating the marginal effects of the exogenous variables on both market participation and supply, based on full sample of both market and subsistence farmers. This study tried to identify the marketing behavior as a two-step decision process: (i) the household decides whether or not to participate in the market, and (ii) establishes how much to sell. This study adopted Heckman two stage estimation procedure as suggested by Goetz (1992) along with the censored regression (Tobit model) to compare the results of the models.

### **2.4.3. Sample selection bias**

Sample selection is a generic problem in social science research that arises when an investigator does not observe a random sample of a population of interest. Specifically, when observations are selected so that they are not independent of the outcome variables in the study, this sample selection leads to biased inferences about social processes. In recent decades, however, many social scientists have formalized the ways that selectivity can affect inferences about social processes through the use of models for sample selection bias. These models demonstrate formally how and why bias comes about, and they also show the common formal structure of an array of substantive investigations affected by sample selection bias. In a linear regression model, selection occurs when data on the dependent variable are missing non-randomly conditional on the independent variables.

Elementary statistical methods in this situation generally yield biased and inconsistent estimates of the effects of the independent variables. For example, if a researcher uses ordinary least squares (OLS) to estimate a regression model where large values of the dependent variable are underrepresented in a sample, the estimates of slope coefficients may be biased. Heckman's (1979) estimator has been used extensively in the recent social science literature and this study adopt this technique to explicitly identify factors that farmers poultry market participation and volume of marketable surplus. This study tried to identify the marketing behavior as a two-step decision process: (i) the household decides whether or not to

participate in the market, and (ii) establishes how much to sell. The study employed Heckman two step estimation procedure that takes selectivity bias into account.

### 3. METHODOLOGY

#### 3.1. Description of the Study Area

##### **Dale woreda**

Dale woreda is located in SNNP regional state, Sidama zone. The woreda has a total area of 1326.4 square kilometers and total population of 416842. The woreda is characterized by dega, woinadega and kola agro-ecologies and produces a variety of crop and livestock. The woreda is known for its coffee production. Out of the total population 213068 male and the remaining 203774 are females. The woreda is located at an altitude of 1161-3167m (asl). The annual rain fall and temperature of the woreda ranges from 1027-1452ml and 11-22c°, respectively.

The soil type of the woreda constitutes Haplic Luvisols (orthic), Chromic Luvisols (nitic), Chromic Luvisols (orthic), Humic Nitisols (mollic), Eutric Vertisols (chernic), Eutric Vertisols (ferralic). The woreda has 76 kebeles (Peasant Associations). The woreda is able to produce various crops such as Coffee, Haricot bean, Fruit, Spices, Vegetables (Irrigated). The woreda has livestock population. of 166142.0, cattle 19492.0 sheep, 16381.0 donkeys, 431.0 mules 218923.0 poultry, 10506.0 Beehives (IPMS PRA, 2006). Mixed agriculture, pottery, petty trade and sale of alcoholic drink are the main activities under taken by inhabitants of the woreda. Recently the woreda has been split into three woredas (namely Dale, Antete, and Bocasso woredas) and the focus of this study is Dale woreda and the information discussed above refers to Dale woreda before its split into three distinct woredas.

Figure 1. Dale Woreda geographic location map\*

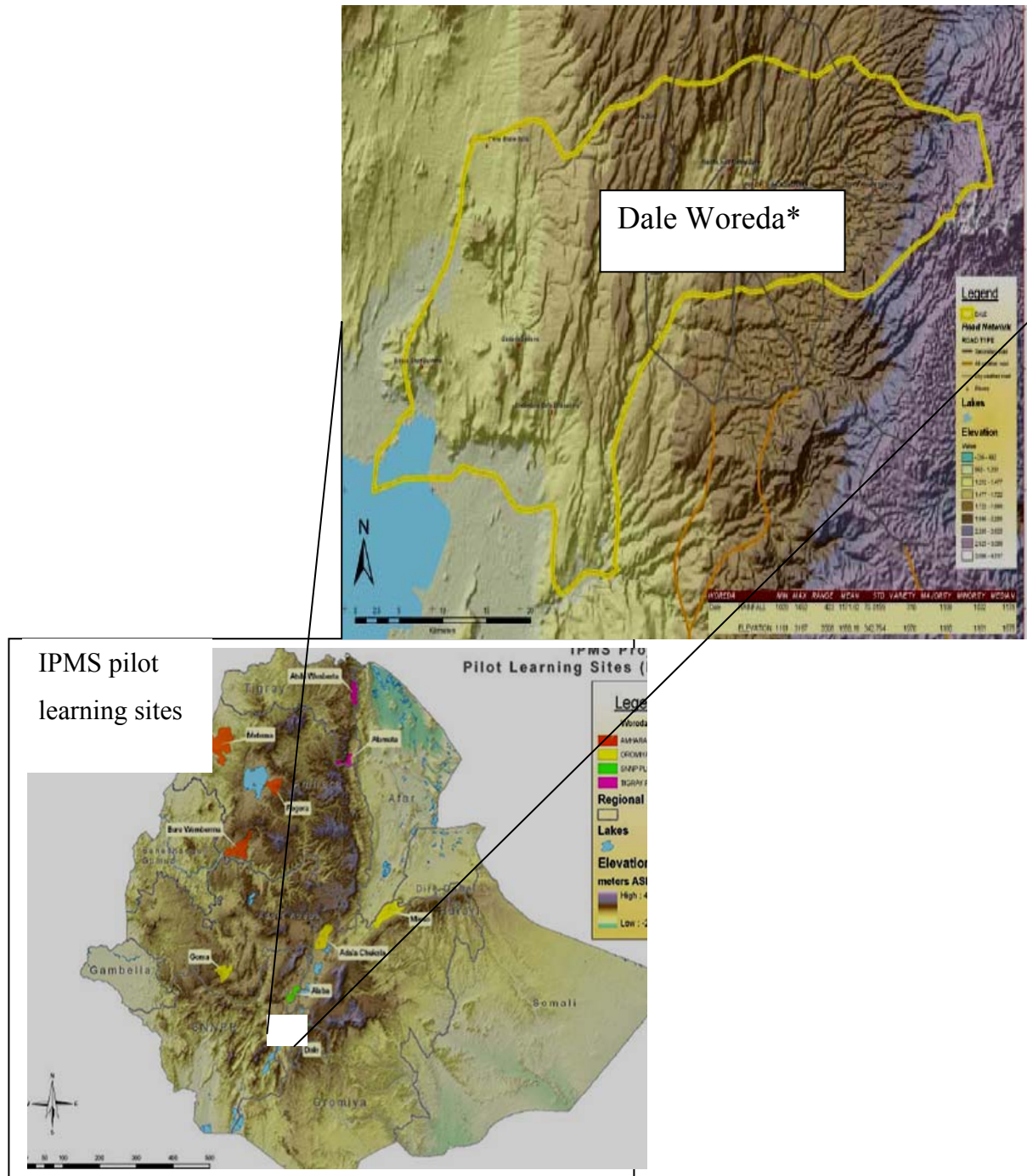


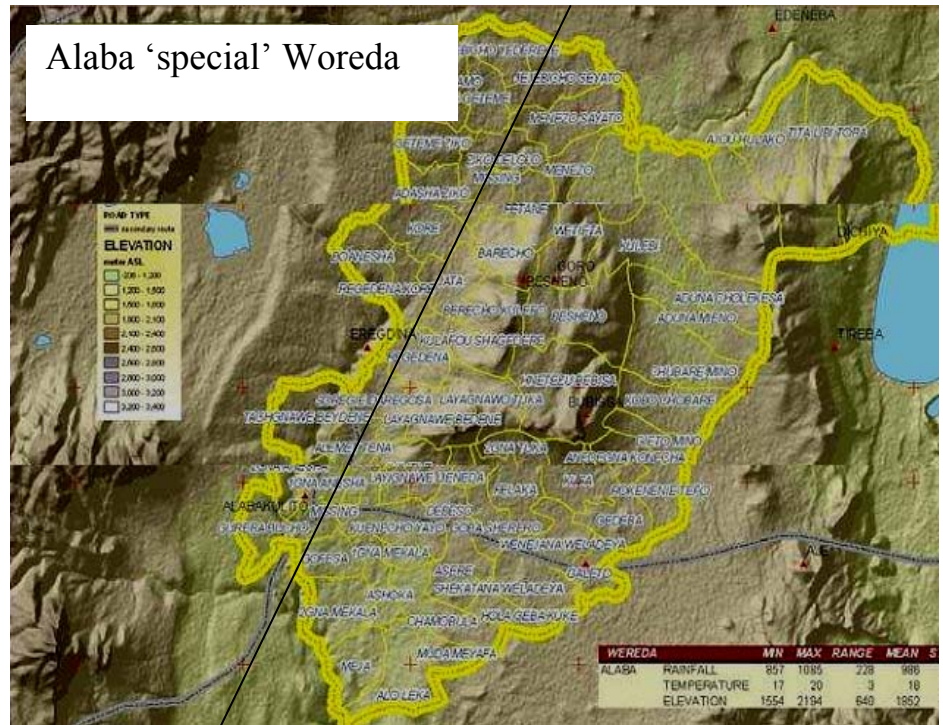
Figure 1. Dale Woreda Map\* (IPMS PRA, 2006)

\*: This map shows Dale woreda before it split into three woredas.

### **Alaba ‘special’ woreda**

Alaba special woreda is located in SNNPR state, and the Woreda constitutes one of the eight special Woredas found in the region. The woreda has a total area of 973.8 square kilometers and a total population of 255127. The woreda is located at 1554 to 2149 m (a.s.l), but most of the woreda is found at about 1800 m.a.s.l. The land use pattern has shown that out of the total area coverage of the woreda 64116.25 hectare, 44020 hectare is currently cultivated; 4317 hectare used for grazing, 3644.45 hectare cultivable, 4592 hectare forest cover, 4737.8 hectare for others and the rest about 2805 uncultivable land. The woreda also characterized by woinadega agro-ecologies and produce a variety of crops and livestock. Out of the total population, 127060 are males and the remaining 128067 are females. The woreda is located at an altitude of 1553-2194m (a.s.l). The annual rain fall and temperature of the woreda ranges from 853-1080ml and 17-20 c°, respectively. The soil type of the woreda constitutes Andosol (orthic), Solonchak (orthic), Phaeozem (ortic), and Chromic Luvisols (-orthic). The woreda has 76 kebeles (Peasant Associations). The woreda produce various crops such as hot pepper, pulses, and Fruit. The woreda has livestock population of 161566, cattle 34760 sheep, 27661 donkeys, 27661 goats, 2346 mules, 218923, poultry, and 14690 beehives (IPMS PRA, 2006).

Figure 2. Alaba 'special' Woreda geographic location map.



IPMS pilot learning site

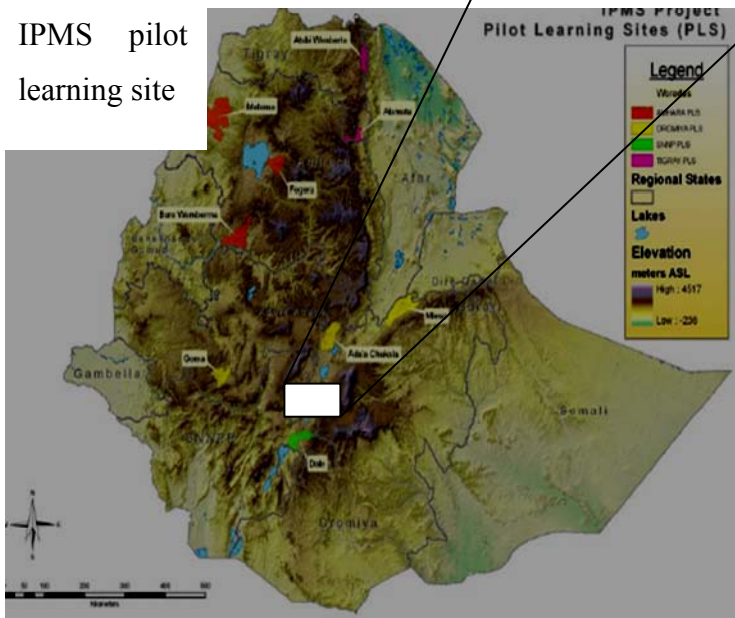


Figure-2 Alaba 'special' Woreda (IPMS PRA, 2006)

### **3.2. Source of Data**

For this study both primary and secondary data sources were used. The primary data was collected from farmers, traders, and other market participants involved in the production and marketing of poultry subsector. The information includes the overall socioeconomic characteristics of farmers and traders involved in this business using structured questionnaires designed for this study. Beside this informal survey was also employed to gather information from different market participants in the poultry marketing chain. The study also employed information from secondary sources such as Central Statistical Authority (CSA) and Woreda and zonal Agriculture and rural development offices regarding poultry production and marketing.

### **3.3. Data Requirements**

Generally the data required for this study were categorized into two parts. The first one encompasses information regarding the poultry marketing system and marketing institutions or business support services involved in poultry marketing in the study area. This data include the number and role of various intermediaries, the price received and paid by each intermediary, the number and role of marketing institutions, number of poultry bought and sold by each traders category, access to market, market information, condition of entry and exit and other marketing information. The second type of data required for this study include the general socioeconomic characteristics, access to market and market information, extension and credit access, institutional organization, input access particularly feed, veterinary service and improved breeds, number of poultry kept and sold in each family and other relevant information was gathered from sample households. Finally the role and responsibility of household members engaged in the production and marketing decision making within the family members had been gathered.

### **3.4. Sample Size and Method of Sampling**

The study has two parts that are market and the farmers' survey. The market survey was employed in six sample markets. The sample markets include Awassa (regional) market, Alaba and Yirgalem (woreda) markets and one local market from Alaba and two local markets from Dale woreda. The selection of local sample markets was based on the number and availability of local poultry markets in the two districts. The marketing information was collected using purposefully selected 35 and 20 market participants (traders) in chicken and egg markets respectively and the choice of them was made based on the number and category of traders, mobility of the traders among the sample markets and also informal discussions with key informants in the marketing system. Informal discussions were also made with respondents selected from producers, consumers, traders, and service providers in the poultry marketing system. Two stage sampling technique were used to select sample farm households. The population or sample frame of the study was the list of households in Alaba 'special' and Dale woreda. In Alaba 'special' woreda, from the 76 PAs, 5 PAs were selected randomly and from the 5 PAs, 20 farmers from each PA were selected and a total of 100 farmers were selected and interviewed using systematic random sampling technique. The same sampling technique was also employed in Dale woreda to select representative farmer households and a total of 200 farmers were selected and interviewed from both woredas.

### **3.5. Methods of Data Collection**

This study was conducted using information collected from farmers and other marketing agents that participate either directly or indirectly in the functioning of the poultry market system in the study area. For this study both formal and informal survey were conducted using structured questionnaires designed for this study. Informal survey is used to gather data that are qualitative and enable to give due attention in the design of questionnaire in addition to its importance giving deep insight into the marketing chain. Moreover, Rapid Market Appraisal (RMA) technique was employed using checklists from market participants in all stage to obtain additional supporting information for the study. Enumerators were oriented

about the type of data required, the number and list of sample respondents and also the general objective of the study before they start collecting the data and they collected the data under the close supervision of the researcher.

### **3.6. Methods of Data Analysis**

The data collected from the farmers, traders and other sources were analyzed using descriptive and inferential statistics and econometric models were also applied by the help of statistical software packages such as SPSS and LIMDEP. The descriptive statistics analysis that were employed using diagrams, charts, ratios, percentages, means, variances and standard deviations in examining the poultry marketing system as well as farmers' demographic and socio-economic characteristics. The conduct and various strategies and also other characteristics of the different marketing agents, market efficiency parameters and the role and organization of market institutions and functions in the market chain were also analyzed using descriptive statistics. Econometrics model was also used to identify factors affecting the farmers' participation decision and volume of poultry products (chicken and egg) supplied to the market.

#### **3.6.1. Descriptive statistics**

##### **3.6.1.1. Structure conduct and performance (S.C.P) model**

The SCP approach evaluates the marketing system at the industry level for a specific commodity. The critics on this approach are its assumption that firms interact horizontally and this interaction determines the conduct of the marketing system. But in reality these interactions are themselves influenced by other variables that are characteristics of the individual firms that comprise the industry. Hence the structure, conduct and performance of the poultry marketing system were studied in terms of the sub sector organization approach or firm analysis along with the industry as a whole system. That is the application of SCP approach to poultry value chain analysis in the market (sub sector approach) was applied in this study to examine the poultry marketing system in the study area. In this approach the

following are the major areas to be investigated; commodity characteristics, consumption pattern, supply situation, price relationship and seasonality, marketing institutions and infrastructures. Moreover the structure, conduct and performance of the entire industry were also be analyzed.

#### **3.6.1.1.1. Market structure**

The market structure and the structure of a firm (size and market share) were analyzed in this section. Market structure can be measured with CR, HHI, and Gini coefficient. This study adopt concentration measure (CR) to analyse the degree of traders concentration in sample market places in performing the exchange function.

#### **Concentration ratio (CR)**

Concentration ratio measures the market share of each supplier involved in the market. It is the percentage of total market sales accounted for by a given number of leading firms, four largest firms here in this case. The greater degree of concentration is the greater the possibility of non-competitive behavior existing in the market.

$$CR = \sum_{i=1}^n S_i$$

Where  $S_i$  represents market share of  $i^{\text{th}}$  firm and  $m$  is number of largest firms for which the ratio is going to be calculated. The concentration measure or market share was used in the analysis of poultry market structure for Awassa, Alaba and Yirgalem markets.

Barriers to entry can also influence the structure of a marketing system. It is simply any advantage held by existing firms over those firms that might potentially produce same output in a given marketing system. Potential entry barriers were investigated based on: demand conditions, product differentiation, price elasticity, and control over input supplies, legal and institutional aspects, economies of scale, capital and technological factors to analyze the market structure.

The structure of the sub sector organization that affects the industry or market structure can be analyzed using information like the location, timing, and clustering of functions, the number of stages, the number of parallel channel, the type of information, the cost and distribution of products and the type of exchange and existing exchange institutions. The nature of these conditions and response and adaptability of the marketing actors determine the firms' decision environment and then the market structure.

#### **3.6.1.1.2. Market conduct**

There are no universally accepted methods for the analysis of elements of market conduct. The following information's can be considered to systematically detect indication of unfair price setting practice and conditions under which such practices are likely to prevail. The existence of formal and informal producing and marketing groups that affect the bargaining power of marketing agents. The availability of price information and its impact on the prevailing prices. The accessibility of alternative market channels and their relative efficiency in the flow of goods and services from the point of production to the point of consumption. The exchange practice and pricing behavior of the marketing firms were analyzed to examine the influence of the existing market structure on the market conduct. The conduct of firms were also analyzed using information such as: type of exchange used, supply, demand, and price forecast, information and quality specification, timing and means of exchange and response to changes in market places.

#### **3.6.1.1.3. Market performance**

The performance of an industry for a particular commodity can be evaluated in terms of technical and pricing efficiency. Marketing costs and marketing margins, influences on consumption, distribution and market access are best efficiency parameters to analyze the performance of a market. Performance in light of the firm view can be explained by allocative accuracy, efficiency and transaction cost, distribution and capital cost efficiency, right and control, etc.

**Marketing margin:** The marketing margin is a measure of the percentage of price that is paid by the consumer that is maintained by each agent in the marketing chain. These include the total gross marketing margin, producer's gross marketing margin, and net marketing margin. These margins can be calculated by deducting the selling price and marketing cost from the purchase price and then dividing by the price paid by the end users and the proportion and distribution of these values among marketing actors were used to study the performance of village poultry marketing system. Mathematically these margins can be calculated as follows:

$$\text{TGMM} = \frac{\text{End buyer price} - \text{First seller price}}{\text{End buyer price}} \times 100$$

Where, TGMM = Total gross marketing margin

$$\text{GMMp} = \frac{\text{End buyer price} - \text{marketing gross margin}}{\text{End buyer price}} \times 100$$

Where, GMMp = the producer's marketing margins (producers share) from consumer price.

$$\text{NMM} = \frac{\text{Gross margin} - \text{Marketing costs}}{\text{End buyer price}} \times 100$$

Where, NMM = Net marketing margin

**Market cost:** This include handling (packing and unpacking cost, loading and unloading cost), transportation cost, production loss, storage cost, processing cost, capital cost, commission and other unofficial payments.

The various institutions involved in poultry marking system and their role were indentified using information from informal survey. The cost component of keeping poultry and their profitability were also analyzed. Furthermore, the different market channels and the percentage share of these channels were identified. The result of this market investigation was

compared with the perfectly competitive market conditions to measure the marketing efficiency.

### **3.6.2. Econometric analysis**

Econometric model was used to identify the factors that affect farmers' participation decision in the supply of poultry to the market in one hand and determinants of the volume of poultry supplied to the market in the other hand. Most recent literatures adopt "Tobit and Heckman's two stage models' to identify factors that affect producers to participate in the supply of poultry (sale of poultry) or not and also identify the limiting factors that determine the level of poultry (chicken and egg) supplied to market. The aim of this study was to look at factors that affect participation decision and the volume of marketable surplus in poultry marketing system. Ideally, the OLS model is applicable when all households participate in the market. In reality not all households participate in a specific commodity market. Some households may not prefer to participate in a particular market in favor of another, while others may be excluded by market conditions. If the OLS regression is estimated excluding the non-participants from the analysis, a sample selectivity bias is introduced into a model. Such a problem can be overcome by following a two-step procedure as suggested by Heckman (1979). Tobit model can also be used to address the above mentioned problem; but its assumption that both the participation decision and level of supply determined by the same variable in the same way introduces inconsistency bias into the model. But in reality all producers may not be potential suppliers of a product and a variable that affect participation decision may or may not have similar effect on the volume of a produce supplied to the market. Hence, Heckman's two stage estimation procedure was used in this study. The maximum likelihood estimates of Tobit model was also presented in Annex.9 for comparison purpose.

Because of the restrictions put on the values taken by the regressand, (censored from lower bound in this case) Tobit model can be called limited dependent variable regression model.

## Model specification

The censored regression (Tobit model) is appropriate when the dependent variable is censored at some upper or lower bound depending on nature of the data available. (Tobin 1958, Maddala 1983). For censoring at a lower bound, the model is:

Tobit with left-censoring at zero:

$$Y_i^* = \beta_0 + \sum_{i=1}^m \beta_i X_i + U_i \quad i= 1, 2, 3, \dots, m;$$

Where  $Y = Y^*$ , if  $Y^* > 0$ , and  $Y = 0$  if  $Y^* \leq 0$  and  $Y = \max(Y^*, 0)$

Where  $Y^*$  = market supply of poultry (dependent variable)

$\beta_0$  = an intercept

$\beta_i$  = coefficients of  $i^{\text{th}}$  independent variable ( $x_i$ )

$X_i$  = independent variable, and 'i' is 1, 2, 3,

$U_i$  = unobserved disturbance term

Where, for the  $i^{\text{th}}$  observation,  $Y^*$  is an unobserved continuous latent variable,  $Y_i$  is the observed variable,  $X_i$  is a vector of values on the independent variables,  $U_i$  is the error term, and  $\beta_i$  is a vector of coefficients. This model assumes that  $U_i$  is uncorrelated with  $X_i$  and is independently and identically distributed. The model parameters are estimated by maximizing the likelihood function of the following form;

$$L = \prod_{Y_i^* \geq 0} \frac{1}{\sigma} f\left(\frac{Y_i - \beta_i}{\sigma}\right) \prod_{Y_i^* \leq 0} F\left(\frac{-\beta_i X_i}{\sigma}\right)$$

Where  $f$  and  $F$  are respectively, the density function and cumulative distribution function of  $Y_i^*$ ,  $\pi_{y_i^*} > 0$  implied the product over those observations for which  $y_i^* > 0$ , and  $\pi_{y_i^*} \leq 0$  implied the product over those observations for which  $y_i^* \leq 0$ .

1. The marginal effect of an explanatory variable on the expected value of the dependent variable is:

$$\frac{\partial E(Y_i)}{\partial X_i} = F(z)\beta_i \quad \text{where } \frac{\beta_i X_i}{\delta} \text{ denoted by } z \text{ Maddala, (1997)}$$

Where  $f$  and  $F$  are respectively, the density function and cumulative distribution function of  $Y_i^*$ ,  $\pi_{y_i^*} > 0$  implied the product over those observations for which  $y_i^* > 0$ , and  $\pi_{y_i^*} = 0$  implied the product over those observations for which  $y_i^* = 0$ .

2. The change in the probability of market participation as independent variable  $X_i$  changes:

$$\frac{\partial F(z)}{\partial X_i} = f(z) \frac{\beta_i}{\delta}$$

3. The change in intensity of value of quantity supplied with respect to a change in an explanatory variable among sellers:

$$\frac{\partial E\left(\frac{Y_i}{Y_i^*} > 0\right)}{\partial X_i} = \beta_i \left[ 1 - z \frac{f(z)}{F(z)} - \left( \frac{f(z)}{F(z)} \right)^2 \right]$$

Where,  $F(z)$  is the Cumulative Normal Distribution of  $z$ ,  $f(z)$  is the value of the derivative of the normal curve at a given point (i.e., unit normal density),  $z$  is the Z score for the area under

normal curve,  $\beta_i$  is a vector of Tobit Maximum Likelihood estimates and  $\sigma$  is the standard error. Estimation of the whole system of the supply function would give more efficient estimates, but excluding inconsistencies or biases. Recently the commonly used technique is the well known Heckman's sample selection model (Heckmans' two step model). The disadvantage of the Tobit model is the assumption that both the decision to participate and the amount of product marketed given participation is determined by the same variables, and that a variable that increases the probability of participation also increases the amount of product marketed. This problem can be overcome using the Heckman's sample selection model where a Probit model for the participation equation is estimated and a regression model, which is corrected for selectivity bias, is specified to account the factors affecting participation decision and its impact on the level of produce marketed.

First, the probability of participation and factors affecting participation decision were specified by Maximum Likelihood Probit model, and from which inverse Mill's ratios was estimated and included as independent variable in the linear regression model to estimate the impact of participation decision on the value of volume of supply. Second-step, the estimated Inverse Mill's Ratio (IMR) was used as explanatory variable at the right hand side of the linear supply function to include the impact of participation decision on the intensity of volume of poultry supplied to the market.

The Probit model is specified as:

$$Y_i = X_i\beta_i + \varepsilon_i \quad i= 1, 2, 3 \dots\dots\dots n$$

Where:  $Y_i$  is a dummy variable indicating the market participation decision that is related as  $Y_i = 1$  if  $Y_i > 0$ , otherwise  $Y_i = 0$

$X_i$  - is the variables determining participation decision in the probit model

$\beta_i$  - is unknown parameter to be estimated in the probit regression model

$e_i$  is random error term.

Then the parameters can consistently be estimated by OLS over  $n$  observations reporting values for  $Y_i$  by including an estimate of the inverse Mill's Ratio, denoting  $\lambda_i$ , as an additional regressor to identify the impact of participation decision on the level of volume of poultry supplied to the market.

More precisely selection model is specified (second step of Heckman's two stage):

$$Y_i = X_i\beta_i + \mu\lambda_i + \eta_i; \quad \text{where } Y_i \text{ is the volume of supply}$$

Where:

$X_i$  is the explanatory variable determining the level of quantity supply

$\beta_i$  is unknown parameter to be estimated (OLS)

$\mu$  is a parameter to be estimated that shows the marginal impact of participation decision on the level quantity supply

$\eta_i$  is the error term corrected for selectivity bias

### 3.6.3. Hypothesis and variables definition

This part of the study tries to hypothesize factors that influence both the participation decision of farmers and level of poultry supplied to the market. In the course of identifying factors influencing poultry supply, the main task is to explore which factors potentially influence and how (the direction of the relationship) these factors related with the dependent variables. Therefore, potential variables, which are supposed to influence poultry market participation and intensity of volume of poultry were explained. Thus the list of variables expected to have influence on both the farmers' participation decision and volume of quantity supplied to markets was defined.

#### **Dependent Variables**

**Market participation decision (MKTPARTN):** The dummy participation decision whether to supply chicken and/or egg or not to the market and this variable is the dependent variable that is to be regressed in the first step of the Heckman's two stage estimation procedures (Probit). For the respondents who participate in chicken or egg market = 1, and = 0, otherwise in the year 2007/8.

**Value of quantity supplied (VQUTSPLD):** It is a continuous variable which represents the value (birr) of chickens and eggs supplied to the market by family members of the sample respondents in 2007/8 production year.

#### **Independent Variables**

**Distance to the nearest poultry market (DSTPLTMKT):** It is a continuous variable measured in walking time (minute) which the farmer spends to reach the nearest poultry market. If the farmer is located in a village that is further distant from the market place, he/she is poorly accessible to the market. The closer the market place the lesser would be the transportation cost and time spent. Therefore, it is hypothesized that this variable is negatively related to market participation.

**Average lagged price of poultry (AVLAGPC):** This is a continuous variable that measures annual average lagged price per bird in the year 2007/8. When poultry price is high in the market in the previous year, farmers would be interested to produce and supply more. Thus, price of bird in the previous year is expected to have positive relationship with market participation and level of marketable surplus.

**Total number of birds owned (TNBRDOWN):** It is a continuous variable and measured by the number of birds kept by members of the family during the survey period. A marginal increase in poultry production is expected to have significant effect on the value of poultry product supplied and also the producers' participation decision. The volume of poultry production is expected to have positive relationship with market participation and marketable surplus. Singh and Rai (1998) identified factors affecting marketed surplus of buffalo milk in Haryana and identify that milk production and price significantly affected marketed surplus positively.

**Age of the household head (AGHHD):** It is a continuous variable and measured in the age (years) of the household heads. This variable is expected to have negative relationship with the independent variables.

**Family size (FAMSIZ):** It is a continuous variable, measured in the total number of members of the household, which affects farmer's decisions to participate in market particularly in poultry production and marketing. Any family member might decide to participate in poultry production and marketing. Hence it is expected to have positive relationship with the dependent variable.

**Family size greater than 14 years old (FMSZ14YRS):** It is a continuous variable, measured in the number of members of the household who have greater than 14 years old. Most family members made independent decision to participate in poultry production and marketing. Hence it is expected to have positive relationship with the dependent variable.

**Size of land holding (LNDHLD):** This is the total land holding measured in hectare, which is a continuous variable and expected to have negative relationship with poultry market

participation and volume of poultry products. If the producer has small land size the probability of market participation in poultry and the amount of marketable surplus is expected to be high.

**Breed type (BRDTYP):** This variable is a dummy variable indicating the breed type of the birds that the household owned (exotic or local and/or any combination of the two breed types). The former type is more productive in terms of both egg and meat yield. But due to feed requirement and disease vulnerability farmers may prefer the local breed type. Therefore, this variable might take both negative and positive sign on market participation and marketable surplus. The households owning exotic breed = 1 and 0, otherwise.

**Sex of the household head (SEXHHD):** It is a dummy with value of 1 for men and 0 for women HHD participating in production and marketing of poultry. Female household heads have been observed to have a better tendency than male household heads to enter into poultry production and marketing business. Thus, this variable is expected to have negative relationship with market participation and volume of marketable surplus.

**Purpose of keeping chickens (PURPCKNKP):** This variable is a dummy variable and refers to whether the household keeps chicken to sell birds and egg (for business purpose) or just for home consumption purpose. For those households keeping chickens for selling purpose assigned with 1 and 0, otherwise. The purpose of keeping chickens is expected to have positive relationship with the volume of poultry supply.

**Education level of household head (EDUCHHD):** It is a dummy variable and refers to whether the household head has a formal education or not. Those household heads who have formal education determines the readiness to accept new ideas and innovations, and hence promote to get supply, demand and price information and this enhances farmers' willingness to participate and increase volume of sale. Therefore, formal education was hypothesized to positively influence market participation and marketable surplus. Holloway et al. (1999) found that education and visits by an extension agent had significant and positive effect on quantity of milk marketed in Ethiopian highlands. Out of the total household heads

interviewed, 15% of them do not have formal education and the remaining 85% have formal education.

**Extension service (EXTSRV):** A categorical variable measured in contact with extension workers for poultry production and marketing assuming extension service as a source of information on the production and marketing of the product under consideration. Previous studies revealed that efforts have been made to introduce cross breed chickens but farmers were less likely to adopt these breeds mainly due to high feed requirements and disease vulnerability. Farmers who have contact with extension workers are more likely to know the advantage of production like poultry and the availability, quality, and price of inputs and assigned with 1 and 0, otherwise. Therefore contact with extension agent is assumed to have positive relationship with market participation decision and volume of marketable surplus.

**Credit access (CRDTACS):** This is a dummy variable and measured with 1 for those farmers who take credit for the production and marketing of poultry and 0, otherwise. Access to credit would enhance the financial capacity of the farmers to purchase the necessary inputs for the production and marketing of poultry. Therefore, it is hypothesized that credit use for poultry keeping and marketing would have positive influence on market participation and volume of poultry supplied.

**Income from non-farm activity (NFRMINC):** It is a continuous variable that show the amount of income obtained from non-farm activities undertaken by the household members. This income might strengthen their farming bussiness or might become reluctant to keep poultry in favor of other farming activities. However, getting income from non farming activities may be used to purchase inputs for poultry business. Thus, this variable is assumed to have direct or inverse relationship with market participation and volume of supply.

**Market information (MRKTINF):** It is a dummy variable and assigned with 1 for those households who access marketing information and 0, otherwise. Farmers marketing decisions are based on market price, supply and demand information, and poorly integrated markets may convey inaccurate and inadequate information on price, demand and supply, leading to

inefficient production and marketing decisions. Therefore, it is hypothesized that market information is negatively related to market participation and marketable surplus.

**Feed supplement (FDSPLT):** It is a dummy variable and assigned 1 for those farm households who supplement feed for their chicken and 0, otherwise. Food supplementation for scavenging local chickens would significantly improve the productivity of local breeds. Thus, this variable is expected to positively influence the market participation and level of supply.

**Off-farm income (OFRMINC):** It is a continuous variable and measured with the annual income earned (birr) by the households members from off-farm activity. This income might strengthen their farming business or might become reluctant to keep poultry in favor of other farming activities. However, getting income from off-farm activities might be used to purchase inputs for poultry business. Thus, this variable is assumed to have direct or inverse relationship with market participation and volume of supply.

**Income from farming (INCFRMG):** It is a continuous variable and measured with the annual income earned (birr) by the households from farming activity within their land holding. Poultry production and marketing is not considered as an independent business activity by most rural farm families and hence higher farming income is expected to adversely affect the farmers participation in poultry marketing and level of supply.

**Years of experience in farming (EXPFRMG):** It is a continuous variable; measured in the number of years that the household head spend in farming business. Higher experience in farming business may favor farming activity than poultry business. Hence, this variable is expected to have adverse impact on the participation on and volume of chickens and egg supplied to the market.

## **4. RESULTS AND DISCUSON**

In this chapter, chicken and egg production and marketing, socio-economic and demographic characteristic of farmers and chicken and egg traders had been discussed. Production and marketing support services of extension, input supply, and credit and information access had also been discussed. Furthermore, the structure, conduct and performance of chicken and egg marketing, profitability of chicken keeping, determinants of chicken and egg supply had been discussed.

### **4.2. Results of Descriptive Analysis**

#### **4.2.1. Socio-demographic characteristic of farmers**

The result of this finding showed that 6 and 1 percent of the sample respondents were female headed in Dale and Alaba woreda respectively. Sex of the household head in the two woredas has significant difference at 10 percent significance level. The respondents in Alaba woreda implied that there is a possibility of having more than one wife in Muslim community and close relatives can marry women who do not have husband to protect the wealth and children of the family. This might be the source of variation as 4 and 96 percent of the household are Muslims in Dale and Alaba woreda respectively. Family size also showed variation at 10 percent significance level due to the same reason (5.8 in Dale and 6.3 in Alaba). Education level has shown strong variations between the woredas in favor of Dale woreda. Only five percent of the respondents in Dale woreda are illiterate whereas it is 25% in Alaba. Religion in the two woreds has clear boundary at 1% significance level. In Alaba woreda 96% of the sample respondents are Muslims whereas 91% of the respondents in Dale woreda are protestant. The average age of sample respondent in Dale and Alaba are 39 and 36 years respectively. Regarding marital status more respondents in Alaba woreda are married (95%) than Dale woreda (93%). Table-1 presents the demographic characteristics of sample respondents (farmers) in Dale and Alaba woredas.

Table 1. Demographic characteristics of sample households (farmers)

Variables		Woreda			$\chi^2/t$
		Dale	Alaba	Total	
Sex (HHH)	Male	94	99	193	3.701*
	Female	6	1	7	
Age (HHH)	Mean	39.07	36.02		2.194**
Family size	Mean	5.806	6.341		-1.647*
Education level	Illiterate	5	25	30	34.824***
	Read and write	19	13	32	
	1-6 grade	38	53	91	
	7-12 grade	38	9	47	
Religion	Ort. Christian	2	4	6	179.307***
	Muslim	4	96	100	
	Catholic	3	0	3	
	Protestant	91	0	91	
Marital status	Single	1	4	5	5.488*
	Married	93	95	188	
	Divorced	1	0	1	
	widowed	5	1	6	

Source: Own computation

\*\*\*, \*\*, \* show level of significance at 1, 5 and 10 percent

Annex 2 presents the distribution of sample households by the age of family members. In Alaba woreda there are more family members (both sex) under 14 years age at 1 percent significance level. There are also variations in family members between the age of 14 to 64 at 1 percent level of significance for males and 5 percent level of significance for females.

Annex.1 presents family size by age and sex distribution as these variables are hypothesized to have an impact on chicken production and marketing decision making. The two woredas have statistically significance difference in all categories of age and sex.

Ownership and decision making in bird keeping and marketing is not limited to the head of the household unlike other livestock. According to the result presented in Annex 3 significant portion of the birds in the sample household are owned by females and children (both male and female). Annex 2 revealed that mother, father, male children and female children are owner and decision makers of bird production at the ratio of 5:4:2:1 respectively. Mothers owned more hatchery (25.5%) and hen (32%) than fathers (13.5%, 22%) and the difference might indicate mother's interest in the production of chickens and egg to fulfill immediate cash need and nutrition requirements of the family.

#### **4.2.2. Source and income level of farmers**

Most farmers in the study area earn their entire income only from agriculture. According to the result presented in Table 2, 78 and 88 percent of the sample households earn their total annual income from agricultural activities. More farmers in Dale woreda integrate trading and other economic activities with their agriculture than farmers in Alaba woreda. The annual average income of farmers in Alaba woreda is about 6570 birr that is much larger than farmers in Dale woreda which is 3244 birr. This variation might be due to the high population density and their better involvement in non agricultural activities among other potential reasons. The annual revenue from poultry production cannot be undermined. Most farmers replied that they do not have clearly stated purpose regarding the intention of poultry keeping. But the figures presented in Table 4 can prove the contribution of the subsector for the betterment of the livelihood of the rural poor relative to the low financial and labor investment.

Table 2. Source and income level of farmers

Variables	Item	Woreda		Total	$\chi^2/t$
		Dale	Alaba		
Main source of income	Farming	78	88	166	5.1*
	Trading	16	11	27	
	Others	6	1	7	
Annual revenue from	Farming	3244.3	6569		-5.7***
	Poultry production	805.9	208.9		3.65***
	Off-farm income	1140	2478		-2.13**
	Non-farm income	2293.78	1566		

Source: Own computation

\*\*\*, \*\*, \* show level of significance differences at 1, 5 and 10 percent confidence level

#### 4.2.3. Flock size and breed composition of bird in the sample household

Flock size and breed composition of birds in rural and small scale farmers highly depend on the accessibility of input, housing, disease incident and purpose of bird keeping among others. Sonaiya and Swan (2004) stated most common flock size of family poultry ranging from 5 to 20 birds seems to be the limit that can be kept by a family without special inputs in terms of feeding, housing and labor. The average flock size per family in Dale woreda is about 27 and that of Alaba woreda is about 17 for both local and exotic breeds. The independent sample t test showed that these two means show significance difference at 1 percent significance level. Table 3 presents the flock characteristics of birds by age category, breed type and sex for the sample households between the two woredas. Hatchery flock size (both local and exotic) shows strong variation (<0.01 significance level) in the two woredas. Cock, hen, cockerel, pullet and hatchery ratio kept by the sample respondent is 1:2:1:4:3.

Table 3. Flock characteristics and breed composition of bird

Breed type	Woreda	N	Mean	Std. Deviation	t-test
Hatchery local	Dale	47	5.17	4.65	-4.171***
	Alaba	55	9.94	6.56	
Hatchery exotic	Dale	34	45.70	12.93	15.53***
	Alaba	6	4.50	3.56	
Pullet local	Dale	48	3.87	3.33	0.734
	Alaba	51	3.45	2.29	
Pullet exotic owned	Dale	6	10.00	19.60	1.965**
	Alaba	20	1.80	.62	
Cockerel local	Dale	24	2.66	1.76	-1.217
	Alaba	36	3.25	1.90	
Cockerel exotic	Dale	4	2.00	1.41	0.917
	Alaba	19	1.57	.692	
Hen local	Dale	78	3.76	3.07	1.942**
	Alaba	78	3.01	1.55	
Hen exotic	Dale	18	3.11	1.60	-0.638
	Alaba	21	4.33	7.97	
Cock local	Dale	39	2.20	-1.36	
	Alaba	63	2.74		
Cock exotic	Dale	7	1.85	1.49	
	Alaba	9	1.11		
Total number of bird	Dale (96)		26.93	26.63	3.022***
	Alaba (84)		17.28	12.95	

Source: Own computation

\*\*\*, \*\*, \* show level of significance differences at 1, 5 and 10 percent confidence level

N: Represents number of sample respondents

### **4.3. General Characteristics of Village Poultry Production**

#### **4.3.1. Ownership and decision making role**

Ownership and decision making ability in the production and marketing of birds and eggs within the household in the study area is diverse and independent. All household members including male, female and children are owners and decision makers in the production and marketing of birds and eggs. From the farmers survey the respondents replied that owners and decision makers in bird production and marketing include the household head spouse, and children at the ratio of 5:4:3 respectively.

#### **4.3.2. Feeding structure**

In most parts of the country indigenous birds are left aside to find their feed requirement on free ranges and scavenge what they find elsewhere. From the total sample households' 45% of them responded that they supplement left over grains for birds. But discussions with farmers revealed that the supplementation is irregular and highly depends on the availability of grains. Out of the total sample households 26 and 2 percent in Dale and Alaba woredas respectively, purchase grain and compound feed in various mix to supplement their birds (Table 12). The remaining 14% replied that they entirely left their birds aside to scavenge from free range and waste disposals elsewhere in the surrounding. According to the information obtained from sample respondents the diversity of ownership within the family members discourages the purchase of supplementary feeds as most of bird owners have not separate day and night time housing so that birds compete for what they are supplied with.

#### **4.3.3. Diseases management and housing**

Discussions with the development agents and agricultural bureau experts revealed that Newcastle disease is the most frequently observed diseases in the study areas. Red-pepper and lemon with water are supplied for the chickens in the time of diseases outbreak without consultation with veterinary officers due to the difficulty of getting the service. Lack of

knowledge among bird keepers on modern drugs availability, inadequate resources to seek for veterinary advisory, Existence of traditional knowledge on poultry diseases management are the possible bottlenecks in the sub-sector regarding disease management. More than 72 percents of the respondent replied that they do not have separate day and night time house and birds spent the whole day elsewhere searching for feed for survival making diseases transmission substantial and severe.

#### **4.4. Productivity and Profitability of Village Poultry Keeping**

##### **4.4.1. Productivity of village poultry keeping in the Study Area**

Poultry is kept in most farm households without clearly defined purpose by most producers. Ownership and decision making in this subsector is also diverse and independent. Understanding the exact purpose of poultry keeping in rural family has a paramount importance in the development of the subsector. Tadelles (2002) decomposes the major uses and benefits of poultry and egg in rural Ethiopia into egg for hatching (51.8%), sale (22.6%), home consumption (20.2%) and birds produced for sale (26.6%), sacrifice for ceremonies (25%), stock replacement (20.3%) and home consumption (19.5%). This decomposition cannot reflect the ultimate purpose of why farmers are keeping poultry because the activities are not scheduled before the production decision. Village poultry production system is also characterized by low input-output ratio. Birds are left to scavenge what they find elsewhere and given minimal or virtually nothing to supplement their daily feed requirements. Most respondents in the study area replied that the supplements include home leftover wastes, grains that cannot be used for home consumption and anything they find irregularly. Under such management condition village poultry lay 40-60 eggs per hen per year (Tadelles, 2002). The same source also revealed that this low productivity is a factor of high mortality rate, low hatchability, and long broodiness time of local breeds. Table 4 shows the productivity of local breed under smallholder production management system in the study area. The mean egg production of local birds under smallholders' management system is 58 eggs per annum per bird in the study area. This figure is very low when compared to the production potential of

exotic breeds which is 250 eggs per annum per bird. This figure (local chickens egg productivity) can be improved to 100 eggs per annum per bird and ten clutches per annum under semi intensive management system (Tadelle and Ogle, 1996). About fifty percent of the loss in the eggs incubated by local chicken is due to the low hatchability rate and low survivability rate of local hatcheries.

Table 4. Productivity of village poultry keeping in the study area

Item	N	Minimum	Maximum	Mean	Std. Deviation
Average egg laid per bird per annum (local breed)	99	30	120	57.9	12.4
Length of broodiness time/ clutch	30	5	60	18.3	8.88
Number of clutches per year	79	3	10	4.67	1.1
Number of eggs hatched per clutch	70	4	18	11.24	2.6
Proportion of eggs hatched successfully per clutch	51	4	15	8.67	2.2
Survivability rate per clutch	16	3	10	6.8	1.8
Total number of bird owned (local)	149	1	56	14.1	10.66
Chickens dead in 2000 (local)	122	0	18	5.2	4.3

Source: Own computation

N: Represents the number of sample respondents

However, the input-output ratio of village poultry keeping is minimal, the production system is still economical under the smallholder management condition with virtually minimal or nil input cost. The productivity of the production system can be significantly improved by small supplementation of feed, decreasing mortality rate by introducing day and night time housing, and improving the veterinary service. Tadelle and Ogle (1996c), pointed out that it is possible to achieve daily production per hen over 30% using a supplement of 30g/day maize and 30g/day noug cake, to 28% from 30g/day maize. According to Udo et al. (2001) housing, NCD vaccination, feed supplementation and control of broodiness showed greatest increase in flock size.

#### **4.4.2. Cost structure and profitability of village poultry keeping**

Cost component of village poultry keeping is mostly related with the production constraints like high mortality rate of chicks, low hatchability, diseases (particularly NCD), long broodiness time of local birds and the cost of stock replacement. Other input costs like feed, labor, housing, and veterinary costs (if any) would have been analyzed to compute the profit level of the subsector even if these cost categories contribute less in the subsector under small holders production system. The profitability of village poultry keeping here is assessed by studying the cost and revenue for a hypothetical producer who owns the average number of birds kept in the sample households in each flock composition for one year production period. According to the result obtained in Table 5, the cock, hen, cockerel, pullet and chick composition of the sample respondents is 1:2:1:4:3 and this figure is used as a stock (starting capital) in the start of production year in which the profitability of poultry is undertaken. Productivity of village poultry keeping is also revealed in Table 5. The profitability analysis is undertaken in each stage in bird and egg production cycle including hatching egg layer, chicks keeping, table egg layer and, growers stage and cocks for one year interval based on the productivity of village bird keeping in the study area presented in Table 5. The finding is in line with the finding of Udo et.al. (2001) and Tadelles and Ogle (1996) in that most cost component of the subsector is attributed to death caused by disease, predation, long broodiness time and low productivity of local breeds, and low input base production system. But the profitability analysis proved that the subsector is still profitable and attractive as it requires less capital and input that are most common constraints in most investment decisions of rural community in particular and the country as a whole. According to the analysis the subsector provides about 100 percent net profit of the initial investment cost. The profitability of poultry keeping can also be improved significantly by making improvements in the management and input utilization.

Table 5. The cost structure and profitability of village poultry keeping (in birr)

Flock composition	No	Cost/revenue Items in Birr	Unit cost	Total no	Total cost (-)	Unit price	Total no	Total revenue (+)
Hatching hen\Hatchery	1	Stock cost	0.9	17.4	15.66	-	-	-
	2	Feed cost	3.0	5Kg	15	-	-	-
	3	Labor cost	-	-	1.5	-	-	-
	4	Hatchability loss	0.9	5.94	5.346	-	-	-
	5	Death loss<6week	2.75	4.8	13.2	-	-	-
	6	Revenue (sale)=<6 week	-	-	-	8.5	17.4	147.9
Subtotal=a			-	-	50.71	-	-	147.9
Pullet and cockerel/ broilers	1	Stock cost	8.5	23.8	202.3	-	-	-
	2	Labor	-	-	-	-	-	-
	3	Feed cost (Birr/Kg)	3	7.5	22.5	-	-	-
	4	Death loss =<12 weeks	12	2.2	26.4	-	-	-
	5	Revenue=<12 week	-	-	-	23.5	21.6	507.6
Subtotal=b					251.2			507.6
Hen/laying/ table egg production	1	Stock cost	23.5	15.2	357.2	-	-	-
	2	Feed cost	3.5	7.5	26.25	-	-	-
	3	Housing cost	4	7.5	30.0	-	-	-
		Cost (death)	21.5	4	86	-	-	-
	4	Revenue from sale egg	-	-	-	0.9	510.2	459.18
5	Revenue sale of birds	-	-	-	19.0	11.2	212.8	
Subtotal=c					499.6			671.98
Keeping cockrels	1	Stock cost	27	9.98	269.46	-	-	-
	2	Feed cost	3.5	4.5	15.75	-	-	-
	3	Cost due to death	-	-	-	-	-	-
	4	Revenue (sale)	-	-	-	32.0	9.98	319.36
Subtotal=d					285.21			319.36
Cost of veterinary service=e			25	1	25	-	-	-
Gross total=a+b+c+d+e					1111.7			1646.84
Net profit							535.12	

Source: Own computation

## **4.5. Farmers' Access to Business Support Services**

Access to business support services for all actors in the marketing chain is pivotal to make the chain actors and the market chain as a system competitive so that producers, intermediaries and end users of goods and services can make the best use out of it. In this section support services of extension, credit, input supply and marketing in poultry sub-sector have been assessed and evaluated by farmers.

### **4.5.1. Farmers access to credit**

Competitive financial market is a fundamental in undertaking each and every economic activity in order to get the maximum benefit out of the activity undertaken. Formal financial market in most developing countries is not competitive and even nonexistent in the rural areas. Farmers in rural areas of Ethiopia get most of their financial requirements from informal money lenders and relatives at higher interest rate. Formal credit access and sources of the credit for the poultry keeping and marketing in study areas are described in Table 6. About 49 % of the sample respondents in Dale and 32% in Alaba special woreda replied that they do not want credit for poultry keeping and marketing in the year 2000. Most of these farmers added that they never consider poultry keeping and marketing as an independent business and they do not have schedule for bird keeping and marketing unlike other economic activities. There is significance difference ( $<0.05$ ) in farmers credit need between the two woredas. This might be due to the introduction of exotic breed day old chicks in credit (kind) in Dale woreda by IPMS project (NGO). Credit taken for poultry keeping in 2000 also shows significant difference ( $<0.01$ ) between the two woredas for the same reason.

Table 6. Farmers' access and source of credit for poultry production and marketing

Variables	Item	Woreda		Total	$\chi^2/t$
		Dale	Alaba		
Did you need credit for poultry in 2000?	Yes	49	32	81	5.61**
	No	47	62	109	
Did you take credit in 2000?	Yes	36	2	38	35.633***
	No	59	87	146	
Source of credit	NGO	35	0	35	24.629***
	Relatives & friends	1	2	3	
How much did you take?	Mean	873.7	220		3.441***

Source: Own computation

\*\*\*, \*\*, \* show level of significance differences at 1, and 5 percent confidence level

Farmers were also asked to evaluate their credit access for the production and marketing of poultry. The evaluation criteria include availability of credit access, timeliness of credit, repayment duration and relevance of the credit. Table 7 presents farmers evaluation of the service for the aforementioned criterion. Regarding the availability of credit access about 35 percent of the respondents strongly agree that availability of credit service is poor. About 61% of the respondents agree that credit access is not available. Farmers in Dale woreda reply that they receive credit in the year 2000 E.C. But the repayment duration was fixed and they were asked to repay the entire amount at a time. Those farmers who take credit were also asked to evaluate the service in relation to its timeliness and most of them agreed that the credit taken was not timely. They also evaluate the service in terms of the repayment duration and adequacy and most of the service users agreed that it was not satisfactory. Farmers from Dale woreda replied that the credits they take were relevant and they benefit out of it even if they were asked to repay within a short period of time so that they unable to adopt the technology.

Table 7. Farmers evaluation of credit service access for poultry keeping and marketing

Variable	Item	Woreda		Total	$\chi^2$
		Dale	Alaba		
Evaluation of credit availability	Strongly disagree	19	21	40	4.037693
	Disagree	35	34	69	
	Neutral	4	0	4	
Evaluation of credit timeliness	Strongly disagree	10	5	15	2.195122
	Disagree	26	15	41	
	Neutral	4	0	4	
Evaluation of credit repayment duration	Strongly disagree	9	0	9	5.96129
	Disagree	19	11	30	
	Neutral	2	0	2	
	Agree	1	0	1	
Evaluation of credit relevance	Strongly agree	9	1	10	1.435376
	Agree	15	4	19	
	Neutral	2	0	2	
	Agree	2	0	2	
Evaluation of credit adequacy	Strongly disagree	5	0	5	1.851852
	Disagree	14	4	18	
	Neutral	2	0	2	

Source: Own computation

Farmers also pointed out that major the problems in credit service include absence of formal credit access, inconsistent supply, farmers afraid taking credit and lack of collateral are the most frequently mentioned problems among others (Table 8).

Table 8. Problems in credit service for the production and marketing of poultry

Variable	Item	Woreda			$\chi^2$
		Dale	Alaba	Total	
Major problems in credit	Afraid of taking credit	1	5	6	34.46***
	Inconsistent	17	2	19	
	No formal credit institution	40	60	100	
	No collateral	0	5	5	

Source: Own computation

\*\*\* Show level of significance differences at 1, 5 and 10 percent confidence level

#### 4.5.2. Farmers access to extension service

Now a day agricultural experts are trained and assigned at the lower administrative level “kebele” to assist farmers to improve productivity and competitiveness so that earn better income and improve their livelihoods. Extension service here is assessed and evaluated based on the frequency of farmers contact with the development agent and how farmers are evaluating and measuring the quality and relevance of the service they get from the experts. In Ethiopia these services are provided by ministry of agriculture and rural development and other nongovernmental organizations (NGOs) to equip farmers with technological know how and information access so that they can better utilize their scarce land and labor resources to improve their productivity and competence. The type and frequency of these services are described by the sample farm households as shown in Table 9. About 76 and 57 percent of the respondents in Dale and Alaba “special” woredas respectively get extension service for poultry production and marketing in the year 2000EC.

Table 9. Extension service coverage between the two woredas

Variables	Item	Woreda			$\chi^2$
		Dale	Alaba	Total	
Did you get extension service for poultry production?	Yes	76	57	133	11.602***
	No	18	41	59	
Who provide the service?	BOARD	39	42	81	6.844***
	NGO & BOARD	37	15	52	
How often did you contact the development agent?	Once a week	27	8	35	8.012**
	Monthly	22	25	47	
	Twice a week	23	20	43	
What was the extension advice on?	Production	28	30	58	9.21*
	Credit facilitation	5	0	5	
	Marketing facilitation	5	4	9	
	All the above	28	13	41	
Have you ever attend demonstration field day?	Yes	15	4	19	7.24***
	No	76	88	164	

Source: Own computation

\*\*\*, \*\*, \* show level of significance differences at 1, 5 and 10 percent confidence level

Extension service access for poultry production and marketing shows statistically significant difference ( $<0.01$ ) between the two woredas. The variation is the resultant involvement of IPMS-ILRI project in the subsector in Dale woreda along with the woreda bureau of agriculture and rural development (BOARD) in the survey year. This also improves the frequency of farmers contact with the development experts in Dale woreda than Alaba “special” woreda at significance level of 5 percent. The extension advice that was given for farmers includes advice on production, credit facilitation and marketing facilitation among others. Farmers from Dale woreda also better enjoy visiting demonstration field day than farmers of Alaba special woreda. Table 10 presents farmers evaluation of extension services they get on the production and marketing of poultry.

Table 10. Evaluation of Extension service by farmers

Variable	Item	Woreda		Total	$\chi^2$
		Dale	Alaba		
Evaluation of extension service relevancy	Disagree	7	9	16	0.5296
	Neutral	17	17	34	
	Agree	38	33	71	
	Strongly agree	28	27	55	
Evaluation of extension service timeliness	Disagree	25	32	57	15.748***
	Neutral	31	23	54	
	Agree	31	16	47	
	Strongly agree	2	14	16	
Evaluation of extension service effectiveness	Strongly disagree	1	3	4	5.21
	Disagree	35	43	78	
	Neutral	15	14	29	
	Agree	31	18	49	
	Strongly agree	7	7	14	
Evaluation of extension service adequacy	Strongly disagree	8	1	9	9.0579*
	Disagree	40	46	86	
	Neutral	28	20	48	
	Agree	10	10	20	
	Strongly agree	2	6	8	

Source: Own computation

\*\*\*, \*\*, \* show level of significance differences at 1, 5 and 10 percent confidence level

According to the result presented in Table 11 more than 66% and 60% of the respondents in Dale and Alaba woreda respectively agree that the extension service related to the subsector is relevant and they are interested to get the service if accessible. The farmers also evaluate the service in terms of its timeliness, effectiveness and adequacy and most of them replied that the service is not satisfactory regarding the above evaluation criteria. And they exhaustively list problems of the service in Table 11 below.

Table 11. Major problems in extension service for the production and marketing of birds

Items	Woreda			$\chi^2$	
	Dale	Alaba	Total		
Problems in extension service	The service is not consistent	30	16	46	25.77***
	Inefficient in transfer of technology	5	6	11	
	The service not focus on input supply and credit facilitation	33	59	92	
	Less weight is given for the sub sector	5	1	6	
	Poor infrastructure	5	10	15	
	No demonstration site	3	0	3	

Source: Own computation

\*\*\*, \*\*, \* show level of significance differences at 1, 5 and 10 percent confidence level

The most frequently mentioned bottleneck in extension service is its failure to integrate input supply and credit facilitation in the package. Inconsistency and inefficiency are also mentioned as constraint in extension service provision for the sub sector. The service also gives less weight for the production and marketing of village poultry than other crop and livestock. Poor infrastructure and absence of demonstration sites have paramount importance for the success of the business support services to impact the competence of the subsector.

#### 4.5.3. Farmers access to input supply

Farmers were asked to list and evaluate the type, source, adequacy, and efficiency of input supply in the woredas. The following table summarizes the farmers' responses for the input supply system in the two woredas. This input supply system includes all input types used for the production and marketing of both local and exotic chickens. This input supply system includes all input types used for the production and marketing of both local and exotic chickens. More families in Dale woreda have better access for inputs for exotic birds

including chicks and pullet for stock establishment along with the credit, feed and veterinary service than farmers in Alaba. This is due to the fact that the involvement of the nongovernmental organization (ILRI-IPMS) among others potential possibilities in provision of full package of inputs for exotic bird keeping in selected five kebeles of Dale woreda in the study year.

Table 12. Farmers access of input supply for bird keeping

Variable	Item	Woreda			$\chi^2$
		Dale	Alaba	Total	
Did you have exotic chickens?	Yes	46	36	82	1.8136
	No	48	56	104	
Source of the exotic chickens?	Board	10	27	37	40.727***
	PA market	1	4	5	
	Woreda market	2	2	4	
	NGO	29	0	29	
Mode of purchase of the exotic chickens	Cash	11	27	38	38.65***
	Credit	34	0	34	
Source of local chicks	Local market	51	43	94	5.596*
Mode of purchase of the local chickens	Cash	49	36	85	0.0967
	Credit	2	1	3	
Did you supplement feed?	Yes	75	60	135	5.128**
	No	25	40	65	
Did you get veterinary service?	Yes	41	16	57	14.751***
	No	58	81	139	
Did you have separate shelter for you chickens?	Yes	29	4	33	22.618***
	No	60	83	143	
What was the major feed for the chickens?	Scavenging	10	18	28	51.636***
	Scavenging & grain	46	53	99	
	Compound feed	9	0	9	
	Scavenging & compound feed	26	2	28	

Source: Own computation

\*\*\*, \*\*, \* show level of significance differences at 1, 5 and 10 percent confidence level

Source of inputs and mode of purchase of these inputs for exotic chicken production shows significant variations between the two woredas ( $<0.01$ ) percent level of significance. In Dale woreda about 69% of the respondents confirmed that the source of these inputs was NGO where as this figure is 0% in Alaba woreda. About 82% of the respondents replied that the source of the input was bureau of agriculture and rural development and this figure was about 30% in Dale woreda. This might be the reason for the high variation in the average flock size between the two woredas that is 17 in Alaba and 26 in Dale woreda (Table 3). With regard to feed supplementation and availability of housing services, farmers in Dale woreda are better accessing the service due to the same reason mentioned above. Furthermore, farmers in Dale woreda are in a better position in supplying their birds a combination of grain and compound feed beside the traditional free ranging system. Table 13 summarizes farmers' evaluation of input supply system for the production and marketing of birds in the study area. The evaluation criterion includes availability, adequacy, price and timeliness of inputs for both local and exotic bird keeping. Most farmers in both woredas do not hesitate the input supply system for local bird keeping. This is because of the fact that farmers do not consider village poultry keeping as an independent business and birds are left aside to fulfill their feed requirements. Local birds also have better performance in surviving harsh environmental condition and disease. But regarding exotic bird input supply, most farmers are strongly opposing the service as the breeds require much more inputs than the local ones. The exotic input supply was strongly challenged interms of price, adequacy and timeliness of the service in Dale woreda. This is because of their exposure to evaluate the exotic birds for their intensive input requirement and the corresponding benefit out of it.

Table 13. Farmers' evaluation of input supply for poultry production

Variable	Item	Woreda			$\chi^2$
		Dale	Alaba	Total	
Evaluation of local chicken input availability	Strongly disagree	29	20	49	8.5*
	Disagree	4	9	13	
	Neutral	19	7	26	
	Agree	33	37	70	
Evaluation of local chicken input adequacy	Disagree	9	9	18	0.71
	Neutral	16	14	30	
	Agree	53	46	99	
	Strongly agree	6	3	9	
Evaluation of exotic chicken input availability	Strongly disagree	21	14	35	1.34
	Disagree	54	52	106	
	Neutral	7	4	11	
Evaluation of exotic chicken input adequacy	Strongly disagree	16	8	24	6.36
	Disagree	45	32	77	
	Neutral	20	22	42	
Evaluation of local chicken input price	Agree	43	34	77	12.53**
	Disagree	9	16	25	
	Neutral	27	13	40	
Evaluation of exotic chicken input price	Strongly disagree	17	1	18	33.54***
	Disagree	48	21	69	
	Neutral	11	21	32	
	Agree	6	9	15	
Evaluation of exotic chicken input timeliness	Strongly disagree	27	2	29	25.76***
	Disagree	43	38	81	
	Neutral	9	14	23	
	Agree	4	12	16	

Source: Own computation

\*\*\*, \*\*, \* show level of significance differences at 1, 5 and 10 percent confidence level

The problems associated with input supply system for local and exotic bird keeping is summarized in Table 14. According to the result most farmers in both woredas stated that the input supply system for exotic breeds is poorly developed or nonexistent and characterized by high price and inconsistent availability if it exists. The input supply system for local breeds is also poor and inconsistent in availing inputs like compound feed and veterinary services that cannot be found in local market places. Even if it existed, characterized by high price and found in long distance from the farmers resident. This poorly developed input supply system can have adverse effect in the productivity and profitability of the subsector. This also makes the marketing system function inefficiently to coordinate the flow of birds and eggs between the production and consumption points.

Table 14. Problems in input supply for chicken keeping

variable	Items	Woreda		Total	$\chi^2$
		Dale	Alaba		
N		85	75	160	
Problems in input supply	Absence of input for exotic breeds	41	40	81	22.7***
	Absence of inputs for local breeds	13	14	27	
	High input price	8	2	10	
	Absence of veterinary service	7	1	8	
	Exotic input not timely	1	4	5	
	Inconsistent input supply and poor supervision	9	1	10	

Source: Own computation

\*\*\*, \*\*, \* show level of significance differences at 1, 5 and 10 percent confidence level

#### **4.5.4. Farmers access to market and market information**

Market places in rural areas are often characterized by long distance and considerably long time interval between two market days. These characteristics of rural marketing system obviously adversely affect the transaction of goods and services by rural households. This in turn affects the farmers' production and marketing decision of goods and services. Table 17 presents the market access and farmers evaluation of bird and egg marketing system in the study area. Many past works in the production and marketing of poultry stated that the activities undertaken in this subsector involve the active participation of women and children. These groups of the society are believed to participate in other activities like production and reproduction responsibility of women and children are expected to enroll school which is also far away from home in many rural areas. So that understanding of the situation of the poultry marketing system in the study area is crucial in analyzing the production and marketing behavior of owners and decision makers of village bird keepers.

About 70% of the total sample respondents engaged in the marketing of bird and egg in the survey time (Table 15). In order to arrive the nearest poultry market, producers must walk about 10Km distance and trade their birds and egg at a market which function once or twice a week mostly (Table 15). Almost all sample markets were starting at the afternoon that imposes tension on the market participants as they walk long distance back to home. Table 13 summarizes the action taken by each participants when they unable to sale what they bring to the market. About 45%and 25% of the respondents replied that their bird that is not sold at the market took back home and sold at lower price respectively. About 46%and 36% of the respondents replied that their egg that is not sold took back home and sold at lower price respectively. According to the result obtained most poultry owners are price takers and price is set by negotiation of the parties that lead to increase the bargaining power of the buyers depending on the time of sale. Above all most sellers (69%) do not have price information of another market before they transact their produce. Lack of market access and absence and/or asymmetric information are the major constraints mentioned in deciding how much to produce and supply to the market.

Table 13. Chicken and egg marketing behaviors of households in the two woreda

Variables	Item	Woreda		Total	$\chi^2$	Woreda		Total	$\chi^2$
		Dale	Alaba			Dale	Alaba		
		Egg Marketing				Chickens Marketing			
Did you sell eggs /Chickens in 2000	Yes	70	69	139	0.2677	69	72	141	0.2217
	No	22	18	40		30	27	57	
Chickens/ eggs not sold in a market day	Took back home	10	23	33	4.826	21	24	45	0.7547
	Took another market	5	6	11		10	15	25	
	Sold at lower price	14	12	26		11	13	24	
Who set selling price of Chickens/ egg?	Sellers	28	37	75	12.9**	13	50	63	38.57***
	Buyers	33	18	51		55	20	75	
How the selling price of Chickens/ egg set?	By demand and supply	27	38	65	2.2319	30	46	76	5.21**
	Negotiation	39	34	73		43	31	74	
Did you know Woreda price before you sold?	Yes	63	48	111	3.112*	53	45	98	0.2486
	No	19	27	46		30	30	60	
Did you know awassa price before sold?	Yes	0	3	3	2.898*	3	2	5	0.236
	No	70	71	141		69	72	141	
Difficulty getting' buyers	Yes	27	17	44	2.187	27	17	44	2.187
	No	53	57	110		53	57	110	
Reason of difficulty	Inaccessibility of market	11	2	13	17.18***	11	2	13	17.187***
	Lack of information	8	0	8		8	0	8	

Source: Own computation

There is significance difference between the two woredas in price setting strategy that is who and how price is set in the chicken market at 1 and 5 percent significant level respectively. In general egg marketing was better functioning in terms of price setting and information on the price before sold. Some bird sellers replied that the variation between egg and bird marketing is due to the fact that the demand for bird is not consistent as that of the egg demand and also they afraid to return back birds once they are supplied to the market due to diseases transmission to birds that are left at home.

Table 16. presents the farmers evaluation of market access for the production and marketing of birds and egg. Friend farmers, personal observation and traders are the most important source of information on price, supply and demand of birds and eggs. Farmers were also asked to evaluate information access in terms of reliability, adequacy and timeliness of the information regarding price, supply and demand of birds and eggs and most of them agree that the information was reliable but they added that the service was not consistent and adequate. Information access in Dale woreda is in a better position than in Alaba at high level of significance ( $<0.05$ ) because Alaba woreda is larger than Dale woreda in geographic area so that market places are far away from the farmers resident. Most farmers (69%) do not get price information so that they were neutral to evaluate the market access. According to the result presented in the Table 16 information access is generally dependent on market access that in turn depend on distance of the market place to resident. Based on the above analysis one can conclude that proxy of market places, infrastructure development and information access have significant implication on the production and marketing decision of rural households.

Table 16. Source and farmers' evaluation of market information

Variable	Category	Woreda				Woreda			
		Dale	Alaba	Total	$\chi^2$	Dale	Alaba	Total	$\chi^2$
		On Supply				On Demand			
Source of information	Traders	22	8	30	13.8**	17	5	22	10.5**
	Observation	27	21	48		17	14	31	
	Friend farmer	29	44	73		42	53	95	
Source of information on price	Traders	20	10	30	13.32**	20	10	30	13.3**
	Observation	16	19	35		16	19	35	
	Friend farmer	35	44	79		35	44	79	
Reliability of information	Disagree	6	5	11	4.59	18	33	51	9.45*
	Neutral	23	22	45		21	14	35	
	Agree	44	47	91		40	27	67	
Reliability of information on price	Strongly disagree	3	6	9	16.1**	3	6	9	16.1**
	Disagree	8	12	20		8	12	20	
	Neutral	18	31	49		18	31	49	
Adequacy of information	Agree	43	22	65		43	22	65	
	Strongly agree	9	2	11		9	2	11	
	Disagree	8	27	35	35***	5	21	26	35.9***
Timeliness of information	Neutral	21	31	52		27	38	65	
	Agree	47	12	59		42	10	52	
	Strongly disagree	3	2	5	17.7***	3	0	3	33.4***
Timeliness of information on price	Disagree	11	27	38		11	29	40	
	Neutral	26	26	52		22	30	52	
	Agree	38	14	52		42	9	51	
Timeliness of information on price	Strongly disagree	3	6	9	28.7***	3	6	9	28.7***
	Disagree	12	17	29		12	17	29	
	Neutral	18	37	55		18	37	55	
	Agree	41	9	50		41	9	50	

## **4.6. Structure, Conduct and Performance of Poultry Marketing System**

### **4.6.1. Structure of poultry marketing system**

#### **4.6.1.1. Demographic characteristics of bird and egg traders**

Bird and egg traders in the sample markets were interviewed to gather information about their distribution based on different socioeconomic characteristics. Markets participants in Dale and Alaba woredas are considered as one market participants each because almost all participants engaged in all markets within the woreda except when there exists more than one market in a day. Table 17 revises traders' distribution on the bases of demographic characteristics. Sex of the sample traders in all sample markets are 100% male. But in the survey period it is observed that females are also involved in egg trading at retailing stage in the market chain even though they are not included in the sample due to their nonexistent in the market place. Females actively involved in bird and egg sell to cover their cash requirements in market days. Most bird and egg traders in the sample market are part time traders like poultry keeping. This might be the reason for the poor involvement of women in bird and egg trading as women has diverse responsibilities in rural family. School aged children and farmers involve in this market. Out of the 35 bird traders and 15 egg traders interviewed about 83 and 60 percent of bird and egg traders respectively are not married or are singles. This implies that bird and egg trading in the two woredas are integrated with other farming and non farming activities and most traders do not consider it as an independent business. Language and religion show statistically significant variation at ( $<0.01$ ) level significance among the three market places for both bird and egg traders. The mean age of the sample respondents are about 24 and 25 years for bird and egg traders respectively that is smaller than that of other crops or livestock traders.

Table 17. Traders distributions by demographic characteristics

Variable	Category	Awassa	Yirgalem	Alaba	Total	$\chi^2/F$	Awassa	Yirgalem	Alaba	Total	$\chi^2/F$
		Chicken traders					Egg traders				
Sex	Male	7	15	13	35	.	6	5	4	15	.
	Female	0	0	0	0		2	4	3	9	
Marital status	Single	6	12	11	29	0.15	2	4	3	9	2.9
	Married	1	3	2	6		4	1	1	6	
Language spoken	Amh& Alabigna	1	0	11	12	31.4***	0	0	1	1	22.14***
	Amha & sidamigna	4	14	0	18		0	0	3	3	
	Amh & wolaytgna	2	1	2	5		2	5	0	7	
Religion	Ortho Christian	0	2	1	3	29.4***	2	0	0	2	17.7***
	Muslim	1	0	12	13		0	0	4	4	
	Protestant	6	13	0	19		4	5	0	9	
Education level	Read and write	2	4	0	6	11.9**	2	0	0	2	4.625
	1-6 grade	4	2	9	15		1	1	2	4	
	7-12 grade	1	9	4	14		3	4	2	9	
Age	Mean	26.4	22.26	24.6	23.9	1.13	29.6	21.2	22.75	25	4.5**
	Min	19	15	16	15		20	18	17	17	
	Max	32	40	36	40		36	28	27	36	

Source: Own computation

#### **4.6.1.2. Traders' distribution by resource ownership**

**Physical resource:** Resource ownership of market participants for both chicken and egg traders is summarized in Table 18. Most of the traders in the sample markets particularly in primary markets are very young and are living with their parents. They are school aged and perform marketing activities mostly in market days that take place at weekend. Very few full time bird and egg traders are observed in Awassa and Yirgalem markets. Resources owned by traders when they start the business and in the year 2000E.C are summarized for comparison. Almost all traders have not virtually any physical resource when they start the business (100%). These is due to the fact that bird and chicken trading are not considered as an independent business activity and most traders perform the business with very low financial capital temporarily depending on season, capital availability and cash requirement.

Traders in local markets transact their birds within one market day and store birds that can't be sold that day in their resident and left to scavenge with birds owned by their family. The number of bird and egg traders is very high in time of festivals than other time in all sample market. Physical resource ownership is improved in 2000 E.C in all sample markets for both bird and egg traders. According to the results displayed in Table 19 bird traders in all sample markets have physical resource like shop shed, telephone, stores (both separate and resident) and bicycle in 2000 E.C. Physical resource ownership in 2000 E.C. shows statistically significant difference among the sample markets at a 5 percent level of significance in favor of Awassa market. About 86% of bird traders in Awassa market have mobile telephone in 2000 E.C. the figure is much higher than the 15% and 46% of Yigalem and Alaba markets respectively. The variation is due to the fact that traders in Awassa market have better financial and physical asset and consequently higher volume of transaction.

Table 18. Live bird and egg traders' distribution by resource ownership

		Market place			Total	$\chi^2/F$	Market place			Total	$\chi^2/F$
		Awassa	Yirgalem	Alaba			Awassa	Yirgalem	Alaba		
		Chicken traders				Egg traders					
Store separate at start	Yes	0	0	0	0	a.	0	0	0	0	
	No	7	15	13	35		6	5	4	15	
Store resident at start	Yes	0	0	0	0		0	0	0	0	
	No	7	15	13	35		6	5	4	15	
Mobile telephone at start	Yes	0	0	0	0		6	5	4	15	
	No	7	15	13	35		0	0	0	0	
Fixed line telephone in 2000	Yes	0	0	1	1	1.7	6	5	4	15	
	No	7	15	12	34		0	0	0	0	
Bicycle in 2000	Yes	1	0	3	4	3.7**	6	5	4	15	
	No	6	15	10	31		0	0	0	0	
Shop shed in 2000	Yes	0	0	0	0		0	0	0	0	
	No	7	15	13	35		6	5	4	15	
Mobile telephone in 2000	Yes	6	2	6	14	10.7**	5	1	1	7	5.4***
	No	1	13	7	21		1	4	3	8	
Store separate in 2000	Yes	2	0	0	2	8.5**	0	0	0	0	
	No	5	15	13	33		6	5	4	15	
Store resident in 2000	Yes	2	4	1	7	1.97**	5	1	1	7	5.4***
	No	5	11	12	28		1	4	3	8	

**Financial resource:** financial resource is one of the most important marketing inputs for agricultural marketing in general. In developing countries like Ethiopia financial market is poorly developed and less competent. Most farmers and traders particularly in rural areas of Ethiopia entirely rely on informal credit source as the only source of finance for the development of their business activities. Meyer and Nagarajan (1992) define “informal” finance as farmer source of credit from traders, input suppliers, moneylenders, friends and relatives to support their business activity. Since these financial service providers are not regulated and supervised by the national financial authorities, all the rules and regulations are set in favor of the lender. Traders in sample market are analyzed in (Table 19) in relation with their financial capacity to plan, organize and implement their business activities. In the course of the survey it is observed that farmers and children keep and trade poultry as a means of initial capital accumulation to involve in another business activity due to its comparatively low capital and labor requirement. The traders’ initial mean operating capital was 243 and 345 for bird and egg traders in the study area. The initial capital was ranging from a minimum of 11birr to a maximum of 800birr for bird traders and this figure ranges from minimum of 50birr to a maximum of 1300Birr. The mean operating capital of bird and egg traders in 2000E.C was 2657 and 2533 birr respectively. This means the mean operating capital of bird traders in 2000E.C is eleven times greater than that of the operating capital at the start of the business. Operating capital of egg traders in 2000E.C also increase by seven times that of initial capital. Operating capital of bird and egg traders reach peak of 9000 and 7000 birr respectively and both peak capital are registered in Awassa market. Moreover traders confirmed that the source of the financial increase is from internal source except few traders get credit from informal credit institutions. The source of capital in the start of the business is from gift from family members and own fund. No credit is given to enter new traders into the bird and egg trading business activity.

Table 18. Financial position of bird and egg traders in sample markets

Financial capital	Market	N	Mean	Std. Dev	Min	Max	F	N	Mean	Std. Dev	Min	Max	F
Amount of working capital in the start	Awassa	7	237.1	139	110	500	7.5*	6	625	373.8	200	1300	6.3**
	Yirgalem	15	143.1	106.5	11	330		5	174	71.6	100	250	
	Alaba	13	361.5	190.7	150	800		4	137.5	110.9	50	300	
	Total	35	243	175.2	11	800		15	344.7	332.2	50	1300	
Amount of working capital in 2000	Awassa	7	6050	2556.2	750	9000	8.8*	6	3458	2064.1	750	7000	1.3
	Yirgalem	15	1677	2281.8	150	6000		5	1990	1746.6	750	5000	
	Alaba	13	1961	2436.8	450	7000		4	1825	1325.1	300	3500	
	Total	35	2657	2893.5	150	9000		15	2533	1839.8	300	7000	

Source: Own computation

\*\* , \* show level of significance differences at 1, 5 and 10 percent confidence level

**Social capital:** social capital refers to a capital stock developed by trust and emotional attachments to some indigenous rules and regulations stated by members of a group involved in same or related functions in a marketing system. It improves the efficiency and competitiveness of a market chain by decreasing the marketing costs and also reduces the risk of conducting marketing business activities in the course of product and service flow from the point of production to the end users across the market chain. Table 20 presents social capital that has direct or indirect impact on the development and competitiveness of bird and egg marketing system in the study area. With regard to traders' parent occupation, most traders (about 97% and 93%) of live bird and egg traders respectively in sample markets are from farmer family. This result showed that both the production and marketing functions of the sub sector is dominated by farmers and members of farm families. Most bird and egg traders in the sample market replied that they do not have previous occupation before they start this business. According to the result obtained from the survey, about 77 and 67 percent of bird and egg traders in the sample markets respectively, do not have any occupation before they start the business. This result showed that this sub sector has crucial importance as a source of starting capital for the development of business activity within and outside the sub sector. The finding of the thesis presented in Table 19 also depicted that most bird and egg traders have regular buyers and sellers without any systematic relationship pattern. The traders added that having regular buyer and seller is important in sustaining the business activity and reduces the cost of finding buyers and/or sellers. Eggs traders have involved more frequently/regularly operate the business than bird traders. Regarding experience in this and other business activity the result also showed that bird traders have higher experience.

Table 20. Social capital of bird traders in sample market

		Market places (Bird traders)							
		Awassa	Yirga	Alaba	Guba	Naramo	Abosto	total	
			lem			Della			$\chi^2/F$
N		7	6	7	5	5	5	35	
Fathers occupation	Farmer	5	5	6	8	5	5	34	4.9
	Civil servant	0	1	0	0	0	0	1	
Mothers occupation	Farmer	0	5	5	8	5	5	28	24.6***
	House wife	5	1	1	0	0	0	7	
Did you have	Yes	0	1	5	2	0	0	8	17***
Occupation before	No	5	5	1	6	5	5	27	
Do you have regular	Yes	5	3	6	6	3	2	25	8.54
buyer	No	0	3	0	2	2	3	10	
Buyers relation	Same ethnic	3	0	1	2	1	0	7	
	No relation	2	0	1	1	1	0	5	
	Customer	0	2	4	3	0	2	11	
Do you have regular	Yes	3	3	5	7	3	2	23	4.7
seller	No	2	3	1	1	2	3	12	
Sellers relation	Same ethnic	1	0	0	1	1	0	3	12.9
	No relation	1	0	2	1	1	1	6	
Years experience in	Mean	5.6	7.8	6.2	4.3	3.4	2.6	5.5	4.04***
this business	Stand dev.	0.55	7.7	1.3	1.8	1.5	2.2	4.2	
Frequency of	Year round	3	2	3	2	1	2	13	8.3
operating business	In holidays	2	4	3	6	4	3	22	
Years experience in	Mean	10			5			6.7	13.3**
other trading	Stand dev.	0			1.8			2.9	

Source: Own computation

\*\*\*, \*\*: Show level of significance differences at 1, 5 and 10 percent confidence level

Table 21. Social capital of egg traders in sample market

		Market places (Egg traders)							$\chi^2/F$
		Awassa	Yirga	Alaba	Guba	Naramo	Abosto	Total	
Variable		lem		della					
N									
Fathers occupation	Farmer	6	2	1	2	2	1	14	
	Civil servant	0	0	1	0	0	0	1	7
Mothers occupation	Farmer	6	2	1	2	2	1	14	
	House wife	0	0	1	0	0	0	1	7
Did you have	Yes	3	2	0	0	0	0	5	
Occupation before?	No	3	0	2	2	2	1	10	8.3
Do you have regular buyer?	Yes	5	2	1	1	2	1	12	
	No	1	0	1	1	0	0	3	3.5
Buyers relation	Same ethnic	0	1	0	0	1	0	2	
	No relation	2	0	1	0	1	0	4	
	Customer	3	1	0	1	0	1	6	9.5
Do you have regular seller?	Yes	4	2	1	2	2	1	12	
	No	2	0	1	0	0	0	3	3.5
Sellers relation	Same ethnic	1	0	1	0	1	1	4	
	No relation	3	2	2	2	0	0	9	10.8
Years experience in this business	Mean	4.8	5	6.5	2	4	3	4.5	
	Stand dev.	2.3	0	0.7	1.4	1.4		1.9	1
Frequency of operating business	Year round	6	2	2	2	0	0	12	
	In holidays	0	0	0	0	2	1	3	15****
Years experience in other trading	Mean	4.3	5	6.5	2	4	3	4.2	
	Stand dev.	2	0	0.7	1.4	1.4		1.9	1.6

Source: Own computation

\*\*\*\*: Show level of significance differences at 1, 5 and 10 percent confidence level

N: The number of sample respondents

#### **4.6.1.3. Roles and linkage of actors in poultry marketing chain**

In this section the roles and linkages of chain actors involved in various marketing functions and also their linkages within each function category would have been discussed. Producers are the sole source of birds and egg that are core stones in the development of the marketing chain. They have various market outlets to inject their produce into the marketing chains at the alternative periphery of the supply chain. The researcher observed that all traders in this subsector are males in all sample markets. Farmer traders or rural assemblers are actors who play great role in coordinating the transactions between and within producers and traders/urban assemblers. Other important actors in the marketing chain are urban assemblers. This group of the chain actors performs important marketing functions in facilitating the flows of birds and egg from producers and village collectors to consumers and regional whole sellers. Brokers, supermarkets, hotels and retailers also have significant contribution in the market chain.

**Producers:** This group of the chain actors includes males, females and children within the farm family at the ratio of 5:4:3 and performs the physical production of birds and egg. In other agricultural products household heads are the ultimate decision makers. But in this subsector all family members are independently owners and decision makers in the production and marketing of birds and egg. Producers are buyers and sellers of birds and egg. They buy birds and egg for consumption and stock establishment and sell their produce to satisfy their cash requirement. The supply and price of birds and egg depend highly on the availability of holydays. This impacts the number of farmers' market outlet. In the ordinary seasons farmers are the major market outlet for stock establishment in local markets and in time of holydays no farmer buy birds for this purpose. In ordinary seasons the local markets are full of pullets and cockerel because the major buyers are producers to keep birds until the time of holydays. Table 22 presents farmers market outlet for birds and egg.

Table 22. Farmers' bird and egg market outlet

Market outlet (volume traded)	Percent (bird)	Percent (egg)
Producer farmers	10.4	3.8
Producer /village traders	34.5	19.5
Urban assemblers	29.6	38
Whole sellers	20	22.2
Consumers	5.5	16.5

Source: Own computation

**Farmer traders/ village collectors:** This group of the chain actors has immediate contact with farmers who supply bird and egg to the market. They buy egg and bird from local market and resell it back for farmers, urban assemblers and whole sellers in local and woreda markets for a profit. These categories of traders are usually part time traders and most of them are yang and school aged male children who themselves are producers. According to informal discussion with this trader category, most of them are part time traders but they transact about 35 percent of birds in local and woreda markets. They collect birds and egg from different local markets using their financial advantage and local knowledge sold for a profit in same or other markets/day. They walk long distance to the village and woreda market carrying their birds and egg to sell their product. High proportion of the birds is transacted through this group of actors.

**Urban assemblers:** These traders are also important actors in the market chain and they all are male in the study area. They serve the chain by transacting the product from farmers and village collectors to whole sellers and consumers in the woerda and regional markets. They also travel to nearby local markets to buy birds and egg by competing with village collectors. They have better capital and most of them are full time traders than village collectors. These assemblers supply their birds and egg for Hotels and restaurants and retailers and whole sellers in woreda and regional markets.

**Whole sellers:** Whole sellers in village poultry marketing chain refer to those traders who sell large quantities of birds and egg to other traders via brokers or direct communication. In egg marketing chain whole sellers buy egg from urban assemblers and village collectors from woreda and regional markets and sell in bulk for shops, Hotels and Restaurants in woreda and regional markets. They are full time traders and travel to different woredas to buy egg. They use baskets to pack their egg and put straw and grass to protect the egg from mechanical injury during transportation. These traders have strong financial resource and better information on the price and supply of egg in the source and destination markets. In bird marketing chain whole sellers are conducting important marketing functions by linking the woreda and regional markets with the terminal market. In Alaba town there are two whole sellers involved in the supply of birds to Adis Ababa market. These traders transact very high volume of birds from Alaba and other woreda markets to Adis Ababa market. They transport the birds by truck/ ISUZU to Adis Ababa and supply for brokers who sell the birds to retailers and Hotels and Restaurants in Adis Ababa. They use large box made of bamboo to pack their birds in the course of the transportation. These whole sellers receive their price set by the brokers after the birds are sold.

**Transporters:** Transport service providers have also played very fundamental role in the village poultry marketing system. They serve the physical function of marketing and add place value (utility) to the product by transferring the product from the surplus area to where the products are scarce and so that fetch better price. They play the role of scarce resource allocation and distribution by optimizing the transaction of the product to where they value most.

**Brokers:** Brokers in this market chain play crucial role by coordinating the flow of birds from Alaba town to consumers in Adis Ababa. They don't possess ownership of the birds they transact. Rather they receive the birds sent by whole sellers in Alaba town and sell them for retailers and hotels and restaurants in Addis Ababa terminal market for Alaba bird marketing system. They set the price themselves according to the demand and supply of birds from the different parts of the country to Addis Ababa market and deduct 2 birr per bird and send the

remainder to the whole sellers. There is neither legally enforceable agreement nor any kin relationship between the brokers and the whole sellers rather they have just business clientele relationship based on mutual trust.

**Retailers:** Retailers in bird and egg marketing chain are those actors who perform the last marketing function by linking consumers with other traders and/or producers. The number of these traders varies according to the demand and supply condition. In the time of holydays the number of retailers reaches its peak and drop as the holyday ends. These retailers include both full and part time traders and operate in local, woreda, regional and terminal/ Adis Ababa market.

**Hotels and Restaurants:** Traditional “doro wot” and egg dishes are served by Hotels and Restaurants for consumers in most parts of the country although the number and proportion from the total volume of is less (Fig. 3). This group of the actors in market chain also adds value to the birds and egg they serve for their customers even though the cost and benefit of these actors is not included in this market chain analysis due to the complexity of the business undertaken by them. They get the supply from different actors who involve in the transaction process.

**Processors:** The number of actors in this category is very limited and most birds are supplied to consumers without passing any processing function that adds farm utility to the product. But informal discussion with consumers revealed that the most reason they do not buy poultry product is they could not find the product in a form they wish it could be. But in Awassa town there are few processors using the traditional processing technology and supply for super markets. They slaughter, wash and pack the birds and sold for consumers via Super markets. The most important observation here is both these processors and Hotels and Restaurants use female birds due to their comparative price advantage than cocks that are mostly preferred by consumers who buy live birds.

**Super markets:** Although the proportion of birds and egg in these chain actors are minimal their contribution in the market chain is worthy to be mentioned. They get the birds from processors and stored in refrigerator until sell. They pack the different parts of the bird in plastics according to Ethiopian traditional “doro wot” dish preparation procedure and sold for consumers.

**Consumers:** Consumers in village poultry subsector comprise the full range of the society in all parts of the country. Consumers are the final end points and are the ultimate goal of the production and marketing process and the consideration of whom is central for which the development of the subsector organization comes to reality. Their demand pattern, socio-cultural distribution and geographic location can have influence on the entire marketing efficiency parameters along the market chain. In village poultry marketing chain, the consumption pattern is seasonal and dynamically changed based on availability of festival and existing price of birds and egg. Consumers get the product at different channels as in represented by fig. 3 based on their geographic location, the number and size of intermediaries and the number and type of marketing functions performed by varies marketing agents within the marketing chain. Consumers claim the marketing system is incapable of availing high quality and value added poultry product in all sample markets. Along with the numerous customs and social values associated with the consumption of chicken meat and egg in Ethiopia, the aforementioned factors can potentially influence the consumption pattern of the society. Due to the poor development of the village poultry marketing system, the per capita consumption of bird meat and egg is very low in the country compared with international and African standards and this figure do not even show slight improvements in the past few decades.

#### **4.6.1.4. Live bird and Egg marketing channels**

Marketing channel analysis is useful tool to examine the series of intermediaries and their systematic linkage in performing marketing functions and information flow in the market chain to facilitate the flow of goods and service from the point of production to the end users. Fig. 3 Presents varies marketing channels used in the flow of birds and egg from their point of production to the end users (consumers) in the study area. The most important routes (channels) involved in the transfer of live bird and egg in the study area are listed below.

**Channel –I** Producer-Village collector-Urban assembler-Whole seller-Retailer-Consumer

**Channel–II** Producer-Village collector-Urban assembler-Broker-Retailer-Consumer

**Channel –III** Producer-Village collector-Urban assembler-Whole seller-Consumer

**Channel –IV** Producer-Village collector-Whole seller-Retailer-Consumer

**Channel –V** Producer-Village collector- Broker-Retailer-Consumer

**Channel –VI** Producer-Village collector-Consumer

**Channel –VII** Producer-Village collector-Whole seller-Consumer

**Channel –VIII** Producer-Urban assembler-Whole seller-Retailer-Consumer

**Channel –IX** Producer-Urban assembler-Whole seller-broker-Retailer-Consumer

**Channel –X** Producer-Urban assembler-Retailer-Consumer

**Channel –XI** Producer-Urban assembler-Whole seller-Consumer

**Channel –XII** Producer-Retailer-Consumer

**Channel –XIII** Producer-Consumer

#### **Egg marketing channels**

**Channel –I** Producer-Village collector-Urban assembler-Whole seller-Retailer-Consumer

**Channel –II** Producer-Village collector-Urban assembler-Whole seller-Consumer

**Channel –III** Producer-Village collector-Whole seller-Retailer-Consumer

**Channel –IV** Producer-Village collector-Consumer

**Channel –V** Producer-Village collector-Whole seller-Consumer

**Channel –VI** Producer-Urban assembler-Whole seller-Retailer-Consumer

**Channel –VII** Producer-Urban assembler-Retailer-Consumer

**Channel –VIII** Producer-Urban assembler-Whole seller-Consumer

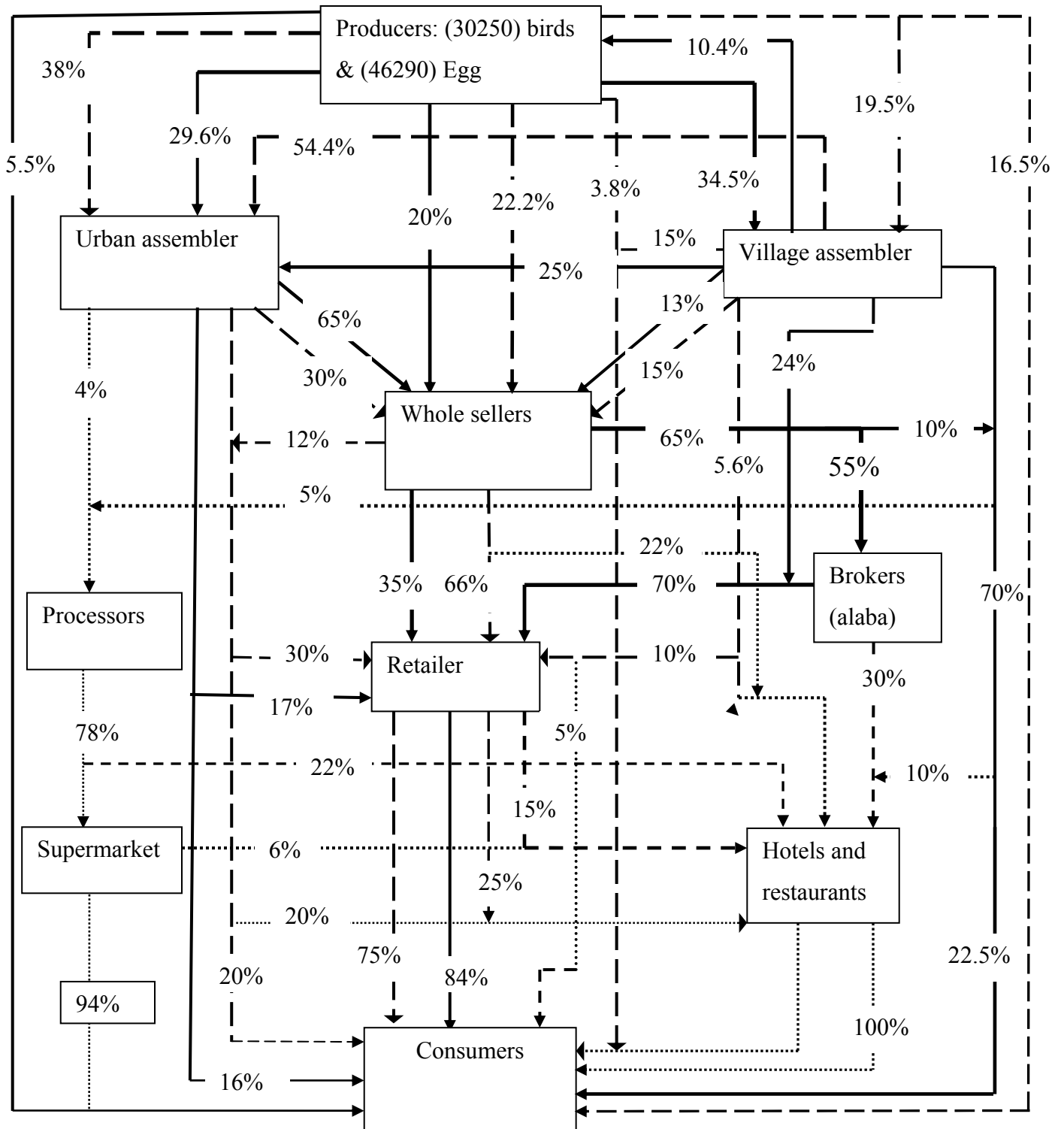
**Channel –IX** Producer-Whole seller-Retailer-Consumer

**Channel –X** Producer-Retailer-Consumer

**Channel –XI** Producer-Consumer

The outputs of marketing system in village poultry subsector (live bird and egg) are reached to the final end users in many interlinked channels as in shown by marketing chain map (Fig. 3). According to the information gathered from key informant discussion very little (less than one percent) portion of the birds and egg transacted in the market chain have passed through value addition process which creates form utility (processing function). The long broken lines and black solid lines in the marketing chain map refers to alternative paths used in the flow of egg and live birds from the point of production to the end users respectively. The relative importance and competence of varies channels is described by the percent share of each channel in the transfer of bird and egg, among others, across the different marketing stages in the marketing chain map. There exist relatively long channels in Alaba special woreda due to the involvement of brokers in Addis Ababa terminal market that are virtually nonexistent in Dale and Awassa markets. In Alaba special woreda the channels that engage the involvement of brokers play crucial role in the transfer of the product from the origin to the final consumers. Detailed analysis of the marketing costs and benefits of participants in the marketing system involving Hotels and restaurants, processors, and supermarkets (fine broken lines in marketing chain map) is not included in the analysis of margins and costs due to the difficulty of obtaining data. But as we can see from the marketing chain map of the subsector (Fig. 3), these channels have contributed much (as in shown by the percent share of these actors) in the transaction of the produce between the production and consumption ends.

Figure 3. poultry subsector marketing chain map of Dale and Alaba 'special' Woreda



Source: Own computation

#### 4.6.1.5. Traders concentration ratio

Structure of a marketing system refers to the size and market share of firms, relative ease of free entry and exit from the marketing chain, degree of product differentiation and the degree of market transparency among the chain participants within a given subsector. Concentration ratio, potential entry and exit barriers, degree of product differentiation and quality and availability of marketing information have been analyzed to evaluate the market structure of the subsector in sample markets. Traders' market concentration ratio was calculated for the wereda and regional markets. Table 23 shows bird and egg traders' concentration ratio for Yirgalem, Alaba and Awassa markets. The analysis is made for bird and egg traders in sample market places. Most traders in the two sample woreda visited local markets to buy birds and egg and the concentration measures are calculated excluding local markets to avoid double counting.

Table 23. Chicken and egg traders' concentration ratio in sample markets

Markets places	Traders' concentration ratio (%)	
	Bird traders'	Egg traders
Awassa (regional market)	39.00	38
Yirgalem (woreda market)	26.22	98
Alaba (woreda market)	59.73	93

Source: own computation

According to the finding presented in the above table bird buyers are concentrated (59.7%) of the total bird supply in Ababa woreda. This figure show strong oligopolistic power in live bird trading in Alaba woreda. This is due to the fact that there are two bird traders in the woreda who export live birds to Addis Ababa market (destination market) without any limit. But in Awassa and Yirgalem market the percent share of traders is moderately concentrated within the hands of few traders.

With regard to the attributes of the subsector organization, most traders (about 95%) have similarly organized in terms of the firms' location, timing of marketing functions undertaken, and the clustering of these functions, the number and type of channels used and the type of exchange used that might influence the structure of the village poultry marketing system. And this might in turn influence the conduct of firms and thus affecting the competitiveness of the marketing chain. About 5% of the sample traders (in Alaba market) are organized in a different way concerning the aforementioned characteristics such as the location, timing and clustering and type of marketing functions undertaken (transportation, storage, packaging and the type and payment arrangements) by these category of chain actors and their institutional arrangements alter the conduct of most marketing actors in the respective market channels. Informal discussions with these traders confirmed that they have performed different types of marketing functions in undertaking the physical, exchange, and other marketing functions.

#### **4.6.1.6. Condition of entry and exit to live bird and egg trading**

Barriers to enter to and exit from a given marketing system influence the structure of marketing system. Licensing procedure and the associated cost incurred, information access, and price and demand fluctuation can be the possible entry and exit barriers to live bird and egg trading in the study area. About 63% of traders replied that their source of information on price, demand and supply is other traders and hence information access is among one of the potential entry barriers in bird marketing system.

Table 24. Entry barriers mentioned by bird egg traders

Entry barriers	Category (%)	Role of the traders (%)				Total
		Rural assembler	Whole seller	Retailer	Secondary trader	
Trend of finance access	Improved	5.88	2.94	2.94	2.94	23.53
	Deteriorated	14.71	0.00	0.00	2.94	23.53
	No change	17.65	2.94	11.76	20.59	52.94
Major problem to enter chicken market	Lack of capital	23.53	2.94	5.88	5.88	44.12
	Lack of information	0.00	2.94	8.82	8.82	20.59
	Lack of warehouse	8.82	0.00	0.00	5.88	14.71
	Coincide with school time	8.82	0.00	0.00	2.94	20.59
Information on price	Other traders	25.71	2.86	0.00	20.00	62.86
	Personal observation	14.29	2.86	14.29	5.71	37.14
Information on demand	Other traders	25.71	2.86	0.00	20.00	62.86
	Personal observation	14.29	2.86	14.29	5.71	37.14
Information on supply	Other traders	25.71	2.86	0.00	20.00	62.86
	Personal observation	14.29	2.86	14.29	5.71	37.14

Source: Own computation

According to the information from the informal survey of traders, there is no trading license requirement in all sample markets. Most live bird and egg traders (94.3%) in Awassa and Yigalem markets have no any trading license at all. And none of the traders pays check point fee in the survey period when transporting their birds and eggs across market places. But there are two traders in Alaba market who have bird trading license and pay annual tax even though there is no formal trading license requirement in the market and they reply that they face competition with non licensed traders because there is no barriers to enter and exit the market due license requirement.

Most traders in the sample markets replied that live bird and egg trading is constrained by low or virtually nonexistent formal capital (credit) access and this might be possibly an entry

barrier particularly for the full time bird and egg traders. Above all the availability and quality of information access could be one entry barrier in the marketing system. Table-25 presents trend of credit access, source and availability of marketing information by bird and egg traders in the sample markets. According to this result lack of capital, quality and source of marketing information and absence of storage facility are listed in order of importance in the sample markets as the main entry barriers in bird and egg trading in the sample markets.

#### **4.6.2. Conduct of traders in poultry marketing system**

Market conduct refers to the exchange practice and pricing behavior of the marketing firms that make up the industry to examine the influence of the existing market structure on the market conduct and the bargaining power of marketing actors in the marketing system. Here in this analysis the market conduct of firms in the subsector have been analyzed using information like selling and buying behaviors and price setting strategy of sample traders have been analyzed. Furthermore type of exchange used, supply, demand, and price trend forecast, information and quality specification, timing and means of exchange and response to the anticipated changing environment.

According to the result obtained from the market survey presented in Table 25 About 77% of the respondent replied that the purchasing price of bird is set by buyers in the sample market. Almost 100% of the sample traders agreed that the purchasing price of birds is entirely dependent on demand and supply of birds in the market day. All sample traders also confirm that the purchasing price of birds cannot be clearly identified until the final transaction took place. The selling price of bird is set by a combination of buyers, negotiation and also demand and supply balance of birds in the market day (Table 25). Provision of better price than others and use of strong negotiation word power and varies combination of these two strategies are applied by most bird and egg traders to attract buyers and sellers. Except two traders in Alaba market (5.7% of the total respondents) who receive prices already set by brokers in Addis Ababa (terminal market for Alaba woreda market), all sample respondents transact their birds on cash payment bases in all sample markets (94.3%) at the time of transaction.

Unlike bird trading, the price setting strategy in egg market is better in terms of price setting and information access. The price of egg is not that much volatile as in observed in live bird trading. According to the finding of the market survey, the price of egg is set earlier in the market day based on the price information in the destination market (Awassa market). There are no significant variations in egg traders' response regarding egg traders' marketing behaviors (conduct measures) among the sample respondents as in observed by live bird marketing participants. Regarding product differentiation, very few actors involved in processing function add values to alter the type of the product they serve for consumers.

Table 25. Buying, selling and pricing strategy of live bird traders in sample markets

Marketing strategy	Marketing behavior of traders (%)	Market place			
		Awassa	Yirgalem	Alaba	Total
Who set the purchase price of chicken in 2000?	Buyer	6.67	26.67	43.33	76.67
	Seller	16.67	6.67	0.00	23.33
How is the purchase price set?	Demand & supply	23.33	33.33	43.33	100.00
Time of purchasing price of chicken set	At the time of Purchase	23.33	33.33	43.33	100.00
Who decide your chicken selling price?	Buyers	0.00	0.00	22.86	22.86
	Negotiation	20.00	42.86	14.29	77.14
How is your chicken selling price set?	Demand and supply	6.67	26.67	43.33	76.67
	Negotiation	16.67	6.67	0.00	23.33
	After sale at terminal market by brokers	0.00	0.00	2.00	5.70
How do you attract your suppliers?	Provide better price	12.50	28.13	28.13	68.75
	Negotiation power	3.13	9.38	3.13	15.63
	Better price& negotiation	6.25	0.00	9.38	15.63
How do you attract your buyers?	Provide better price	0.00	28.13	6.25	34.38
	Negotiation power	15.63	3.13	15.63	34.38
	By visiting them	0.00	6.25	9.38	15.63
	Better price& negotiation	6.25	0.00	9.38	15.63
Type of payment	Cash	100	100	75	94.3
	Credit	0	0	25	5.7

Source: Own computation

### **4.6.3. Performance of poultry marketing system**

#### **4.6.3.1. Marketing costs of traders**

The marketing cost of live bird and egg trading for various marketing stages is calculated and depicted in Table 26. In live bird trading the highest average marketing cost of various trader categories is registered by labor cost including the trader's opportunity cost in all categories of traders that is 2.2 birr/bird. The next highest average marketing cost in live bird trading is attributed to storage loss cost that is 1.5 birr/bird. The storage cost is due to diseases, predation and theft in the course of the storage period (mostly between two consecutive market days). This is due to the periodic nature of local markets in most of rural parts of the country that imposes traders to store the birds and egg for a longer period of time. Feed and water cost, loading and unloading cost and transportation costs are worthwhile to be mentioned as they have significant contribution to the transaction cost involved in chicken trading. Urban assemblers or secondary traders and whole sellers incur the highest marketing cost in bird trading business accounting 3.3 and 2.8 birr per bird respectively. The average transaction (marketing) cost in the flow of bird from the point of production to the final consumer is 2.6 birr/bird. Labor and transportation cost in egg marketing constitute the greater portion of the total marketing cost accounting 0.06 birr/egg each. The average marketing cost in bird trading in all trader categories is about 0.13 birr per egg. Out of whom rural assemblers and secondary traders incur the highest marketing cost in the flow of bird from the point of production to the end users accounting 0.15 and 0.14 birr per egg respectively. Higher marketing cost by actors in marketing channels reduces the relative competence of the marketing channel in the market chain.

Table 26. Marketing cost of bird and egg marketing system

Cost items	Traders category (Bird)					
		Rural assembler	Whole seller	Retailer	Secondary trader	Total
Transportation	N	9	4	8	8	31
cost	Mean	0.04 (0.2)	0.13 (1.1)	0.07(0.1)	0.14(0.8)	0.08(0.7)
Storage loss	N	13	3	7	9	37
cost	Mean	1.5 (0.7)	2.2 (2.3)	1.4 (0.2)	1.8 (2.0)	1.5 (1.2)
Loading and unloading cost	N	0	1	0	5	6
	Mean	.	0.2(0.2)	.	0.8 (0.8)	0.7 (0.7)
Labor cost	N	13	2	5	9	34
	Mean	2.6 (0.1)	2.8 (0.1)	1.6 (0.0)	2.1(0.8)	2.2 (0.5)
Water and feed cost	N	13	2	5	9	34
	Mean	0.2 (1.6)	0.3(3.2)	0.3 (0.2)	0.5 (2.2)	0.3 (1.7)
<b>Total</b>		1.7	2.8	1.8	3.3	2.6
		Traders category (Egg)				
Storage lose	N	10	5	0	3	18
Cost	Mean	0.02 (0.03)	0.0 (0.00)	.	0.01(0.00)	0.01(0.02)
Transportation	N	6	2	1	3	12
Cost	Mean	0.07 (0.02)	0.02(0.002)	0.053 (0.00)	0.05 (0.001)	0.06 (0.02)
Labor cost	N	10	6	1	3	20
	Mean	0.06 (0.05)	0.07 (0.01)	0.02 (0.00)	0.08 (0.00)	0.06 (0.04)
<b>Total</b>		0.15	0.09	0.07	0.14	0.13

Source: Own computation

Note: numbers in parenthesis represent standard deviations.

#### 4.6.3.2. Marketing margins in bird and egg marketing chain

Table 27 summarizes marketing margins maintained by each actors in varies bird and egg marketing channels. Total gross marketing margin in bird trading is highest in channels: II, V, VI, and VIII and they account a TGMM of 38.3 each. Rural assemblers enjoy the highest net marketing margin that is 42.9 in channel II followed by urban assemblers who maintain a NMM of 40.5 in channel V and VI. Producers share from the price paid by consumers is highest in channel III which accounts 76.3% of the price paid by consumers. The lowest net marketing margin is associated with rural assemblers in channel III of bird marketing chain.

Table 27. Marketing margins maintained by marketing actors in bird and egg marketing chain

Bird trader	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
TGMM	27.5	38.3	23.7	27.5	38.3	38.3	27.5	38.3				
NMMra	24.4	42.9	19.2									
NMMua					40.5	40.5	23.0					
NMMws		33.0		20.5	33.0	38.0						
NMMrt	19.6	34.5				34.5		34.5				
GMMp	72.5	61.7	76.3	72.5	61.7	61.7	72.5	61.7				
Egg traders												
TGMM	36.0		36.0	36.0	15.8	33.3	36.0	36.0	36	33.3		
NMMra	10.4			12	11.58		6.4					
NMMua								8	8	8.3		
NMMws	29.6		16.8	20.0		24.2	13.6	16.8				
NMMrt	13							19				
GMMp	64.0		64.0	64.0	84.2	66.7	64.0	64.0	64	66.7		

Source: Own computation

The highest producer share is observed in channel V of egg marketing chain that is 84.2 out of the price paid by consumers. The highest net marketing margin in egg marketing chain is observed in channel I by the whole sellers that is 29.6. The lowest net marketing margin in egg marketing chain is observed in channel VII that accounts 6.4 and this is maintained by rural assemblers. The marketing margin analysis of the subsector revealed that producers share and net marketing margin maintained by varies chain actors are remarkably varied across the different marketing channels.

#### **4.6.3.3. Marketing profit of live bird and egg trading**

The marketing profit of each bird and egg traders' category is summarized in annex-1 and 2 respectively. The highest profit in bird marketing chain is attained by retailers' category in channel VI which accounts 12 birr per bird. This highest profit was made possible by the retailers due to the exclusion of village collectors and whole sellers from participation in the market channel. But urban assemblers in channel V account 9.2 birr/bird which is the highest marketing profit for these traders' category across the total bird marketing channel which comprises the marketing chain. This highest profit is maintained by urban assemblers due to the fact that they directly purchase the birds from producers in local markets and sold for whole sellers avoiding the involvement of rural assemblers in this particular marketing channel. Whole sellers made their maximum profit (8.7 birr/bird) in channel II and minimum profit (1.7 birr/bird) in channel VI. In channel II the maximum profit (9 birr/bird) is maintained by rural assemblers because in this channel this group of the traders' category bypasses urban assemblers and sold directly to whole sellers. According to the result presented in Annex.2 the price and profit margins maintained by each trader category in egg trading is more consistent than bird trading. The highest profit is made possible (0.29 birr/egg) by whole sellers' category in channel VI in which case whole sellers by from rural assemblers and directly sold to consumers. Rural assemblers attained the lowest marketing profit in channel VII of the egg marketing chain.

#### 4.7. Determinants of Market Participation Decision and Intensity of Supply

Farmers' decision to participate in village bird and egg supplied to the market and the underlying intensity of the value obtained from the supply is determined by the following hypothesized variables.

Table 28. Description of the hypothesized variables

Variable	Description	Type	Value
PARTICIPAT	Participation bird or egg supply	Dummy	0-no and 1-yes
VALBRDSD	Value of bird and egg sold	Continuous	Value of bird and egg in birr
AGHD	Age of the household head	Continuous	Number of years
FAMSIZ	Family size over 14 years old	Continuous	Family members over 14 yrs
YREXPFM	Years of experience in farming	Continuous	Number of years
ANRVFMG	Annual revenue from farming	Continuous	Amount of income in birr
ANRVOFI	Annual revenue from off-farm	Continuous	Amount of income in birr
LANDHLD	Total land holding (hectare)	Continuous	Size of land holding (hec)
PLTWND	Number of bird owned	Continuous	Number of bird kept
DCEPLMKT	Nearest poultry market	Continuous	Distance in kilometer
AVLAGPRC	Average lagged price of bird	Continuous	Annual lagged price in birr
MRKTINFO	Market information access	Dummy	0-no and 1-yes
EDCATN	Education level of the household	Dummy	0-no and 1-yes
SXHDHD	Sex of the household head	Dummy	0-male and 1-female
FEDSPLT	Feed supplement	Dummy	0-no and 1-yes
EXOCHKN	Exotic breed availability	Dummy	0-no and 1-yes
TAKCRDT	Credit taken	Dummy	0-no and 1-yes
GTEXTION	Extension service access	Dummy	0-no and 1-yes
PRPCKNKP	Purpose of bird kept	Dummy	1-consumption and 2- sell

Source: own computation

Table 28 presents the dependent variables and the independent variables that influence the producers' decision to participate or not in the supply of bird and egg to the market and the intensity of value of the volume supplied to the market. Before running the selection model and the centered regression it is crucial that the repressors should be checked for multicollinearity and degree of associations for the continuous and dummy variables using VIF and CC techniques respectively (Annex.1 and 2). According to the result obtained from the analysis there is no strong multi co linearity and degree of association between the continuous and dummy variables respectively.

Table 29. presents the first step of the selection model that is the results obtained from the probit model which analyses those factors that determine the farmers' decision to participate in bird and egg supply to the market. This model also helps to calculate the Inverse mills ratio that is used in correcting the selectivity bias incorporates the effect of participation decision in to the supply function. According to the results of the probit model (Table 29), the most important factors that determine the producers' decision to participate in the supply of bird and egg to the market are identified and presented in Table 29. Three independent variables namely number of bird kept, feed supplement and purpose of bird keeping has been found to be highly significant (<1%) in the participation decision. There are also two repressors namely family size and sex of the household that head affect the participation decision at 5 percent level of significance.

**Sex of the household head (SXHHD):** Sex of the household head has a significant and positive effect (< 5%) on the farmers' participation decision. This implies that being female headed household would increases the probability of that family to supply poultry product to the market by 0.655 percent.

**Family size (FAMSIZ):** Family size has significant and positive effect (< 5%) on the farmers' participation decision to sell their produce or not. This implies that as the number of family members increased by one the probability of that family to become seller poultry product would increase by 0.22 percent.

Table 29. Results of the Heckmans' first step estimation in the selection model (probit)

Variables	Coeff.	Std.Err.	t-ratio	Marginal effects
CONSTANT	0.94933	0.1488	6.37976***	
AGHHD	0.001503	0.00255	.590	0.031372
FMSIZGR14	0.005691	0.0168	0.338728	0.013221
FAMSIZE	0.023086	0.0094	2.45535**	0.002183
YREXPFM	-2.69E-04	3.14E-04	-0.85516	-0.00143
ANRVFMG	-1.58E-06	5.74E-06	-0.27525	-0.00575
ANRVOFI	3.18E-05	1.69E-05	1.87766*	0.001014
TLANDHLD	0.0028	0.0091	0.308645	1.08E-02
POLTOWN	0.041991	0.00756	5.55326***	8.78E-08
DCEPOLMK	-0.0005	0.00409	-0.12109	-0.00469
AVPRCPL	-0.00343	0.0025	-1.38106	-0.02007
MARKTINF	0.077216	0.0486	1.58928	0.00426
EDGCATN	0.081099	0.049	1.65527*	0.005614
SXHHHDHD	0.170071	0.0801	2.12207**	0.006554
FEDSUPLT	0.206624	0.0599	3.44866***	9.77E-05
DDHVEXCKN	0.114245	0.0623	1.83462*	0.003467
GTEXTION	0.037038	0.0542	0.68291	0.012481
PURPOSE	0.147163	0.0440	3.34487***	0.000242

Source: own computation

\*\*\*, \*\*, \* show level of significance differences at 1, and 5 percent confidence level  
 Dep. var. = DIDUPART                      Mean= .805,                      S.D. = .397195  
 Model size: Observations =200,              Parameters = 17,                      Deg. Fr. = 183  
 Fit:      R-squared= .462484,              Adjusted R-squared = .40903  
 Model test: F [16, 183]=8.65,              Prob. value = .00000  
 Diagnostic: Log-L = -36.5411,              Restricted (b=0) Log-L = -98.62

**Total number of bird kept (POLTOWN):** Bird keeping in rural areas is characterized by many integrated socio cultural values and this make the sub sector to be considered as one of the most important activities undertaken in rural farm households. As it was hypothesized, this variable affects the dependent variable positively. The number of birds kept within the family members highly influences (<1%) the producers decision in favor of participating on bird and egg supply.

**Feed supplementation (FEFSUPL):** Most literatures agreed that supplementation of feed for birds in scavenging type of production system significantly increase their productivity. The above result also revealed that feed supplementation highly affects the farmers' decision of bird and egg supply positively at one percent level of significance. When the family supplements feed for his scavenger birds, the probability of the producers' decision in favor of participation in supplying birds and egg increases by about 0.001 percent.

**Purpose of bird keeping (PRPBRDKP):** It is also stated that the purpose of bird keeping in rural areas of the country is complex and diverse. According to this finding keeping birds for the purpose of business activity (selling) highly influences (at 1% level of significance) the farmers' decision to supply in a positive way. Keeping poultry for sale increases the probability of participation in the supply of poultry products by about 0.0242 percent.

## **OLS estimation of the selection model**

According to Heckman (1979) a sample selection bias refers to the problems where the dependent variable is only observed for a restricted and non random sample. Ordinary least square estimation hence leads to both biased and inconsistent estimates of the parameters. To overcome the problem Heckman suggested adding inverse mills ratio (sometimes referred as hazard rate) as a regressor in to the model enables the parameter estimates become unbiased and inconsistent. The effect of participation decision also on the level of supply is indicated on the parameter estimates of the IMR which is obtained from the probit mode in the first step of the Heckman two step procedures. Table 30 summarizes the result of the ordinary least square estimation corrected for the selection bias (second step in Heckman's selection model). Average annual price of bird (lagged), Sex of the house hold head, Feed supplementation, Credit use for poultry keeping, purpose of bird keeping and selectivity bias correction (LAMBDA) are found to affect the value (in birr) of the volume of birds and egg supplied to the market positively at higher statistical level of significance.

**Inverse mills ratio (LAMBDA):** The p-value of this variable is almost zero as in presented in Table 30. This implies that the correction for selectivity bias is highly significant at 1% level of significance. The coefficient of this variable is interpreted as an observation is being a participant in poultry supply, the value obtained from poultry keeping and marketing increases by 1.67 birr.

**Feed supplementation (FEDSUPLT):** It was hypothesized that Feed supplementation for the scavenging bird production system positively affect the value obtained from the sale of birds and egg as it was hypothesized and is significantly and positively affected the value earned from birds and egg supply at 5% level of significance. As supplement of feed to scavengers' increases by an observation, the value obtained from the supply of bird and egg increases by 169.89 birr.

Table 30. OLS estimates of the supply function corrected for selectivity bias

Variables	Coeff.	Std.Err.	t-ratio	P-value
AGHHD	1.46893	3.62409	0.405323	0.685719
FAMSIZGR	8.19162	21.8137	0.375526	0.707709
FAMSIZE	2.65908	12.4118	0.214238	0.830603
YREXPFM	0.05722	0.405087	0.141254	0.887826
ANRVFMG	-0.00983	0.007463	-1.31715	0.189454
ANRVOFFI	0.030283	0.022043	1.37378	0.171209
TLANDHLD	-18.0264	12.0297	-1.49849	0.135748
POLTOWN	6.5819	10.557	0.623465	0.533764
AVPRCBRD	22.927	3.5056	6.54013***	0.000000
INFOACCS	40.6171	64.4812	0.629906	5.30E-01
EDGCTN	103.224	67.649	1.52587	1.29E-01
SXHDHD	425.366	116.669	3.64593***	0.000348
FEEDSUPL	169.893	80.9518	2.09869**	0.037232
DHVEXCHN	11.3571	80.9815	0.140244	0.888623
TAKCRDT	447.646	106.128	4.218***	3.89E-05
EXTNSERCE	110.102	71.1477	1.54751	1.23E-01
PRPSBRDKP	182.597	62.4832	2.92234***	3.92E-03
LAMBDA	1.69967	0.275577	6.16767***	3.78E-09

Source: own computation

\*\*\*, \*\*, \* show level of significance differences at 1, and 5 percent confidence level

Dep. var. = VALTOTAL                      Mean= 452.604,                      S.D. = 748.0328

Model size: Observations =200,                      Parameters = 18,                      Deg. Fr. = 182

Fit:                      R-squared= .705390,                      Adjusted R-squared = .6761

Model test: F [17, 182] =24.08,                      Prob. value = .00000

Diagnostic: Log-L =-1484.5655,                      Restricted (b=0) Log-L = -1606.7758

**Average lagged price of bird (AVLAGPRC):** The average lagged price of birds influence the value obtained from the sale of live birds and egg significantly (<1%) and positively. An increase in the average lagged price of local chicken by one birr the value obtained from the supply of chickens and egg to the market increases by 22.93 birr.

**Sex of the house hold head (SXHD):** Sex of the house hold head also significantly (<1%) and positively affects the value obtained from the sale of live birds and egg. Female headed households in the observation attain about 23 birr additional income from the sale of chickens and eggs to the market.

**Credit taken for poultry production (CRDT):** Credit use by the sample respondents significantly (<1%) and positively affects the value obtained from the supply of live birds and egg to the market. The value obtained from the sale of chickens and eggs for sample respondents who access credit has shown an increase by about 447.6 birr than those who do not access credit.

**Purpose of bird keeping (PRPBRDKP):** Purpose of bird keeping by the sample respondents has been found that it has significant (<1%) and positive impact on the value of volume of birds and egg sold in favor of keeping village chicken for selling purpose. Those sample respondents who keep poultry for selling purpose achieve additional revenue of 182.6 birr than respondents who keep chickens without clearly defined purpose.

## **4.8. Constraints and Opportunities of Village Poultry Keeping and Marketing**

### **4.8.1. Constraints and opportunities of village poultry keeping**

Village poultry production system is the most important economic activity in rural poor households. It serves as a starter capital stock, source of easily disposable cash income, source of protein and also has crucial social and cultural values.

Disease is among the most distressing constraints in the production and marketing of village poultry product. According to the farmers' survey, about 37 percent of the total respondent pointed out that disease is the most important constraint in the subsector. They also added that New castle disease (NCD) is most common among others in the study area. Absence of day and night housing, variable inputs and predation are also mentioned economically important challenges in the production and marketing of local birds and egg.

Table 31. Constraints and opportunity of bird keeping and marketing

Major problems in bird keeping		
N=118	Frequency	Percent
Disease	104	36.95
No day and night housing	57	29.21
No Exotic breed and compound feed	35	17.27
Predator	29	14.29
Price variation	4	2
Low finance, lack of awareness	10	5
Major problems in bird marketing (N=142)		
No marketable surplus	5	2.5
Volatile price	18	8.9
Seasonal demand	41	20.2
Low market access	53	26.1
Lack of information	25	12.3
Major opportunity in bird keeping(N=82)		
Require less labor and capital	16	7.9
Require less management	28	13.8
High but irregular demand	38	18.7
Doesn't need large area, high skill	11	5.4

Source: Own computation

Village poultry production also avail ample opportunities compared to other alternative investments in rural areas particularly. It requires less labor and capital, management and technical skill in which rural communities have comparative advantages. The increasing price of animal products within and abroad the country also provide real and sustainable business opportunity for the rural poor.

#### 4.8.2. Constraints and opportunities of live bird and egg trading

According to the result presented in Table 32, the most frequently mentioned constraints and opportunities of live bird and egg trading are identified by sample traders. Absence of reliable and adequate information on price, shortage of supply is most frequently mentioned constraint in both chicken and egg marketing system. About 65% and 45% of the sample chicken and egg traders respectively replied that they face severe problem in getting adequate and reliable information regarding the price and quantity (supplied and demanded) in the market places.

Table 32. Constraints and opportunities in live chicken and egg marketing system

Variable	Item	Frequency (bird traders)	Frequency (egg traders)
Problems in bird and egg trading	Little and seasonal bird supply	51.43	31.43
	Seasonal and inconsistent demand	31.43	11.43
	Absence of transportation	27.14	27.54
	Absence of storage facility	34.53	4.50
	Absence of adequate and reliable information	65.45	45.45
	Disease and absence of packaging material	23.55	38.56
	Imperfect financial market	54.16	54.16
	Theft	19.50	8.00
Opportunities in bird trading	Predation	30.92	55.92
	Requires less capital & labor	30.30	39.30
	Less barriers of entry and exit	53.64	67.64
	Used as a starter capital	36.06	43.06
	High profit margin and demand	18.70	28.70
	Less risk	24.50	44.36

Source: Own computation

Absence of competitive financial market and little or/and inconsistent produce supply are constraints mentioned markedly by both live bird and egg traders category in all sample markets. Access to credit is equally constrained both live bird and egg marketing participants. But low and irregular supply of produce is highly highlighted by live bird traders' category than the egg traders. Disease, theft and predation are also important marketing constraints in chicken marketing system. Actors in egg marketing chain confirmed that packaging material is significant treats in egg marketing chain actors. These constraints of the subsector chain actors create systematic inefficiencies at different stages of the marketing functions across the supply chain.

## 5. CONCLUSIONS AND RECOMENDATIONS

### 5.1. Conclusions

This study was conducted primarily to analyze the marketing system of village poultry sub sector. Structure, conduct and performance of village poultry marketing system were analyzed to study the efficiency of the marketing system. Furthermore structure and component of village poultry production cost of farmers had been analyzed. Support services of extension, credit, input provision and market access of farmers in village poultry keeping and marketing has also been analyzed. Determinants of farmers participation decision in the supply of birds and eggs to the market and intensity of the volume of supply was analyzed and key determinant factors were identified.

Regarding the structure of live bird and egg marketing system, there are about 14 and 11 marketing channels in live bird and egg marketing systems respectively. The concentration measures in live bird and egg marketing system in Awassa (regional) live bird and egg markets take values of 39 and 38 percent respectively and show that these marketing systems are fairly concentrated in terms of few firms' domination. The concentration measures of Yirgalem and Alaba egg markets shows strongly concentrated taking values of 98 and 93 percent respectively. These figures imply that very few egg traders in the two woredas are dominating the entire transaction process that adversely affects efficiency of egg marketing system in the two markets. The concentration measure of Alaba live bird market also shows moderate few firms' dominance (60%) in the transfer of bird particularly to Addis Ababa terminal market that in turn influences the conduct of other marketing actors in the market imposing some sort of systematic inefficiency to the competitiveness of the marketing system. Lack of information on price, supply and demand, low or lack of financial access and short and inconsistent supply of live bird and egg are among the most influential entry barriers in all sample markets mentioned by sample traders. The existing structure of marketing system affects the conduct of marketing actors and hence the performance of the entire marketing system. Table-24 presents the conduct of live bird and egg traders regarding the pricing and exchange (buying and selling) behavior of traders and the type of payment used by the

marketing agents. Provision of better price, negotiation and combination of these two are commonly used by most traders in buying and selling activities to attract their customers. Most producers replied that they received prices already set by traders for their produce. It is also observed that all most all traders perform the exchange functions themselves at cash payment bases except few traders 5% in Alaba market whom sent their live birds to brokers in Addis Ababa without priori agreed upon price. The brokers sell the birds based on the existing market price at Addis Ababa terminal market and deduct brokerage fee of 2 birr/bird and send the remainder for the traders. These traders have no any written agreement with the brokers and the agreement is entirely based on mutual trust between the contracting parties and they transact three to five thousand of live birds once a week. Informal discussions with this traders revealed that they take this risk to reduce transaction cost.

The average marketing cost in the flow of live birds from the point of production to the final consumer is 2.6 birr/bird. Urban assemblers or secondary traders and whole sellers incur the highest marketing cost in bird trading business accounting 3.3 and 2.8 birr per bird respectively. This is due to the fact that these trader categories visit many market places to undertake their exchange functions adding the cost of transportation. The average marketing cost in egg trading in all traders category is about 0.13 birr per egg. Higher marketing cost by actors in marketing channels reduces the relative competence of the marketing channel in the market chain.

Total gross marketing margin in bird trading is highest in channels: II, V, VI, and VIII and they account a TGMM of 38.3 each. Producers share in bird trading from the price paid by consumers is highest in channel III which accounts 76.3% of the price paid by consumers. The lowest net marketing margin is associated with rural assemblers in channel III of bird marketing chain. The highest producer share is observed in channel V of egg marketing chain that is 84.2 percent of the price paid by consumers. The highest net marketing margin in egg marketing chain is observed in channel I by the whole sellers group that is 29.6%. The marketing margin analysis of the subsector revealed that producers share and net marketing margin maintained by varies chain actors are remarkably varied across the different marketing

channels. The highest profit in bird marketing chain is attained by retailers' category in channel VI which accounts 12 birr per bird. The highest profit is made possible (0.29birr/egg) by whole sellers' category in channel VI in which case whole sellers by from rural assemblers and directly sold to consumers. Rural assemblers attained the lowest marketing profit in channel VII of the egg marketing chain. From the above analysis one can conclude that live bird and egg trading are operating profitably and the distribution of the profit margin is comparatively fair when compared to other agricultural commodities.

The most important constraints that the respondents (traders) highlighted in the poultry marketing chain includes the short and inconsistent supply and demand of bird and egg in markets. And informal discussion with consumers in the sample markets revealed that it is too tedious to prepare meal using the live bird that can be found in the market. Thus we only interested in it in the time of festivals as per the Ethiopian cultural traditional 'doro wot preparation. This is probably due to the fact that there is little or nonexistence of marketing actors that participate in processing and other marketing functions that adds value by changing the form of the product as per the consumers interest. The development of this sector would have substantial contribution to the increasing demand of food items particularly livestock products developing countries like Ethiopia.

It is also indicated that business development support services are almost nonexistent in village poultry marketing system. This makes the marketing system inefficient in facilitating the performance of marketing functions to be undertaken to maximize the output expected from the sub sector while the subsector avails a profitable market niche. The cash rich and time poor consumers need quality and value added products that can be hardly achieved without the active involvement of firms that involved in the processing function and add form utility to the product. If business development support services are developed and assist the market participants, the short and inconsistent supply and demand problem that most traders underline can be confronted by availing the product in all time, form and places to satisfy the consumers need.

Village poultry production system in Ethiopia is characterized by very low input-output ratio due to many systematically interlinked constraints. These include very low or no feed supplementation, diseases, Housing and above all absence of clearly defined purpose for keeping birds by rural farm families are among those bottlenecks for the inefficiently competence of the subsector. The productivity of village poultry keeping by rural farm families is very low compared to even African standards but according to the profitability analysis, it is still profitable. About 50 percent of the eggs hatched by local chickens per clutch were lost due to the low hatchability rate and low survivability rate of hatcheries. Under even this poor management system the subsector provides attractive business activity for all age and sex group of the society. It is also revealed that improving the feeding structure using grain supplementation, housing and disease management, it is possible to achieve a higher improvement in input-output ratio of village bird production system. But institutional business development services in the study area are poorly developed to improve this situation so that maximize the output expected from the sub sector.

According to the econometrics analysis, there are variations in the findings of the two methods employed and correction of the selectivity bias is highly significant. Hence the result of Heckmans two step procedure would have been used to identify variables that affect producers participation decision and the level of poultry supply. The most important variables affecting the producers' participation decision on the supply of birds and egg to the market and the volume of live bird and egg supply includes: total number of birds the family kept, feed supplementation to local chickens, purpose of poultry keeping, family size, sex of the household head and Credit use for the production and marketing of village poultry. These variables are found to be economically important variables in determining the volume of birds and eggs that the family supply to the market. The inverse mills ratio estimated from the probit model is highly significant and implying farmers' participation decision has shown significant and positive impact on the level of chickens and eggs supply in the study area.

## **5.2 Recommendations and Policy implications**

It is indispensable to forward policy directions based on the findings of the study to formulate strategies and intervene from the most appropriate edge of the supply chain. Based on this understanding the following recommendations would have been made.

Live bird and egg traders replied that short and inconsistent supply in market places are the most devastating constraints for the development of their business activity. Hence intervention by the government or any interested body is compulsory aimed the improvement of the volume and the consistency of the chicken and egg supply to the market.

Participants in poultry marketing system should be trained and supported about the development of competitive marketing chain which give due attention to the efficiency of the commodity chain based on trust and mutual interests and members should be committed and favor the competence of the entire marketing chain rather than the individual interest.

An intervention by any interested organ should be made by the establishment and promotion of chain actors involved in the physical marketing function of processing that adds value to the product by changing the form of the product and helps the establishment of regular demand in market places. There was only one actor in Awassa sample market who slaughter, wash and packs live birds and supplied to supermarkets and this channel was the only one that local birds passes value addition process (form utility) except dishes provision by very few hotels at high prices. Thus promoting and developing the financial and technical capability of such innovators would provide substantial contribution to the supply chain development.

Research and higher education institutions should give due attention to the preparation and promotion of chicken fast food recipes as part of the research development programs hand in hand with the genetic improvements of local breeds.

About 99 percent of the country's poultry (meat and egg) supply constitutes local breeds from rural farm families most of whom live farther away from market places and where most public goods are in short supply. Thus improving the development of infrastructures in the study areas in particular and the country as a whole would have solid implications in the development of the supply chain.

It is also recognized that village chicken producers in the rural areas of the country did not have clear boundary for their purpose of keeping chickens. According to the result of the econometric analysis, purpose of chicken keeping and total number of birds kept within the family significantly affected the farmers' participation decision and level of poultry supplied to the market. Thus extension advisors should be trained and involved actively at this spot by equipping farmers about the profitability and the untapped productivity potential of village poultry production system with minimal increment in inputs usage and management such as application of supplementary feeding, separate night housing and veterinary services and discouraging the broodiness time.

Interested pilot producers should be selected and assisted to undertake semi-intensive production of local chicken under close supervision by the extension advisors. The selection of target farmers should mainly focus on female headed households, large sized households, and personal interest of the target groups to specialize in the business and intensive persuasion should also be made priori before the intervention.

Village (local) poultry producers should also be trained about the optimum number of local chicken to be kept and assisted by availing credit facility for the production and marketing local chickens as the number of chicken kept by farm households and access to credit are important variables in determining the farmers participation decision and the level of chickens and egg supplied to market places.

In most developing countries, the provision of business support services such as access to credit, information, storage facility and training on the production and the functioning and dynamic nature markets to the marketing actors should be provided by the government as competitive establishment of these services is hardly practical with the existing poorly developed marketing system particularly in agricultural products. These services are of course entirely non-existent in the study areas at any stage of the market chain. So that the government and other development partners should exert profound effort to assist the chain actors in holistic manner.

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## APPENDICES

Annex 1. Sample respondents distribution by the family members age

Woreda			
Variable (age)	Dale (mean)	Alaba (mean)	t
Male less than 14	1.6351	2.0694	-2.682***
Female less than 14	1.5079	2.0811	-3.557***
Male >14 &,<64	2.0899	1.4458	3.267***
Female >14 &,<64	1.4725	1.3690	807**
Male > 64	1.0000	...	...
Female >64	1.0000	1.0000	...

Source: Own computation

\*\*\*, \*\* show level of significance at 1, and 5 percent confidence intervals respectively

Annex 2. Multicollinearity check among the continuous independent variables

Independent variables	Multicollinearity check	
	Tolerance	VIF
Age of the household head	0.895	1.117
Total family size	0.886	1.129
Annual revenue from farming	0.822	1.216
Annual revenue from off-farm income	0.929	1.076
Total cultivated land holding	0.846	1.183
Total number of bird owned	0.737	1.356
Distance from residence to the nearest poultry market	0.942	1.061
Average lagged price of bird sold	0.769	1.301

Source: own computation

Annex 3. Ownership and decision making role in bird keeping and marketing in each flock composition within family Members

Owner	Hatchery		Pullet		Cockerel		Hen		Cock	
	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%
Son	21	10.5	19	9.5	13	6.5	23	11.5	10	5
Daughter	11	5.5	9	4.5	3	1.5	9	4.5	9	4.5
Father	27	13.5	40	20	23	11.5	44	22	37	18.5
Mother	51	25.5	38	19	23	11.5	64	32	42	21

Source: own computation

Annex 4. Profit earned by marketing actors in the different bird marketing channels per unit bird sold

Rural assemblers'	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
Buying price	28.2	29.3	28.2									
Selling price	33.5	40	37.8									
Marketing cost	1.7	1.7	1.7									
Profit	3.6	9	7.9									
Urban assemblers'												
Buying price					29	29	29		36.5			
Selling price					40	32.7	37.5		41			
Marketing cost					1.8	1.8	1.8		2.6			
Profit					9.2	1.9			1.5			
Wholesalers''												
Buying price		33.5		33.5	37.5	35.5						
Selling price		47		40	47	40						
Marketing cost		4.8		2.8	4.8	2.8						
Profit		8.7		3.7	4.7	1.7						
Retailers''												
Buying price	32	47				32.7		29				
Selling price	46.8	52.7				46.8		32.75				
Marketing cost	1.8	1.8				1.8		1.8				
Profit	13	4				12		2				

Source: Own computation

Annex 5. Degree of Association among the categorical independent variables (contingency coefficients)

VARIABLE	MARKTINFO	EDGCATN	SXHHDHD	FEDSUPLT	DDHVEXOCH	DDTAKCRDT	GTEXTION	PURPOSE
MARKTINFO		0.095	0.007	0.159	0.219	0.148	0.042	0.012
EDGCATN	0.095		0.118	0.096	0.175	0.154	0.237	0.193
SXHHDHD	0.007	0.118		0.115	0.219	0.396	0.148	0.027
FEDSUPLT	0.159	0.096	0.115		0.002	0.174	0.289	0.002
DDHVEXOC	0.219	0.175	0.219	0.002		0.521	0.298	0.009
DDTAKCRD	0.148	0.154	0.396	0.174	0.521		0.286	0.033
GTEXTION	0.042	0.237	0.148	0.289	0.298	0.286		0.016
PURPOSE	0.012	0.193	0.027	0.002	0.009	0.033	0.016	

Source: Own computation

Annex 6. Profit earned by each trader category per unit egg sold for the different channels.

<b>Egg marketing channels</b>	<b>I</b>	<b>II</b>	<b>III</b>	<b>IV</b>	<b>V</b>	<b>VI</b>	<b>VII</b>	<b>VIII</b>	<b>IX</b>	<b>X</b>	<b>XI</b>
Rural assemblers'											
Buying price	0.75			0.75	0.75		0.87				
Selling price	0.93			0.95	0.91		1.00				
Marketing cost	0.05			0.05	0.05		0.05				
Profit	0.13			0.15	0.11		0.08				
Urban assemblers'											
Buying price								0.75	0.75	0.75	
Selling price								0.95	0.95	0.95	
Marketing cost								0.05	0.05	0.05	
Profit								0.15	0.15	0.15	
Wholesalers''											
Buying price	0.79	0.95	0.87			0.87	0.95	0.95			
Selling price	1.25	1.25	1.21			1.25	1.21	1.25			
Marketing cost	0.09	0.09	0.09			0.09	0.09	0.09			
Profit	0.37	0.21	0.25			0.29	0.17	0.21			
Retailers''											
Buying price	1.10							0.95			
Selling price	1.3							1.21			
Marketing cost	0.07							0.07			
Profit	0.13							0.19			

Source: Own computation

Annex 7. Parametric estimates of Tobit model.

Variable	Coeff.	Std.Err.	t-ratio	Marginal change (whole)	Marginal change (sellers)	Change in probability
CONSTANT	480.605	28.04	17.141***	-----	-----	-----
AGHHD	-9.099	4.181	-2.176**	-6.976	-7.617	-0.06333
FAMSI ZGR	35.077	27.26	1.287	26.891	29.364	0.25453
FAMSIZE	-3.964	15.58	-0.254	-3.039	-3.319	-0.20336
YREXPFM	-0.062	0.499	-0.124	-.0476	-.052	-0.11197
ANRVFMG	-0.006	0.010	-0.615	-.0046	-.005	-0.33139
ANRVOFI	0.037	0.029	1.286	.0282	.031	0.25467
LANDHLD	-42.840	15.207	-2.817***	-32.843	-35.863	-0.01352
POLTOWN	61.512	16.908	3.638***	47.158	51.4937	0.00073
DCENRPO	-20.713	7.457	-2.778***	-15.879	-17.320	-0.01444
AVPRCPL	12.008	3.991	3.009***	9.2059	10.052	0.00933
MARKINF	-36.876	79.27	-0.465	-28.271	-30.870	-0.29862
EDGCTN	-86.007	83.94	-1.025	-65.936	-71.999	-0.31200
SXHHHDH	62.867	127.57	0.493	48.196	52.628	0.30682
FEDSUPL	196.087	103.75	1.890*	150.329	164.151	0.10886
DHVEXCH	31.175	104.76	0.298	23.900	26.097	0.22793
DTAKCDT	645.393	132.23	4.881***	494.786	540.278	0.00000
GTEXSCPL	18.495	92.211	0.201	14.179	15.483	0.16868
PRPBRDK	60.996	72.725	0.839	46.762	51.082	0.33709

Source: Own computation

\*\*\*, \*\*, \* show level of significance differences at 1, and 5 percent confidence level

Dep. var. = VALTOTAL

Mean= 452.604,

S.D. =748.0328

Model size: Observations = 200,

Parameters = 18,

Deg. Fr. =182

Fit: R-squared= .699412,

Adjusted R-squared = .66952

Model test: F [17, 182] = 23.40,

Prob. value = .00000

Diagnostic: Log-L = -1486.5743,

Restricted (b=0) Log-L = -1606.7758