Factors Affecting Diffusion of Cassava Root: The Case of Ofa Woreda, Wolaita Zone, Southern Ethiopia

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Advisors´ Approval Sheet

This is to certify that the thesis entitled "Factors Affecting Diffusion of Cassava Root: The Case of *OfaWoreda,Wolaita* Zone, Southern Ethiopia" submitted in partial fulfillment of the requirements for the Degree of Master in MarketingManagement, the graduate program of the School of Commerce and has been carried out by Melese Mena Gemeso, under my supervision. Therefore, I recommend that the student has fulfilled the requirements and hence hereby can submit the thesis proposal to the department.

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Examiners' Approval Sheet

We, the undersigned, members of the Board of Examiners of the final open defense by Melese Mena Gemeso have read and evaluated his thesis entitled"Factors Affecting Diffusion of Cassava Root: The Case of *Ofa Woreda,Wolaita* Zone, Southern Ethiopia", and examined the candidate. This is, therefore, to certify that the thesis has been accepted in partial fulfillment of the requirements for the degree.

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Declaration

I hereby declare that this MA thesis entitled "Factors Affecting Diffusion of Cassava Root: the Case of *Ofa Woreda, Wolaita* Zone, Southern Ethiopia" is my original work and has not been presented for a degree in any other University, and all source of materials used for the thesis have been duly acknowledged.

Melese MenaGemeso	_____	_____
Name of the Designate	Signature	Date

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Abbreviations and Acronyms

CC	Contingency Coefficient
CSA	Central Statistics Agency
DA	Development Agent
FAO	Food and Agricultural Organization
HH	Household
IFAD	International Fund for Agricultural Development
NCFCP	Nigeria Casava Master Plan
NGO	Non-Governmental Organization
OWAO	Ofa Woreda Agricultural Office
OWBoFED	Ofa Woreda Bureau of Finance and Economic Development
SPSS	Statistical Package for Social Science
VIF	Variance Inflation Factor
WZBoA	Wolaita Zone Bureau of Agriculture

Abstract

The study was carried out in Ofa Woreda, Wolaita Zone with the main objective of assessing the factors affecting diffusion of Cassava root. Specifically, it was intended to assess the effect of upstream value chain, market information, infrastructure, extension service, credit service, and demographic factors on diffusion of cassava root in the study area. The study employed explanatory research design with mixed research approach of both qualitative and quantitative methods. Multistage sampling technique was used. The study was employed both primary and secondary sources of data and the data collected through questionnaire, key informant interview and focused group discussion. Data were cleared, coded, entered and analyzed using SPSS software version 21, while descriptive and inferential statistical techniques were employed. Descriptive statistics such as percentage, frequency, mean, and standared deviation were used to summarize the data collected through questionnaire. Furthermore, inferential statistics such as correlation and multiple Linear Regression analysis were used to identify determinants of honey market supply in the study area. In addition, the results of key informant and focus group discussion were used to triangulate the quantitative findings. The study found out that among different variables identified to determine the diffusion of cassava root, the regressions model analysis result revealed that total household size, upstream value chain, access to market information, access to infrastructure, access to extension service, and availability of credit service were the major factors that affect the quantity of cassava root supplied in the study area.. The study recommended that Zonal and Woreda cooperative office, Woreda agricultural office and Woreda administration office should organize cassava root producers in a cooperatives, provide modern technologies and follow cassava them for their proper usage. Micro-finance institutions should address the availability of credit for cassava root farmers. The government should also facilitate appropriate infrastructure for cassava root producers.

Keywords: *Ofa Woreda, Cassava root, Diffusion, Market supply*

CHAPTER ONE
INTRODUCTION

1.1. Background of the Study

Around the world, cassava is a vital staple food for about 500 to 600 million peoples. Cassava's starchy roots produce more food energy per unit of land than any other staple crops (Ayoade, 2012). Its leaves, commonly eaten as a vegetable in parts of Asia and Africa, provide vitamins and proteins. Nutritionally, the cassava is comparable to potatoes, except that it has twice the fiber content and a higher level of potassium. Also it is rich in carbohydrate content as tocompare with other root crops and it is the third carbohydrate rich crop next to Rice and Maize in tropical zones (Lebot, 2009).In some countries of the world,the rate of cassava diffusion in the market was unappreciated and poorly understood. The linkage between farmers and processors in urban centers were weak (Ayoade, 2012). On the other hand, the diffusion of cassava in Thailand was successful. The cassava product can easly transformed in to industrial crop. In Thailand, cassava marketing and distribution occurs between smaller producers and export brokers, the latter responsible for shipping the goods to the importing country, usually through an import agent in the importing country. The products get to the final end-users through a network of wholesalers, distributors (NCMP, 2006).

In Africa, the diffusion of cassava can be described as a self-spreading innovation.Cassava was first introduced to the Africa continent by Portuguese explorers and traders from Brazil, South America in the course of the 16^{th} and 17^{th} centuries. From there it was diffused by Africans, too many parts of sub-Saharan Africa over a period of two to three hundred years. In the course of its spreading across the continent, cassava has replaced traditional staples such as millet and yam and has been successfully incorporated into many farming systems. It was initially adopted as a famine reserve crop as it provided a more reliable source of food

during drought, locust attacks and the hungry season, the period before seasonal food crops are ready for harvesting(FAO and IFAD, 2005).

Cassava is a staple food crop cultivated in several developing countries.Cassava is consumed either directly as cooked tubers or as the products prepared from cassava. Globally Cassava is grown in an area of 18.51 million ha producing 202.65 million tons with a productivity of 10.95 t/ha. (FAO, 2005). It is grown in 102 countries in the world. African continent occupies first position covering 66.21 per cent of cassava area producing 53.37 per cent of world cassava as it is a staple in many of the African countries. Even though the area is more in Africa, its production is low due to low productivity (8.824 t/ha) which is lower than the world average productivity (FAO, 2012).

Cassava roots have heavy concentration of carbohydrates, about 80%. The shoots grow into leaves that constitute a good vegetable rich in proteins, vitamins, and minerals. New knowledge of the biochemistry of the crop has proved that the proteins embedded in the leaves are equal in quality to the protein in the egg. Cassava leaves and roots, if properly processed, can, therefore, provide a balanced diet protecting millions of African children against malnutrition (Taye, 2015).Cassava is a very important food crop in tropics, that is, cassava leaves also have excellent potential and are extensively used in Africa and Asia, as either human food or animal feed. Cassava is the fourth most important commodity after rice, wheat, and maize, and is a basic diet of many millions of people(FAO, 2012).

According to IFAD(2005), the vision for cassava in Africa is that if the cassava food system is improved, it enhanced rural industrial development and raise incomes for producers, processors, and traders. Cassava will contribute more to the food security status of its producing and consuming households and will become an even more important cash crop that can promote rural development.

In addition to the economic value of the products and byproducts obtained from cassava, it offers other recognized advantages; tolerance of drought capacity to produce considerable

yield in degraded soil, resistant to insect pests and diseases, tolerance of acid soils, and flexibility in planting and harvesting time (Bernardo and Hernan, 2012).

Africa is the world's largest cassava producing region and accounts for nearly 55 percent of the world's cassava. However, Africa's yields are the lowest in the world standing at only 10 tons per hectare compared to 26 tons per hectare in India. The low productivity is a result of limited market opportunities due to low utilization of mechanization and production or processing tools. It takes a farmer in Africa 10 days to uproot or harvest their fields while a farmer in India requires only six hours (AATF, 2013).

In Ethiopia, cassava grows in vast areas mainly in Southern Region. According to Feleke (1997), cassava was introduced by some NGOs to drought-prone areas of southern part of the country such as Amaro, Gamogoffa, Sidama, Wolayta, Gedeo primarily to fill the gap for subsistence farmers due to the failure of other crops as a result of the drought. In these areas, farmers usually grow cassava in small irregular scattered plots either sole or intercropped mainly with taro, enset, maize, haricot bean and sweet potato. Although its first introduction into the country is not yet known, the crop had been growing in south, southwest and western part of Ethiopia for several years (Teshome et.al., 2004).

In Southern Ethiopia, Cassava is one of the most important food crops that constitute a considerable portion of the daily diet of the people and also serves as a major source of carbohydrate. Despite its importance cassava production in Ethiopia has different constraints and opportunities. It is mainly cultivated by small resource-poor farmers on smallholding plots of land. It is both a food security crop and a source of household income. It is increasingly becoming a source of industrial raw material for the production of starch, ethanol, waxy starch, bio-plastics, glucose, bakery and confectionery products, glue among others (Tesfaye et al., 2012).

Cassava was produced by smallholder farmers of the *Wolaita* zone. The average total coverage and productivity of cassava per annum in Wolaita zone of southern Ethiopia are 5,896.25 hectares with the yield of 308 quintals per hectare respectively (WZBoA, 2017).

1.2. Statement of the Problem

Cassava plays a very important role in household income for farmers. According to Nwibo et al. (2014), there was a significant rise in cassava contribution to farmers' household income. They also added that cassava contribution is increasing from year to year for farmer household economy. For example: in 2013 cassava contributed more than 70% to farmer household economy in Kampong Cham and Pailin while it was only 55 % before 2010(Nwibo et al., 2014).

According to Mahungu (2010), cassava initiatives were assisting farmers in planting high yielding cassava varieties that grow in relatively dry conditions to ensuring food security and enhance incomes for thousands of families in sub-Saharan Africa.Product marketing is important for cassava farming and processing since understanding the marketing process and using that knowledge in marketing produce can have a major impact on the profitability (or net farm income) of a farmer (Penh, 2015).

However, the marketing process of cassava farming is poor in*Wolaita* Zone. The majority of cassava farmers in the study area grown cassava root crop for consumption purpose and they supplied some amount of cassava product to the market (Samuel, Derib and Ashenafi, 2017). Cassava producing farmers in *Wolaita* zone in general and Ofa Woreda in particular haslow market suppy (WZBoA, 2017). Besides, there are limited numbers of research works that have been done on cassava root production in Ethiopia such as Samuel, Derib and Ashenafi (2017) and Taye (2015). But they did not address the major determinants for the product flow or the amount of cassava root supplied to the market. Therefore, this study tried to identify the factors that affect cassava root diffusion in*Ofa Woreda, Wolaita* Zone, Southern Ethiopia.

1.3. Objectives of the Study

1.3.1. General objective

The general objective of the study is to identify the factors that affectcassava rootdiffusion in *Ofa Woreda, Wolaita* Zone, Southern Ethiopia.

1.3.2. Specific objectives

Based on the above general objective, the following points are identified as specific objectives of the study.

1. To examine the effects of the upstream value chain on the diffusion of cassava root in the study area.
2. To findout the effects market information on diffusion of cassava root in the study area.
3. To identifythe effects of infrastructure on diffusion of cassava root in the study area.
4. To determine the influence of extension service on diffusion of cassava root in the study area.
5. To investigate the influence of credit service on diffusion of cassava root in the study area.
6. To examinethe influence of demographic factors on diffusion of cassava root in the study area.

1.3.3. Hypothesis

In order to address the research objectives, hypotheses are developed with the following expectations:-

Ho_1: Upstram value chain has no significant effect on diffusion of cassava root.

Ho_2: Market information has no significant effect on diffusion of cassava root.

Ho_3: Infrastructure chain has no significant effect on diffusion of cassava root.

Ho_4: Extension service has no significant effect on diffusion of cassava root.

Ho_5: Credit service has no significant effect on diffusion of cassava root.

Ho_6: Demographic factors have no significant effect on diffusion of cassava root.

1.4. Significance of the Study

Previously different studies were carried out in many areas, regarding marketable supply. In this study, the researcher paid attention to indentify factors affecting cassavaroot diffusion in in *OfaWoreda*. Therefore, this study would be important in the following ways:

First, it is believed that it enables the government and stakeholders to clearly identify major constraints that affect cassava rootdiffusion in the study area. Secondly, it is hoped that the research result might create awareness about cassava farmers enhancing benefits of its members and improving quantity supplied on the household level in local people in the study area. Thirdly, it would help the local administrators to realize the problems and advance the effort to address problems by mobilizing and encouraging the cassava farmers' active involvement to solve cassava rootdiffusion problems in the study area. Fourth, the output might help to clarify and giving enough information for someone who interested to study in the same area.

1.5. Scope of the Study

The studyfocused on identifying the factors that affect cassava rootdiffusion in *Ofa Woreda,* three selected *kebeles.* It does not include farmers who were not involved in Cassava root production in these three *kebeles,* because of the shortage of time and inadequate finance to handle and analyze large numbers of the population. The researcher followedexplanatory research design and also used quantitative and qualitative research approaches to analyze and explain the data which were gathered from sample respondents through questionnaires, focus group discussion and a key informant interview. This research work was completed onApril 2018.

1.5. Limitation of the Study

The limitation of the study was some challenges met with data collectors to meet the respondents, the respondents were not meet with data collector on the appointed time, due to critical farming season, they biased to their farming work, for this reason waiting for long time to meet focused group members was challenge of this study. Another limitation of this study is mainly related to the limited coverage of the study area in the zone other cassava producing *woredas* were available. The study focused only in *Ofa woreda* due to lack of sufficient finance and time limitation. However, for the mentioned constraints the researcher was tried to solve the problems by using all possible opportunities to got valid data from the respondents.

1.6. Operational Definitions of Key Terms

Cassava: refers to a root crop that grows tall, sometimes reaching 15 feet or 4.57 meters, with leaves varying in shape and size. For most people, cassava is most commonly associated with tapioca or starches. However, the edible parts are the tuberous root and leaves. The tuber (root) is somewhat dark brown in color and grows up to 2 feet long.

Diffusion: refers to a process whereby the amount of cassava root supplied to the market.

Market: refers to an institution within which the forces of demand and supply operate; sellers and consumers are in constant communication.

Supply: refers to as the quantity of a product that would be offered for sale at a given prices in a given market at a given time.

1.7. Organization of the Thesis

The thesis organized in to fivechapters. Chapter one is the introductory part of the study which consists of background of the study, statement of the problem, objective of the study,

research hypothesis, significant of the study, scope of the study. Chapter two is deals about review of related literatures. Chapter three discusses about research methodology which involves description of Research area, research design, types and sources of data, study Population, sample design, data collection methods and data analysis and presentation. Chapter four is Data analysis and interpretation. Chapter five is Summary of findings, conclusion and recommendations.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

Studies on the factors affecting diffusion of cassava root in Ofa Woreda, Wolaita Zone, and Southern Ethiopia were reviewed in general and seen in the Ethiopian context in particular. The reviews gave some conceptual framework within which the study questions were formulated as follows.

2.1. Conceptual Litrature

2.1.1. Introduction and Difussion of Cassava

Cassava introduced and diffused to Africa in the form of flour by Portuguese (FAO, 2005).Cassava (Manihotesculenta) is a shrubby, tropical, perennial plant that is not well known grown in the temperate zone with eventually some periods of dormancy (if temperature is low). In cultivation, however, it is treated as annual crop. During the growth there are five distinct phases. These are sprouting phase, leaf and root system development phase, canopy establishment phase, high carbohydrate translocation phase and dormancy phase (Lebot, 2003).

According to Lebot (2009) cassava thrives better in poor soils than any other major food plantsAs a result, fertilization is rarely necessary. However, yields can be increased by planting cuts on well-drained soil with adequate organic matter; cassava is a heat loving plant that requires a minimum temperature of $80^{o}_{F}$to grow, in other hands it grows under a favorable temperature condition which ranges from 25 to $29^{o}_{c,}$ but it can tolerate temperature as low as 12 $^{o}_{c}$and as high as 40 $^{o}_{c}$. Its leaf has a capacity to reduce evaporation at a hot temperature conditions by closing the stomata. This increases the water use efficiency (Lebot, 2009).

Since many cultivars of cassava are drought resistant it can survive even during the dry season when the soil moisture is low but humidity is high. The critical period for cassava root initiations after planting is 30-150 days (Lebot, 2003). During this phase the water deficit causes decrease its production from 30 to 60%. Also if water deficit reaches high it can causes a death of plant. Cassava can successfully cultivated in the areas of annual rainfall is between 1000mm to 3000mm but it can tolerate low rainfall if well distributed. The most favorable conditions seem to be in climates with 1500mm to 2000mm/ year and maximum solar radiations and it can be planted all years round(Kyamanywa et al., 2011).

Cassava is a native from South America around Brazil of Goias state, that is extensively cultivated as an annual crop in the tropical and sub-tropical regions for its edible starchy tuber as root but in Ethiopia it is a perennial crop for edible the root. Cassava has the ability to grow on marginal lands and its one of the most important staple food crops in Tropical Africa with its efficient production of food energy from its roots, year round availability and tolerant of extreme environmental stresses which makes it eminently suitable for farming and food system in many cassava producing countries. Cassava production plays a key role in alleviating poverty in some African countries like Nigeria, Cameroon, Ghana, Madagascar, Uganda, Zambia, Zimbabwe, Senegal etc. Therefore, cassava production is an important factor in ensuring food security, in poverty alleviation, reducing rural-urban drift and reducing unemployment among others by creating a job opportunity participating in the cassava production, processing and marketing (Okupukpara, 2006).

Cassava is a tropical woody shrub and dicotyledonous plant. It originated from North East Brazil. Cassava is the most widely distributed and cultivated root crop in different parts of Africa. Cassava used as a staple food in many regions of the developing world. Cassava is fast becoming an elite food crop in SSA countries. Cassava in Africa has played and will continue to play a major role in efforts to alleviate the African food crisis because of its production rate number of producing country increment and efficient production of food energy (Zemach, 2013).

Cassava was introduced in Ethiopia around 1960's. Currently the plant is being distributed throughout the country to tackle food insecurity (Tesfaye et al., 2012); the crop has been cultivated, mainly, in the south, south west, and western parts of Ethiopia. Its use as a potential food crop in Ethiopia has increased during and after the 1984 famine. It was introduced by some NGOs to drought prone areas of southern part of the country such as Wolayta, Amaro Kello, Sidamo and others primarily to fill the gap for subsistence farmers due to failure of other crops as a result of drought (Amsalu, 2006).

Cassava is one of the most important food crops in the daily diet of the people and also serves as a major source of carbohydrate in Southern Ethiopia. Despite its importance cassava production in Ethiopia has different constraints and opportunities. It is mainly cultivated by small resource poor farmers on smallholding plots of land. It is both a food security crop and a source of household income (Tadesse et al., 2012). In Ethiopia, the main common cassava flour products prepared for human consumption is sundried. Traditionally, cassava flour can be produced from washed or peeled roots that are chipped, or sliced, then sun-dried on trays, and finally milled into flour. The crop was introduced to Ethiopia as the bitter cultivars (traditional varieties) had been introduced first, and then followed by the sweet cultivars (Qulle and Kule). It is known by a variety of local names like ''Mita Boye'' ''Yenchet Boye'', ''Furno Tree'' ''Manna'', ''Pamppa'' and ''Mogo'' in the southern parts of Ethiopia, where it is dominantly grown, utilized and used as food crop. In Wolayta cassava roots are widely consumed after washing and boiling or in the form of bread or "injera" (Ethiopia staple food) after mixing its flour with that of some cereal crops such as maize , wheat, sorghum, or teff. Variety plays a very important role in the production of diversified food products due to inherent characteristics which vary from one cassava to the other. Currently cassava is being promoted in food insecure northern areas of Ethiopia (Tadesse et al., 2012).

2.2.2. Market information

Agricultural marketing in most developing countries historically traces back to 1980s where governments controlled and regulated the major export and strategic food commodities and

inputs (Kherallah, M. et al, 2000). Access to marketing information was very limited during this era. Different media were involved in the provision of marketing information such as Radio, TVs broadcasts, newspapers, word of mouth, and bulletin boards at selected markets visiting the markets and Radio broadcasts were essential in creating awareness. Marketing information was generally disseminated periodically and for selected markets and produces.

2.2.2.1. The Need for Provision of Marketing Information

Establishing marketing information services is seen as a means of increasing efficiency of marketing systems, and promoting improved price information. Market information products include market news (e.g. information on price, quantities, market conditions, and business contacts), market analytical reports (e.g. reports that analyze factors that cause changes in market conditions and their effect on stakeholders), and business reports (e.g. providing information that can help stakeholders identify reliable trade partners (Ferris, S. et al, 2008). Tschirley et al (1995) clearly stated that market information is a public good according to economist theories. Shephered, A. W (1997) supported this concept by specifying that the preconditions for a market economy are that correct information on market conditions must be available and accessible to the public. Market information in most developing countries is considered as a public good service provided by the government. Market information services usually involve the regular collection of commodity prices from major markets and supply conditions, processing, storing them, and disseminating the information to the different stakeholders using one or more channels (Tschirleycet al, 1995).

This information is usually intended to different beneficiaries like farmers, traders, consumers, policy makers, governments, development agencies, scholars, and researchers. As a result, information for use in marketing systems can be categorized as either up-to-date, current information or information accumulated over time, usually, several years referred to as historical information (Shephered, 1997). Current information facilitates efficient bargaining while historical information is used for production planning, storage decisions, government planning, and early warning system for food security.

Access to timely market information services and analyses has benefits to market participants. Improved information enables farmers to plan their production more in the timeline with market demand; schedule their harvest at the most profitable times, and decide to which markets they should send theirs produces and negotiate on a more even footing with traders. Other benefits have been seen for traders. Improved information enables traders to move produce profitably from surplus to a deficit market; and make decisions about the viability of carrying out storage, where technically possible.

Market information services provide transparency by creating awareness of all parties of prevailing market prices and other relevant information (Shephered, 1997). By improving transparency of the market systems, reducing the riskiness of participating in the markets, and transmitting market signals more effectively to farmers & traders, they are encouraged to produce more for the market. Improving market information services facilitates efficient allocation of productive resources and improves the bargaining power of farmers with traders. Farmers with trade's access to timely and reliable market information can decide to which market they send their produce to maximize returns. Improved market information strengthens both the availability of and access food (Mawazo et al, 2014).

Access to market and marketing information has a positive impact on the welfare of farmers. A study on the impact of market information to rural maize farmers in Uganda found that access to market information resulted in higher farm-gate, price and improves farmers' relative bargaining position to local traders. Another study to develop an efficient grain marketing system in Ethiopia noted that improving farmers and traders awareness of prices in various market throughout country promoted grain marketing system efficiency by encouraging grain flow from relative surplus to relatively deficit areas, thus helping stabilize prices over space, improvingfarmers' decision and confidence regarding what to plant, how much to invest, and where and when to market their products, which will benefit both producers and consumers (Tschirley et al., 1995).

2.2.2.2 Objectives of a market information system

The most important objective of a public MIS is to enhance competition in the market by increasing market transparency for all market participants and in particular the weakest who are smallholder farmers. Therefore, an MIS means empowerment of farmers by strengthening their bargaining power in order to increase their share of the retail proceeds of their produce (Giovannucci, 2003).

Market transparency is a condition for effective competition and good marketing performance in liberalized markets. It can be defined as the degree of information that farmers, cooperatives, traders, exporters, and control institutions, including the government, have regarding parameters relevant to their decision making. Adequate knowledge of prevailing prices, quantities, qualities, and conditions of sales in the markets are indispensable for rational production and marketing decisions (shepherd, 1997). From the farmers' point of view, market transparency allows them to adjust their sales strategy in order to maximize their welfare. From a macroeconomic point of view, market transparency allows vertical coordination in the marketing chain whereby price signals play their proper role in adjusting production and consumption such that maximum efficiency is attained and overall welfare is optimized.

2.2.3. Acess to Infrastructure

Market integration over space and time requires good infrastructure and effective market institution. Where spatial market integration is poor, favorable local growing conditions, enhanced production practices, or adoption modern technologies that result in increasing marketable surpluses may result in radical fall in local prices, while other areas may suffer from deficits and rapidly increasing prices. Such large spatial price differences and unexpected inter-sequential price changes are common in low-income countries with poor infrastructure and/ or poorly functioning markets. For example, maize prices in Ethiopia tripled from 1997-98 to 1999-00 followed by 80 percent drop from 1999-2000 to 2000-

2001. In Malawi, the price of maize quadrupled between April 2001 and April 2002 (Pinstrup-Andersen, 2002).

2.2.4. Acess to extension service

Extension programs were originally conceived as a service to "extend'' research-based knowledge to the rural sector in order to improve the lives of farmers. Extension, therefore, included components of technology transfer, broader rural development goals, management skills, and non-formal education. The traditional view of extension in the developing countries was very much focused on increasing production, improving yields, training farmers, and transferring technology. Understanding of extension goes beyond technology transfer to facilitation, beyond training to learning, and including helping farmers form groups, deal with marketing issues, and partner with a broad range of service providers and other agencies. The agricultural extension can be defined as the entire set of organizations that support people engaged in agricultural production and facilitate their efforts to solve problems; link to markets and other players in the agricultural value chain; and obtain information, skills, and technologies to improve their livelihoods (Kristin, 2009).

2.2.5. Credit service

The provision of credit has increasingly been regarded as an important tool for raising the incomes of rural populations, mainly by mobilizing resources to more productive uses. As development takes place, one question that arises is the extent to which credit can be offered to the rural poor to facilitate their taking advantage of the developing entrepreneurial activities. The generation of self-employment in non-farm activities requires investment in working capital. On the other hand, at low levels of income, the accumulation of such capital may be difficult. Under such circumstances, loans, by increasing family income, can help the poor to accumulate their own capital and invest in employment-generating activities (Okupukpara, 2010).

2.3. Theoretical Litrature

2.3.1. Economic Theory of Competition

Competition between supply chains could also be regarded as developing along with other forms such as co-opetition and national competition whereby the behavior causing competition arises from the interaction between supply chains for resources, innovation and advantage of particular sort. Building on the process orientation discussed above, emergence extends this idea to a logical conclusion by looking at interaction from the opposite side, i.e., in terms of results. Therefore, emergence focuses on the behavioral outcome of interaction between entities and treats these outcomes as a result of the very same interaction between entities. Over time, this should allow certain outcomes to be expected of certain types of interaction and possibly vice-versa. Based on this, emergence specifically assumes that competition (competitive interaction) must involve more than one entity. To be accommodating to supply chain versus supply chain competition, theories must place equal emphasis on process orientation as they do on emergence. For supply chain, doing this may be instrumental to understanding how some of the complexities of supply chains compete (Storey et al., 2006).

2.3.2. Operations Management Theory

Operations consists of the jobs or tasks composed of one or more elements or subtasks, performed typically in one location operations transform resources or data inputs into desired goods, services, or results, and create and deliver value to customers. Operations management is the design, improvement, and the management of the transformation processes that create value by converting inputs, such as goods or services. Operations management is concerned about systems and how to make them operate better, whether more efficiently, more effectively, at a higher level quality, at reduced cost, and/or at lower environmental emission, using the appropriate criteria determined by the organization (Saraja, 2013).

2.3.3 Firm Theory

Theories of the firm were originally developed to identify why firms existed hence, earlier theories of the firm were rooted in deductive economics and had their foundation transaction cost theory. Introduction of the concept of transaction costs as the factor to determine whether a firm or market contracts existed for the condition of production. Firm existence based on the differences between the transactions costs of market contacts versus those of a firm (Mentzer et al., 2004). If market contacts were characterized by low transaction costs, it meant that all factors of firm production both intra and inter had low transaction costs as well hence logistics could have influenced such situation in the market when handled correctly by the firm (Fugate et al., 2010). According to the supply chain cost framework, the organization's form that developed the one that most efficiently completed transaction and minimized production costs. Transaction costs were those costs associated with exchange, while production costs were associated with the coordination of various production activities (Mentzer et al., 2004).

Mentzer et al. (2004) identified three characteristics of transactions; asset specificity, uncertainty, and the number of input sources: that determined when firms of markets prevailed. Market contacting was more efficient when assets were non-specific to any particular transaction. Likewise, when small numbers of sources and imperfect information were not significant, market contacts dominated over firms. The study of Mentzer et al. (2004) revealed that, the greater the asset specificity, uncertainty (imperfect information), and likelihood of a few input sources, the greater the rationale for the disorganization of the firms.

Researches conducted in the various functional business areas, including logistics, were therefore advanced through the theories of the firm by understanding how the goals and resources of the organization drove firm's behavior. As well based on insights from the theories of the firm, the researcher understood better the strategic role of logistics in supply chain (Das and Teng, 2000).

Firm theory served as a good starting point for the analysis, which explained why certain tasks were performed by firms (Fugate*et al.*, 2010).

2.4. Emprical Litrature

Biforin et al. (2010)found out that the area has young, experienced, good level of education and high social participation amongst members, which is an advantage for innovation adoption and transfer. Majority inherited their cassava farms and financed them mainly through personal savings. The result showed that extension agents 45.0% was the majoir source of information on improved cassava production technologies and also majority (35.0%) gave high yield as their major reason for growing improved cassava varieties. The majoir constraints to the adoption of improved cassava production technologies include: high cost of fertilizer, agro-chemicals and unavailability of market. It was concluded thatthere is the need for applying organic fertilizers and bio-pesticides which are less costly, environmentally friendly and reduces the hazard inherent in the application of mineral fertilizers and synthetic agrochemicals equally; efforts of the extension workers are highly needed to organizetraining programmes, workshops, agric show and seminar which will lead to multiplier effect in the adoption of improved cassava technologies.

Taye (2015) reported that an adult's daily recommended allowance for energy can be provided by cassava by about 80%, while providing an average of 10-20% for vitamin A, iron and zinc. An exceedingly increasing current price of tef in Ethiopia could be a good opportunity to utilize cassava flour as a supplement to tef. In the present situation of our country where by the price of cereals increased from five to six folds higher than their last years price; producing farmers at Gofa, Amaro, Abaya, Kindo, SodoZuriya areas of the southern region consider cassava as an important source of cash for households so that it can be sold at not reasonable price and its dried chips are suitably mixed with tef, wheat and sorghum prepare injera and bread.

Tesfaye et al. (2013), the study results indicated that cassava stands first in the production and productivity followed by sweet potato and maize in Belg (short rainy season) while during Meher (long rainy season) the reverse was observed. The result indicated that cassava requires low moisture content of the soil for higher yield than the other crops under comparison. The adoption rate of improved varieties by the sample farmers in the study area in average was only 30%.

According Odoemenem and Obinne (2010) the study was undertaken to analyze the economics of cassava production in Benue State. The result of the stoical analysis shows that investing in cassava production enterprise is profitable. As a cash crop, cassava generates cash income for the largest number of households in companion with other staples. Thus, many Nigerians derive much of their food and employment from cassava production, processing, marketing and cassava based agro-industrial schemes.

Adjimoti (2013), the result shows that the majority of producer, collector, wholeseller, and retailer (67%) are using the informal market for their products. The lack of information, communities' collective actions and infrastructure can explain this situation. We also found that physical constraints such as access to information, road and transportation influence the market participation. On the same time this constraint increases the probability to choose informal market. Processors tempt to participate more in the formal market than producers.

Biruk (2014) the survey results show that the trend of root crop production in the Soddo zuria woreda is increasing. Root crops contribute significantly to household food security. The major production and marketing problems for root crops are: crop disease and pest infestation, land shortage, water problem, labour shortage, input shortage and market information. According to all the results root crops contributes significantly to household food security.

2.5. Conceptual Framework

According to the reviewed literature, there are different factors that affect cassava diffusion. Therefore, to sum up, the factors affecting diffusion of cassava root, it is necessary to construct a conceptual framework. The dependent variable of the study is diffusion of cassava root. The independent variables are arranged in six categories, i.e., access to credit, access to extension service, access to market information, access to infrastructure, upstream value chain, and Socio-Demographic factors.

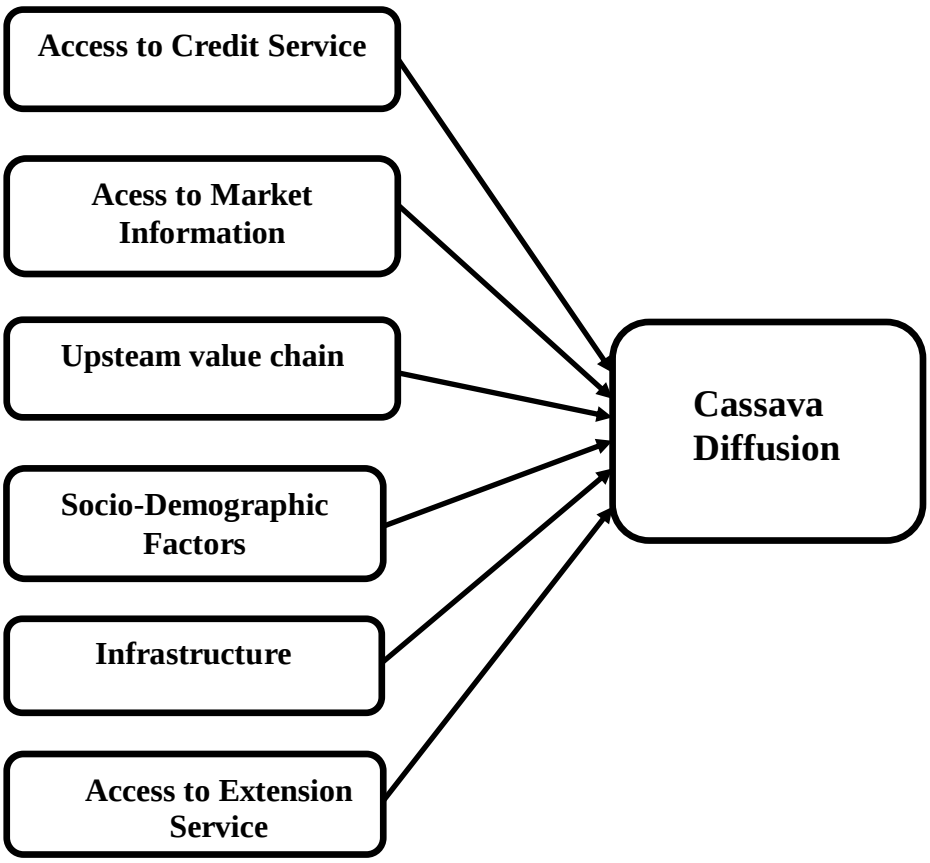

Figure 2.1: Conceptual framework

Source: Adapted from Salum, 2016

CHAPTER THREE

RESEARCH METHODOLOGY

3.1. Description of the Study Area

3.1.1. Location

The study conducted in *Ofa Woreda.*This *Woreda*is located in *Gamogofa Zone Kuca Woreda* from South, *SoddoZuria* and *KindoKoysha woreda* from North, *KindoDidaye woreda* from West and *Humbo woreda* from East. The total area of the *Woreda* is 37,474km^2 with aerial density of 85sq/km (*Ofa Woreda* Agriculture Office (OWAO), 2017).

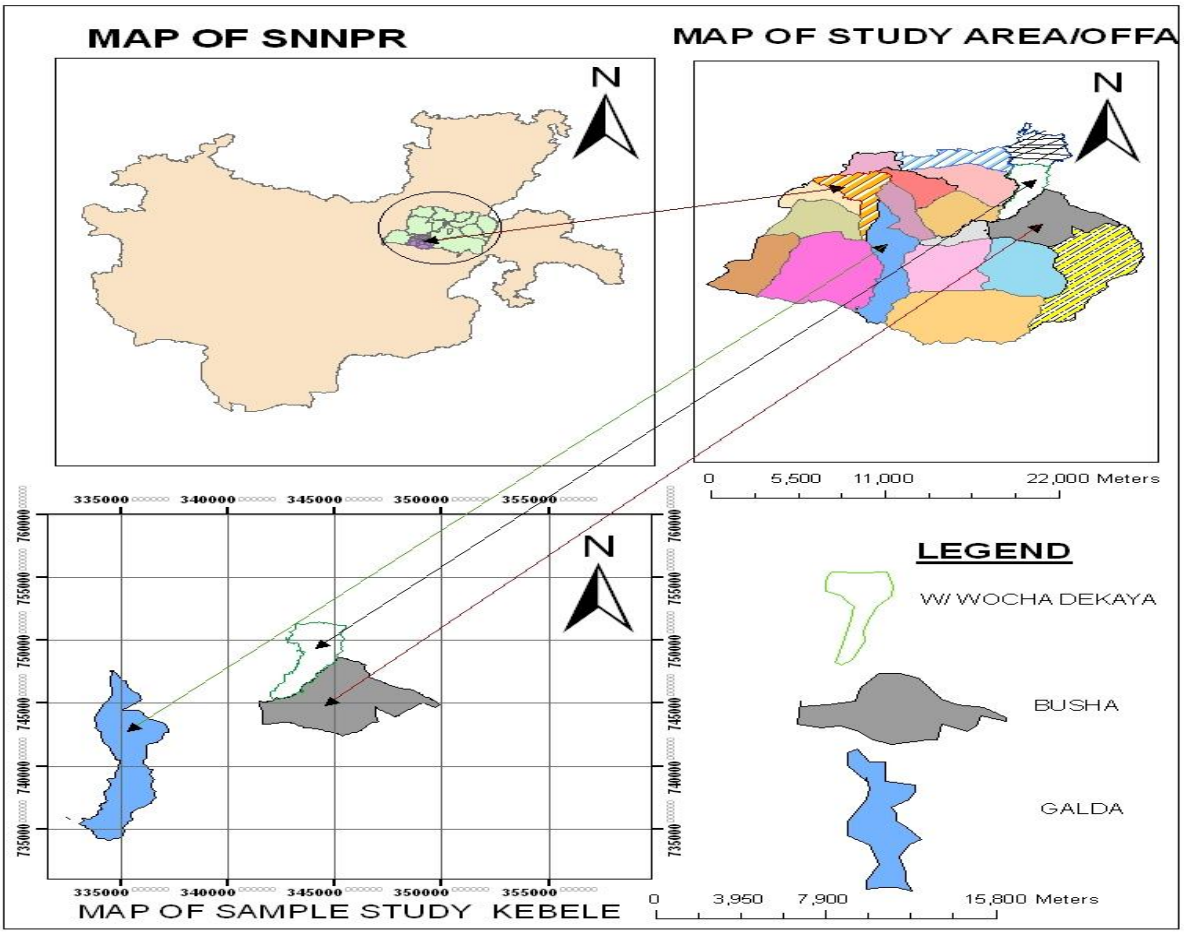

Figure 3.1: Administrative Map of *Ofa Woreda*

Source:OWBoFED, 2017

3.1.2. Administrativedivision

OfaWoreda is found in South Nation Nationality and People Regional State. *OfaWoreda's* town is *Gesuba*. *Gesuba* is located 406km from Addis Abeba, 183km from the regional city, *Hawassa* and 29km from zonal town *WolaitaSoddo*. *Ofa Woreda* has 20 rural *kebeles* and two urban *kebeles* (BOFED, 2016).

3.1.3. Altitude and climate

The climatic condition of the study area is characterized by *Kola,W/dega*and *Dega*. The topography of the *Woreda* is 30% of the mountains , 29% of sloppy, 29% of flat lands and 12% of valley and with an elevation ranging from 1000-2800m.a.s.l. Annual rain fall 800-1400mm and temperature ranges from 14℃ - 28℃ (OWAO, 2017).

3.1.4. Land use pattern

The annual crop coverage in the *Woreda*is 11,450 *hectare*. Among this,7,216 *hectare*covered by grazing land, 2,278 *hectare*areforest land, 4,638 *hectare* are covered by Shrubs and 2486 *hectare* are uncultivated land.The annual cassava production coverage area is 840.3*hectare.* The average productivity of cassava root in the study area is 350 *quintal* per hectare and the total production in O*fa Woreda*is294, 105*quintal.*Currently, cassava is the primary root crop than potato, sweet potato and yam production in the study area(WZBoA, 2017).

3.1.5. Demography

According to CSA (2015) population projection, there are 131,708(65,459 male and 66,249 female) populations live in Ofa Woreda. Among them 6,003(4,812 male and 1,191 female) households are cassava producers (WZBoA, 2017).

3.1.6. Socio economic aspects

As far as economic condition of the *Woreda* is concerned, more than 95% of the populations are engaged in a mixed agriculture, crop production and animal rearing and the remaining 5% are engaged in different economic activity such as retailer and some are unemployed(OWAO, 2017).

3.2. Research Design

The study employed explanatory research design. Since explanatory research design is the best if the research question is to identify factors associated with exploring decisions, or to understand the best predictors of the dependent variable (Oleary, 2004). This can be achived by using the use of both descriptive and inferencial analysis.

3.3. Research Approach

The researcher used mixed method (quantitative and qualitative) approach. Quantitative research is based on measurement quantity that can be expressed in terms of numeric, whereas qualitative method produces a narrative or textual description of the phenomena under study (Scott, 2009). Therefore, throughout the study, the researcher used quantitative method to compute and interpret numerical data, and qualitative method to narrate and explain information obtained from qualitative data.

3.4. Data Sources

Both primary and secondary sources of data wereused for the study. Primary sources of data werecollected from cassava root producers and secondary sources of data werecollected from Woreda and Zonal agricultural offices. Furthermore, published and unpublished studies, journal articles and report documents available were perused.

3.5. Sampling Design

A sample design is a definite plan for obtaining a sample from a given population. It includes determining the sample size that is representative of the population and the sampling technique or the process of taking a sample from a population (Kothari, 2012). Therefore, the formula taken to calculate the sample size and the sampling technique adopted were explained below.

3.5.1. Sample Size Determination

Sample rather than census was better to accomplish the study (Dattalo, 2008). To determine the sample size, the information about number of farmers who were cassava root producer was taken from selected kebeles.According to *Ofa* agricultural office (2017) report, there are 1660 total cassava producers in the sample *kebeles.* Inorder to determine the sample size, Yamane (1967: 886) formula was used. The formula is stated as follows:

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

$$n = \frac{1660}{1 + 1660(0.05)^2}$$

$$n \approx 322$$

Where: n= Sample size
N=Total household
e=Sampling Error (Level of Precision)

Therefore, **322** cassava root producers were arrived as sample for eliciting the required data.

3.5.2. Sampling techniques

After determining the sample size, respondents were selected using multi-stage sampling technique. In the first stage, among the three potential cassava producer rural *Woredas* of *Wolaita* Zone, Ofa woreda was selected purposefully based on its highest potential on cassava production. In the second stage, the *Woreda* is stratified in to two strata according to

the agro-ecology zone namely *Woinadega and Kola*. It is because cassava products are produced in two agro-ecological zones (*Woinedega and Kola*). In the thirdstage, one Kebele fromWoinedega agro-ecologyzone and two *kebeles* from Kola agro-ecology zone were selected using simple random sampling technique from seven and nine kebeles respectively. In the fourth stage, each respondent was selected using systematic random sampling technique.

Table 3.1: Sample distribution to the number of household in each sample kebeles

S.No	Name of the *Kebeles*	Total cassava producers in each *kebeles*	Sample HHs
1	*Busha*	672	130
2	*Woshiwocha Dakaya*	485	94
3	*Galda*	503	98
Total		**1660**	**322**

Source: *Ofa woreda* agriculture office report

3.6. Data Collection Methods

The study employed both qualitative and quantitative data collection methods. The quantitative data werecollected through household survey and document analysis. The qualitative data wascollected through Key Informant Interviewees and Focus Group Discussion.

3.7. Methods of Data Analysis

Data which were collected through household survey questionnairewerecleaned, coded, entered, edited and analyzed using SPSS software version 21. Descriptive statistical analysis such as frequency, percentage, mean and standard deviation were used to analyze the data. Inferential statistics such as correlationand multiple linear regression analysis were employed to identify the determinants of cassava rootdiffusion. The qualitative data

collected through interview and focus group discussions were analyzed qualitatively using narration to triangulate the quantitative data.

3.7.1. Model Specification

The study examined the level of significance for factors affecting cassava root diffusion using multiple linear regression model. However, before fitting important variables in to the multiple linear regression model, it is necessary to test multicollinearity problem among continuous variables and check relationship between discrete variables, which seriously affects the parameter estimates. According to Gujarati (2003), multicollinearity refers to a situation where it becomes difficult to identify the separate effect of independent variable on the dependent variable because of existing strong relationship among them. In other words, multicollinearity is a situation where explanatory variables are highly correlated. There are two important measures that are frequently suggested to test the existence of multicollinearity, these are; Variance Inflation Factor (VIF) for among the continuous independent variables and Contingency Coefficient (CC) for dummy variables.

Therefore variance inflation factor (VIF) is used to check multicollinearity of continuous variables. As R^2 increase towards 1, it is a collinearity of explanatory variables. The larger the value of VIF, the more upsetting or collinear is the variable Xi. As a rule of thumb if the VIF are greater than 10 (this will happen if R^2 is greater than0.80) the variable is said to be highly collinear (Gujarati, 2003). Multicollinearity of continuous variables can also be tested through Tolerance. Tolerance is 1 if Xi is not correlated with the other explanatory variable, whereas it is zero if it is perfectly related to other explanatory variables. A popular measure of multicollinearity associated with the VIF is defined as:

$$VIF(Xj) = (1-Rj^2)-1 \quad \text{---------- (1)}$$

Where, Rj^2 is the multiple correlation coefficients between independent variables, the larger the value of Rj^2 is, higher the value of VIF (Xj) causing higher collinearity in the variable (Xj).

$Yi = \mathbf{Xi}\beta + Ui$ ---------- (3)

Where **Yi** = market supplied of cassava root

Xi = a vector of explanatory variable, and '**i**' is 1, 2, 3… n

β = coefficient of i^{th} independent variable

Ui = unobserved disturbance term

The main identified variables expected to affect cassava rootdiffusion in the study area are clarified under the following sub-section.

3.8. Definition of Variables

The dependent variable used in Multiple Linear Regression model is cassava production. The independent variables are age, sex, marital status, education, family size, dependency ratio, farm size, soil fertility, pests and disease, access to modern irrigation, livestock, oxen ownership, technology adoption, extension visit, access to agricultural input, total cassava production, annual crop income, annual expenditure, training support, calorie intake, land for cassava production, distance to local market, frequency of meal, education expenditure, health care expenditure and family savings.

3.8.1. Dependent variable

The dependent variable for this study is diffusion or quantity supplied to the market. It is a continuous variable which represents the amount of cassava root actually supplied to the market by household in the year 2016/2017 which is measured in kilograms.

3.8.2. Independent variables

There were a number of independent variables that determine the diffusion of cassava root. Based on the review of related literatures, variables related to market information, quantity produced, infrastructure, access to extension service, access to credit, and socio-

demographic characterstics were considered as independent variables.The following is the list and operational definition of independent variables considered in the study.

Access to credit : Access to credit were measured as a dummy variable taking the value of 1 if the cassava root producing farmer has access to credit and 0 if not. This variable is expected to influence the marketable supply of cassava root positively on the assumption that access to credit improves the financial capacity of cassava root producing farmers to buy modern inputs, thereby increasing production which is reflected in the marketable supply of cassava root.

Extension service: The variable extension service has been measured as a dummy taking the value of 1 if cassava root producing household head has contact with a development agent (DAs) and 0 otherwise. Extension service is expected to have a positive effect on the volume of marketable supply of cassava root through its stimulation of production and productivity. Farmers that have acess ti extention service with DAs will have better access to information and could adopt better technology that would increase their marketable supply of cassava root product.

Access to market information: This is measured as a dummy variable taking a value of 1 if cassava root producing farmer had access to market information and 0 otherwise. The general idea is that maintaining a competitive advantage requires a sound business plan. Again, the business decision is based on dynamic information such as consumer needs and market trends. This requires that an enterprise is managed with due to attention to new market opportunities, changing needs of the consumer and how market trends influence buying. At this point, market information has been affecting cassava root marketable supply of farm households positively. Because producers that have access to market information are likely to supply more product to the market. Better market information significantly raises the probability of market participation for potential selling households.

Age of household head: It is a continuous variable measured in years. Aged household heads are not technology users and it is expected to have a negative effect on production.

The higher the age of the household head, the more become technology resistant, because older people have also relatively less educated and have less market information. The estimated coefficient of age is expected to have a negative relation with quantity supplied to the market.

Household size: It is a continuous variable measured in the number of family members in the household, which affects farmers' decision to participate in the market. Since production is the function of labor, availability of labor is assumed to have a positive relation with the quantity of supply. Though household size is expected to increase the production volume of cassava product,large total household size requires large amount of consumption that reduces the marketable surplus. Therefore, the estimated coefficient of household size is expected a negative relation to quantity supplied to the market.

Education: It is a dummy variable and refers to the formal schooling of a respondent during the survey period. Those household heads who had formal education determines the readiness to accept new innovations and easy to get supply, demand and price information and this enhances farmers' willingness to produce more and increase volume of sales. As a result, formal education is positively influenced market participation and marketable surplus.

Upstream value chain: It is an economic factor and continuous variable that can affect the household level marketable supply and measure in kilograms. The variable is expected to have a positive contribution in smallholder marketable supply of cassava root. Quantity produced is assumed to affect the marketable supply positively because a farmer that obtains high yield can supply more to the market than a producer who has fewer yields. The product price has direct relations with marketable supply and hence it was expected to affect the household marketable supply of cassava root positively.

Infrastracture: It is a continuous variable measured in walking time (minute) which farmers spend time to sell their product to the market. If the farmer is located in a village or distant from the market, he/she is poorly accessible to the market. The closer to the market the lesser would be the transportation cost and time spent. Therefore, it was identified to be variable is negatively related to marketed supply.

3.9. Ethical Consideration

Due attention wasgiven for the cultural values of the informants and the community as a whole over the course of the study especially for those who cannot read and write. Similarly, the researcher took legal aspects into account. The purpose of the research wasexplained to cassava root producer farmers to make it more formal. Appropriate times were set together with key informants and focus group discussantsso as not to affect their daily routines schedule. All sensitive information was kept confidential.

CHAPTER FOUR

RESULTS AND DISCUSSION

This chapter presents the results and discussion arrived from the data collected to address the objectives. The results are presented in the form of tables and diagrams followed by interpretation and the inference. About 307 responses were returned from 322 distributed questionnaires; that accounts for 95.3% response rate.

4.2. Background Characteristics of Respondents

Analyzing background characteristics of the respondents is important to understand their profile included in the study. Accordingly, respondents' sex and marital status has been analyzed and presented in Table 4.1.

Table 4.1: Demographic characteristics of sample respondents (n=307)

Variables	Categories	Frequency(n)	Percent (%)
Sex	Male	277	90.2
	Female	30	9.8
	Total	307	100
Marital status	Married	282	91.9
	Single	8	2.6
	Divorced	5	1.6
	Widowed	12	3.9
	Total	307	100
Educational level	Not attended	58	18.9
	Grade 1-4	57	18.6
	Grade 5-8	104	33.9
	Grade 9-12	69	6.2
	Certificate & above	19	6.2
	Total	307	100

Source: Own survey, 2018

Sex refers to the characteristics of the respondent being male or female. Most of the respondents (90.2%) are male and 9.8% of respondents were female. This indicates that females had less involvement in cassava production. It is noticed in FGDs that male headed households had more access to agricultural technologies, labor power and farm land as compared to female headed household in the study area.

Regarding marital status of respondents, the majority (91.9%) of them were married, followed by widowed (3.9%). The rest 2.6% and 1.6% sample cassava producers were single and divorced respectively. This implies that the majority of cassava root producers in the study area are married.

Regarding the literacy status of cassava root producers in the study area, about 33.9% of them were attended second cycle primary education (grades 5-8), 18.9% did not attend formal education, and 18.6% were attended first cycle primary education(grades 1-4). The result indicated that the majority of cassava root producers attended formal education which is an opportunity to understand the training and advice given by development agents.

4.3. Data Reliability

A questionnaire is said to be 'reliable' if it is consistent. That means the research instrument produces the same data time after time on each occasion that it is used and none of the variations is due to fluctuations caused by the volatile nature of the research instrument itself (Denscombe, 2010). According to George and Mallery (2003), reliability score of greater than 0.9 is excellent, greater than 0.8 is good, greater than 0.7 is acceptable, greater than 0.6 questionable, greater than 0.5 is poor and less than 0.5 is unacceptable. Therefore, before proceeding to the descriptive and inferential statistical analysis, the reliability of data for each independent variable, the dependent variable and the overall reliability on every question item were tested using Cronbach's alpha**(** α **)** as follows:

Table 4.2: Reliability test for the questionnaire items

Variables	Cronbach's Alpha	Number of items
Access to credit	0.718	3
Access to extention service	0.876	4
Access to market information	0.733	3
Acess to infrastructure	0.772	5
Upstream value chain	0.832	8
Overall	0.867	16

Source: Own survey, 2018

As showed in Table 4.2, the results of Cronbach's Alpha values of the study variables reveal that the overall reliability coefficient of the study variables is 0.867. Therefore, the result showed that the overall reliability of the questionnaire is greater than 0.8 which is at acceptable level.

4.2. Descriptive Analysis

Under this sub-topic, data that were collected using five points Likert Scale are analyzed. Five independent variables such as upstream value chain of cassava root, market information, infrastructure, extension service, and credit service were identified. To make the analysis easy, the researcher used Al-Sayaad, Rabea and Samrah (2006) proposed techniques of mean score ranges and summarized in Table 4.3.

Table 4.3: Mean Score Range for Five Scale Likert's Response

Mean	Response
1.00 - 1.79	Strongly Disagree
1.80 - 2.59	Disagree
2.60 - 3.39	Neutral
3.40 - 4.19	Agree
4.20 - 5.00	Strongly Agree

Source: Al-Sayaad et al. (2006)

As can be seen from Table 4.3, the ranges of values were presented as disagreeing if the mean score is between 1.00 and 2.60, neutral if the mean score is between 2.60 and 3.40 and agree if the mean score is above 3.4. Based on these classifications the interpretations of all Likert scale items such as upstream value chain of cassava root, market information, infrastructure, extension service, and credit service items were presented as follows:

Table 4.4: Descriptive Analysis

Variables	Minimum	Maximum	Mean	Std. Deviation
Upstream value chain	1.00	4.33	3.1933	.66251
Market information	1.00	4.67	2.5005	.69774
Infrastructure	1.00	4.33	2.9414	.74157
Extension service	1.00	5.00	2.7402	.74117
Credit service	1.00	5.00	2.0554	.58315

Source: Own survey, 2018

As Table 4.4 shows, respondents have neutral response on upstream value chain (*M* =3.2, *SD* = 0.663), infrastructure (*M* =2.9, *SD* = 0.741), and extension services (*M* =2.74, *SD* = 0.741). Other respondents were tended to the idea of disagreement on market information (*M* =2.5, *SD* = 0.698) and credit services (*M* =2.1, *SD* = 0.583).

4.3.1. Correlation Analysis

Correlation analysis measures how variables or rank orders are related. Correlation coefficients range in value from –1 (a perfect negative relationship) which indicates an inverse relationship between variables to +1 (a perfect positive relationship) or a direct relationship between two variables. A value of 0 indicates no linear relationship between two variables (kothari, 2004). In this section, the independent variables were analyzed one by one using correlation analysis in order to identify their individual relation with the dependent variable. For this purpose, eight independent variables which are indicators of cassava diffusion such as age, total household size, educational level, upstream value chain,

market information, infrastructure, extension service, and credit service were identified from literature reviews and tested their degree of relationship with cassava diffusion before conducting the regression analysis. Therefore, to know the strength and type of correlation between variables, the following table set as a rule of thumb for discussion of variables.

Table 4.5: Rule of Thumb for about the Strength of Correlation of Coefficient

Range of Coefficient	Description of Strength
±.81 to ±1.00	Very strong
±.61 to ± .80	Strong
±.41 to ±.60	Moderate
±.21 to ±.40	Weak
±.00 to ±.20	None

Source: Bhattacherjee (2012)

The following table (Table 4.5) shows correlation between dependent (cassava diffusion (CD)) and independent variables (age, total household size (THHS), educational level (EDU), upstream value chain (UVC), market information (MI), infrastructure (INF), extension service (EXT), and credit service (CRE)) of the study.

Table 4.6:Correlation Analysis Result

	Age	THHS	EDU	UVC	MI	INF	EXT	CRE	CD
Age	1								
THHS	.355**	1							
EDU	-.348**	-.277**	1						
UVC	-.016	.011	.074	1					
MI	-.079	.015	.018	.129*	1				
INF	-.158**	-.014	-.016	.282**	.123*	1			
EXT	.033	-.056	.073	.344**	.290**	.176**	1		
CRE	.023	-.009	-.016	.065	.256**	.144*	.243**	1	
CD	-.160*	-.135*	.193*	.368**	.430**	.330**	.760**	.461**	1

**Correlation is significant at the 0.01 level (2-tailed)
*Correlation is significant at the 0.05 level (2-tailed).

Source: Own survey, 2018

Regarding the relationship between extension service and cassava diffusion, the correlation analysis shows that extension service has positive and statistically significant association with cassava diffusion ($r = 0.760$, $p<0.01$). This indicated that the extension service have significant relationship with cassava diffusion. Likewise, credit service has positive and statistically significant relationship with cassava diffusion ($r = 0.461$, $p<0.01$). In the same manner, market information has positive and statistically significant relationship with cassava diffusion ($r = 0.430$, $p<0.01$). Similarly, upstream value chain has positive and statistically significant relationship with cassava diffusion ($r =0.368$, $p<0.01$). Equally, infrastructure has positive and statistically significant relationship with cassava diffusion ($r =0.330$, $p<0.01$). The result implies that all the independent variables have weak correlation to each other but they have moderate and strong relationship to the dependent variable based on Bhattacherjee (2012) rule of thumb presented in Table 4.6

4.3.2. Regression analysis

In this study, multiple linear regression analysis is applied since it facilitates the evaluation of the level of effect that multiple independent variables that cause on a particular dependent variable. Before applying regression analysis to test the factors affecting diffusion of cassava root, linearity, normality, and multicollinearity tests are made for identifying misspecification of data if any so as to fulfill research quality as follows:

4.4.2.1. Linearity Test

Linearity refers to the degree to which the change in the dependent variable is related to the change in the independent variables. To determine whether the relationship between the dependent variable which is diffusion of cassava root and the independent variables; age, total household size, educational level, upstream value chain, market information, infrastructure, extension service, and credit service is linear; plots of the regression residuals through SPSS software had been used. Therefore, the results of the linearity test were presented in Figure 4.1.

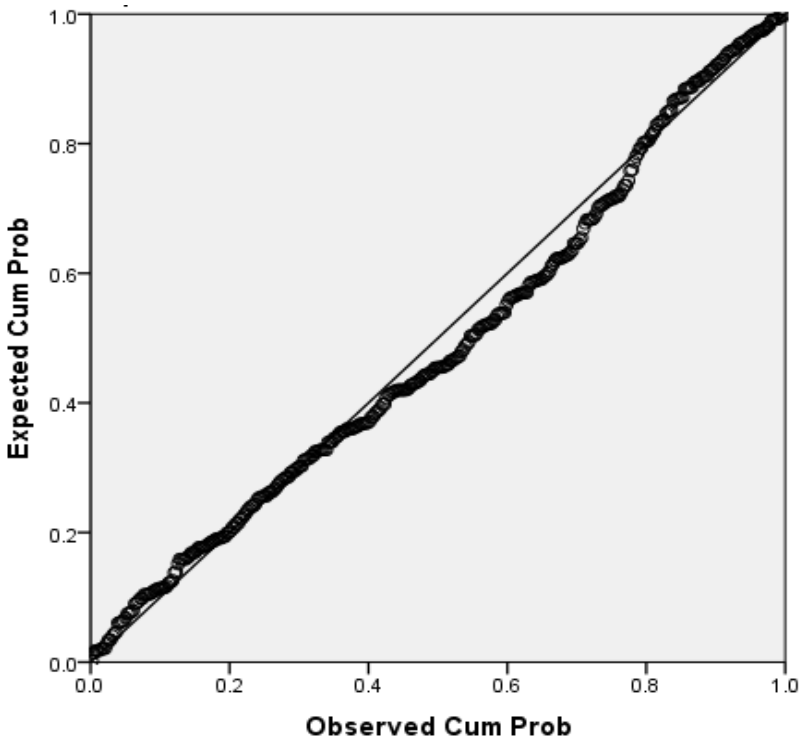

Figure 4.1: The Linearity test of Standardized Residual

Source: Own survey, 2018

The scatter plot of residuals shows no large difference in the spread of the residuals as can be seen from left to right on Figure 4.1. This result suggests that the predicted relationship is linear. Similarly, the figure shows the distribution of residuals around its mean of zero. Hence the linearity assumption is fulfilled as required based on the above figure. Therefore, it is possible to conclude that the inferences that the researcher make about the population parameter from the sample is valid.

4.4.2.1. Normality Test

The other important diagnostic test conducted in this paper is the normality assumption. Normality test is used to determine whether a data set is modeled for normal distribution or not. As a result, there are both graphical and statistical methods for evaluating

normality. Graphically, histogram and statistically, two measures of shape that are skewness and kurtosis were used to test for normality. The results are presented as follows;

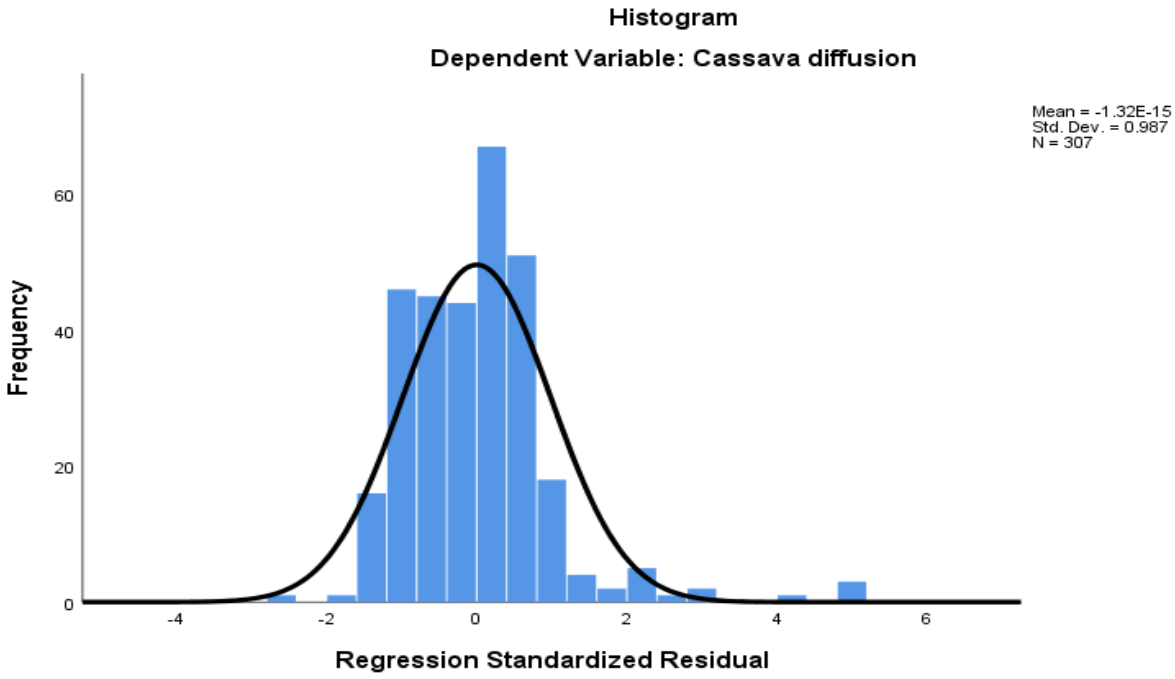

Figure 4.2: Frequency Distribution of Standardized Residual

Source: Own survey, 2018

Normality test can be Figure 4.2 shows the frequency distribution of the standardized residuals compared to a normal distribution. Although there are some residuals (e.g., those occurring around 0) that are relatively far away from the curve, many of the residuals are fairly close. Moreover, the histogram is bell shaped which lead to infer that the residual (disturbance or errors) are normally distributed. Thus, no violations of the assumption normally distributed error term.

The other statistical measure of normality is skewness and kurtosis. According to Kim (2013), assessing normality using skewness and kurtosis of the distribution used for both small and largr sample.Therefore, inaddition to histogram the researcher tests both skewness and kurtosis as follows:

Table 4.7: The results of Skewness and Kurtosis

Tests	Statistic	Standared Error
Skewness	0.437	0.139
Kurtosis	0.417	0.277

Source: Own survey, 2018

According to George and Mallery (2012), a kurtosis value between -1 and 1 show excellent and a value between ±2.0 is in many cases also acceptable. Likewise, the skewness values falling outside the range of -1 to +1 indicate a substantially skewed distribution (Hair, Black, Babin & Anderson, 2013). Therefore, the results of Table 4.7 showed that the data is normally sistributed.

4.4.2.2. Multicollinearity Test

Under this section multicollinearity test were checked using variance inflation factor (VIF) and Contingency Coefficient (CC) in Table 4.8.

Table 4.8: Multicollinearity assumption

Independent variables	Collinearity Statistics	
	Tolerance	VIF
Age	.761	1.313
Total HH size	.837	1.194
Educational level	.835	1.198
Upstream value chain	.823	1.215
Market information	.864	1.157
Infrastructure	.865	1.157
Extension service	.777	1.287
Credit service	.890	1.123

Source: Own survey, 2018

One of the information included in Table 4.8 is collinearity statistics which is associated with the extent of correlation between independent variables. If there is high correlation between two independent variables, the regression model assumes redundancy of one of these variables that the significance of it becomes too low and its coefficient also be negatively affected. The problem is checked by Tolerance and Variance Inflation Factor (VIF). A tolerance of >.10 and a VIF < 10 are considered as good enough to minimize the effect of multicollinearity (Miller and Whicker,1999). Thus, the result implies that the regression model is not affected by higher correlation between two independent variables.

Table 4.9: *Results of Regression Analysis Model Summary*

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.853[a]	.728	.721	.450

Source: Own survey, 2018

According to the model summary of multiple linear regression analysis, the r value of the model as per Table 4.9 was 0.853 which shows the highest degree of relationship between independent and dependent variables. The adjusted R^2 value of the regression model was 0.721, indicating that 72.1% of variance in cassava diffusion was accounted by age, total household size, educational level, upstream value chain, market information, infrastructure, extension service, and credit service factors. The remaining 27.9% of variance in cassava diffusion was not accounted by age, total household size, educational level, upstream value chain, market information, infrastructure, extension service, and credit service factors.

Table 4.10: *Results of ANOVA Output*

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	161.564	8	20.195	99.904	.000[b]
	Residual	60.241	298	.202		
	Total	221.805	306			

a. Dependent Variable: Cassava diffusion

b. Predictors: (Constant), CRE, Total HH size, Upstream, MI, Educational level, INF, EXT, Age

Source: Own survey, 2018

The ANOVA table (Table 4.10) indicated that the multiple regression model itself is statistically significant or not significant. Because R^2 is not a test of statistical significance (it only measures explained variation in Y from the predictor Xs), the f-ratio is used to test whether or not R^2 could have occurred by chance alone. In short, the f-ratio found in the ANOVA table measures the probability of chance departure from a straight line. On results of the output found in the ANOVA table, the model is statistically significant age, total household size, educational level, upstream value chain, market information, infrastructure, extension service, and credit service factors were included ($F=99.904$, $p<0.01$). Therefore, the overall equation was found to be statistically significant.

Table 4.11: *Results of Multiple Linear Regression Analysis*

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	SE	Beta		
1	(Constant)	-1.541	.231		-6.683	.000
	Age	-.001	.003	-.009	-.265	.791
	Total HH size	-.040	.014	-.093	-2.813	.005
	Educational level	.004	.007	.018	.558	.577
	Upstream value chain	.037	.014	.087	2.624	.009
	Market information	.068	.013	.167	5.128	.000
	Infrastructure	.055	.012	.143	4.392	.000
	Extension service	.169	.010	.590	17.218	.000
	Credit service	.121	.016	.249	7.777	.000

Note: B= Regression coefficient (Estimate), Std.Error = Standard Error, Dependent variable = Cassava diffusion

Source: Own survey, 2018

Based on Table 4.11, using "β"(standardized)coefficients, the regression equation of the research model becomes in the form indicated as follows.

CD = - 1.541 - 0.009 * Age -0.093 * THHS + 0.018 * EDU + 0.087 * UVC + 0.167 * MI + 0.143 * INF + 0.590 * EXT + 0.249 * CRE

Where:

CD = Cassava Diffusion
Age = Age of the household
EDU = Education
THHS = Total Household Size
UVC = Upstream Value Chain
MI = Market Information
INF = Infrastructure
EXT = Extension service
CRE = Credit service

The regression equation is interpreted in the following few paragraphs. Out of eight variables which were included in the model, six predictors have found to be significant effect on the cassava root diffused to the market. These are total household size, upstream value chain, market information, infrastructure, extension service, and credit service. Since it has no value to present insignificant variables, the following paragraphs describe only significant variables.

Total household size: Household size was found to be determinant factor for cassava diffusion in the study area. The result of beta coefficient for household size was found to be negative and statistically significant at 1% level of significance ($\beta = -0.093, p < 0.01$). The negative relationship implies that households with large family size cannot diffuse cassava root adequately, rather they use for consumption purpose, while households with small family size diffuse cassava root adequately. Therefore, the result implied that family size of a household negatively affects diffusion of cassava root.

Upstream value chain: Regarding to this variable, Table 4.11 shows that upstream value chain has positive and significant effect on diffusion of cassava root. The results of the beta coefficient ($\beta = 0.087, p < 0.01$) indicates the amount of increase in cassava diffusion that would be predicted by a one unit increase in the upstream value chain. The values of the beta coefficient indicated that for every unit increase in upstream value chain, a 0.087 unit increase in cassava diffusion is predicted.

Market information: According to the results of Table 4.11, market information has positive and significant effect on cassava diffused to the market. The results of the regression coefficient ($\beta = 0.167, p < 0.001$) indicates that a one unit increase in the availability of market information, brings a 0.167 unit increase in cassava diffusion. This indicated that obtaining and verifying information helps to diffuse cassava root adequately. Having market information increase the amount cassava root diffused to the market. This is similar with the findings of Adugna (2009) who indicated that if farmers get information, the amount their production supplied to the market increases.

Infrastructure: It refers to the availability of transport, road, store, and so on for cassava root farmers. It is an important element for the diffusion of cassava root. In line with this variable, Table 4.11 shows that infrastructure has positive and significant effect on cassava root diffusion. The results of the beta coefficient ($\beta = 0.143, p < 0.001$) indicates that a one unit increase in the availability of good infrastructure, leads a 0.143 unit increase in the diffusion of cassava root. The focus group discussants informed that the main problem to sale their cassava root production was the market distance. Since the main market is 11-18 Kms far from their environment, they simply give them for illegal traders and get less income. This discourages them to produce more for diffusion.

Extension service: It is an important variable that enable cassava producers to produce more and diffused adequately. In line with this variable, Table 4.11 shows that extension service has positive and significant effect on cassava root to the market. The results of the beta

coefficient ($\beta = 0.590, p < 0.001$) indicates that a one unit increase in the extension service, leads a 0.590 unit increase in the amount of cassava root diffused to the market. The results of the key informant interview and focus group discussion indicated that extension services for cassava producers was very low than other crop production. From the discussion, cassava production uses less technology inputs than other crop production even though cassava production contributes more for addressing food security status at household level. As a result diffusion of cassava root to the market becomes less. The results of Ayelech (2011) proved that access to get extension service avails information regarding technology which improves production that affects the marketable surplus.

Credit services: Credit is the amount of money that a financial institution is prepared to lend some body purposively. Table 4.11 shows that credit service has positive and significant effect on cassava root diffusion. The results of the regression coefficient ($\beta = 0.249, p < 0.001$) indicates that a one unit increase in the credit service, leads to a 0.249 unit increase in the amount of cassava root diffused to the market. The key informants informed that the main source of agricultural credit services in the study area was micro finance institute. The focus group discussants indicated that most farmers had less awareness about taking agricultural credit services because they think that agricultural credit service is not necessary or not needed for cassava production since its production cost is lower than other crop production. However, they assure that those farmers who received credit produce greater amount of cassava root and sale to the market. Others boldly rose that credit service is not provided or access able for cassava production in the study area. In connection to this finding, Bifarin *et al.* (2010) and Okpukpara (2010) argued that credit services enhance the use of agricultural inputs thereby increase production and productivity.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

This chapter provides summary of major findings, conclusion and recommendations of the study. It begins with summary of major findings that are obtained from quantitative and qualitative results followed by presentation on conclusion. Finally, it forwards recommendations for the identified gaps by this study.

5.1. Summary of Major Findings

The main purpose of this study is to identify the factors that affect cassava root diffusion in *Ofa Woreda*, *Wolaita* Zone, and Southern Ethiopia. A total of 307 cassava producer household heads were participated in responding the questionnaire and the collected data is analyzed using frequency, percentage, correlation and multiple linear regressions. The data also collected through semi-structured interviews and focus group discussion guidlines. Based on what the result shows, what the participants said, and what the analysis revealed, the following summaries are made:

- The ranges of values were presented as disagreeing if the mean score is between 1.00 and 2.60, neutral if the mean score is between 2.60 and 3.40 and agree if the mean score is above 4.20. Therefore, the interpretations of all Likert scale items such as upstream value chain of cassava root, market information, infrastructure, extension service, and credit service items were done based on these classifications.

- Based on the result, respondents have neutral response on upstream value chain of cassava root (M =3.2, SD = 0.663), infrastructure (M =2.9, SD = 0.741), and extension services (M =2.74, SD = 0.741).

- However, other respondents were disagreed on the accessibility of market information (*M* =2.5, *SD* = 0.698) and availability of credit services (*M* =2.1, *SD* = 0.583) in the study area.

- The results of the correlation analysis indicated that extension service (r = 0.760, p<0.01), credit service(r = 0.461, p<0.01), market information(r = 0.430, p<0.01), upstream value chain(r =0.368, p<0.01) and infrastructure(r =0.330, p<0.01) has positive and statistically significant association with cassava diffusion. In general, the results of the correlation analysis indicated that all the independent variables have weak correlation to each other but they have moderate and strong relationship to the dependent variable.

- The result of the model summary of multiple linear regression analysis indicated that theoverall relationship between the dependent and independent variables is strong (R= 0.853).

- The adjusted R^2 value of the regression model was 0.721, indicating that 72.1% of variance in cassava diffusion was accounted by age, total household size, educational level, upstream value chain, market information, infrastructure, extension service, and credit service factors. The remaining 27.9% of variance in cassava diffusion was not accounted by age, total household size, educational level, upstream value chain, market information, infrastructure, extension service, and credit service factors.

- The ANOVA table indicated that the multiple regression model itself is statistically significant or not significant. Accordingly, it is found that the model is statistically significant when age, total household size, educational level, upstream value chain, market information, infrastructure, extension service, and credit service factors were included (F=99.904, p<0.01). Therefore, the overall equation was found to be statistically significant.

- Regarding the first hypotheis, the researcher rejects the null hypothesis and accepts the alternative hypotheis since the p-value for its significance test is less than 0.01. This indicated that upstream value chain has significant effect on diffusion of cassava root in the study area.

- Concerning the second hypotheis, the researcher rejects the null hypothesis and accepts the alternative hypotheis since the p-value for its significance test is less than 0.001. This indicated that market information has significant effect on diffusion of cassava root in the study area.

- With reference to the third hypotheis, the researcher rejects the null hypothesis and accepts the alternative hypotheis since the p-value for its significance test is less than 0.001. This indicated that infrastructure has significant effect on diffusion of cassava root in the study area.

- In relation to the fourth hypotheis, the researcher rejects the null hypothesis and accepts the alternative hypotheis since the p-value for its significance test is less than 0.001. This indicated that extention service has significant effect on diffusion of cassava root in the study area.

- In line with the fifth hypotheis, the researcher rejects the null hypothesis and accepts the alternative hypotheis since the p-value for its significance test is less than 0.001. This indicated that credit service has significant effect on diffusion of cassava root in the study area.

- Corresponding to the sixth hypotheis, there were three variables (age, total HHsize and education level) included independently in the regreesion model. Among them one variable which is total HHsize was found to be significant. That means total HHsize has statistically sifnificant effect on diffusion of cassava root in the study area.

5.2. Conclusion

Total household size, upstream value chain, access to market information, access to infrastructure, access to extension service, and availability of credit service were the major factors that affect the quantity of cassava root supplied in the study area. Total household size decreases the households to supply their product to the market. A large number of household size require much spending for their daily sustenance. That means an increase in household size especially the non-working household member put pressure on consumption than production which in turn decreases the marketable supply of cassava root. Likewise, households who use fertilizer and improved seed produce more quantity of cassava root and had also supplied more to the market. Equally, obtaining and verifying information helps to supply more. Having market information increase the probability of quantity supplied; if farmers get information, the amount their products supplied to the market increases. Also, access to infrastructure increased the volume of cassava root supplied to the market also increased. Similarly, access to get extension service avails information regarding technology which improves production that affects the marketable surplus. In the same way availability of credit enlarges their chance to use improved seed and produce more and supplied more to the market.

5.3. Recommendation

In order to fill the identified gaps of cassava root marketing supply in the study area, the following recommendations are forwarded based on major findings and conclusion.

- Large household size affects the amount of cassava root supplied to the market. Since their amount of production is small and used for household consumption. Therefore, zonal and *Woreda* agricultural office and *Woreda* administration office should support cassava producers to produce more than their household consumption. The Woreda cooperative office also should also organize cassava root producers in a cooperative to increase their supply to the market.

- Availability of credit service was found to be significantly affecting supply of cassava to the market. Therefore, attention should be given by government to create access to credit for cassava root producers. Sincethis is already in the government plan to increase access to credit, micro-finance institutions should address the availability of credit for cassava root farmers. Because this helps rural farmers to increase their cassava root production and productivity; which in turn improve their product supply to the market.

- Access to infrastructure is found to be a factor that affects the quantity of cassava root supplied to the market. Those farmers who have better infrastructure such as all weather road and store facilities become benefited to supply more quantity of cassava root. Therefore, the government should facilitate appropriate infrastructure for cassava root producers.

- Extension contact affects the quantity of cassava root supply in the study area. Therefore, cassava root producers in the Woreda should have a better relationship with Woreda Development Agents for getting skill-based training on land preparation, planting, weeding, product harvesting, and processing. Extension agents that were assigned in each kebele should have continuous follow up cassava root producers for their proper usage of improved cassava root seeds and fertilizer available in the study area.

- The upstream value chain is a factor that influences the amount of cassava root supplied to the market in the study area. Therefore, zonal and Woreda cooperative office, *Woreda*agricultural office and *Woreda* administration office should provide modern technologies such as adequate fertilizers and improved seed to increase their productivity.

- Market information is found to be a factor that affects the quantity of cassava root supplied to the market. Therefore, the *Woreda* trade and industry office in collaboration with *Woreda* cooperative development office should give timely and

reliable market information. In addition they should give training about the importance of market information and usage (how they use the information practically).

Further research implications

- Since enhancing the supply of cassava root can help both the farmers and the people to sustain food security, it is recommended that other researchers should carry out about the cassava production and marketing. Moreover, it is better to include other factors that can affect the duffusion of cassava root to the market which are not included in this study.

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APPENDICES

Appendix A: Questionnaire for HHH Respondents (English Version)

ADDIS ABABA UNIVERISITY
SCHOOL OF COMMERCE
MARKETING MANAGEMENT DEPARTMENT

Introduction

Dear respondents, this questionnaire is intended to collect data on "Factors Affecting Diffusion of Cassava Root: The Case of *Ofa Woreda,Wolaita* Zone, Southern Ethiopia"**.** The data is going to be used as an input for the research to be conducted with the aim of fulfilling the requirements for MA degree in marketing management. With your active participation, the outcome of this study would lead to sound recommendations. The researcher hereby assures you that the information you provide is going to be reported in aggregate and utmost care and will be taken for its confidentiality.

Part I. Socio-demographic information of cassava root producers

Instruction: Circle the choices for closed questions and mention your suggestions for open ended questions in the space provided.

1. Sex: 1) Male 2) Female
2. Age: _____
3. Marital status: 1) Single 2) Married 3) Divorced 4) Widow
4. Family size? Male _____ Female_____ Total_____
5. Educational status 1) Did not attend formal education 2) Grade1-4
   3) Grade 5-8 4) Grade 9-12 5) Certificate & above

Part II: Cassava Diffusion

6. Cassava is diffused to the market adequately?

   1. Strongly disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly agree

7. If your answer for Q#6 is Disagree / strongly disagree why?

   _____

   _____

8. If your answer for Q#6 is Agree / strongly agree how?

   _____

   _____

Part III: Factors affecting cassava root diffusion

Instruction: The grading scale is from (SDA) to (SA) with **SDA**= strongly disagree, **DA**= disagree, **N**= neutral, **A**= agree and **SA**= strongly agree

Factor	Statement	SDA	DA	N	A	SA
Upstream value chain of cassava root	1. I have produced adequate amount of cassava root.					
	2. I have used fertilizers for cassava production.					
	3. I have used improved cassava root for cassava production.					
Market information	1. Current price information affects supply of cassava root to the market.					
	2. Training on how to market cassava root affects its supply to the market.					
	3. Current information on demand of potential buyers (users) affects cassava root supply to the market.					
Infrastructure	1. Storage facilities are important for cassava root and affect supply to the market.					
	2. Access to road affects cassava root supply to the market					
	3. Availability of means of transport affects the supply of cassava to the market.					

Factor	Statement	SDA	DA	N	A	SA
Extension service	1. Frequency of contact with extension agent is important factor affecting cassava root supply to the market.					
	2. Training on cassava production affects the quantity produced and supplied to market.					
	3. Utilization of improved cassava production technologies is a key determinant of cassava root diffusion.					
	4. Extension service enhances cassava productivity and supply to the market.					
Credit service	1. Credit helped me to maximize cassava supply to the market.					
	2. Credit helps me to purchase fertilizers for cassava production.					
	3. Credit helped me to purchase improved cassava root.					

Part IV: Open ended questions

1. What will be other factors that affect diffusion of cassava root in your kebele?

   _____

   _____

2. What you recommend to maximize the amount of cassava supplied to the market?

   _____

   _____

   _____

Thank you for your cooperation!

Appendix B: Questionnaire for HHH Respondents (Amharic Version)

አዲስአበባዩኒቨርሲቲ

ኮሜርስትምህርትቤት

ማርኬቲንግማኔጅመንትዲፓርትመንት

መግቢያ

ወድ መላሾች የዚህ ማጠይቅ ዋና ዓላማ **የቦዬ/የካሳቫሩትወደገበያእንዳይሰራጭየሚያደርጉ ተግዳሮቶችበአፋወረዳወላይታዞንደቡብኢትዮጲያ**በሜል ርእስ ለሚከና ጥናት የሚረዳ መረጃ ለማባሰብ ነው፡ ፡ የእርስዎ ትክክለኛና ሚዛናዊ ምላሽ ለጥናቱ ዓላማ ግብ መምታት አስተዋጽአዉ ከፍተኛ ነው፡ ፡ በዚህ ማጠይቅ የሚሞሉትን መረጃ የመረጃዉን ምንጭና የመረጃ ሰጪዉን ማንነት ለሦስተኛ ወገን የሚገለጽና ለዚህ ጥናት አላማብቻ የሚዉል መሆኑን በእርግጠኝነት ላረጋግጥሎት እወዳለሁ፡ ፡

ለሚያደርጉት ትብብር በቅድሚያ አመሰግናለሁ!

ክፍልአንድ፡የቦዬ/የካሳቫሩትአምራቾችዳራዊመረጃ

አጠቃላይመመሪያ: እባክዎን መልስ ይሆናል ብለውያሰቡትን አሚራጭበእያንዳንዱ ጥያቄ ፊት ለፊት ያሉትን ቁጥሮች በማክበብ ወይም በተሰጠውክፍት ቦታ በመሞላት ይመልሱ ፡ ፡

1. ፆታ 1. ወንድ 2. ሴት

2. ዕድሜ_____

3 የጋብቻ ሁኔታ 1. ያገባ/ች 2. ያላገባ/ች 3. የተፋታ/ች 4. በሞት የተለየ/ች

4 የቤተሰብ ብዛት ወንድ_____ ሴት_____ ጠቅላላ ድምር _____

5. የትምህርት ደረጃ 1. መደበኛ ትምህርት ያልተማረ 2. ከ1-4 ያጠናቀቀ 3. ከ5-8 ያጠናቀቀ

4. ከ9-12 ያጠናቀቀ 5. ሰርተፍኬት እና ከዛ በላይ

ክፍልሁለት፡ የቦየ/የካሳቫሩትስርጭት/አቅርቦት

6. በገበያ ላይ በቂ የቦዬ/የ ካሳቫ ሩት ስርጭት/አቅርቦት አለ .

1=በጣም አልስማማም 2= አልስማማም 3= ገለልተኛ 4= እስማማለሁ 5= በጣም እስማማለሁ

7. ለጥያቄ ቁ.6 መልስዎ በጣም አልስማማም/ አልስማማም ከሆነ ለምን?

8. ለጥያቄ ቁ.6 መልሶ እስማማለዉ/ በጣም እስማማዉ ከሆነ እንዴት?

ክፍልሶስት: ቦየ/የካሳቫሩትወደገበያእንዳይሰራጭየሚያደርጉተግዳሮቶች

መመሪያ:የእርስዎን የማህበሩ እና አለማህበሩ ደረጃ ከተዘረዘሩት ቁጥሮች ስር የሚጠቹ ቁጥር ላይ የ"√" ምልክት በማድረግ ይመልሱ::

መፍቻ: 1=በጣም አልስማማም 2= አልስማማም 3= ገለልተኛ 4= እስማማለሁ 5= በጣምእስማማለሁ

ተግዳሮቶች	አረፍተነገሮች	1	2	3	4	5
የቦየ (የካሳቫ ሩት) ምርታማ ትና ግብአት አቅርቦት	9.በቂ የቦዬ/የካሳቫ ምርት አምርቻለሁ					
	10. ለቦዬ/ለካሳቫ ምርት ማዳበርያ ተጠቅሜያለሁ					
	11. ለቦዬ/ለካሳቫ ምርት ምርጥ ዘር ተጠቅሜያለሁ					
የገበያ መረጃ	12. ስለ ቦዬ/ካሳቫ የዋጋ መረጃ ማወቅ ለገበያ በማቅርበዉ የቦዬ ምርት አቅርቦት ለይ ተፅኖ ያደርጋል					
	13. በቦዬ/በካሳቫ ንግድ ላይ የሚሰዉስልጠና በካሳቫ					
	14. የቦዬ/የካሳቫ ፈላጊዎች ስለ ቦዬ/ካሳቫ ያላቸዉን ፍላጎት መረጃ ማወቅ የካሳቫ ምርት አቅርቦትን ይወስናል					
መሰረተ-ልማት	15. የምርት ማከማቻ/መጋዘን አገልግሎት ለቦዬ/ለካሳቫ ምርት ጠቀሜታ አለዉእና በገበያ አቅርቦቱ ለይ ተፅኖ ያደርጋል.					
	16. የመንገድ አገልግሎት ለገበያ በማቅርበዉ የቦዬ/የካሳቫ ምርት ስርጭት ለይ ተፅኖ ያደርጋል					
	17. የመጓጓዣ አገልግሎት መኖር ለገበያ በማቅርበዉ የቦዬ/የካሳቫ ምርት አቅርቦት ለይ ተፅኖ ያደርጋል					
የግብርና ባለሙያ አገልግሎት	18. የግብርና ባለሞያወችን በተደጋጋሚማገኘት የቦዬ/የካሳቫ ምርት ስርጭት ለይ አስተዋፅኦ ያደርጋል.					
	19. በቦዬ/በካሳቫ አመራረት ላይ የሚሰጡ ስልጠና ለቦዬ/የካሳቫ ምርት ማጠን እና አቅርቦት ለይ ተፅኖ ያደርጋል					
	20. የተሻሻሉ የቦዬ/የካሳቫ ማምረቻ ቴክኖሎጂዎችን/ግብዓቶችን ማጠቀም ለቦዬ/ለካሳቫ ምርት እቅርቦት					
የብድር አገልግሎት	22. የብድር አገልግሎት ለገበያ የማቀርበዉን የቦዬ/የካሳቫ ምርት እንዳሳድግ ረድቶኛል					
	23. የብድር አገልግሎት ለቦዬ/ለካሳቫ ምርት የሚጠቅመኝን ማዳበሪያ እንድገዛ ረድቶኛል					
	24. የብድር አገልግሎት የተሻሻሉ የቦዬ/የካሳቫ ምርጥ ዘሮችን እንድገዛ ረድቶኛል					

ክፍልአራት: ተጨማሪጥያቄወች

ነ. እርሰዎ በሚኖሩበት ቀበሌ ሌሎች በቦዬ/በካሳቫ ምርት ስርጭት/አቅርቦት ላይ ተፅዕኖ ያደረጋሉ ብለዉየሚያስቡትን ነገሮችን ይዘርዝሩ?

_____

_____

2. ለገበያ የሚቀርበዉን የቦዬ/የካሳቫ ምርት ስርጭት/አቅርቦት መጠን ለማሳደግ እርሶ ምን መደረግ አለበት ይላሉ?

_____

_____

_____

ላደረጉልኝ ትብብር በድጋሚአመሰግናለሁ!

Appendix C: Semi-structured Interview Schedule

ADDIS ABABA UNIVERISITY
SCHOOL OF COMMERCE
MARKETING MANAGEMENT DEPARTMENT

Interview schedule

Dear interviewees, first of all, I would like to thank you in advance for your willingness to give your valuable ideas. Without your participation, the purpose of the study will not be achieved. This interview is prepared for the purpose of the study on "Factors Affecting Diffusion of Cassava Root: The Case of Ofa Woreda, Wolaita Zone, Southern Ethiopia". The information that you are going to give will be used only for academic purpose. Therefore, you are kindly requested to provide genuine information.

1. *What is your Woreda cassava production goal? Do you believe that the Woreda achieved its goal at local level? If not why?*
2. Do you believe your office/department given appropriate support to cassava producers? If not what is the root cause and how to be solved in the future?
3. How do you explain the attitude of the community and the producers towards cassava production?
4. What is the role of your office in improving the quantity of cassava produced and diffused?
5. How did you support cassava producers to get adequate credit access for cassava farmers to encouraging cassava production and supply?
6. Did your office give training to cassava producers? What skill training is given to encourage them towards cassava production and market supply? Who supported the training? If training is not given why?
7. What do you think is the major solutions to be taken to improve cassava producers' quantity and quality supply to the market by the government, Stakeholder, & producers themselves?

Thank you for your cooperation!

Appendix D: Focus Group Discussion Guideline

ADDIS ABABA UNIVERISITY
SCHOOL OF COMMERCE
MARKETING MANAGEMENT DEPARTMENT

Focus group discussion

Dear participants! You are well come to this Focus Group Discussion on "Factors Affecting Diffusion of Cassava Root: The Case of Ofa Woreda, Wolaita Zone, Southern Ethiopia". I hope the discussion we will be having with you is very useful to enhance understanding of factors hindering cassava market supply in Ofa Woreda. Before going to a discussion, I would like to thank you all of you for your willingness to participate in focus group discussion by sacrifice your precious time.

1. What is the contribution of cassava in improving cassava producers' livelihood? How do you explain?
2. How do you evaluate the extension service provided by Development Agent in cassava producing and marketing?
3. Do you supply your cassava production to the market?
4. As producer to which market your focuses to supply/ sell your cassava?
5. How can you explain the overall quantity and quality of cassava supplied to the market?
6. How do you explain the influence of credit service on cassava production and quantity supplied to the market?
7. Do you have access to road to sale your product in a market?
8. What are the critical factors that hindering cassava quantity supplied to the market in your Woreda? How do you think these problems can be solved? By whom?

Thank you for your cooperation!