The Contributions and Challenges of Rice Value Chain Development on the Livelihood of Small Holder Rice Farmers.

(*In the case of Ethiopia Driving Growth Entrepreneurship and Trade (EDGET) project in Fogera and Libokmkem District*)

Meron Abebe

Thesis Submitted to
Department of Geography and Environment Studies

Presented in Fulfilment of the requirement
For the Degree of Master of Arts in **Geography and Environmental studies**

Addis Ababa University

Addis Ababa, Ethiopia

June, 2016

THESIS APPROVAL SHEET

As member of the Board of Examiners of the Master of Sciences (MSc) thesis open defense examination, we have read and evaluated this thesis prepared by **Ms Meron Abebe** entitled**The Contributions and Challenges of Rice Value Chain Development on the Livelihood of Small Holder Rice Farmers.(*In the case of Ethiopia Driving Growth Entrepreneurship and Trade (EDGET) project in Fogera and Libokmkem District*).** We hereby certify that, the thesis is accepted forfulfilling the requirements for the award of the degree of Master of Sciences (MSc) in **Urban and Regional Development Planning**

Board of Examiners

__________________________ _________________ ________________

Name of External Examiner Signature Date

__________________________ _________________ ________________

Name of Internal Examiner Signature Date

__________________________ _________________ ________________

Name of Chairman Signature Date

The Contributions and Challenges of Rice Value Chain Development on the Livelihood of Small Holder Rice Farmers.

(*In the case of Ethiopia Driving Growth Entrepreneurship and Trade (EDGET) project in Fogera and Libokmkem District*)

Meron Abebe

Thesis Submitted to
Department of geography and Environment Studies

Presented in Fulfilment of the requirement
for the Degree of Master of Arts in **Geography and Environmental studies**

Addis Ababa University

Addis Ababa, Ethiopia

June, 2016

This is to certify that the thesis prepared by Meron Abebe, entitled:**The Contributions and Challenges of Rice Value Chain Development on the Livelihood of Small Holder Rice Farmers.(*In the case of Ethiopia Driving Growth Entrepreneurship and Trade (EDGET) project in Fogera and Libokmkem District*)**submitted in partial fulfillment of therequirement forthe degree of Master of Arts (Geography and Environmental studies) compiles with the regulation of the university and meets the accepted standards with the regulation of the university and meets the accepted standards the respect to originally and quality.

Signed by the examining committee:

Examiner ___________________ Signature __________________Date_________________

Examiner ___________________ Signature __________________ Date_________________

Advisor ____________________ Signature ___________________Date_________________

Chair of Department or Graduate Program Coordinator

DECLARATION

This is to certify that this thesis entitled:**The Contributions and Challenges of Rice Value Chain Development on the Livelihood of Small Holder Rice Farmers.**

(*In the case of Ethiopia Driving Growth Entrepreneurship and Trade (EDGET) project in Fogera and Libokmkem District*)Submitted in partial fulfillment of the requirement for the award of the degree of Master of Arts in **Geography and Environmental studies** to the graduate program of College social science, Addis Ababa University by Ms Meron Abebe (ID.No.GSE/0291/2005) is an authentic work carried out by her under the advisor guidance. The matter embodied in this project work has not been submitted earlier for award of any degree or diploma to the best of our knowledge and belief.

Name of the Student

Meron Abebe

Signature and date ___________________________________

Name of the Supervisors

Tegene G/egziabhere(Professor)

Signature and date______________________________________

ACKNOWLEDGEMENTS

First I would like to thank God for giving me this opportunity and for providing me everything I need throughout the course of this thesis preparation. I would likealso to express my deepest gratitude and special thanks to myadvisor Tegene G/egziabhere (Professor) for his suggestions and constructive criticisms made starting from the beginning of the research proposal to the final shape of thismanuscript.

I am greatly indebted to Mennonite Economic Development Associate (MEDA) for staff and senior management for supporting and allowing me to use the organization data collection device at the time of data collection.My grateful acknowledgements are extended to the sample respondents and key informants who co-operated in supplying relevant information and to the enumerators for their valuable assistance during field data collection that included Mr Mulu Eyayu, Mr Belaynew Gultie, Mr Getnet Teferi, and Mr Menberu Kindie.

Sincere appreciation is also forwarded to the staff of MEDA, who directly or indirectly helped me to do my work. I am especially very grateful to W/ro Rebeka Amha and Mr Loren Hostter for pushing me to roll in MS program and encourage me in every step of my semesters and to approve all my costs related to the thesis, I want to thank Ato Dawit Biratu who help me with the questionnaire device design and data collectors training. My gratitude is also extended to the Fogera and Libokmkem field facilitators Ato syied and Ato Geberhiwot Michael who were guiding and supervising data collectors every day. All the above mentioned individuals providing me suitable and conducive environment, encouragement though out the thesis process.

My heartily appreciation goes to my colleague Ms Solyana Amsalue for her professional advice andunreserved cooperation rendered to me in the course of the entire work.

I am very grateful to my parents for their incessant moral support. The generous support and encouragement of my mother Wro YetemWork Ayele and my father Ato Abebe Regassa, all closest families and relatives are deeply acknowledged and emphasized in all cases of my future life.

DEDICATION

I dedicate this manuscript to the best parents in the whole world, my father Ato Abebe Regassa and my mother Wro Yetemwork Ayele.

ACRONYMS AND ABBREVIATIONS

ACSI	Amhara Credit and Saving Institution
AfDB	African Development Bank
AISCO	Agricultural Input Supply Corporation
ANRS	Amhara National Regional State
BDS	Business Development Services
EDGET	Ethiopian Driving Growth through Enterprise and Trade
EUCOR	The European Cooperative for Rural Development
FAO	Food and Agriculture Organization
FGD	Focus Group Discussion
GO	Government Organization
Ha	Hectare
IRRI	International Rice Research Institution
KFP's	Key Facilitating Partners
IPMS	Improving Productivity and Market Success
LDOA	Libokemkem District Office of Agriculture
MDG	Millennium Development Goal
MEDA	Mennonite Economic Development Associate
MoA	Ministry of Agriculture
MoARD	Ministry of Agriculture and Rural Development
MT	Metric Tone
NERICA	New Rice for Africa
NGO	Non-Governmental Organization
NRRDS	National Rice Research and Development Strategy
PA	Peasant Association
SCP	Structure Conduct Performance
SSA	Sub-Saharan Africa
UNIDO	The United Nations Industrial Development Organization

THE IMPLIMNTATION, CONTRIBUTION ANDCHALLENGES OF RICE VALUE CHAIN PROJECTS IN SOUTH GONDER ZONE: In the case of Ethiopia Driving Growth Entrepreneurship and Trade (EDGET) Project in Fogera and Libokmkem District)

By: Meron Abebe
Supervisor: Tegene G/Egzyabhere(Prof)

ABSTRACT

Rice (Oryza sativa L.) has been gathered, consumed, and cultivated by women and men worldwide for more than 10,000 years. Ethiopian rice is known for its flavor and nutritional value because the majority of production is organic. Due to Ethiopia's large area and favorable agro-climatic conditions, the country has immense potential for expanding rice production.The present study was conducted in Fogera and Libo Kemkem District of South Gondar Zone, in 2015. The objectives of the study were to assess the major challenges facing rice producer farmers to improve their livelihood in Fogera and Libokmkem district; the study also examines prospects to improve the livelihood of rice producers though successful rice value chain development. In this study four representativekebeleswere selected using purposive sampling techniques. Then, sample household farmers were drawn by random sampling technique. Both primary and secondary data were collected for this study. Primary data were collected from 160 sample respondents using semi-structured questionnaires. In addition, related information were collected from other rice value chain actors using checklists.Secondary data were also collected from the different sources to complement the data obtained from the survey.The collected data were analyzed using SPSS version 20.0 (2011) software and the results were interpreted and presented using descriptivestatistics. Based on the results of this survey from the total 160 interviewed households engaged in rice production, 78% are male headed, and the rest 22 % are female-headed households. The mean land holding size of sample respondents was 1.27 ha and the mean land holdingallocated for rice production was 0.59 ha. The results of this survey revealed that rice production in the study area characterized by rain fed production system owned by smallholder farmers. Regarding labor involvement all household family including hired labor involved in almost all rice production activities. It was reported that boys and girls have significant role in rice production. This survey also identified the principal rice value chain actors from conception to consumption and value chain map developed. The major reasons for growing rice were for market and home consumption. Using SWOT analysis, opportunities and constraints in rice production, processing and marketing in the study area were investigated. Based on the research findings the possible recommendations forwarded are improving the extension services, strengthening capacity building of producers, upgrade the existing rice processing machine, promote local rice and strengthening value chain development in the study area.

***Key words**: Rice, households, value chain, value chain actors, value chain supporters*

TABLE OF CONTENTS

DECLARATION i

ACKNOWLEDGEMENTS ii

ACRONYMS AND ABBREVIATIONS iv

ABSTRACT v

TABLE OF CONTENTS vi

Chapter One: Introduction 1

1.1 Background *1*

1.2 Statement of the problem *4*

1.3 General objective *7*

1.3.1 Specific objectives 7

1.4 Research questions *8*

1.5 Scope and limitation of the research *8*

2. Literature Review 9

2.1 The concept of value chain development *9*

2.2. Definition of value chain development *10*

2.3 Basic Concepts of Agricultural Value Chains and Value Chain Analysis *11*

2.3.1 Value Chain 12

2.4 How the rural poor can upgrade in value chains: *16*

2.5 Why Value Chain Analysis? *19*

2.6 GOVERNANCE: WHAT TYPE OF POWER RELATIONSHIP EXISTS, AND IS INFORMATION SHARED? *22*

2.7 MARKET OR BARGAINING POWER (BUYER VERSUS PRODUCER) *23*

2.8 INNOVATION, INFORMATION, INFORMATION SHARING, AND KNOWLEDGE *23*

2.9 Value chain interventions and broader development goals relating to poverty, gender and the environment *25*

2.9.1 Value chain interventions and gender 26

2.9.2 Value chain interventions and environmental issues 28

2.10 Rice Value Chain *29*

2.11 Rice Research and Development *30*

2.12 Government Rice Development Strategy *31*

2.13 Agricultural Marketing Analysis *32*

2.13.1 The Marketing Margin 32
2.13.2 The farmers' Share Approach 33
2.13.3 Profitability Analysis 33

2.14 Review of Empirical Studies on Value Chain *34*

2.15 Conceptual Framework *37*

Chapter 3. MTHODOLOGY OF THE STUDY 40

3.1 Research design *40*

3.2 Sampling size and methods of data collection *41*

3.3 Data Source and Methods of Data Collection *42*

3.3.1 Primary data collection 42
3.3.2 Stakeholder consultation 42
3.3.3 Producers household survey 43
3.3.4 Focus group and key informant interviews 43

3.4 Data management and statistical analysis. *44*

3.5 Description of the Study Area *44*

3.5.1 Location and administrative classification 45
3.5.2 Demographic structure 46
3.5.3 Topography, altitude and climate 46
3.5.4 Farming system of the district 47

3.6 EDGET Project *47*

3.6.1 Major Activities of EDGET Project 48

Chapter 4: RESULTS AND DISCUSSION 49

4.1 Demographic Condition *49*

4.1.1 Age, marital status and family size of the household 50
4.1.2 Educational level of the household 51

4.2 Household Assets *51*

4.3 Landholding Size and Area Allocated to Rice *52*

4.4 Livestock Ownership *53*

4.5 Rice Production System *53*

4.5.1 Source of information on rice seed 54
4.5.2 Capacity building on rice seed 55
4.5.3 Rice planting method 56
4.5.4 Weeding practices 56
4.5.5 Rice production 57
4.5.6 Trend of rice production 58

4.5.7 Use of rice straw 59
4.5.8 Use of rice land after the crop harvest 59

4.6 Rice Storage, Utilization and Marketing 59

4.6.1 Rice storage and management 59
4.6.2 Rice marketing 60
4.6.3 Source of market information 61
4.6.4 Market price setting 61
4.6.5 Rice milling 62
4.6.6 Warehouse and financial service 63

4.7 Division of Labour in Rice Production 63

4.8 Major Source of Income 64

4.9 Cost, Margin of Rice along the Value Chain Actors 65

4.10 Actors, their Roles and Linkage in the Rice Value Chain 68

4.10.1 Input supply 68
4.10.1.1 Seed 68
4.10.1.2 Fertilizer 69
4.10.1.3 Agriculture tools and machineries 69
4.10.1.4 Agro-chemicals (pesticides and herbicides) 69
4.10.1.5 Milling machine 70
4.10.2 Producers 70
4.10.3 Collectors 71
4.10.4 Millers (processors) 71
4.10.5 Brokers 72
4.10.6 Wholesalers 72
4.10.7 Wholesaler (Value add) 73
4.10.8 Parboilers 73
4.10.9 Retailers 73
4.10.10 End markets (consumers) 73
4.10.11. Identification of national end markets 74

4.11 Enabling Environment 76

4.12 Supporters and their Role in the Rice Value Chain 76

4.12.1 Fogera National Rice Research Training Center 76
4.12.2 Extension 77
4.12.3 Market information 77
4.12.3 Financial service 77
4.12.4 EDGET project 77

4.13 Value Chain Structure 78

4.14 Opportunities and Constraints in Rice Production and Marketing 79

4.14.1 Opportunities 80
4.14.2 Constraints in rice production and marketing 81
4.14.2.1 Production constraints 81
4.14.2.3 Marketing constraints 82

Chapter 5: **83**

SUMMARY, CONCLUSION AND RECOMMENDATIONS **83**

5.1 Summary *83*

5.2 Conclusion and Recommendations *86*

REFERENCES .... **i**

APPENDICES .... **vii**

Tables

TABLE 1 SAMPLE SIZE OF THE STUDY 41
TABLE 2 DEMOGRAPHIC CHARACTERISTICS OF SAMPLE OF RESPONDENTS 50
TABLE 3 EDUCATIONAL LEVEL OF THE HOUSEHOLD 51
TABLE 4 HOUSEHOLD ASSETS OF SAMPLE RESPONDENT 51
TABLE 5 LAND OWNERSHIP OF RESPONDENTS (IN HECTARE) 52
TABLE 6 LAND ALLOCATION BY GENDER IN THE STUDY AREA 52
TABLE 7 LIVESTOCK OWNERSHIP OF SAMPLE RESPONDENTS 53
TABLE 8 SOURCE OF RICE SEED INFORMATION FOR SAMPLE RESPONDENTS 54
TABLE 9 SOURCE OF RICE SEED 54
TABLE 10 RESPONDENTS USED THEIR OWN PRODUCED AND EXCHANGED SEED 55
TABLE 11 IDENTIFIED IMPROVED SEED PROBLEMS IN THE STUDY AREA 55
TABLE 12 RICE PLANTING METHODS APPLIED BY RESPONDENTS 56
TABLE 13 RICE WEEDING PRACTICE OF THE RESPONDENTS 57
TABLE 14 RICE PRODUCTION IN THE STUDY AREA 57
TABLE 15 FACTORS MENTIONED FOR INCREASED RICE PRODUCTION 58
TABLE 16 FACTORS MENTIONED FOR DECREASED RICE PRODUCTION 58
TABLE 17 RICE PRICE TREND IN STUDY DISTRICT. 61
TABLE 18 DIVISION OF LABOR IN RICE PRODUCTION 63
TABLE 19 SOURCE OF HOUSEHOLD GROSS INCOME IN THE STUDY AREA IN 2013/14. 64
TABLE 20 PRICES, COSTS AND MARGINS OF RICE FROM *YIFAG* SUB-TOWN TO BAHIR DAR 66
TABLE 21 OPPORTUNITIES OF RICE PRODUCTION IN THE STUDY AREA 80
TABLE 22 PRODUCTION CONSTRAINTS IN THE STUDY AREA 81
TABLE 23 SWOT ANALYSIS OF RICE VALUE CHAIN IN THE STUDY AREA 82
TABLE 24: PROFILE OF PROCESSORS IN THE STUDY AREA (YIFAG SUB-TOWN) 88

Figures

FIGURE 1 TYPICAL AGRICULTURAL VALUE CHAIN AND ASSOCIATED BUSINESS DEVELOPMENT SERVICES. 13
FIGURE 2 MARKET DEVELOPMENT AND VALUE CHAIN DEVELOPMENT 20
FIGURE 3 CONCEPTUAL FRAMEWORK 38
FIGURE 4 MAP OF SOUTH GONDE ZONE, FOGERA AND LIBO KEMKEM DISTRICT AND THE STUDY KEBELES 45
FIGURE 5 BASIC RICE VALUE CHAIN MAP IN THE STUDY AREA 79

Chapter One: Introduction

1.1 Background

In many parts of the world, agriculture continues to play a central role in economic development and to be a key contributor to poverty reduction. Agro-industrial products offer much better prospects of growth than primary commodities (David James Shearer, Aug 2011). In addition, the marked trend to breakdown production processes into specific tasks opens up new opportunities for developing countries to specialize and take a more profitable part in global trade provided they meet increasingly stringent market requirements. However, participation in value chains implies both opportunities and pitfalls for developing countries. The prospect that lead firms such as brand owners, innovators and system integrators may increase shares of rent and therefore further widen the gap is very real(Christian von Drachenfels, 2006).

Another danger is that small and medium enterprises (including farmers) will face insurmountable difficulties as international supermarkets, retailers and buyers govern the access to markets by setting up food safety and quality standards that impose a substantial cost of compliance (Mr. Kapil Bendre, October 2010). Since subordinate firms are standard-takers, their bargaining power is reduced and so are their shares of rent. Furthermore, value chains may increase the risk of marginalization faced by areas with poor infrastructure and small farms since chain development may favor larger farms and processing plants which can invest in infrastructure and increase their production capacity.(UNIDO, 2009)

However, to participate successfully in sustainable agro-value chains, developing countries must cope with the numerous challenges and constraints posed by a continuously changing marketplace. Most noteworthy among these challenges are the intense competition due to the globalization of economies and the liberalization of markets; the impact that the governance of international supermarkets, retailers and buyers has on access to markets; the growing demand for high-quality, organic, minimally processed products and the emphasis on traceability and social responsibility; and the increasing risk of marginalization faced by areas with poor infrastructure and small farms. (UNIDO, 2009)

In developing countries, a significant proportion of national funds are used to support agricultural production inputs – primarily seeds, fertilizers and irrigation systems. Traditionally, little attention has been paid to the value chains by which agricultural products reach final consumers and to the intrinsic potential of such chains to generate value added and employment opportunities. While high-income countries add nearly US$185 of value by processing one tone of agricultural products, developing countries add approximately US$40. Furthermore, while 98 percent of agricultural production in high-income countries undergoes industrial processing, barely 38 percent is processed in developing countries (UNIDO, 2009).

It indicates that well developed agro-value chains can utilize the full potential of the agricultural sector. Except for Antarctica, every continent on the planet produces rice. Rice is grown in the tropical and subtropical regions of most continents. It is cultivated under widely differing conditions because of the great cultivar diversity. Fifty countries currently produce rice, with China and India supporting 50% of total production. Over 90% of the world's total rice crop is produced in South and East Asia. In area and production, China is the leading country in the world. Africa accounts for 3% of global production. The major limiting factor for the growth of rice is not climate, but water supply. Rice is the only major crop that can be grown in the standing water in vast areas of flat, low-lying tropical soils and is uniquely adapted for growth in submerged conditions. (UNIDO, 2009).

Global rice cultivation estimated to cover 144 million farms, mostly smaller than 1 hectare. (GRiSP (Global Rice Science Partnership 2013). Rice yields recorded worldwide include 5.8 MT/ha in Japan, 5.6 MT/ha in China and 4.3 MT/ha Indonesia (ECFRD, 2012). Comparing these yields with the world average of about 3.5 MT/ha, it is evident that there is great potential to improve rice yields elsewhere. The development of rice therefore presents an opportunity to reduce the number of food-insecure people that presently stand at 860 million, by half by 2015, and to achieve MDG 1 (i.e., to eradicate poverty and hunger). (ECFRD, 2012)

Global rice utilization in 2014/15 is set to expand by 2.2% to a new high of 502.3 million tones (milled basis), sustained mainly by demand for food but also for other uses (seeds, post-harvest losses and non-food industrial uses). The anticipated expansion in food consumption in 2014/15 is in spite of firm retail/wholesale prices across much of Asia (with the exception of Cambodia and Thailand). In several important countries, governments' control of retail prices and a widening of subsidized rice distribution will sustain rice consumption. Based on the latest projections of population, the global per capita food rice intake will remain stable around 57.6 kilos per person (FAO, 2014).

The cultivation of rice in Ethiopia is generally a recent phenomenon, which is preceded by its utilization as a food crop. Some reports have indicated that cultivation of rice in Ethiopia was started first at Fogera and Gambella Plains in the early 1970's. It is believed that a Dutch man introduced rice first in 1973 from Gambella to the Fogera Plain in the Amhara Region (Bekur, 1997).

The area of production of rice in the country has been increasing over the past few years. It is reported that the potential rice production area in Ethiopia is estimated to be about thirty million hectares (MoARD, 2010). Ethiopia has tremendous potential to increase the area under rice and is looking for partnerships to make use of this land (ECRD, March 2012).Gambella, Pawe, Fogera, Metema and Oromia Zone in eastern Amhara National Regional State are suitable for rice production (Gebretsadik, 2004)

In Ethiopia, rice production has increased in since 1997 - 2010(EUCORD, 2012). Ethiopian rice is known for its flavor and nutritional value because the majority of production is organic. Due to Ethiopia's large area and favorable agro-climatic conditions, the country has immense potential for expanding rice production. Despite the grain's significance as a food and cash crop, the current level of rice production is low compare to other rice producing country 5.6 MT/ha (Shiratori *et al*., 2014). Thus, there is a possibility to utilize this untapped potential.

Rice has great potential to contribute to food self-sufficiency and security. In the country, four rice ecosystems are identified as*upland rice*, which is grown on naturally drained soils, *Hydromorphic (rain fed lowland) rice***,**which is grown on soils where the roots periodically saturated by fluctuating water table in addition to the rainfall and where the water table always remains below the roots and entirely rain fed; *Irrigated lowland ecosystem;*whereby crop water requirement is entirely satisfied from irrigation, and rainfall is not a limiting factor, and *Paddy rice/paddy filed*which is grown under water-logged or submerged conditions (ibid).

Currently, the Ethiopian government is promoting the development of the rice value chain throughout Ethiopia, including Amhara region. As overviewed in the National Rice Research and Development Strategy of Ethiopia (MoA, 2011), the government given due attention for promotion of rice development and marketing including value addition. Since 2013, National Rice Research and Training Center established based at Fogera to generate and promote rice technologies in the country. In addition to the government's effort, some NGOs, like Mennonite Economic Development Associates (MEDA) also operating in Fogera and Libokemkem districts since 2011 to improve the quality, reputation, and productivity of rice particularly to benefit smallholder farmers. Currently, there is an unmet growing demand for rice consumption in the low and middle-income markets. Rice is relatively inexpensive, as compared to alternative cereals. More households are mixing rice grain and Teff to produce *Enjera*. Furthermore, due to its high production potential rice is more profitable than similar crops like Teff for producer farmers (ibid).

Designing value chain interventions to benefit vulnerable groups poses a considerable challenge for development organizations. It is necessary to identify the challenges and opportunities beneficiaries encounter from a value chain approach. The main purpose of this is to identify efforts that will be necessary to enable poor farmers to access capital assets and strengthen their capacity to manage the chain or chain activities. MEDA (Mennonite Economic Development Associates) is international non-governmental organization has designed EDGET rice value chain project. It is a five year project being implanted in SNNPR and Amhara region. The project operates in Libokemkem and Fogera district of South Gondar Zone. The broader project strategy is to improve the quality, reputation and productivity of Ethiopian rice to specifically benefit smallholder farmers (Mennonite Deconomic Development Associates ,DIP, 2010).

1.2 Statement of the problem

Rice is an emerging crop in Ethiopia. Among the target commodities that have received due emphasis in promotion of agricultural production, rice is one which is considered as the "Millennium Crop" expected to contribute in ensuring food security in the country (MoA, 2011). Since 2006, Ethiopian rice production has been increasing steadily both in terms of area and productivity.

In Ethiopia agriculture remains the main contributor to the GDP, contributing 47 percent and 43 percent, respectively. Nevertheless, agriculture still accounts for about 75 percent of the labor force, underscoring the importance of the sector in job creation and poverty reduction across countries (AfDB and FAOSTAT, 2009).

Over 75 percent of the total agricultural outputs in most developing countries are produced by smallholder farmers with farm sizes of about 2.5ha on average, producing mainly for home-consumption, and using traditional technologies. Limited commercial and semi commercial production also occurs. Besides, less than 4 percent of total land area is irrigated. (AfDB and FAOSTAT, 2009).

By definition, agricultural growth is the primary source of poverty reduction in most agriculture-based economies. The expansion of smallholder farming can lead to a faster rate of poverty alleviation, by raising the incomes of rural cultivators and reducing food expenditure, and thus reduces income inequality (Magingxa and Kamara 2003)

Rising on-farm productivity also encourages broad entrepreneurial activities through diversification into new products, the growth of rural service sectors, the birth of agro-processing industries, and the exploration of new export market (Harvey, 2006; World Bank, 2008).

The international experience shows that countries that have achieved sustained agricultural growth have done so by adopting technology, which led to increased joint productivity of land, labor and capital (that is total factor productivity). Whether the pattern of technological change has been labor saving or land saving has depended on which factor is relatively scarce. In East Africa, the access to additional available land for agricultural purposes has been the major constraint.(Dercon and Zeitlin 2009). The authors posit that technology adoption and expanding land holdings of individual smallholders, that is changes in factor ratios, lead to productivity gains. However, technology adoption and increased access to land influence the overall productivity in different ways. While technology adoption improves productivity of all factors of production, increased access to land raises labor productivity at the expense of land productivity.(Dercon and Zeitlin 2009).

The Asian green revolution made a dramatic contribution to world food supply, through lower food prices as well as high economic growth, resulting in poverty reduction. The determining factor in the Asian “green revolution” was the increased productivity of land through enhanced crop varieties, extended application of fertilizers and improvements in irrigation facilities. At the same time, concerns emerged regarding overuse of chemicals, loss of biodiversity, soil degradation, pest problems, and nutritional and risk implications of monoculture systems (G S Bhalla, Gurmail Singh 2001).

In India, food grain production increased by 3.5 percent a year throughout the 1980s, helping poverty reduction. The incidence of poverty declined from over 50 percent in the early 1970s to 35 percent in the late 1990s. Public expenditure on agricultural development (with subsidies on fertilizers and credit) and rural infrastructure were key determinants of agricultural growth and poverty reduction (Fan et al., 2004). India’s small-holder farmers (those owning less than 2.0 ha of farmland) comprise 80 percent of the country’s farmers, but own only 33 percent of the total cultivated land; they nonetheless produce 41 percent of the country’s food-grains. Their productivity is somewhat higher than that of medium- and large-size farms. Moreover, their marketable surpluses are increasing. In 1970, the small-size holdings in India were net buyers or produced meager surpluses. However, in the 1990 and beyond they were generating a marketable surplus of 7.2 Mt / ann (million ton per annum) of rice, 1.3 Mt / ann of wheat, 2.1 Mt / ann of coarse cereals, and 1.7 Mt / ann of oilseeds.(PGulati, Fan, and Dalafi, 2005,Kumar and Woodhead, 2002).

In the rural context of Ethiopia, not only it is hard to find a study that has been conducted to identify challenges and prospects of value chain development approaches but also there are very limited initiatives of development efforts. It is a challenge for smallholder and marginal farmers, through their business organizations, to understand market demands and develop their skills and capital requirements to supply the required volumes and quality product at the right place and time of the season.

Rice is an emerging crop in Ethiopia. Among the target commodities that have received due emphasis in promotion of agricultural production, rice is one which is considered as the

“Millennium Crop” expected to contribute in ensuring food security in the country, Since 2006; Ethiopian rice production has been increasing steadily both in terms of area and productivity. (MoA, 2011).

However, in developing countries, a significant proportion of national funds are used to support agricultural production inputs – primarily seeds, fertilizers and irrigation systems. Traditionally, little attention has been paid to the value chains by which agricultural products reach final consumers and to the intrinsic potential of such chains to generate value added and employment opportunities (UNIDO, 2009)

Despite the significance of rice in the livelihood of many farmers in the study area, development practitioners don’t give due attention to small holder farmers that involve in rice value chain. It is only recently that studies have done by(Takele, 2010), (Gebremeskel, 2010); and (Tilahun Gebey, 2012)on rice value chain analysis though the value chain analysis has mainly focused on production and marketing aspects. Moreover, (Tilahun Gebey, 2012) mainly focused on IMPS experience and all actors in the value chain and supporters are not fully addressed. Hence, this study attempts to examine mainly on the contribution of rice value chain in the case of EDGET project on the livelihood of small holder farmers as well as the problem faced by small holder farmers in improving their production. In addition the study investigates the value chainactors’ role and linkage and maps the existing rice value chain in the study area.

1.3 General objective

The general objective of the study is to examine the contribution of EDGET rice value chain development to the livelihood of smallholder farmers and assess the challenge/constraints faced by small holder farmers.

1.3.1 Specific objectives

1. To examine the contribution of rice value chain on the lively hood of rice farmers.
2. To identify the major problems that smallholder rice farmers face in increasing their production, product qualities and market linkages.

3. To explore the major actors, their roles and linkages in rice value chain.

4. To investigate the opportunities and contribution of rice value chain actors

1.4 Research questions

1. What are the contributions of rice development on the livelihood of small holder rice farmers?
2. What are the problems faced by small holder rice farmers that involved in rice development approach?
3. Who are value chain actor, what are their role and linkage in the study area?

1.5 Scope and limitation of the research

Even though EDGET rice value chain project is being implemented in two districts of South Gondar Zone, the study will be conducted only on sample farmers from both district not all targeted farmers.

This study aimed to assess and analyze the overall rice value chain development in Amhara region in Libokemkem District, South Gondar, Ethiopia. Due to time and financial resource unavailability, the study is limited in its depth and coverage to fully address the aforementioned objectives of the study. Furthermore, Ethiopia has wide range of diverse agro-ecologies, institutional capacities, organizations and environmental conditions, the result of the study may have limitations to make generalizations and make them applicable to every part of the country. However, it may be useful for areas with similar context with the study area.

2. Literature Review

2.1 The concept of value chain development

The value chaindescribes the full range of activities which are required to bring a product or service from conception, through the different phases of production (involving a combination of physical transformation and the input of various producer services), delivery to final consumers, and final disposal after use (Kaplinsky and Morris, 2000).

According to (UNIDO 2009), as opposed to the traditional exclusive focus on production, the concept stresses the importance of value addition at each stage, thereby treating production as just one of several value-adding components of the chain. The macroeconomic landscape, policies, laws, regulations, standards and institutional elements such as research and innovation, human resource development and other support services form the environment in which all activities take place and therefore are also important actors and activities in the value chain.

The value chain concept entails the addition of value as the product progresses from input suppliers to producers to consumers. A value chain, therefore, incorporates productive transformation and value addition at each stage of the value chain. At each stage in the value chain, the product changes hands through chain actors, transaction costs are incurred, and generally, some form of value is added. Value addition results from diverse activities including bulking, cleaning, grading, and packaging, transporting, storing and processing (Anandajayasekeram and Berhanu, 2009).

Porter (1985) distinguishes between primary activities and support activities. Primary activities are directly concerned with the creation or delivery of a product or service. They can be grouped into five main areas: inbound logistics, operations, outbound logistics, marketing and sales, and service. Each of these primary activities is linked to support activities which help to improve their effectiveness or efficiency. There are four main areas of support activities: procurement, technology development (including Research & Development), human resource management, and infrastructure (systems for planning, finance, quality, information management etc.).(Porter,1985)

2.2. Definition of value chain development

The term value chain was first popularized in a book published in 1985 by Michael Porter,(Porter, Michael E. 1998) who used it to illustrate how companies could achieve what he called "competitive advantage" by adding value within their organization. Subsequently the term was adopted for agricultural development purposes (Kaplinsky, R. And Morris, M. 2014) and has now become very much in vogue among those working in this field, with an increasing number of bilateral and multilateral aid organizations using it to guide their development interventions.

At the heart of the agricultural value chain concept is the idea of actors connected along a chain producing and delivering goods to consumers through a sequence of activities.(L.F. Henriksen L. Riisgaard S. Ponte F. Hartwich P. Kormawa, 2010.) However, this "vertical" chain cannot function in isolation and an important aspect of the value chain approach is that it also considers "horizontal" impacts on the chain, such as input and finance provision, extension support and the general enabling environment. The approach has been found useful, particularly by donors, in that it has resulted in a consideration of all those factors impacting on the ability of farmers to access markets profitably, leading to a broader range of chain interventions. It is used both for upgrading existing chains and for donors to identify market opportunities for small farmers.(Michael Hailu, Spor2000)

There is no commonly agreed definition of what is actually meant by agricultural value chains. Indeed, some agencies are using the term without having a workable definition or definitions and simply redefined ongoing activities as "value chain" work when the term came into vogue.(Andreas Stamm and Christian von Drachenfels, 2011) Published definitions the term ''value chain'' describes the full range of value adding activities required to bring a product or service through the different phases of production, including procurement of raw materials and other inputs" (Webber, C. M., P. Labaste. 2014) "actors connected along a chain producing, transforming and bringing goods and services to end-consumers through a sequenced set of activities (Riisgaard. L, S. Ponte, 2014), The concept of a (global) value chain was developed by international business scholars,focusing on the buyer or lead firm and on the national level. One of the earliest descriptions of such a value added chain is: “The process by which technology is combined with material and labor inputs, and then processed inputs are assembled, marketed, and distributed. A single firm may consist of only one link in this process, or it may be extensively vertically integrated” (Kogut, 1985).

Porter (1985), who argues that value creation is performed at different, but connected, stages (the value chain). The critical issue dealt with in is which activities are kept within the firm and which can be outsourced to otherfirms (Gereffi et al. 2005). A value chain describes all those activities that deliver a product or service from development up to disposal after use. The value chain concept takes the focus from manufacturing as merely an activity performed by a single firm to all activities performed by several actors in order to supply a good or service to the market(Kaplinsky, 2000).

The value chain concept entails the addition of value as the product progresses from input suppliers to producers to consumers. A value chain, therefore, incorporates productive transformation and value addition at each stage of the value chain. At each stage in the value chain, the product changes hands through chain actors, transaction costs are incurred, and generally, some form of value is added. Value addition results from diverse activities including bulking, cleaning, grading, and packaging, transporting, storing and processing (Geberemdin, 2009).

2.3 Basic Concepts of Agricultural Value Chains and Value Chain Analysis

Although the value chain approach in general has a long tradition especially in industrialproduction and organization, its application in international development and agriculture, hasgained popularity only in the last decade (Anandajayasekeram and Berhanu, 2009).

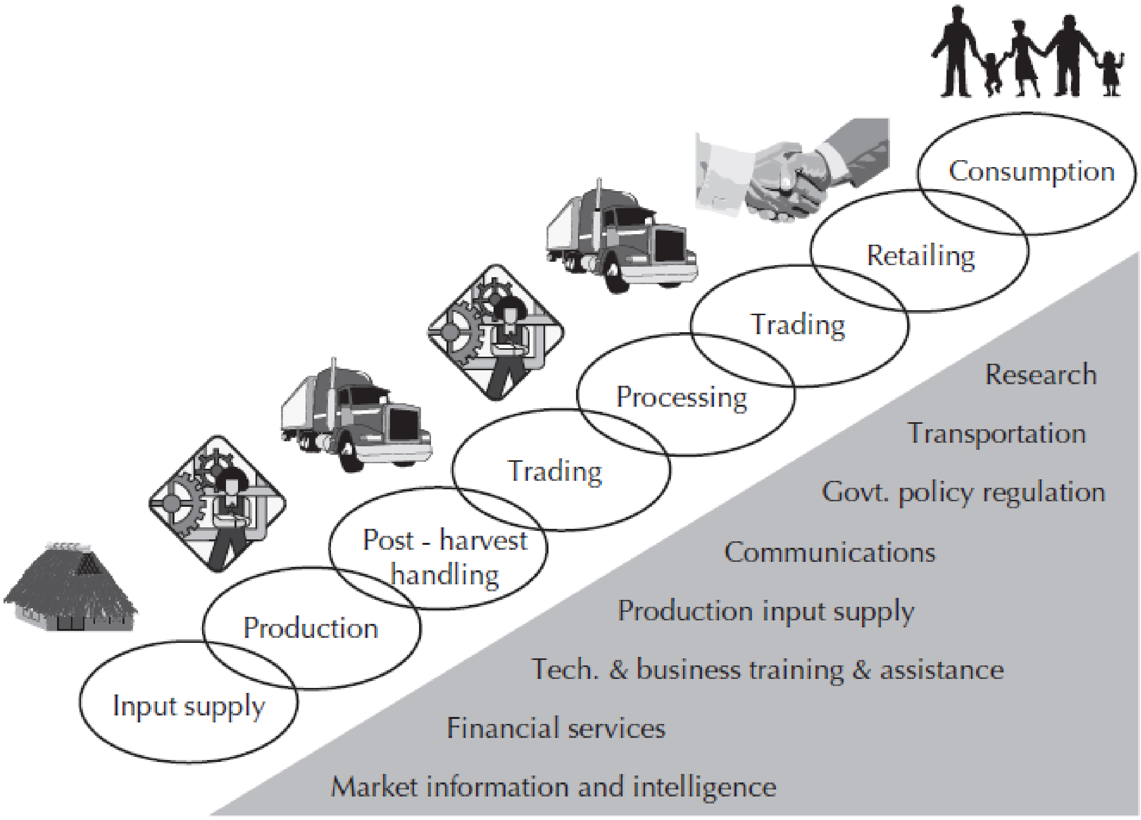
The valuechain concept has proven particularly useful for the identification and formulation of projects aswell as in the development of strategies for improved agricultural and rural development.According to Anandajayasekeram and Berhanu (2009) in agricultural value chain, there are fourmajor basic concepts: value chain, stages of production, vertical coordination and businessdevelopment services.

2.3.1 Value Chain

A value chain is the full range of activities required to bring a product from conception, throughthe different phases of production and transformation. A value chain is made up of a series ofactors (or stakeholders) from input suppliers, producers and processors, to exporters and buyersengaged in the activities required to bring agricultural product from its conception to its end use(Kaplinsky and Morris, 2001). Bammann, (2007) has identified three important levels of valuechain.

- *Value chain actors*: The chain of actors who directly deal with the products, i.e. produce,process, trade and own them.
- *Value chain supporters*: The services provided by various actors who never directly deal withthe product, but whose services add value to the product.
- *Value chain influencers:* The regulatory framework, policies, infrastructures, etc.

The value chain concept entails the addition of value as the product progresses from inputsuppliers to producers to consumers. A value chain, therefore, incorporates productive Transformation and value addition at each stage of the value chain. At each stage in the valuechain, the product changes hands through chain actors, transaction costs are incurred, andgenerally, some form of value is added. Value addition results from diverse activities includingbulking, cleaning, grading, and packaging, transporting, storing and processing (Anandajayasekeramand Berhanu, 2009). See Figure 1 for a typical agricultural value chain.



Source: Source: Anandajayasekeram and Berhanu, 2009.

Figure 1Typical agricultural value chain and associated business development services.

Value chains encompass a set of interdependent organizations, and associated institutions, Resources, actors and activities involved in input supply, production, processing, and distributionof a commodity. In other words, a value chain can be viewed as a set of actors and activities, andorganizations and the rules governing those activities.(ibid).

Value chains are also the conduits throughwhich finance (revenues, credit, and working capital) move from consumers to producers;technologies are disseminated among producers, traders, processors and transporters; andinformation on customer demand preferences are transmitted from consumers to producers andprocessors and other service providers (ibid).

Value chains can be classified into two based on the governance structures: buyer-driven valuechains, and producer-driven value chains (Kaplinisky and Morris 2001). Buyer-driven chains areusually labor intensive industries, and so more important in international development andagriculture, which is our focus in this paper. In such industries, buyers undertake the leadcoordination activities and influence product specifications. In producer-driven value chainswhich are more capital intensive, key producers in the chain, usually controlling keytechnologies, influence product specifications and play the lead role in coordinating the variouslinks. Some chains may involve both producer- and buyer-driven governance (Kaplinisky andMorris 2001).

Stage of Production

In agricultural value chain analysis, a stage of production can be referred to as any operatingstage capable of producing a saleable product serving as an input to the next stage in the chain orfor final consumption or use. Typical value chain linkages include input supply, production,assembly, transport, storage, processing, wholesaling, retailing, and utilization, with exportationincluded as a major stage for products destined for international markets. A stage of productionin a value chain performs a function that makes significant contribution to the effective operationof the value chain and in the process adds value (Anandajayasekeram and Berhanu, 2009).

Vertical Coordination

The performance of an agricultural value chain depends on how well the actors in the value chainare organized and coordinated, and on how well the chain is supported by business developmentservices (BDS). Verticality in value chains implies that conditions at one stage in the value chainare likely to be strongly influenced by conditions in other stages in the vertical chain, in directand indirect ways, and in expected and unexpected ways. It should be noted that intra-chainlinkages are mostly of a two-way nature. (Anandajayasekeram and Berhanu , 2009).

A particular stage in a value chain may affect and beaffected by the stage before or after it. Coordination refers to the harmonization of the functions of a value chain—its conduct. Theresult of good coordination between the stages of a value chain may be reflected in a good matchbetween buyer preferences and seller supplies. That is, better coordination in a value chain results in better matching of demand and supply between the chain stages, resulting in efficient and low-cost exchange, quality maintenance, and value addition. It should be noted that the coordination of activities by various actors within a value chain is not necessarily the same as chaingovernance. (Anandajayasekeram and Berhanu , 2009).

Coordination usually involves managing required parameters as exhibited in the bundles of activities undertaken by various actors performing specific roles in the chain. Coordination of value chains takes place at different places in the linkages to ensure consequences of interactions are as required. Coordination also requires monitoring of the outcomes, linking the discrete activities between different actors, establishing and managing the relationships between the various actors comprising the links, and organizing logistics to maintain networks (Anandajayasekeram and Berhanu , 2009).

Coordinating mechanisms are the set of institutions and arrangements used to accomplish harmonization of adjacent stages of the chain. Coordination can be done in various ways. Firms at specific key stages of a value chain (e.g. wholesalers and processors) can be coordinating agents, by handling or processing large volumes of commodity, thereby coordinating assembly, transformation and distribution. Government and nongovernment agencies that provide needed services, and associations of producers and processors and traders may also act as coordinating organizations. (Anandajayasekeram and Berhanu , 2009).

Various forms of contractual arrangements, different forms of markets (spot, futures, auction), various forms of information exchanges and vertical integration are other types of coordinating mechanisms. Uncertainty and risk, perishable nature of agricultural commodities, and increasingly stringent quality and safety standards by consumers provide strong incentives to develop effective coordinating institutions and arrangements (ibid).

Business Development Services (BDS)

Closely related to the concept of value chains is the concept of business development services. These are services that play supporting role to enhance the operation of the different stages of the value chain and the chain as a whole. In order for farmers to engage effectively in markets, theyneed to develop marketing skills and receive support from service providers who have betterunderstanding of the markets, whether domestic or international. Local business support services are, therefore, essential for the development and efficient performance of value chains.

Business development services can be grouped into infrastructural services; production and storage services; marketing and business services; financial services; and policies and regulations. Basic infrastructural services include market place development, roads and transportation, communications, energy supply, and water supply. Production and storage services include input supply, genetic and production hardware from research, farm machinery services and supply, extension services, weather forecast and storage infrastructure. (Anandajayasekeram and Berhanu , 2009).

Marketing and business support services include market information services, market intelligence, technical and business training services, facilitation of linkages of producers with buyers, organization and support for collective marketing. Financial services include credit and saving services, banking services, risk insurance services, and futures markets. Policy and regulatory services include land tenure security, market and trade regulations, investment incentives, legal services, and taxation. (Anandajayasekeram and Berhanu , 2009).

The roles of the business development services have hitherto been neglected. The neglect was a result of the mistaken assumption that profitable business development services will emerge as value chains develop or that the public will provide business development services where they are needed and when markets are insufficient to provide profitable niches for competitive services to develop (Anandajayasekeram and Berhanu , 2009).

2.4 How the rural poor can upgrade in value chains:

Upgrading is the process of trading up, which allows poor people to access viable value chains or improve their position in existing value chains. Over the past few years, development studies have been developing a language, approach and experience to support poor people in rural areas to upgrade their position in viable value chains. This has necessitated an adaptation of the „traditional" upg rading sequence: that of process upgrading before moving into product upgrading and on into functional and inter-chain upgrading. (Jonathan Mitchell, Jodie Keane and Christopher Coles, 2009)

This categorization, based on the historical experience of the newly industrialized countries of East Asia, may still be relevant for manufacturing firmsseeking global markets, but it needs adjustment if it is to be relevant to the pressing task of upgrading some of the poorest and most disadvantaged, including agricultural producers and exporters, into viable value chains.(Jonathan Mitchell, Jodie Keane and Christopher Coles, 2009)

The Overseas Development Institute (ODI) has been working with the International Development Research Centre (IDRC), the Danish Institute of International Studies (DIIS)and with action research teams across Africa and Asia for the past three years to exploredifferent ways that the rural poor can engage successfully in viable value chains.(Jonathan Mitchell, Jodie Keane and Christopher Coles, 2009)

On thebasis of this practical experience, it is proposed a menu of seven different types of strategy to upgrade the position of the rural poor in value chains.(Jonathan Mitchell, Jodie Keane and Christopher Coles, 2009:

1. **Horizontal coordination**

This is the process of greater intra-nodal organization, often in the production andprocessing nodes, in some form of collective structure (typically a producer group). Thisform of upgrading is very important for poor people in rural areas because coordinationwith others allows producers to achieve economies of scale in supplies and to reducetransaction costs. Often, horizontal coordination is the first step in a sequence ofinterventions that ultimately result in access to the market, and is a prerequisite for otherforms of upgrading. Critical to the success of horizontal coordination strategies are theentry rules to join the group and the quality of management of the group structure.

2. **Vertical coordination**

This is the move away from one-off spot transactions and towards longer-term inter-nodalrelations, for instance contract farming, whereby a processor or exporter will contracthorticultural out-grower farmers. This form of upgrading is important because it can resultin greater certainty about future revenue flows for poor participants. In practice, verticalcoordination is often a slow and difficult process, because it involves the building of trustrelations between the buyer and the seller (to avoid the common scenario wherebyproducers break their contractual commitments and sell their produce on the spot marketwhen prices are higher than specified in the contract).

3. **Functional upgrading**

This refers to changing the mix of functions performed by actors in the value chain – increasing (upgrading) or reducing (downgrading) the number of activities performed byindividuals and firms. For instance, an agricultural producer starting to process some oftheir output to add value to it represents functional upgrading. Often, horizontallycoordinated institutions are best able to provide these value-adding activities (such asgrading and packaging of produce). The shortening of the value chain can be achieved bymeans of the exclusion of intermediaries and the redistribution of their functions amongthe partners of a newly formed vertical relationship. It is very rare for poor people tofunctionally upgrade themselves without carrying out other upgrading strategies.

4. **Process upgrading**

Process upgrading involves improving value chain efficiency by increasing output volumes or reducing costs for a unit of output. Examples of this include improving agronomy to enhance yields that result in higher sales or own consumption, or both. This may be theresult of improved planting techniques, planting materials or investments, such as irrigation infrastructure.

5. **Product upgrading**

Improving the quality of the product of the value chain has become increasingly importantas the richer Northern economies have become more quality conscious and as standardshave risen. Some standards are driven by lead buyers (i.e. supermarkets requiringtraceability of food products), others by statutory hygiene standards in importing countriesand others, increasingly, in response to fair trade and organic demands by finalconsumers. The challenge of standards lies in achieving them (to allow market access)without excluding the poor from the value chain. Process and product upgrading areclosely related because improving product quality often involves improvements to theproduction process.

6. **Inter-chain upgrading**

This is the use of skills and experience developed in one value chain to productivelyengage with another – usually more profitable – value chain. Examples of this include the shift from growing traditional commodities to high-quality export horticulture. Inter-chainupgrading often has significant barriers to entry for the poor and vulnerable to access themore lucrative value chain.

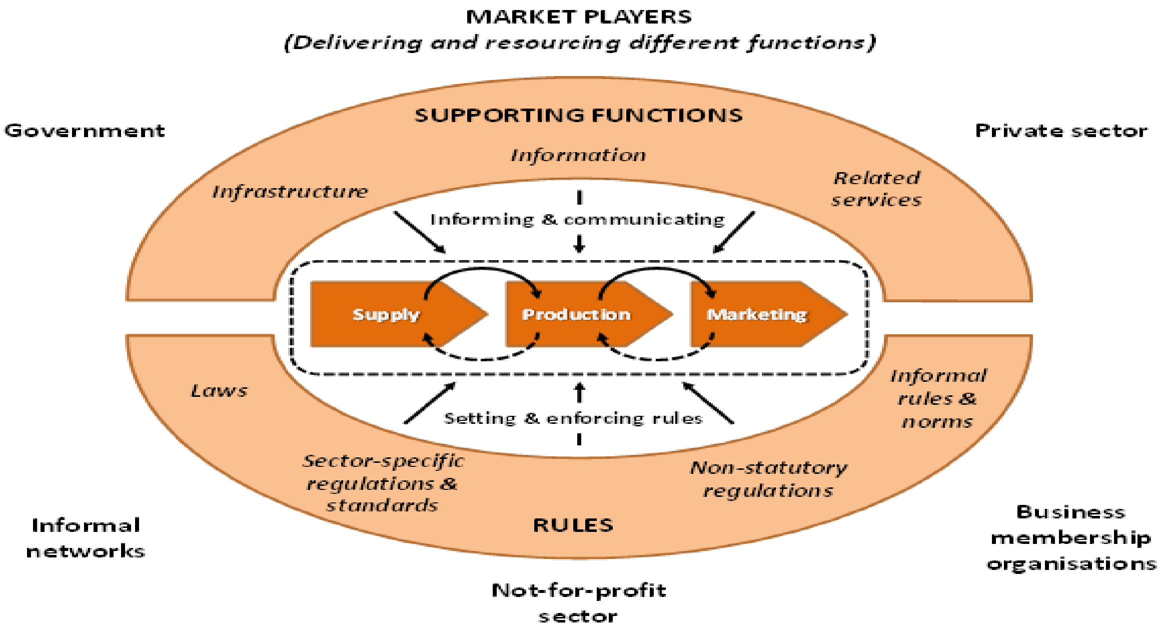
7. **Upgrading of the enabling environment**

Although not an upgrading strategy in a strict sense, the competitiveness of the enablingenvironment for value chains is a major contributing factor in the success of theoperations of a value chain. Improvements to the support, services, institutional, legal andpolicy frameworks in which value chains operate are often a productive area in whichdevelopment agencies can intervene to improve the functioning of a chain.

2.5 Why Value Chain Analysis?

Value chain analysis can make an important contribution to pro-poor economicdevelopment for seven key reasons.(Jonathan Mitchell, Jodie Keane and Christopher Coles, 2009):

1. Value chains are particularly well suited to understanding **how poor people canengage**, or engage more beneficially, with domestic, regional or international trade. Thecontribution of the global value chain thinkers was a recognition of something veryimportant to the resource poor in rural areas – their lack of power compared with the leadfirms setting the „rules of the game" in the value chain. Trade is about productivity andfactor costs, but also about the use of brute economic power to extract value from thechain.
2. Value chain analysis has **economic viability and sustainability** at its corebecause of its focus on markets and commercial viability (as well as developmentconcerns). This is an important advance on more "traditional" enterprise developmentprojects, which have often focused almost exclusively on producers (or the supply side), tothe neglect of sources of demand. Ironically, "traditional" approaches to enterprisedevelopment (by both external donors and the state) have often paid insufficient attentionto the existing market systems in which their interventions took place. Value chain analysisis therefore compatible with market development approaches to development.



Source: www.springfieldcentre.com

Figure 2 Market development and value chain development

Value chain analysis provides a framework for engagement with both business andbeneficiary groups. Successful value chain development projects, therefore, aim for winwinoutcomes for all participants. This implies that there is nothing „anti-development‟about generating incentives for the already rich to get richer, providing it is done in a waythat includes, and benefits, groups of poor people.

3. Value chains are a strong qualitative **diagnostic tool**, capable, if employed withskill, of identifying critical issues and blockages for specific target groups and thengenerating robust and effective policies and development strategies. The key point beingthat a sound value chain analysis does not simply provide a robust explanation for why theresource poor are poor. It also provides a logical framework to formulate concreteintervention strategies to change the circumstances of the poor. In this sense, valuechains are a normative, as well as a diagnostic, tool to understand what reality currently isand how it can be changed for the better.
4. Value chain analysis identifies the core rents and barriers to entrythat determine who in the chain benefits from production for **diverse final markets**. Thishelps to focus minds on how best to facilitate the participation of the poor in these chains.There may be little point in assisting producers to enter chain links characterized byexcessive competition (i.e. where there are no barriers to entry). On the other hand, poorproducers can also be assisted in creating their own barriers to entry through upgradingstrategies, for example

brands of estate coffee produced and sold into global markets byCentral American coffee farmers. Figure 2 outlines five of the key triggers for value chainupgrading: the need to improve system efficiency; product quality; product differentiation;social and environmental standards; and the business environment.

5. Value chain analysis is **inherently scalable**. This is important because, followingthe logic of the Millennium Development Goals (and particularly MGD1), external donorsare increasingly concerned with reducing poverty at scale. Developing value chains which,if successful, benefit only a few tens of beneficiaries is – quite rightly – becoming difficultto justify. Even if the initial focus of a value chain development exercise is on a singleproducer group or firm, there is no reason why the same logic cannot be applied to acluster of firms or a region or country.
6. Value chain analysis is relatively evidence based and action oriented. Thiscontrasts sharply with the academic theories on orthodox trade and development, whichoften require acceptance of a range of fairly improbable neoclassical assumptions abouthow economic actors work and commitment to the theory when the empirical evidencefails to support these assumptions. However, value chains are not entirely „value free‟ they are based on notions of power as well as competitiveness and value addition. Butadopting a value chain approach does not predetermine the outcome of the analysis, sovalue chains are a framework for collecting data and understanding reality, rather thanconstructing an elaborate theoretical neoclassical edifice, one which may bear littlerelationship to reality.
7. Value chains provide a clear way forward as a policy and restructuring tool.International evidence shows that achieving systemic competitiveness requires cooperation along the chain, as well as within links in the chain. After all, a chain is only asstrong as its weakest link. So the establishment of a collation of interested parties involvedin promoting participation by the poor, or the restructuring of value chains, is often anecessary process to ensure that appropriate global competitiveness is realized. Ideally,this includes both private sector parties concerned with endogenous rents and publicsector participants concerned with exogenous rents for, as Rodrik (2004) indicates, thereis evidence of both market failure and state failure. Realizing global competitivenessinvolves a joint journey of discovery.

It is for these reasons that value chain analysis has had a profound impact on development studies in recent years. A number of development agencies and development practitioners have invested heavily in analysis using the framework. It is to this body of knowledge we now turn.(Jonathan Mitchell, Jodie Keane and Christopher Coles, 2009)

2.6 GOVERNANCE: WHAT TYPE OF POWER RELATIONSHIP EXISTS, AND IS INFORMATION SHARED?

"Governance" is a description of the dynamic distribution of power, learning, and leadership in standards and strategysetting among a value chain's firms. While the term can have many meanings, in this instance we use it to describe the sharing of information and systematic standards promoted by the "governing" entity in a value chain. Governance can be characterized along a continuum of four types of relationships that center on information and the use of market power (Dunn 2005):

- **Market relationship:** Arms-length transactions in which there are many buyers and many suppliers. Repeat transactions are possible, but little information is exchanged between firms, interactions are limited, and no technical assistance is provided.
- **Balanced relationship:** Both buyers and suppliers have alternatives, that is, a supplier has various buyers. There are extensive information flows in both directions, with the buyer often defining the product (that is, design and technical specifications). Both sides have capabilities that are hard to substitute, and both are committed to solving problems through negotiation rather than threat or exit.
- **Direct relationship:** Main buyer takes a large percentage of supplier's output, defines the product (that is, design and technical specifications), and monitors the supplier's performance. The buyer provides technical assistance and knows more about the costs and capabilities of the supplier than the supplier does about the buyer. The supplier's exit options are more restricted than those of the buyer.
- **Hierarchical relationship**: Vertical integration of valueadded functions within a single firm. The supplier is owned by the buyer or vice versa, with the junior firm having limited autonomy to make decisions at the local level.

Governance ensures that interactions between firms along a value chain exhibit some level of organization rather than simply being random. Value chains are governed when the parameters requiring product, process, and logistic qualification that are set have consequences up or down the value chain, encompassing bundles of activities, actors, roles, and functions (Kaplinsky and Morris 2002).

In many sub-Saharan Africa cases, certain key actors—the lead firms or “governors of value chains”—have the capability and power to define and set the parameters of contracts and subcontracts in their supply chains. For example, they can define chainwide product and process standards, quantities, and conditions of delivery. This power may be based on ownership of well-established brand names, proprietary technology, or exclusive information about different product markets, which enable the firm to act as a system integrator (Altenburg 2006).

2.7 MARKET OR BARGAINING POWER (BUYER VERSUS PRODUCER)

All approaches to value or supply chains identify the crucial impact of power relations among different actors. Power relations determine how economic gains and risks are distributed among value chain actors and to what extent dominant firms may set and enforce standards. (Kaplinsky 2000).

With the aim of raising entry barriers for competitors and achieving market foreclosure. The concept of “governance of value chains” implies that “there are key actors in the chain who take responsibility for the inter-firm division of labor, and for the capacities of particular participants to upgrade their activities” Market power” refers to the idea that one firm in the market may be able to exert significant influence over the goods and services traded or the price at which they are sold. Governance plays a large part in determining and explaining various firms’ market power. However, commercial competence, market forces, and technical capabilities also determine the market power of value chain participants.(Kaplinsky 2000).

2.8 INNOVATION, INFORMATION, INFORMATION SHARING, AND KNOWLEDGE

In competitive markets, innovation helps maintain or grow market share or profits and can be a route to competitiveness and the development of competitive advantage. Innovative production and processing can create cost efficiencies and improved services that translate into higher margins or more competitive pricing. Innovations in logistics can also provide cost efficiencies, as well as improved service. In terms of value chain development, innovation must be viewed as necessary for overall chain competitiveness by capturing more value or upgrading the value chain. The production factor of “know-how” is one core factor regarding the upgrading of value chains (Porter 1998).

Upgrading refers to the innovation that increases firm and/or value chain competitiveness. According to the Accelerated Microenterprise Advancement Project (AMAP)/ Business Development Services (BDS) lexicon developed by USAID, there are five categories of upgrading (Dunn 2005).

1. **Process upgrading**: Increasing efficiency (that is, more output for same level of inputs or same output for lower level of inputs), achieving standards and certifications (for example, organic, HACCP, and ISO).
2. **Product upgrading:** Improving product quality, new product development, new varieties, or line extension.
3. **Functional upgrading:** Operating at a new level in the value chain.
4. **Intrasectoral upgrading:** Operating in a new market channel within the same value chain.
5. **Intersectoral upgrading**: Producing a completely different product in a completely different value chain.

The concept of upgrading explicitly recognizes relative endowments and, hence, the existence of value. Upgrading approaches emphasizes issues of knowledge creation, transfer, and appropriation. Critical questions are raised regarding the manner in which knowledge flows along value chains, firms acquire information and upgrade processes, and firms “unlearn” certain capabilities as they specialize, types of knowledge are transferred by technology proprietors, and firms disclose their core competencies. However, this field requires substantial further research.(Dunn 2005).

2.9 Value chain interventions and broader development goals relating to poverty, gender and the environment

The value chain approach traditionally revolves around analyzing the structure, actors and dynamics of value chains, including examining the typologies and locations of chain actors, the linkages between them, and the dynamics of inclusion and exclusion. It also entails understanding the structure of rewards, the functional division of labor along a chain and its changing shape and the distribution of value-added. Past applications of value chain research however, have not in a consistent way considered the broader issue of the terms on which poor people participate in value chains or the impact of value chain activities on poverty, gender and the environment (Bolwig et al. 2010).

Conversely, approaches that look in detail at the local dynamics of livelihoods and changes in the depth or nature of poverty or at gender and environmental issues often downplay the ways in which these issues are shaped by value chain dynamics and restructuring (Bevan 2004, Bolwig et al 2010).

The value chain development in relation to poverty, gender and the environment in turn. Value chain interventions and poverty almost all donor-supported value chain development projects work under the assumption that value chain development will help reducing poverty. It is assumed that there is under-utilized potential in value chains for improving the incomes of poor producers or the employment prospects of poor people.(Kula et al., 2006).

Thus by making value chains function more effectively, for example by improving flows of knowledge and establishing linkages, it is expected that interventions will benefit the poor. However apart from this general assumption about the connection between value chain development and poverty reduction, the approach to poverty reduction differs tremendously between interventions. Some approaches focus solely on making value chains work more efficiently and have little or no poverty focus apart from the overall assumption that benefits will automatically reach the poor. (Kula et al., 2006).

One of the research questions addressed in Humphrey and Navas-Alemán (2010) is “How were the VC interventions linked to poverty alleviation strategies, and what attempts, if any, were made to focus interventions on the poor?" From analyzing relevant literature, they find that in general there is not enough evidence on poverty alleviation impacts from interventions to claim that they are effective or efficient in helping the poor. Furthermore, they conclude that "the poverty focus of value chain interventions is not clear (which of the poor are being targeted, what kind of poverty is being targeted and how)." (Humphrey and Navas-Alemán 2010). They find that projects that attempt to target the poor do so in three main ways:

1) By targeting areas where the poor live (geographical focus);
2) By targeting sectors where the poor are more likely to be earning a living (sectoral targeting); or
3) By working with specific groups of poor or vulnerable people (social targeting).

On the basis of the distinction between 'lead firm' and 'linkages' interventions mentioned before, Humphrey and Navas-Alemán find that although interventions differ, "overall, the explicit linkage of lead firm interventions to poverty reduction seems to be quite weak. The linking of SMEs to large firms and the development of links between farmers and agribusiness companies was quite often viewed as poverty reducing without any further justification" (Humphrey and Navas-Alemán 2010).

Targeting value chain interventions towards the poor was found to be much clearer in so called 'linkage interventions'. In this group of interventions, several projects identified and targeted particular disadvantaged groups and projects often worked with the poorest directly, enhancing their assets and supporting improvements in value chain knowledge and negotiating power.(Humphrey and Navas-Alemán 2010).

2.9.1 Value chain interventions and gender

Women are in most cases more disadvantaged than men in the context of value chain operations (e.g. limited access to information, training and markets), and many development organizations have begun to recognize and address the need for a more active gender strategy in relation to value chain interventions. However, gender is approached in markedly different ways in value chain analyses and interventions, depending on how gender equality is conceptualized (Riisgaard et al 2010).

Other interventions are more directly focused on increasing quantities of and gains for female chain participants, or in some cases simply to ensure that no harm is produced. At the other end of the continuum are interventions that address gender inequality at the level of the household, in institutions and in value chain governance, or that attempt to help women achieve a better functional position along a value chain (e.g. Rubin et al., 2009).

Even though there is an expanding number of methodological ‘toolboxes’ for gendered value chain analysis providing ‘how to’ guidance for researchers and practitioners (Flores and Lindo, 2006) there is a paucity of robust evidence of the gender impact of both generic and gender-focused value chain interventions. Although generic value chain interventions can (in specific circumstances) have positive effects for participating women, evidence also shows that more gender-sensitive value chain analysis, intervention designs and implementation plans are required in order to secure such impacts and to avoid negative consequences. Lack of mobility, lack of access to assets and markets, and lack of linkages to other value chain actors are often major gender-based constraints in relation to value chains.(Riisgaard et al 2010).

However, such constraints can be addressed by value chain interventions that include specific gender strategies (such as for example forging women-focused vertical and horizontal linkages). Specific measures are required to ensure that women’s participation leads to gains, not just to increased number of women participants. Facilitating better bargaining power both in relation to other value chain actors (e.g. buyers, input suppliers) but also in relation to intra-household gender dynamics (e.g. negotiations over distribution of income) can also help improve gains (Ibid.).

2.9.2 Value chain interventions and environmental issues

No systematic review has yet been conducted of how (if at all) value chain interventions approach environmental issues (Bolwig et al 2010). According to Bolwig (2010), value chains affect the environment by the way primary production uses and interacts with the local resource base (for example, biodiversity, soil and water) and by the emissions of nutrients, toxic substances and greenhouse gasses (GHG) from production, processing, transport and other activities along the value chain. When studying environmental impacts and management in the context of value chains, it is useful to distinguish between two types of processes, based on the scale at which they operate (Halberg et al., 2005):

(i) local processes related to the management and use of local natural resources, where the impact is mainly confined to the area of production, including positive or negative impacts on local biodiversity, soil fertility, soil and water contamination, and water availability; and

(ii) (ii) global processes that transgress ecosystem and landscape boundaries and are accumulated along the entire value chain and therefore have impacts and must be managed on a much larger scale, for example emissions of GHGs or toxic substances.

Common environmental issues to be approached through development projects and which could be targeted via value chain interventions include the following: ·
Land used for production and processing;

- Land used for production and processing;
- Efficiency of energy use;
- Sources of energy;
- Water use and contamination;
- Quantity and quality of chemicals;
- Waste production and management;
- Possible effects of production and processing on ecosystems;

· Pollution potentials such as acidification, eutrophication and others; and
· Greenhouse gas emissions.

2.10 Rice Value Chain

Astewel (2010) identified six chain actors in the rice value chain at Fogera district. These are: producers, wholesalers, millers, brokers, assemblers and retailers.

Producers*:* Producers are the first link in the marketing chain. Farmers produce and sell their rice through different channels. The main channels are wholesalers and millers, rural assemblers, urban assemblers and consumers. Farmers transport rice to the nearest markets using pack animals, animal carts and vehicles. Large amounts of grain are sold and purchased immediately after harvest between December and March. Supplies of rice decrease between May through October.

Wholesalers*:* These are licensed grain wholesalers who bulk and store large amounts of grain. Wholesalers don't move from one market to another as the petty grain traders do. They permanently reside in town with their permanent store and collect rice grains brought by farmers, assemblers (rural and urban) and processors. They are few in numbers and most of the time they sell rice to Addis Ababa.

According to European cooperative for rural development (EUCORD, 2012)Rice millers in Ethiopia are licensed for both milling and the retail trade. Millers, as owner of milling machines, have dual roles in rice trading. Firstly, they are involved in milling the rice; secondly, they purchase milled rice for themselves, storing it to sell later. They sell the rice to locally available urban distributors and consumers. Most of the time, the rice is sold regionally to distribution centers in Addis Ababa, Bahir Dar, Gondar and Woldia. These collect rice from farmers and rural assemblers.

Brokers:These are unlicensed traders who are often involved in wholesale trade. Brokers don’t have a warehouse, but facilitate buying and selling of other traders and sometimes make their own purchases (ibd).

Assemblers:These include unlicensed rural and urban assemblers of rice. Rural assemblers are traders who collect rice from farmers at local markets during market days and sell to wholesalers or millers. The markets are placed in remote areas which are usually held once a week. Urban assemblers are few in number and purchase rice from producers during market days. They sell to wholesalers only to get a better price (ibd).

Retailers:These are shop owners who are licensed to sell a variety of different products. They are not specialized rice sellers, but have it as part of their assortment of grain products for their customers. Retailers usually purchase from distributors in the cases of Bahir Dar, Gondar and Woldia but in Woreta they purchase either from millers, wholesalers, farmers or assemblers (ibd).

2.11 Rice Research and Development

Although rice has just been recently introduced to Ethiopia, recognizing its importance as a food security crop and a source of income and employment opportunities, the government of Ethiopia has named it the “millennium crop,” and has ranked it among the priority commodities of the country (Mohapatra, 2012). Accordingly, Ethiopian Institute of Agricultural Research (EIAR) has treated it as one of nationally coordinated research projects. As the crop is a recent introduction in the country, its research status is at infant stage. The National Rice Research and Development Strategy (NRRDS) for 2010-19 has been prepared to tackle rice-related progress in rice value chain, postharvest, grain quality, and marketing issues.

Both regional and federal research centers including Fogera national rice research and training center (FRRTC) formerly Adet (national coordinator), Gonder, Bako, Bonga, Gambella, Gode, Maytsebri, Humera, Pawe, Assosa, and Werer Agricultural Research Centers were involved in rice research as collaborating centers mainly in the national variety and adaptation trials, which are organized and coordinated by the national coordinating center. So far, variety development has been focusing exclusively on pure lines and is targeted to address mainly upland and lowland rain-fed, and to some extent irrigated ecosystems. The sole source of rice germplasm is introductions. The coordinating center introduces rice germplasm from different sources mainly from IRRI and Africa Rice (Kebebew Assefa *et al*., 2011).

The demand for improved rice technologies is increasing from time to time from different stakeholders. This, therefore, calls for the need to establish a strong research and development system to bring about productive, sustainable, stable, and profitable rice farming system in the country. Improved variety is one of the major inputs required for increasing production and productivity of crops. However, a given improved variety has a limited life span with its potential because of environmental interactions. On the other hand, the producers as well as the consumers demand is also changing from time to time which needs to redesign the breeding objectives accordingly. These situations make variety development a continuous activity (MoA, 2011).

So far, 20 improved rice varieties released for large-scale production. Of these, seven are upland New Rice for Africa (NERICA) rice varieties including NERICA-4 and NERICA-3 released for rain-fed upland ecosystem and NERICA-1, NERICA-2, NERICA-6, NERICA-14 and NERICA-15 released for upland - irrigated ecosystem. NERICA rice varieties developed by Africa Rice (the ex-WARDA) scientists, and they are expanding and bringing the rice green revolution in different countries of Africa including Ethiopia. Out of the remaining 13 released varieties, four varieties irrigated, two varieties are lowland rain-fed, and seven varieties are upland rain-fed types (Kebebew Assefa et al., 2011).

Farmers have also given due attention not only for rice production but also for variety development as they have developed two varieties (one upland and one lowland rain-fed types) through selection. The two farmer-selected varieties (Demwoze and Nechu Ruz) produced widely in Fogera area (rain fed lowland) of the Amhara Region and in Guraferda area (upland) of the Southern Nations, Nationalities, and Peoples Region (ibid).

2.12 Government Rice Development Strategy

The importance of rice crop in the Ethiopian agriculture is increasing from time to time and different actors from public and private sectors and donors are showing interest in promoting it. Rice importance is being well recognized in the country as the area coverage of 18,000 ha and total production of 42,000 tons in 2006 has increased in 2009 to 155,000 ha and 496,000 tons, respectively (MoARD, 2010). Rice production has brought a significant change in the livelihood of farmers and created job opportunities for a number of citizens in different areas of the country.

According to MoA 2011, the vision of the national rice researcher and development strategy (NRRDS) is to see the existing limited area and subsistence dominated rice subsector transformed progressively in to commercially profitable and viable production system. This will contribute to the development of a viable agricultural sector through establishment of a competitive and sustainable rice production and marketing system. Moreover, the main objectives indicated on NRRDS to increase domestic production by 125 % from 500 thousand tones to about 4 million tons over a 10 year period through the promotion of gender sensitive and productivity-enhancing innovations of small and commercial local rice producers and entrepreneurs along the value chains; to promote marketable surplus of local rice through investment in irrigation, quality improvement, value addition and both domestic and regional marketing; and to promote stakeholder innovation capacity for the utilization of rice by-products while ensuring sound environmental management practices.(MoA 2011).

Overall, the production level is projected to increase from 498,332 tons in 2009 to about 1.8 million in 2014 about 4.0 million tons in 2019. The area allocated for rice will increase from about 156 thousand ha in 2009 to about 464 thousand and 774 thousand ha in 2014 and 2019, respectively (MoA 2011).

2.13 Agricultural Marketing Analysis

2.13.1 The Marketing Margin

Marketing margin refers to the difference between the price paid and received by a specific marketing agency such as a single retailer, or by any type of marketing agency, that are retailers or wholesalers or by any combination of marketing agencies in the marketing system as a whole (Achike et al., 2010). Total marketing margin includes cost involved in moving the product from producer to consumer and profits of various market functionaries, and is calculated as percentage as follow: (Farm gate price / retail price) x 100. The difference between retail price and farm gate price is calculated as (Retail price – farm gate price) x 100, which will give the total mark up in percentage.

Market Margin =	*Cost involved in moving the paddy/rice from producer to consumer*	+	*Profit of various market functionaries*

Source: Agmarket, 2001.

Among the tasks of marketing margins is to describe the structure of the marketing chain, starting at the farm gate and tracing the product through the marketing intermediaries until it reaches the final consumer (Gabagambi, 2011)

2.13.2 The farmers' Share Approach

The farmer's share or a producers' share is an analysis of farmer income in relation to consumer money spent on the same product (Kennedy, 2011). This measure is used to realize the share of a producer out of the total retail price per unit, be it a kilogram or any metric and non-metric measures. The approach has been widely used in many cases related to agricultural produces in the world, and in Africa, it was used in Ethiopia during the analysis of rice profitability and marketing chain in South Gondar Zone, in 2010. In the United States, it was used by Keystone Agricultural Producers in 2011 during comparison of vegetable markets in the groceries of Prairie Provinces.

2.13.3 Profitability Analysis

Profit is a financial benefit that is realized when the amount of revenue gained from a business activity exceeds the expenses, costs and taxes needed to sustain the activity (Ghimiray et al., 2007). Profit margin is a ratio of profitability calculated as net income divided by revenues, or net profits divided by sales. It measures how much out of every shilling of sales an individual farmer or businessman actually keeps from the money he earned through business (FAO, 2007). Gross margin (also called gross profit margin or gross profit rate) is the difference between revenue and cost before accounting for certain other costs. Generally, it is calculated as the selling price of an item, less the cost of produce sold, production or acquisition costs. (Alter, 2000).

There are several ways of analyzing profitability and one of them is costing-based profitability analysis. In this form, the costs and revenues are grouped according to values and defined costing-based valuation approaches (SAP, 2009). This is the same as values of sales of a product minus cost incurred in making and moving it to the market. Marketing margins can also reveal the profitability of actors at different nodes along the value chain. The marketing margin refers to the difference between the prevailing prices at the two ends of the marketing hierarchy at the time when transactions take place (Ajala and Adesehinwa, 2008).

The marketing margin shows the fraction of the consumer expenditure as a commodity that is received by the producer and each of the marketing agents. Thus, the marketing margin represents the price paid for a collection of marketing services and its size reflects the structural efficiency of the marketing system. The marketing margin is used to give a close approximation of the market performance. The marketing margin can be expressed either in nominal terms or in percentages. A high marketing margin indicates inefficiency because a high cost is incurred in the provision of marketing services. According to Ajala and Adesehinwa (2008), it assumes the following formula.

Marketing Margin= *Selling Price - Supply Price X 100*
Selling Price
Where selling price is the retail price and supply price is the producers' price. Thus, the size of the marketing margin reflects the structural efficiency of the marketing system.

2.14 Review of Empirical Studies on Value Chain

The challenges and opportunities for rice in a value chain are quite different depending on the nature of the sector or circumstance under which the sector operates. The literature that exists concerning the challenges and opportunities in rice value chain is too diversified to be exhaustively reviewed here. Therefore, only the study that is directly or indirectly related to the objectives of this study was reviewed.

According to Agri food consulting international (2005) the major challenges to the rice sector in Thailand is how to maintain its dominance in the world rice trade, increase returns to stakeholders along the marketing chain, lower costs, improve productivity, and increase value added. Part of the challenge is to recognize that innovation and governance along the value chain are key elements of any strategy aimed at maintaining and ultimately increasing the profitability of the rice industry.

Given the larger number of farmers involved in glutinous rice production, the development of the glutinous rice sector and creation of value added products has the potential to benefit more farmers in the Northeast of Thailand than the existing non-glutinous (Jasmine) rice sector. Polices which concentrate on increasing farm productivity and reducing marketing margins through strengthening value chains have the greatest benefits in terms of total income and farm household income. (Agri food consulting international 2005)

In Ghana, a rice value chain study conducted by Kula and Emmanuel (2009) indicated that most inputs used for the cultivation of local rice are imported. These include fertilizers and pesticides that are marketed by wholesale input distributors. The companies supply the inputs to smaller wholesalers and retail shops. The inputs in the retail shops are sold to smallholder farmers and a few commercial producers for the production of rice. Certified seed is mostly not available in local input shops, so farmers resort to re-using their own seed, which contributes to low productivity.

It is also reported that land tenure constraints and uncertainty reduce investment in irrigation and other land improvements. Other constraints are listed below (Kula and Emmanuel 2009):

- Rice import tariff variability and tax policies that do not favor local rice production
- Weak agricultural extension services to farmers leading to poor knowledge on current best practices in rice production
- Inadequate credit/finance from both primary and secondary financial institutions for all actors in the chain due to high default rates in agriculture
- High cost of inputs, especially fertilizer, due to global price increases and local transport costs
- Over-dependence on rainfall and also seasonal irregularities in water supply at irrigation sites
- Inconsistent power supply for processing

Almost all rice that is produced in Ghana is consumed domestically by the producer, sold to nearby households and villages, or sold in local markets. A smaller but potentially highly lucrative and high-growth market is the urban market although it has high transport cost constraints. Several factors make local rice uncompetitive in terms of price and quality, and therefore constraint access to end markets. The main constraints are:

- Mediocre yields and high costs of production that make it difficult for locally produced rice to compete with imports
- Poor seed and varietal selection
- Poor threshing practices that result in a high percentage of broken grains, and poor milling that mixes whole and broken grains and makes the resulting product unclassifiable
- Inadequate warehousing and storage facilities
- In addition, there is a shortage of spare parts for imported machinery and lack of qualified providers.

Moreover, in all channels, horizontal linkages are weak between firms performing similar functions. In the imported rice chain, importers acknowledge each other and exhibit some collaborative behavior to reduce or limit import duties, but otherwise do not cooperate. They are competitors and operate independently from each other. The local rice chain has similar weak linkages among actors performing similar functions. Aggregators compete to secure paddy and sometimes pay higher prices to farmers even after their production has been pre-financed by another aggregator. At the production level in the local rice industry, there are traditional labor-sharing networks where Farmer Based Organization (FBO) members and sometimes loosely related farmers will share labor and less frequently will come together to purchase inputs. In the vertical linkage low levels of trust and weak relationships between producers, buyers, equipment service and input providers, and financial institutions were observed in the rice value chain.

Despite the constraints, Ghana has enormous potential to expand its rice cultivation in the short term through improved production and post-harvest practices and the shift to long-grain aromatic varieties that compete more successfully with imports.

Rice value chain development study was also conducted in Fogera district by Improving Productivity and Market Success (IPMS) project and it was developed based on the experience of the project. The results indicated thatfarmers used rice seeds up to 200 kg/ha (X-Jigina) which is more than 250 % (80 kg/ha) of the recommended seed rate. Since 2008, the number of farmers using inorganic fertilizers decrease. This due to that farmers were asked to pay 100% cash unlike the previous years which allowed credit. (Tilahun, et.al, 2012)

The existing rice varieties were long maturing type and when rains stop early in the uplands, supplementary irrigation to complete the growth cycle was needed. Quality related problem due to machinery used as well as machine operation, and marketing of NERICA as a grain was still in its early stages, were some of the challenges observed in the value chain. On the other hand, the dramatic increase in area coverage and production of rice, farmer positive response to the introduction of rice in the uplands, farmer to farmer seed exchange system for X-Jigina and introduction of parboiling technology were also mentioned as opportunities for innovation in the value chain. (Tilahun, et.al, 2012).

2.15 Conceptual Framework

The market map is a conceptual and practical tool that helps us identify policy issues that may be hindering or enhancing the functioning of the chain and also the institutions and organizations providing the services (e.g. market information, quality standards) that the different chain actors need in order to make better informed decisions. For example, a group of farmers may not know that a particular seed supplier has on offer a seed type that no other seed supplier has in stock. If the farmers do not know the seed is on offer, they may not buy it and, consequently, that particular variety will not be planted. Another example is that farmers might hear from the radio that there is an increasing demand for a particular type of maize. On hearing this on the radio they may well then go and seek out seed of the maize type in question. In order to understand farmer decision-making vis-à-vis what seed they purchase, it is important to note where farmers do or do not get their information from. (Jon Hellin and Madelon Meijer, 2006)

According to Jon Hellin and Madelon Meijer, 2006.The Market Map is made up of three inter-linked components:

- Value chain actors (see above)
- Enabling environment (infrastructure and policies, institutions and processes that shape the market environment)
- Service providers (the business or extension services that support the value chains' operations)

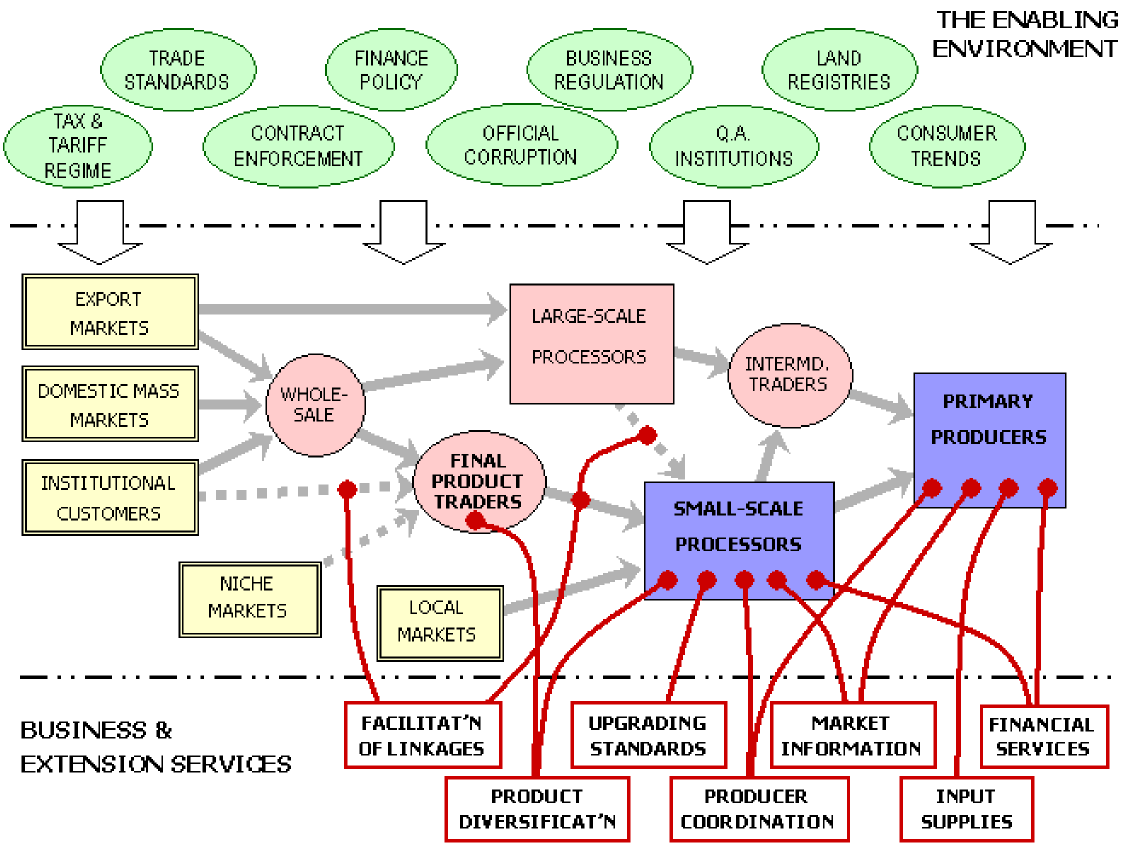


Figure 3 **Conceptual Framework**

The enabling environment consists of the critical factors and trends that are shapingthe value chain environment and operating conditions, but may be amenable tochange. These “enabling environment” factors are generated by structures (nationaland local authorities, research agencies etc.), and institutions (policies, regulationsand practices) that are beyond the direct control of economic actors in the valuechain. The purpose of charting this enabling environment is not simply to map the*status quo*, but to understand the trends that are affecting the entire value chain, andexamine the powers and interests that are driving change. This knowledge can helpdetermine avenues and opportunities for realistic action, lobbying and policyentrepreneurship.(Jon Hellin and Madelon Meijer, 2006)

In order to analyze value chain in rice commodity, conceptual framework is developed. The conceptual framework consists of different actors; their role, linkage and interaction; attitude, practices and habits of the different actors, enabling environment including policies, institutional arrangements and incentives that affect the capacity and efficiency of actors to innovate across the value chain (Biruhalem, 2010).

The concept of value chain provides a useful framework to understand the production, transformation and distribution of a commodity or group of commodities. With its emphasis on the coordination of the various stages of a value chain, value chain analysis attempts to unravel the organization and performance of a commodity system. The issues of coordination are especially important in agricultural value chains, where coordination is affected by several factors that may influence product characteristics, especially quality. The value chain framework also enables us to think about development from a systems perspective (ibid).

Chapter 3. MTHODOLOGYOF THE STUDY

3.1 Research design

In this study, mixed methods, both quantitative and qualitative methods, are employed to get detail and diverse information on the same issue. Use of mixed methods helps to triangulate the reliability of the information which will be gathered. It is usual for researchers to employ mixed method designs to investigate different aspects of the same phenomenon (Sarantakos, 1998). Household questionnaires, semi-structured interview, focus group discussion; key informant interview are utilized to gather the required data. (Biruhalem kassa, 2010).

The research design is highly dependent on the collection of primary data through questionnaire using tablets data collection methods. 160 producer are interviewed including other value chain actors. The study identifies key constraints in production, quality improvement and market linkages. Likewise, existing opportunities that benefit the value chain development is assessed. The later helps to discover the prospects small holder rice producer farmers have in the rice value chain development.

In a nutshell, the household level questionnaire considers the main constraints/gaps that affect rice producers' livelihoods (economic, social, organizational, cultural, and environmental, legal/administration etc.) and the support of EDGET project to narrow down those gaps. In other words the research assessed the resource of poor farmers in relation to the value chain development – particularly of the demographic information, type of training and extension support given, input supply systems and other business development services (BDS), improvement in market linkages, practices changed as a result of adoption of new technologies, rate of adoption of technologies, changes in rice production and its quality, level of trust and transparency established between farmers and processors, motivation and participation of farmers at different stages of the project cycle, etc are explored in this study.

3.2Sampling size and methods of data collection

The data is collected through electronic data collection method and various interview techniques are also applied. The questionnaire has mixed type of questions with more of closed ended questions, rating questions and few open ended questions. The questionnaire applied for 160 sample rice grower farmers excluding other value chain actors such as input suppliers, processors, DAs, project staff and consumers. Interview (such as FGD and key informant) gathered more qualitative data from the key informants for the study.

In this study a multi-stage sampling procedures has been used. EDGET Project is working in both Libokemkem and Fogera districts. The selected study areas represent the major regional and agro-ecological zones of the country as far as rice production is concerned. At the first stage, based on their rice production potential, four representative Kebelesfrom EDGET Project intervention Woreda's(two from upland and two from lowland rice production areas) are selected purposively for field visit and to conduct household level survey.

From the four sample Kebeles a total of 1,543 list of rice farmers were registered as the project (EDGET) target farmers. Finally, about 40 sample rice producer households from each kebele and a total of 160 sample households were selected randomly and considered for the formal survey. The number of selected respondents at each kebele are equal and it is due to the rice producers are homogenous in terms of farming practice, knowledge and skill in rice production, source of income (wealth status). Single household respondent used as sampling unit for the survey. Main and supportive rice value chain actors and supporters that were selected purposively based on their significance role and data were collected using group discussion. The summary is presented in Table 3.1

Table 1Sample size of the study

Main and supportive Value chain actors	Data collection tools	Sample size
Input supplier	In-depth interview	03
Producers (formal survey)	HH interview	160
Focused Group Discussion with producer	Group discussion	2 FGD
Rice collectors	In-depth interview	05

Rice miller/processor	“ ”	10
Cooperatives	“ ”	01
Processing equipment supplier	“ ”	01
Traders (wholesalers, brokers, retailers)	“ ”	57
Restaurants	“ ”	04
Financial service provider	Key informant interviews	02
Seed enterprise	“ ”	01
Government organizations	“ ”	04
NGO’s	“ ”	02
Total		252

3.3 Data Source and Methods of Data Collection

Readily available secondary data, which assumed to supplement the primary data, was collected and analyzed. The secondary data collected include: area coverage, production, yield, processors, prices (market information), marketing systems and the like from different sources. In addition, review of relevant literature on rice production, processing marketing, and utilization was carefully undertaken. Specifically, the situation study focused on identification of the existing players and their bottlenecks in the chains, including geographical mapping, and analysis of local demand and the regional market.

3.3.1 Primary data collection

To collect primary information, stakeholder consultation, producers’ household survey, interviews with focused groups and key informants and personal observation were undertaken.

3.3.2 Stakeholder consultation

The researcher in consultation with administration, office of agriculture, cooperative promotion, trade, primary cooperative at different level identified key stakeholders. The stakeholders weretaken from different segments of the society who are directly or indirectly involved in rice value chain: input supplier, producers, extension agents, researchers, processors, traders, consumers, and NGO’S operating in the area. Thorough discussions on information of current practices, potential and constraints of rice production, harvesting, processing and marketing was collected. Before starting the detailed discussion of various issues, the stakeholders were introduced to the study background, objectives, and expected outputs from this research. It was also valued the feedback from all the stakeholdersand it was observed that different stakeholders have different perspectives on the concept of value chain.

3.3.3 Producers household survey

Enumerators collected data using device or tablet. The primary data pertained to the production year 2013/14 , major activity of rice agronomy (Pre and post management practice of rice production), source seed, marketing & consumption, role of women & men on rice production, source of inputs, opportunities and constraints were collected from sample respondents through a structured questionnaire, which was designed to generate data on some social, institutional, economic variables, input-output data and marketing that supposed to be important for this value chain study. This enabled to collect both quantitative and qualitative data. A total of 160sample households were interviewed by well-trained enumerators. The enumerators are well experienced in device data collection. The enumerators have been acquainted with the question, trained on methods of data collection and interviewing techniques.

3.3.4 Focus group and key informant interviews

Focus group interviews with producers in each kebele, processors and traders at district level were held to collect primary information. Checklists for discussion were developed and used to facilitate the focus group interview. Key informants (knowledgeable observers of the sub-sector) were also identified and interviewed in order to obtain their views, opinions and suggestions about constraints and opportunities. Thekey informants interviewed include: experts, traders at major cities', wholesalers/retailersand end users, the staffs of NGOs, researchers, development agents, cooperatives and groups of rice collectors and sellers.

In addition, I have also made visits to physical facilities of the rice producers and processors during the study period (for instance, producers' storage facilities, processing machines, packing equipment, transport, and storage facilities at processors level) and direct observations of the performance of marketing functions undertaken. I have also observed post-harvest handling, grading, storage, transport, and transactions activities related to rice. This helps for cross-checking of the data collected through various methods.

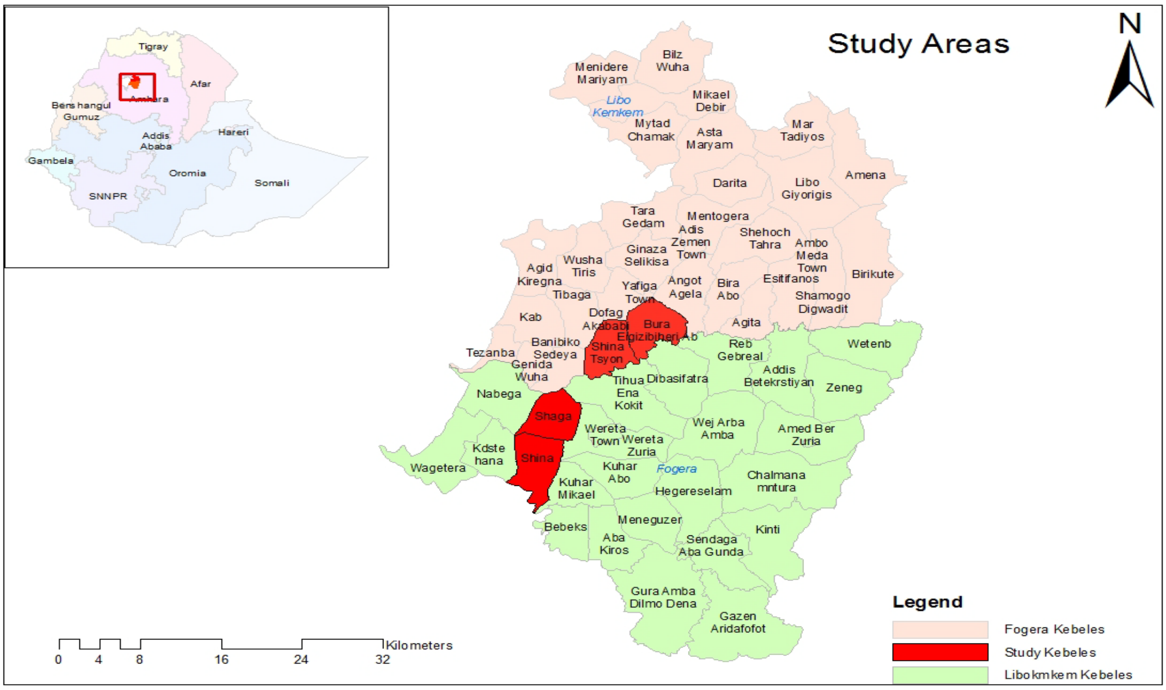
3.4 Data management and statistical analysis.

The collected data is cleaned and exported to SPSS for analysis. The statistical analysis used in the study varied depending on the type of data and information obtained. System of thematic analysis used for the data that was collected through focused group discussion, key informant interview, personal observation and secondary document analysis. Functional analysis used and identified various actors and their roles in the value chain. During analysis, a number of tools employed. For instance; chain mapping and function of actors and their linkage for mapping patterns of interaction between actors.

Regarding the quantitative analysis, simple descriptive statistics such as mean, standard deviation, frequency and percentages were used for the surveyed data collected from sample households. Statistical Package for Social Science (SPSS) version 20.0) employed to analyze the data. The analyzed data presented using tables and figure forms.

3.5 Description of the Study Area

The study area, Fogera and Libokemkemdistricts arefound in the Amhara National Regional State (ANRS) of South Gonder Zone (Figure 3.1).



Source: UNOCHA Shape files

Figure 4 Map of South Gonde Zone, Fogera and Libo Kemkem district and the study kebeles

3.5.1 Location and administrative classification

The town of the Libokemkem, Addis Zemen, found 80 km north from Bahir Dar (the Regional Capital City) and 62 km away West north direction of the zonal capital Deber Tabor. The district lies between 12^{0}11 North latitude and37^{0}77 East longitudes. The district is one of the 10 districts of South Gonder Zone bounded with Gonder Zuria district in the North, Fogera district in the South, Lake Tana in West and Ebenat and Farta districts in the East of ANRS. The district has 6 urban kebeles and 29 rural kebeles.

Fogera woreda is one of the 151 woredas of the Amhara Regional State found in South Gondar Zone. It is situated at 11º46 to 11º59 latitude North and 37º33 to 37º52 longitude East. Altitude ranges from 1774 to 2410 metres above sea level (masl) and is predominantly classified as Woina-Dega. Based on the existing digital data, mean annual rainfall was 1216 mm ranging from 1103 to 1336 mm from both the short (March and April) and long rains (June to September). Farmers depend on long rainy (Kremt) season for crop production.(IPMS-Rice 2012)

3.5.2 Demographic structure

According to Regional Bureau of Finance and Economy (2014) forecast, the total population of the Libokmkem and Fogeradistricts estimated to be 458,688 (49 % are female and 51 % are male).Out of this 95.7% are living in rural areas and the remaining 2.5 % resides in town of Woreta,Addis Zemen and Yifag. The total numbers of households estimated to be 98, 000.

The Fogera woreda was dividedinto 26 rural kebelesand 5 urban kebeles. The total land area of the woreda was 117,405 ha in Fogera woreda based on the IPMS experiencelands account for 76% while mountains and hills and valley bottoms account for 11 and 13%, respectively. Aninteresting characteristic of Fogera woreda was the seasonal flooding of the six kebeles(Shaga, Shina, Nabega, Wagetera, Kidest Hana, Aboakokit) bordering Lake Tana because of overflow of the lake andGumera were the two major rivers that recharge Lake Tana. As a result, the flooded plains are the major riceproduction areas. In addition, two rivers are of great economic importance to the woreda because they areused for irrigating vegetables during the dry season. Both rivers cross many of the kebelesbefore entering intoLake Tana. (IPMS-Rice 2012)

3.5.3 Topography, altitude and climate

According to Libokemkem District office of Argriulture 2013, the total area of the district estimated to be 108,157 ha and crop coverage annual report, suitable area for cropping is 34,694 ha and from which rice land coverage is 10,450 (30%) ha. The study area is characterized by plain land bordering to Lake Tana and a highly rugged topography predominated by mountainous terrain with an altitude ranging from 1800 meter to 2850 meter above sea level. The district constitutes 95 %, 4.1 %, and 0.9% midland, highland and low land agro ecology, respectively. The maximum and minimum average temperature of the district is 27.9 ^{0}c and 11.1 ^{0}c respectively. The district cropping systems is manly using Meher rains with a supplementation of irrigation with 75 % and 25% production of major crops contribution, respectively (Libokemkem DOA, 2013).

According to District Office of Agriculture (2013), plain land comprises 42%, undulating 30%, hilly (mountainous) topography covers 21% of the area and water covers 6 % while valley 1% makeup of the district. Its annual rainfall varies from 900- 1200 mm. This is in fact the main source of water for the rain fed agriculture.

Fogera average land holding was about 1.4 ha with a minimum and maximum area of 0.5 and 3.0 ha, respectively. The total human population of the woredawas 233,529. The rural population was estimated at 206,717. Theproportion of male and female population was almost similar in both rural and urban areas. The number ofagricultural households was 42,746. (IPMS 2005).Fogera woredawas endowed with diverse natural resources and can grow a number of annual and perennial crops. The woredawas one of the eight woredas bordering Lake Tana with estimated water body of 23,354 ha(IPMS 2005) and was also one of the surplus food producing woredasin the region. According to the FogeraWoreda Office of Agriculture the dominant soil type on the Fogera plains was black clay soil (ferric Vertisols), while themedium and high altitude areas were Orthic Luvisols (IPMS 2005).

3.5.4 Farming system of the district

According to Libokemkem Woreda Office of Agriculture 2013, the total 34,694 ha suitable area for cropping rice covers 10,450 ha, teff 7227 ha, wheat 3925ha, maize 2281ha, barely 2064 ha, bean 1626 ha, sorghum 1363 ha, millet covered1246 while the other area covered by potato and others. Moreover, the average yield of the crops are rice 64 Q/ha, Teff 12Q/ha, wheat 32 Q/ha, maize 35 Q/ha, barely 33 Q/ha, bean 15 Q/ha, sorghum 20 Q/ha and millet 16.5 Q/ha. Rice is the major crop that comprise 30 % of suitable cropping area of the district and the average yield of rice per hectare is almost double that of wheat and barley, 55 % more yield than maize. (Libokemkem DOA, 2013).

The livestock population of the Libokemkem District estimated to be 122,959 cattle, 18,673 sheep, 38,483 goats, 5845 non-ruminants and 87,905 poultry. Moreover, there are about 15,194 beehives (Libokemkem DOA, 2013).

3.6 EDGET Project

EDGET a pure value chain project named Ethiopians Driving Growth through Enterprise and Trade (EDGET) that is funded by Canadian government. The implementing organizations are Mennonite Economic Development Associate (MEDA). The project works with small scale artisans in SNNPR and small holder rice farmers in Amhara and SNNPR regions. This study solely focuses in the Amhara location of the project that is Fogera& Libo Kemkem Districts in S. Gondar zone. The target population of the project in this particular location is 6,500 smallholder rice producer households.

Rice is a one of the crops that are proved worthy to farming communities in recent decades. It is a high value commodity on which the livelihoods of thousands of smallholder farmers in Ethiopia depend. Amhara region covers 58% of the rice area and 49% of the production in the country (Takele, 2010). This sub-sector also has a potential for diversifying Ethiopia's agricultural exports and increasing foreign exchange earnings. However, the smallholder producers' access to rice market is currently constrained by several factors. These factors include: low level of productivity, poor product quality, and poor market infrastructure, lack of favorable trade policy, shortage of finance and lack of collective bargaining power.

In general, there is a strong need to help small producers in Ethiopia in general and in Fogera and Libokmkem district in particular in order to increase yields, improve qualities, achieve sustainable and fair access to rice markets and thereby improve income and livelihoods. In light of this, the objective of EDGET project is to raise the competitiveness and incomes of smallholder rice farmers by 50%.

3.6.1 Major Activities of EDGET Project

- Partners Capacity Building through various trainings,
- A series of awareness raising seminars and workshops on cross cutting issues (gender and environment),
- Introducing high potential rice varieties ,high yield production techniques,
- Market linkages
- Financial Services delivery through
    - Loan/Guarantee Fund
    - Innovation Matching Fund/Demand Creation through KFPs

Chapter 4: RESULTS AND DISCUSSION

This section provides an overview of the socio-economic circumstances of rice producers; they are critical actors at production level and involved rice value chain actors in Libokemkem and Fogeradistricts based on the questionnaire survey. The questionnaire approach was useful as it contained many close-ended questions that allowed the respondents to express their opinions on selected issues. In this section, the results presented specifically and entirely to the situation of sample households in descriptive statistics.

this chapteridentifies major constraints and opportunities in production and marketing of rice and also examine the support given to farmers by EDGET project to increase productions, improve qualities and create market linkages in order to benefits them from rice vale chain development and the key factors that affect sustainable rice value chain development of EDGET project.

It also provides information on the support services (research, extension services, input supply, marketing and NGOs involved in support of rice value chain actors) in rice production, processing and marketing.

4.1 Demographic Condition

Inthis section, discusses of the socio-economic or livelihood characteristics of the sample households in the study area and the socio economic variables include sex, age,marital status, family size and education level will be explored.

4.1.1 Age, marital status and family size of the household

From the total interviewed households engaged in rice production, 78% are male headed, and the rest 22 % are female-headed households.

The age of the household is important factor to uptake the extension service as well as to receive improved technology that enhance rice production and benefit the household. As indicated in Table 2, the mean age of the respondents was 42.86 years and ranging from 26 to 75 years. The youngest household is 26 years old, while the eldest is 75 years of age.

Marital status contributes for the benefit of the household especially if he/she isa married, it has positive impact in the form of labor divisiongenerally and for rice production activitiesspecifically compared unmarried, divorced and widowed. From the households interviewed, 85.2% are married, 4.3% are unmarried and the remaining is divorced and widowed.

In the study area, the average family size was 5.06 with a minimum of 2 and maximum of 12. The family is the main labor source for rice production. In this survey study,children at the age of seven start their contribution on rice production activities like rice weeding.

Table 2 Demographic characteristics of sample of respondents

Description	**Frequency**	**Percent**
Sex (%)		
Male	126.0	77.8
Female	36.0	22.2
	Mean	**Minimum**
Age	42.8	26.0
Family Size	5.1	2.0
Marital Status (%)	**Frequency**	**Percent**
Married	138.0	85.2
Unmarried	7.0	4.3
Divorced	14.0	8.6

Widowed	3.0	1.9

4.1.2 Educational level of the household

Among the sample household heads, 29.6 % attended adult education (able to read and write), 27.0 % attended primary secondary cycle (1-8) and only 3.9 % completed secondary school (grade 9-10). On the other hand, 36.8% of the respondents are unable to read and write, and this may affect the rice extension system through inopportune of input utilization, adaptation of improved technology and overall development of rice production.

Table 3 Educational level of the household

Description	Frequency	Percent	Remark
Level of education (%)			*10 respondents are missed*
Able to read and write	45.0	29.6	
Unable to read and write	56.0	36.8	
Primary cycle (1-8)	41.0	27.0	
Primary secondary cycle	4.0	2.6	
Secondary	6.0	3.9	

4.2 Household Assets

The main economic assets considered in this survey were house type, means of information communication (cell phones), irrigation supplies, land holding, and livestock numbers. Of the total sample respondents 99.4% owned iron roofed house: out of these households 10% of them owns three iron roofed houses while the rest 25% and 65% of the households own two and one iron roof house respectively. This indicated that majority of rice producers are in better housing condition.

Table 4 indicated household assets owned by sample respondents. About 37.7% of the respondents have radio that might be used as entertainment and as a source of information. Likewise, 67.9% of respondents owned cell phone that used for communication mainly in market information and currently using their cell phone to dial 8028 and get information on different crop production management including rice. However, only 25.3% of respondents have water pump that used to irrigate their lands from rivers, mostly to produced vegetables and other crops.

Table 4 Household assets of sample respondent

Respondents owned	Percent replied

	Yes (%	No (%)
Radio	37.7	62.3
Tape recorder	6.8	93.2
Television	1.9	98.1
DVD	0.6	99.4
Cell phone	67.9	32.1
Water pump	25.3	74.7

4.3 Landholding Size and Area Allocated to Rice

According to the survey result, the average land holding size is 1.27 ha per household which is more or less equivalent to the national average land holding size per household 1.25(CSA, 2007).

The total land owned by sample respondents is 239.75 hectares and 40 % of this land used for rice production. This shows that rice is one of the major crops cultivated in the area.
Out of the total sample respondents, in addition to their own land 43.8% have rented land for rice cultivation while 5.0% of the respondents rented out their own land to others for rice cultivation.

Table 5 Land ownership of respondents (in hectare)

Variable	N	Sum	Mean
Total land holding (in ha)	160	239.75	1.48
Own land (in ha)	160	206.00	1.27
Rented land (in ha)	160	31.75	0.19
Rented out land (in ha)	160	3.50	0.02
Land for rice cultivation (in ha)	160	95.75	0.59

Based on the study finding, the average land holding allocated for rice production was 0.59 ha which is similar to Astewel (2010) finding. Regarding gender in land allocation for rice production, the average land allocated for rice production were 0.47 and 0.62 hectare of land for female and male respondents, respectively (Table 6).

Table 6 Land allocation by gender in the study area

Description	Female (N=36)		Male (N=126)	
	Total land holding in ha	Cultivated land for rice	Total land holding in ha	Cultivated land for rice

		in ha		in ha
Sum	49.00	17.25	190.75	78.5
Mean	1.36	0.47	1.51	0.62

4.4 Livestock Ownership

Livestock production is an integral component of the farming system in the study area and contributes very much to crop production in general and to rice production in particular. Important animals kept by the sample farmers are cattle, sheep, goats, donkey poultryand honeybees.

About 93.8% of the respondents owned oxen.Oxen are the main source of farm power for land preparation and threshing. Out of this, 88.8% have a pair and above pair oxen and the rest, 11.2% have single ox. The result of number of oxen holding in thissurvey was higher than the findings ofAstewel 2010, which reported thatin Fogera district about 51% of the respondents owned one pair of oxen and 29.9% owned one.

Nearly 67.0% of the respondents have donkeys, which have main role in transportation inputs for rice production as well as transport of produce from the field to home and to the market. Livestock ownership (number, percent and mean) of the respondents shown in Table 7.

Table 7 Livestock ownership of sample respondents

Description	**Number of animal species owned**							
	Cows	Oxen	Sheep	Goats	Mule	Donkey	Poultry	Bee colony
N	153	152	82	13	2	109	131	40
Mean	2.65	2.12	2.30	0.31	0.01	1.02	5.33	0.91

N = Number

4.5 Rice Production System

Rice production in the study area is characterized by rain fed production system. Both up land and low land rice varieties are produced in the study area. X-*Jigna* and *Gumara(IAC-164)* rice varieties are dominantly produced in the low land.Moreover improved varieties such as *Edget* rice variety recently released from the research centers and farmers started growing thisnew variety in low land area where as Nerica-4 (New rice for Africa-4) rice variety are producing in upland area.

4.5.1 Source of information on rice seed

Sample respondents interviewed to mention their source of information to obtained rice seed, neighbors were the main source of information (81.5%), followed by extension workers (45.1%) (Table 8). This designate that small holder rice farmers are not able to get rice seed information with the proper rice value chain channels. The extent of extension support is not satisfactory and should be improve to empower farmers to deliver market competent quality of products.

Table 8 Source of rice seed information for sample respondents

Source of information	**Multiple response**	
	N	**%**
Neighbors	132	81.5
Extension Workers	73	45.1
Cooperatives	9	5.6
Radio/Public office	30	18.5
Processors/Traders	36	22.2

N = Number

About 42 (26.0%) of sample respondents reported that they purchased rice seed and the sources were local farmers that accounts 88.1% (Table 9). This indicated there is shortage of improved seed supply for small holder rice farmers that satisfy the farmers demand in the study area.

Table 9 Source of rice seed

Source of rice seed	**Multiple response**	
	N	%
Local Farmer	37	88.1
Agriculture Office	9	21.4

Private Seed Enterprise	3	7.1
Processors/Traders	1	2.4

N = Number

The rest 120 (74.0%) respondents who did not purchased rice seed reported to use their own seed (89.0%) and exchanged seed from other farmers (46.2%), it indicated in Table 10

Table 10 Respondents used their own produced and exchanged seed

Source of rice seed	Multiple response	
	N	%
My own seed	105	89.0
Exchanged/Bartered	55	46.2

N = Number

When respondents asked if they experience problem of rice seed, 116 (74.4%) replied problem of improved seed. The major problems associated with improved seeds identified by sample respondents are indicated in Table 11. Farmers are still facing the challenges of improved seed supply in the study area.

Table 11 Identified improved seed problems in the study area

Rice seed problem	Multiple response	
	Frequency	Percent
Do you have a problem of variety mixture in improved seed	116	74.4
Do you have a problem of physical impurity in improved seed	64	41.0
Do you have a problem of shortage of in improved seed supply	38	24.4
Do you have a problem of poor germination in improved seed	29	18.6
Do you have a problem of Diseased in improved seed	4	2.6

4.5.2 Capacity building on rice seed

Training is an important entry point to acquire skills of rural communities and it contributes for achievement of sustain development. According to the results of this survey 89.4% of the respondents replied that they got training on rice seed quality. About 67.9% respondents replied that Office of Agriculture was the major institution that delivered training in the study area. NGOs (East Africa and MEDA) also provided training to the farmers on rice production. This result shows farmers are well equipped with seed quality knowledge and appropriate stakeholders provide the capacity building to farmers.

4.5.3 Rice planting method

Respondents in the study area applied more than two rice-planting methods. However, majority (82.6 %) of the respondents applied row planting followed by broadcasting (80.7%). Pre-germination as a planting techniques applied by 41.0 % of the respondents and it is a common practice for both row plating and broadcasting which facilitate the early growing and hasten early maturity of the crops. Pre-germination technique is important for erratic type of rainfall pattern. Planting method applied by sample respondents indicated on Table 12. Given the table 12 Farmers start to adopt new techniques of farming to enhance their capacity to gain a better volume of production.

Table 12 Rice planting methods applied by respondents

Farmers practiced	**Multiple response**	
	Frequency	%
Row planting	133	82.6
Broadcasting	130	80.7
Transplanting	5	3.1
Pre-germination	66	41.0

4.5.4 Weeding practices

Weeding practice of rice in the study area is the most hard works which practiced by whole family (husband, wife and elder children). It practices three to four times weeding frequency throughout the planting period of rice production. Most (99.4%) of the respondents practiced hand weeding and 49.7% of the respondents used weeding tool like sickle to remove the weeds from the ground. Herbicides application mostly used to eradicate weed that grows on constructed bunds. Based on cost structure assessment of rice along the value chain actors in the study area, the cost of weeding accounts 46.9% to 51.8% of the total rice production costs. Weeding practice identified by sample respondents indicated on Table 13. Based on the finding, the majority of the farmers are still using traditional way of weeding technology following traditional weeding tool usage. Taking into account farmers purchasing power and demand,technology suppliers should involve in the study area

Table 13 Rice weeding practice of the respondents

Farmers practiced	**Multiple response**	
	Frequency	%
Hand weeding	159	99.4
Weeding tool	80	49.7
Herbicides	12	7.5
Rotary weeder	8	5.0

4.5.5 Rice production

Based on the results of this survey, total land used for rice production and total yield over theperiod of 2011 to 2013/14 increased; with the exception of 2014/15 production seasonaccording to farmers' opinion, this attributed to low temperature of the soil during the heading stage of the crop. However,rice productivity (yield/ha) over the period of 2011 to 2014/15showed more or less similar.

On the other hand, the amount of rice consumed by households decreased while the marketed volume was increased. This report as farmers replied was mainly due to increased price of the commodity. Details are indicating in Table 14.

Table 14 Rice production in the study area

Year	Total land for rice (ha)	Total production (Qtl)	Yield/ha	Consumed (in Qtl)	Marketed (in Qtl)	% age of consumption
2014/15	136.50	6509	47.68	22.40	25.28	47.00
2013/14	146.50	7250	49.57	23.30	26.27	47.00
2012/13	143.50	6325	44.07	22.91	21.16	52.00
2011/12	113.75	5554	48.82	24.41	24.41	50.00
2010/11	105.75	5105	48.27	25.10	23.17	52.00

4.5.6 Trend of rice production

Regarding trends of rice production in the study area respondents replied both increased and decreased. Based on the survey results 103 (64.4%) of the respondents replied that rice production over the last five years (2010/11 to 2014/15) increased Table 15. Farmers are able to increase their volume of production though out the years and they mention the factors that help them to increase their production these are use of fertilizers, improved seed and good agronomic practices (bund construction, pre-germination, row planting and frequent weeding). Details indicated in Table 15.

Table 15 Factors mentioned for increased rice production

Contribution factors for rice production increments	**Multiple response**	
	N (=103)	Percent*
Using fertilizer	90	87.3
Using improved variety	43	41.7
Due to applying good agronomy practice	42	40.7
Due to increase land allocation	16	15.5

However, based on the focused group discussion majority of rice producers of the study area did not used the recommended rate of fertilizers. This is mainly due to expensive of the fertilizer and producers assume that the rice land is fertile. They believed that flooding from highland areas brings fresh soil and even eroded fertilizer. Astewel (2010) also reported that rice producer at Fogera District used very small amount of fertilizer on their rice field.

On the other hand 57 (35.6%) of the respondents replied that the rice production was decreased over five years due to flooding (33.3%), and shortage of rainfall (29.8%) (Table 15).   Flood affects low land rice production area due to high runoff from high land area.

Table 16 Factors mentioned for decreased rice production

Contribution factors for rice production decrements	**Multiple response**	
	N (=57)	Percent*
Due to flooding	19	33.3

Shortage of rainfall	17	29.8
Unable to use fertilizer	11	19.2
Unable to use improved seed	11	19.2
Pest incidence	11	19.2

4.5.7 Use of rice straw

In addition to paddy rice production, respondents replied that rice straw has important value and the percent utilization was mainly for animal feeding (95 %), followed by local silo making (2%), thatching of livestock shades (2%) and local mattress preparation (1%). In terms of monetary value from one hectare of land, on the average 215 quintals of rice straw produced that worth Birr 16,800.00. This indicates that the majority of farmers are able to feed their livestock's from their rice by product, this in turn will minimize the extra cost a household occurred for their for livestock's.

4.5.8 Use of rice land after the crop harvest

Rice farmers asked to mention whether they are planting other crops after the rice crop harvested. They replied that 87.8 % of sample respondents used their rice land to plant other crops after harvested their rice but the remaining practice fallow land.Regarding the type of crops planted with residual moisture, includes: grass pea (87.7 %) followed by chickpea (34.0 %) and others crop like maize, sorghum, oats as well as vegetable like tomato. Farmers believethat grass pea and chickpea will enhance soil fertility of rice land that further contributes the rice production for the next cropping season.

4.6 Rice Storage, Utilization and Marketing

4.6.1 Rice storage and management

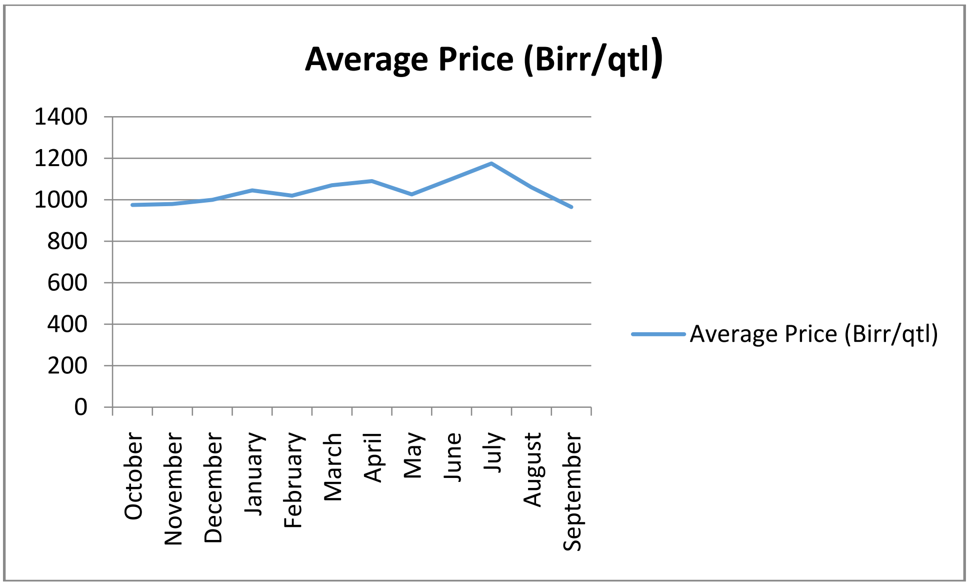
Almost all respondents in the study area replied that they store their rice paddy using different mechanisms: at local made silo (98.1%), plastic bag (85.0%) and processors warehouse (30.9%). However, sample respondents reported that 46(28.8 %) of them faced difficulties on managing the rice using silo during store in and out of the products.Moreover, 34 (21.1 %) of the respondents replied that shortage of space as a problem to store paddy rice since the average capacity of local silo is 10 quintals and the volume of paddy rice produced by sample respondents is high (on the average 50 quintals) that requires at least 5 silos. Thus, this finding shows that even if farmers want to wait and sell their product at high price season, it is not possible to store their product too long because of storage problem. Value chain actors need to be involved in supply of such technological equipment or materials for farmers.

4.6.2 Rice marketing

Regarding rice marketing, out of 160 samplehouseholdsabout 98.8 % of the respondents replied that they sell rice to the market in different ways. This result higher than Astewel (2010) finding in Fogeradistrict which stated that 75.8% of the households sold their productto the market and the rest 24.2% of the respondents did not sell to the market (used rice for home consumption and seed).Farmers are able to sell their product for different actors that are in the value chain.

Based on the results of this survey, about 117 (72.2 %) sell paddy rice to collectors, processors and primary cooperatives; 159 (99.4 %) of respondents sell their products in the form of milled rice to processors, retailersand consumers; and only four (2.5%) of respondents sold in the form of parboiled rice to the processors and consumers. It is known that rice parboiling is newly introduced technology (by MEDA/EDGET Project) that improves the nutritional value of rice, reduce breakage level, and make less sticky during cooking. Thus, this technology should be promoted and popularized. Base on the finding of this study, farmers are able to sell their rice production to diffract value chain actors.

Concerning the frequency of product marketing, about 58 (36.25 %) rice farmers went to market to sell the crop four times a year, 53 (33.12 %)three times, 34 (21.25 %)two times, and 8 (5.0 %) once a year. Moreover, seven (4.37 %) of respondents went to market five times a year to sell the product.Sample households reported the reason for high frequency of taking products to the marketis to get better market price, as market price is relatively low during the peak production season and gradually increases. This is in line with fogera and libokmkem districts Trade Office (2014)which indicatedthat the minimum price observed during October – November and the maximum price observed during May - June (Figure 17).



(Source: Fogera and Libokmkem Trade Office, 2014)

Table 17 Rice price trend in study district.

4.6.3 Source of market information

Sample respondents in the survey replied that they have obtained market price information from different sources, these are mainly from notice board posted at kebele level 124 (76.5 %), followed by processors 120 (74.1 %), then from extension workers 64 (39.50 %) and finally from primary cooperatives 27 (16.7%). According to districts Trade Office, market information have been collect every Saturday from the farmers and processors at the gate of rice processing house and from retailers at open markets. This information compiled, analyzed and distributed to kebele level for producers and traders consumption. According to the study finding, farmers are able to get market price information from different value chain actors and this will empower them when and how to sell their product.

4.6.4 Market price setting

According to the survey results, market price of the rice products determined mainly based on the market price 136 (84.5 %). Followed by 96 (59.6 %) of the respondents responded that they negotiated with processors or buyers based on the cost of the production and 84 (52.5 %) of the respondents replied the processors decided the price of the products. From the survey, it observed that processors purchased farmers products with the same price regardless of the products quality. This in turn, does not encourage the producers to produce quality products. Most attributes for rice is its quality. Hence, attention should give to improve quality of the rice products to satisfy consumer's demand and to compete with imported rice, which in turn to benefit smallholder rice producers.

4.6.5 Rice milling

Paddy rice undergoes milling process for marketing as well as de-hulling (removing the outer cover of paddy rice, that is, husk) for their own consumption. Based on the results of this survey, all sample respondents get rice milling service from private own rice millers. Millers' location are Yifag sub-town of LibokemkemDistrict and Woreta town of Fogera District. According to the sample respondents, the maximum, minimum and average time travel to get rice-milling service from their residence takes 80, 15 and 57 minutes respectively.

Regarding problems encountered in rice milling services, 141 (88.1%) sample respondents identified, as rice breakage was the major problem as the result of old machine, 90 (55.6%) respondents travel long distance from their residence to get milling service and 69 (42.6%) respondents replied that they are unable to get milling service on time after they arrived at the milling service providers.In the study area, there are few millers with modern milling machine, so value chain supporters like government bodies should encourage or create conducive environment for investors to invest and to work as millers/processors in the area. This will create competition and processers will give a better service for farmers.

Respondents rate their level of satisfaction on milling service as poor 97 (60.6 %), good 40 (25.0 %) and neutral 23 (14.4 %). The main reason they rated as poor is due to lower volume of milled rice 76 (79.6 %), unable to get milling service at any time in working days/hours 62 (63.9 %), unable to access improved processing technology 31(30 %), and 17 (17.52 %) respondents feel that they were cheated by processors. This result revealed that farmers are not satisfied with processors/millers service.

According to international rice research institution (2013),recommended value international rice standards are rice milling recovery of brown rice (de-hulled) is 75.0% and above (fair to good), total milled rice 65.1% and above (grade 1 to premium) and the value of head rice is 48.o% and above. The mean recovery amount of total milled rice of this survey result was 66.20%, and this result is in line with International Rice Standards.

4.6.6 Warehouse and financial service

According to the sample respondents rice millers provided additional services to producers like market services 131 (80.9 %), warehouse services 115 (71.0%) and credit service 86 (53.1 %).

4.7 Division of Labour in Rice Production

Labor involvement in different rice productionactivities focused on the study areapresented in Table 17. As it clearly indicated in the table, all household family including hired labor involved in all rice production activities.

Table 18 Division of labor in rice production

S/N	Types of major activities	Tick "x" based on involvement*				
		Husband	**Wife**	**Children**		**Labor (hired)****
				Boys	**Girls**	
1	Land preparation (clearing)	xx	x	xx	x	x
2	Bund construction	x	x	x	x	x
3	Tillage	x	-	x	-	x
4	Seed cleaning	-	x	-	x	-
5	Sowing (broadcasting)	x	-	x	-	x
6	Pre-germination	x	xx	x	xx	-
7	Row planting	x	x	x	x	x
8	Transplanting	x	x	x	x	x
9	Raw fertilizer application	x	x	x	x	x
10	Weeding	x	x	x	x	x
11	Top dressing	x	-	x	-	-
12	Pest control	xx	x	xx	-	xx
13	Supplementary irrigation/ drainage	xx	x	xx	-	xx
14	Ragout (removing unwanted rice varieties)	xx	x	xx	xx	x
15	Harvesting	xx	x	x	x	xx
16	Drying	xx	x	xx	x	xx
17	Hipping	xx	x	xx	x	xx
18	Preparation of threshing field	xx	x	x	x	x
19	Threshing	xx	x	x	x	xx
20	Cleaning (using wind)	x	-	x	-	x
21	Transporting to home	x	x	x	x	x
22	Gotera making for storage	x	xx	x	xx	x
23	Transporting to market	xx	x	x	x	-
24	Processing	x	x	x	x	-
25	Parboiling	x	xx	x	xx	-

26	Marketing of rice	xx	x	x	x	-

[*] Single x implies equal involvement while xx implies higher involvement of sex in the household labour

[**]Hired labor may be temporal or permanent

Tilahun *et al.*, (2012) also reported that the involvement of women in rice production and processing was very high, except in ploughing,which was usually a men's job.

Boys and girls have significant role in rice production. They started supporting of the family at the age of seven. Even the hard work such as plowing performed by boys. Boys started tillage of land at the age of eight for winter land preparation and at age of 14 for summer land preparation.

According to the results of this survey, 55.0 % of the respondents replied thattheowner of the household (husband) was responsible to sell of the products followed by wife (41.0 %) and elder children (4.0 %).

4.8 Major Source of Income

The source of income of sample respondents in the study area mainly generated from farming system. Growing of rice mainly X-Jigina, Gumara(IAC-164)and Nerica-4 resulted in better income of households compared to other crops. In addition to rice, sample farmers cultivate other crops like, maize, Teff, sorghum, finger-millets chickpea, grass pea and vegetables. Source of income and amount of money generated by sample households in the study area presented in Table 19. The most important source of income generated by sample households is rice followed by grass pea and chickpea. As indicated in Table 19, Birr 37,904.32 is the mean income of rice among the interviewedhouseholds.

Table 19 Source of household gross income in the study area in 2013/14.

Gross income source (in Birr)	Mean	SD	Max	Sum
Rice (N=160)	37,904.32	18,541.31	100,000.00	6,140,500.00
Maize (N=69)	567.08	794.05	3000.00	91,300.00
Teff (N=78)	1885.49	2405.64	13,000.00	305,450.00
Sorghum (N=33)	554.47	1520.27	10,800.00	89,270.00
Grass pea (N=134)	4231.14	3060.97	12,000.00	685,445.00
Chickpea (N=127)	3019.20	2608.13	12,350.00	489,110.00
Oat (N=19)	1240.74	4565.05	36,000.00	201,000.00
Onion (N=19)	1377.78	4444.30	24,000.00	223,200.00

Garlic (N=2)	74.07	733.45	9000.00	12,000.00
Tomato (N=8)	401.86	2607.86	24,000.00	64,700.00
Safflower (N=81)	2114.63	2670.67	14400.00	342,570.00
Finger millet (N=9)	391.36	2246.77	20,000.00	63,400.00

4.9 Cost, Margin of Rice along the Value Chain Actors

Rice is one of the cereal crops with increased production volume year after year. Its productivity is relatively better than other crops. Production cost is also assumed to be relatively less than other crops. This result is thus to show the cost structure of rice including among others actors involved in the rice value chain of the cost of production, processing, packaging, transportation, distribution and selling and to indicate the profit margin at the critical value chain actors (producer, processors, wholesaler and retailers).

Total cost of rice production per hectare was Birr 24,983.30. The cost incurred by sample respondents in the study area were purchasing inputs (seed, fertilizer and transport) birr 4430.20,land preparation (first to fourth round), farm tools (*Maresha*, *Wogel*, sickle,*Mofer*, *Kember*, shovel, axel)and labor for bund construction birr 3,580.00 labor cost for weeding (first to fourth round) birr 9,400.00, and labor cost for harvesting and others activities (harvesting, collection, hipping, threshing, hipping straw and others) birr 7,573.10. Average production rice 49.57 Quintal/hectare and the recovery amount considered for this calculation was 69 % (own survey result) and total sold rice 34.20 Quintal.

Rice is one of the cereal crops with increased production volume year after year. Its productivity is relatively better than other crops. Production cost is also assumed to be relatively less than other crops. This result is thus to show the cost structure of rice including among others actors involved in the rice value chain of the cost of production, processing, packaging, transportation, distribution and selling and to indicate the profit margin at the critical value chain actors (producer, processors, wholesaler and retailers).

Total cost of rice production per hectare was Birr 24,983.30. The cost incurred by sample respondents in the study area were purchasing inputs (seed, fertilizer and transport) birr 4430.20,land preparation (first to fourth round), farm tools (*Maresha*, *Wogel*, sickle,*Mofer*, *Kember*, shovel, axel)and labor for bund construction birr 3,580.00 labor cost for weeding (first to fourth round) birr 9,400.00, and labor cost for harvesting and others activities

(harvesting, collection, hipping, threshing, hipping straw and others) birr 7,573.10. Average production rice 49.57 Quintal/hectare and the recovery amount considered for this calculation was 69 % (own survey result) and total sold rice 34.20 Quintal.

The cost and market margin of milled rice at farmers was birr 546 /quintal, processor /miller birr 134.22 /Quintal, wholesaler/distributor birr 68.25 /quintal and retailers birr 256.05/ quintal. The result shows that rice was profitable crops to the main value chain actors.

Sample respondents in the study area obtained net profit of Birr 10,926.70 per hectare. Astewel (2010) also reported that in Fogera district, rice farming was profitable and the average net income for production of paddy per hectare was Birr 5,006.48. The current study showed that there is higher net profit income of rice as compared to Astewel (2010) reports and this variation was due to higher price of paddy rice (Birr 750.00 versus Birr 387.63) and increased production per hectare (49.57 quintals/ha versus 42.19 quintals/ha) in the current study.

Cost benefit analysis, distribution of value along the rice chain of rice in Ethiopia with particular focus on Amhara region, the case of Libokemkem District from Yifag sub-town to Bahir Dar in 2014/15 presented in Table 20, Table. The details description of the cost structure of rice value chain actors (producer, processor, wholesaler and retailers) also annexed.

Table 20 Prices, costs and margins of rice from *Yifag* sub-town to Bahir Dar

Description	**Cost/profit**	
1.Farmers	Br/Qt	%
1.1.Selling price of milled rice		
1.1.1 Selling price of milled rice (Yifag)	1050.00	**65.62**
1.1.2 Selling price of straw	16,800.00/ha	
1.2 Market margin	**546.00**	**52**
1.3 Production cost	504.00	48
1.3.1 Cost of seed and inputs	93.00	18
1.3.2 Cost of land preparation	68.60	14
1.3.3 Cost of weeding	189.65	38

Description	Cost/profit	
1.3.4 Cost of harvest and post- harvest	80.00	16
1.3.5 Other cost (collection, threshing, transporting	72.75.00	14
2.Processors/millers(study area/Yifag)		
2.1. Buying price	1050.00	
2.2 Selling price of milled rice	1150.00	
2.3 Selling price of bran (2 Birr/kg)	62.00	
2.4 **Marketing margin**	**100.00**	**6.25**
2.5 Marketing cost	27.78	
2.5.1 Depreciation cost of machine (Birr /Quintal)	0.65	
2.5.2 Wear and tear (maintenance) (Birr /Quintal)	9.00	
2.5.3 Labor (Machine operator) (Birr /Quintal)	5.38	
2.5.4 Electricity cost (Birr /Quintal)	1.25	
2.5.5 Bagage (Birr /Quintal)	10.00	
2.5.6 Taxes	1.50	
2.6 Profit margin	**134.22**	
3. Wholesaler /Distributor(Bahir Dar)		
3.1 Buying price	1150.00	
3.2 Selling of milled rice	1300.00	
3.3 Marketing margin	**150.00**	**9.37**
3.4 Marketing Cost	81.75	
3.4.1 Transportation (Yifag –Bahir Dar)	20.00	
3.4.2labor cost for loading unloading (Birr /Quintal)	10.00	
3.4.3 Storage rent for three month(5 birr /Quintal/month)	15.00	
3.4.4 Tax (35 % of the profit)	36.75	
3.5 Profit margin	**68.25**	
4.Retailers (Bahir Dar)		
4.1. Buying price	1300.00	
4.2. Selling price	1600.00	
4.3. **Marketing margin**	**300.00**	**18.75**
4.4. **Marketing cost**	43.95	
4.4.1Transportation (From Store to Shop)	10.00	

Description	Cost/profit	
4.4.2 Labor cost to sort milled rice	20.00	
4.4.3 Shop rent (294.10 /month which is 20 % of cost of rent covers by rice sell, 34 quintals sold/month)	8.60	
4.4.4 Miscellaneous (communication expense, tax etc.)	5.35	
4.5 Profit margin	**256.05**	
5.Consumers buying price(Bahir Dar)	1600.00	**100**

4.10 Actors, their Roles and Linkage in the Rice Value Chain

This section presents the actors and their roles in the rice value chain in the study area. Actors at different stages of the value chain, such as input supply, production, processing, marketing and consumption discussed below.

4.10.1 Input supply

In the rice value chain, there are input suppliers who are involved in supplying of seed, fertilizers, chemicals and milling machine in the study area.

4.10.1.1 Seed

The main seed variety used in the study area is local seed (X-*Jigina*) and the sources are farmers. This variety is dominating both upland and lowland areas. Moreover, improved seed such as Nerica-4 for upland and EDGET for lowland areas supplied by *Yimam* Seed Enterprise and District Office of Agriculture respectively. However, both Amhara seed enterprise and *Yimam* seed enterprise tried to multiple Nerica-4 and EDGET seed varieties on rice producers' farm land. Model farmers selected on cluster base together with District office of Agriculture. Both Yimam and Amhara seed enterprise sold their seed to selected farmers for seed multiplication. Finally farmers multiplied the seed and sold their seed to the enterprise with 15 % additional price at the time of marketing day. But the enterprise complained that farmers declined to sell the seed based on the agreement.

4.10.1.2 Fertilizer

Farmers Primary Cooperatives are the main supplier of fertilizers, followed by Office of Agriculture and rice wholesaler/miller in the study area. Wholesaler mainly purchased the fertilizer illegally from farmers and then sold to other farmers who need fertilizers for planting vegetables and other crops using irrigation.

According to Bureau of Agriculture during the study period fertilizer imported from Russia, Jordan, Italy and France through Agricultural Input Supply Corporation. The Corporation supplied to Ribb Union, the unionin turn distribute to farmers primary cooperatives. The primary cooperatives based at Kebele levels provide warehouse service and distribute the inputs. Through this supply system 99.4 % of the respondents accessed fertilizer like DAP and Urea (NPS) for their rice production. Fertilizer delivery system carried out jointly by Cooperatives and ACSI. There are two modalities to get fertilizer from primary cooperatives. The first type of modalities are on cash and credit. Farmers' cooperatives provide fertilizer to the farmers when the farmers presented the receipt or coupons from ACSI. In this case, farmers paid 40 Birr per quintal as service charge to cooperatives andACSI.

4.10.1.3 Agriculture tools and machineries

Agriculture tools such as sickle, knapsack, tractor, rotary weeder, and harvester supplied through Primary Cooperative, Office of Agriculture, privet sector (AMIO Engineering PLC, Robit International Business Group PLC, and Ethiopian Agricultural Engineering Industry Corporation).

4.10.1.4 Agro-chemicals (pesticides and herbicides)

Agro-chemicals used in rice production are herbicides (2, 4-D and Paraquat) that applied at the boarder of the rice field and insecticides (such Endosulpan, Benzonine 35% and Malathion), and these chemicals are supplied by private enterprises (traders), farmers cooperatives, AISCO, and Agriculture Office in decreasing order. There are also different diseases that attack rice crop and these diseases not clearly identified. These are blight disease (that dry the leaves), decay the roots, and leave spots on the grains and chemicals such as *Mankozeb*,*Rodmin* and *Girgit* supplied by traders and used to control these diseases.Moreover, chemicals like *Selfos* and Commando used to control storage pest (weevil and mice) also supplied by traders.

4.10.1.5 Milling machine

The major milling machine supplier is Robit International Business Group PLC. The companyestablished in April 2002 with the aimof importing major products that have a great contribution for development such as agriculture machinery, spare parts and other business lines. The company has branch office at Bahir Dar and Mekelle where the main office is found at Addis Ababa. The company has been supplying rice processing machine (N70, N90, N10, SB-series, NZJ-15/20III combined rice processing machines and grading machine) to rice millers found in Amhara region. The company has imported the rice milling machine mainly from China.

The company mentioned that government focuses on rice production development and hence, the expansion of rice production area creates an opportunity to sell more rice milling machine and spare parts.Even though the country developed rice standards but failed to implement, the machine supplier imported outdated models of rice milling machines. However, if the standards will be practiced and the government regulates the type of rice milling machines before imported, the company is forced to import advanced technology that contributes local rice quality improvements which further competes imported rice.

4.10.2 Producers

Rice production in the study area is currently dominated by smallholders.They produce rice for home consumption and selling purposes. Producersusually processed their paddy rice. They sell paddy rice to collectors, processors and cooperative; andthey also selling milled rice to processors and customers. According to District Office of Agriculture(2014) more than 12,305 smallholders engaged in rice production with average land size of 0.6 ha per household in 2014 production season. While the number of smallholders engaged in rice production is increasing from time to time, smallholders have reported inclining yields and productivity mainly due to use offertilizers and applying of good agronomic practices. Majority of the farmers use local seeds, mainly X-*Jigjna* over years.

In the study area, producerssell up to 53% of the harvested rice and use 47% for household consumption. The smallholders noted that they rarely store the rice; at harvest time, many of them are desperate for cash to buy consumables for their households. Producers reported that they received extension service from Agriculture Office and capacitated by other GOs and NGOs (MEDA, Fogera Rice Research and Training Center and East Africa). Producers usually harvest the rice by using sickle; and they thresh the rice using oxen power and human labor.

4.10.3 Collectors

Collectors are individual farmers (unlicensed) for collecting of paddy rice from farmers specially at harvesting time. Most rice producer farmers sold their rice in the form of milled rice than paddy rice. However, they also sold in the form of paddy rice to collectors and millers.Collectors often sale paddy to rice millers when the price of paddy rice increased. Collectors also provide transport service (using mule cart) to the farmers from their village to milling service. Moreover, according toDistrict trade office, at *Yifag* town there are licenced traders registered for providing milling service but due to lack of electric power currently they are collecting paddy rice from farmers and sell to millers.

4.10.4 Millers (processors)

Rice millers in the study area are usually small scale in size, and usually provide de-hauling and polishing services to farmers as well as buying and selling milled rice. Millers have license from District Trade Office for grain milling for private millers and certificate for cooperatives from cooperative promotion office. Both private and public traders are engaged in wholesaling milled rice. In order to get a license the requirements are kebele identification card, TIN number and capital for private millers. According to District Trade Office, there are 20 (four are females) private and one farmers' cooperative registered and involved in rice milling and wholesaling in the study area.Rice millers have 27 rice milling machines with model number N70, N90 and N110. Moreover, four millers have also additional SB-series rice milling machine and provides de-husk service for farmers to produce rice flour.Service payment for rice de-hulling is birr 0.30/kg but free for polishing service which millers receive bran as compensation.

Rice millers in the study area do wholesale and retail. Milled rice sold at the gate of rice millers mainly through brokers to wholesaler; and to a few extent, they sold milled rice directly to wholesaler. The market destinations of the products are mainly Bahir Dar, Dessie, Gonder, Chagnie, Mekelle, Addis Ababa and Wolega. Rice millers found at Woreta town also buy milled rice from millers found at *Yifag* sub-town. Rice millers also provide warehouse service and credit service to producers.

According to rice millers record data, the recovery amount of de-hulling for white and red rice are 80% and 76 - 78% respectively. The recovery amount from polishing of white and red rice are 65-69% and 60-63% respectively. Moreover, for parboiled rice 75-78% recover results obtained.

Bran and husk are by-products from milling of paddy rice. From 100 kg of paddy de-hulling, up to 18 kg of husk and 2 kg of bran obtained. Likewise, from polishing of 100 kg of paddy up to 30 kg of bran gained. They usually sell bran for wholesalers. Rice bran mainly used for animal fattening and rice husk used as fuel for baking of enjera by local people.

The peak processing months for rice millers ate from Decemberto midof January, March, May to July. Rice miller agreed that there is high rice breakage percentage that affects the product quality, this in turn result in low price of local rice as compare to imported rice. It has also mentioned that source of rice breakage are mainly due to poor post-harvest handling by farmers, that is, too early and too late harvesting, planting different rice varieties and mixing them at harvest time which results poor quality and make milling more difficult and reduce marketability.

4.10.5 Brokers

Brokers are unlicensed middlemen that are playing a key role linking processors to urban markets. Brokers get their commission or payment from both buyers and sellers of rice. They earn commission from rice millers (up to 10 birr/quintals) and wholesaler (2-5 birr/quintal).

4.10.6 Wholesalers

Wholesalers are licensed traders often buy milled rice from rice miller and wholesaling to retailers. They have warehouse to store, sort and packing of milled rice. A wholesaler located at Bahir Dar town has been supplied milled rice for about 400 retailers found at Bahir Dar for more than 66 retailers found at different towns of Amhara region. Wholesalers are trading both local and imported rice. Sources of imported rice are mainly from Pakistan, India and Egypt.

4.10.7 Wholesaler (Value add)

These are traders buying improved local rice (parboiled, X-Jigina, Nerica-4, red brown rice, Edget, and graded milled rice) from rice millers and parboilers. They provide value addition in terms packaging, transporting, sorting and distributing. They pack products with plastic and flexible bags with the capacity of 1/2 kg and 1 kg; labeled, branded and sell to retailers (shops, mini and super markets) and hotels. These traders are buying quality rice products (parboiled rice).

4.10.8 Parboilers

Parboilers are individual women farmers and small-scale processors usually buying paddy rice from farmers. They parboiled the paddy rice and sold to packers and wholesalers. Parboiling is a process of soaking of paddy rice with warm water followed by steaming/boiling and then drying by wind before polishing. This new technology introduced by Sassackwa 2000 and MEDA to rice producers.There are electric and fuel wood source of parboiling machine and pan used to parboiling the rice.

4.10.9 Retailers

These traders licensed to sell different products to consumers. They are not specialized to sell rice only but used milled and parboiled rice along with other grain products. Retailers usually purchase from wholesalers and packers. Whereas those retailers based in areas where rice millers found they directly purchase milled rice from millers. Retailers found at Bahir Dar reported that the selling volume of milled rice 25kg/week and this volume increase during fasting seasons.

4.10.10 End markets (consumers)

Consumers are the final and the most important actors in the value chains. They are the main source of finance and income of all other actors. Both local and imported rice are available to the markets. Local rice are used as table food and making of enjera, soup and porridge. Broken rice is used for production of flour. Currently about 15% to 50% of rice is added to substitute tefffor making enjera. Rice for this purpose preferred by consumers due to it gives white color for the enjera, and increase the number of enjera as compared with teff alone. (Evidences have proven that one hundred kg teff can produce up to 570 pieces of enjera with the weight of 350 grams per piece of enjera, whereas the addition of 35 kg rice (current cost is Birr 13/kg) on one hundred kg teff the number of enjera rice up to 780 pieces and the enjera can stay up to four days without spoiled. Thus, the addition of 35 kg rice (worth Birr 455.00) result in 200 pieces of additional enjera (worth Birr 594.00), with gross profit of Birr 139.00.

According to the wholesalers' record, 28.5% local rice is used to table food and soup preparation especially during fasting period (as variety of fasting food) and the rest 71.5% of local rice used for flour making (mixed with teff to make enjera). From 450 retailers located at Bahir Dar Based 33% replied their weekly sales record of sorted rice was an average of 25kg. Their monthly sales record was 450 quintals.

As a consumers all people regardless of their religion and sex like traders, employees, day laborer purchases rice. Moreover, universities, hospitals, hotels and restaurants are potential buyers of local rice. Rice consumer's number increased from year to year. Future market opportunities to add value and attracts more consumers are quality, expand the current parboiled rice and improve quality of local rice.

The main regulatory factors for rice marketing are price and quality. Consumer's quality preference over milled rice is white color (not mixed with red rice), full grain size (not broken), free from impurities, long size and slender in size and not sticky while cooking.

4.10.11.Identification of national end markets

Three national end markets were identified during the value chain study, based on the focus group discussion of the value chain actors involved in wholesale and retail. It is summarized as below:

Consumers preferred quality rice (aromatic, long grain and packed rice)

This end market is the smallest of the three. Though no numbers are available, it is estimated they are few in numbers compare to others consumers. This market consists of expatriates Ethiopians with experience abroad through travel, work or residenceand foreigners. These individuals prefer aromatic, long grain rice, and are sensitive to country of origin and nicely packed (flexible plastic and jam jar). Rice from Thailand, India and Pakistan are all preferred. This market is currently served completely by importers, who import from large rice producing countries. The average purchase price per kilogram in supermarkets is 25 ETB to over 30 ETB. Purchases are made at higher end supermarkets (e.g. Family, Apple and other supermarkets) and better hotels and restaurants. This market is quite sensitive to packaging, presentation and brand. Customers are much more concerned with quality than price. Rice is consumed as rice, rather than as enjera.

Consumers preferred local rice and improved rice

The second market is also relatively larger, although growing fasting. Consumers in this category consume rice both as flour in enjera and, increasingly, as rice in hotels, restaurants, and in lunches for their children (enjera does not travel as well). Feedback from wholesaler and retailers suggests that a significant proportion of this market consumes parboiled rice, and purchases rice price in the range of 14- 18 ETB per kg. This market is relatively less sensitive to brand, and more price sensitive than the high income market. There is a high sells record registered during the fasting season of both Cristian and Muslim consumers. For these consumers quality is important and local rice is currently able to serve the needs of the consumers. This market is now compete the imported markets through its natural test and quality as well. Moreover, this market is currently growing quickly, and it is realistic that Ethiopian rice can dominate and replace the imported rice in this market segment with in the few year timeframe given that constant supply of parboiled rice and graded rice assured and an effective upgrading strategy (implementation of national rice standard) is put into place and pursued.

Consumers preferred local rice especially rice flour to make enjera

The vast majority of the local rice market falls within the final this category. For this group, rice is consumed mostly as flour, mixed with teff flour to make enjera and rice soup & porridge. This category is characterized by their high price sensitivity. Most purchases are made in open air markets and shop, at a price point of between 9 ETB and 11 ETB. While these consumers would prefer to eat enjera made entirely of teff, the cost savings of using rice flour are attractive enough to encourage the mixing of rice flour. Nevertheless, this market is strongly adverse to the knowledge that rice is being mixed into teff. This market is growing very quickly, as inexpensive rice reaches new areas of the country where it is currently not available.

4.11 Enabling Environment

Rice production in Ethiopia is a recent development. Over the last few years (2000 – 2014), particularly in the study area during 2013/14, rice has received so much attention by the government which has culminated into the development of national rice research and development strategy. The strategy was developed by a technical committee appointed by the Ministry of Agriculture and Rural Development (MOARD). Ethiopian Institute of Agricultural Research (EIAR), Ministry of Water Resources (MOWR),Sasakwa Global 2000, Sasakwa Africa Association, National Rice Research and Development Steering Committee, Rice Research and Development Secretariat, and JICA Ethiopia. The strategy outlines the opportunities and challenges for rice in Ethiopia. The intent is to stimulate growth and performance of the rice sub sector. Government has shown commitment to move this forward. Moreover, recently a fifteen years rice strategy plan developed by Fogera Rice Research and Training Center, Agricultural Transformation Agency, Amhara Seed Enterprise, Ethiopia Seed Enterprise and others and it will expected to starts its implementation on 2016.

Among the key government policies relevant for the rice sector are the policies on input supplies. The government policy on inputs promotes a single distribution channel- the cooperative structure - for the distribution of seeds and the major input supplies.

4.12 Supporters and their Role in the Rice Value Chain

This section provides an overview of rice value chain supporters (Go and NGO) provide supporting services to the rice value chain actors in the study area.

4.12.1 Fogera National Rice Research Training Center

The presence of Fogera National Rice Research Training Center (FNRRTC) seems to be great opportunity of research and development of the rice production in Libo Kemkem, Fogera, and Dera particularly and it is center of excellence at national level. The research center mandated to conduct research, through demonstration fields, on seed multiplication and aspects of rice production. The research center also has a mandate to provide training and build the capacity of extension workers.

FNRRTCestablished in 2013 and the objectives are to increase rice production and productivity in reference to quality through generation and adaptation of rice technologies, which are sustainable and environmental friendly. The major roles of FNRRTC includedevelopment of high yielding and better quality rice varieties, production of breeder and pre-basic rice seed,provision of packaged technologies, provide technical training to extension workers and farmers on rice production and management.Moreover, it organizes forum for knowledge and experience sharing and verification and promotion of best-fit technologies from other countries.

4.12.2 Extension

For rice, being a new crop, staff of Libokemkem District Agriculture Office has provides expertise service to rice producers in appropriate agronomic practices and on pre and post-harvest rice production management.

4.12.3 Market information

District Trade Office provides information about the price of rice and other crops.The information collected at producers, processors and retailers level every week and posted at kebele level and center of *Yifag* where rice processors located.

4.12.3 Financial service

Rice production requires money for different production activity (for input/fertilizer and weed control). Farmers in the study area received credit used to purchase fertilizer, payment to rent additional land for rice cultivation, purchase of donkey for transportation and for payment of hired labor.During focus group discussionthey reported that their sources of credit are ACSI, processors/millers and rural saving and credit cooperatives (RSCCo). Focus group discussion participantfarmers reported that ACSI’s interest rate is 18 % and RSCCo 14 %.ACSI accessed credit to the farmers on group (3-7 farmers)as a collateral system. Whereas RSCCo provides credit to members only and it provides up to 5000 birr. In this case members of the cooperatives select their colleagues for collateral. Farmers complained that group collateralaffects their income as well as their social relationship when some group members failed to pay the loan, other members of the group is forced to pay the loan.

4.12.4 EDGET project

Ethiopians Driving Growth through Enterprise and Trade (EDGET) is a five years (January 2011-December 2015) rice value chain development project funded by Government of

Canada.The executing organizations are Mennonite Economic Development Associate (MEDA). The aim of the project to increase income of 6500 HHs farmers by 50 % through facilitating access to growing markets, enhance production techniques, appropriate technologies, improved input supplies, and affordable support services including finance. The location of the project is Fogera and Libo Kemkem Districtsof South Gondar Zone.

EDGET project implementation approach are rice value chain approach that encompasses the main chain actors (input supplier, producers, rice millers/processors, wholesalers, retailers and consumers), value chain supporters (research center, university, service delivery agency and NGOs) and chain enablers (policy makers, working context, rules and regulation).

The project intervention focused in rice production, marketing, up grading of the current rice milling machines and accessing of finance to small and micro enterprise. Hence, the project facilitated to target 6536 rice farmers at 12 kebeles (Libo and Fogera) through supporting of government partners and achieved to introduce Good Agronomy Practice such as row planting and pre-germination.The project also focused in introduction and expansion of Nerica-4 and EDGET rice varieties, rotary weeder, rice harvester, tractor, super bags (for packaging), combined machine, parboiled machines (electric and fuel system). So far, five varieties of improved rice products that labeled and packed supplied to the markets.

4.13 Value Chain Structure

Value chain mapping clearly shows the rice products flow from producers to consumers (from farm to fork) through various actors. This section highlights the critical value chain actors'involved at input supply, production, processing, marketing and consumption. The current scenarios and how value chain actors are linked in Libo Kemkem and Fogera districts is indicated in figure 5

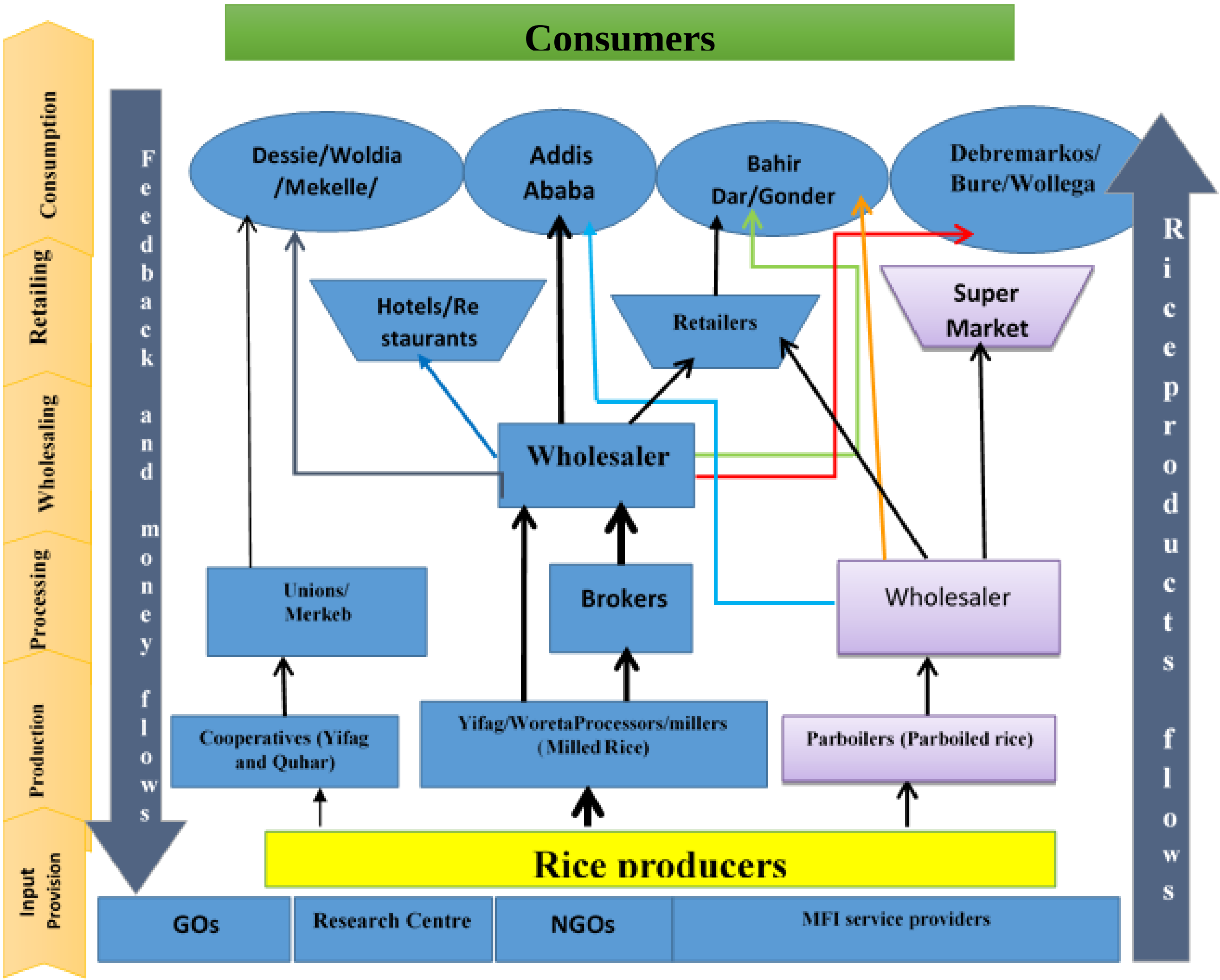


Figure 5 Basic rice value chain map in the study area

4.14 Opportunities and Constraints in Rice Production and Marketing

A number of opportunities and challenges in the study area were identified by the different value chain actors (input suppliers, producers, processors and traders) and supporters (extension workers, experts and officials, researchers, and NGOs). These results were obtained through key informant interview and focus group discussion. In this subsection, the major constraints and opportunities are briefly discussed.

4.14.1 Opportunities

There are opportunities in rice production and marketing in the study area. There is still huge potential to increase rice production and to improve the livelihood of the rice producers. Besides the existing natural resources (water and fertile soil), government has given more emphasis on the development of rice production to reduce poverty.Many NGOs are also giving more attention to the rice sector than ever before as an important intervention areas to support the smallholder farmers and other value chain actors. This will give farmers the opportunity to access improved technologies and capacity building (training on good agronomy practices) and processors to upgrade their processing technologies. Since recently, establishment of new rice processing combined machines in the study area and adjacent town (*Woreta*) and the number of participating traders are increasing. Moreover, established producers cooperatives started in collection, processing and marketing of rice products. These institutional changes will provide good opportunity to create increasing demand and competitive market for quality rice. This will in turn result in endogenous technological change and overall development in the rice sector.

Similarly,high productivity of the crop and high market demand were also some of the opportunities of the crop mentioned by respondents. Details are indicated in Table 21.

Table 21 Opportunities of rice production in the study area

Activity listed as an opportunity	**Multiple response**	
	Frequency	%
Natural resources availability	148	91.4
Conducive weather condition	132	81.5
High productivity of the crop	131	80.9
Good market for the product	129	79.6
Availability of supportive institutions	87	53.7
Increasing trend of consumers demand	86	53.1
Government emphasis	74	45.7
Less damage by insect and pest	57	35.2

4.14.2 Constraints in rice production and marketing

In addition to the above mentioned opportunities, currently producers are facing a number of interrelated problems and constraints that limited productivity and production of rice to improve their livelihood. The main constraints were categorized at different (production, processing and marketing) stages are discussed below.

4.14.2.1 Production constraints

Production related constrains identified by key informants and group discussion was mentioned at pre-harvest and post-harvest levels. As pre-harvest constraints respondents mentioned the following issues: the dominant rice variety (X-Jigina) used for long time may be lost its viability before replaced by other varieties, the mixture of rice variety (white and red rice), weed manifestation, erratic rainfall, flood and rice shattering.

Moreover, it was reported by key informants that post-harvest handling practices by producers are generally poor, and include the following:

- Allowing rice stalks to fall to the ground after cut the rice stalks (causing shattering)
- Not using tarpaulins, plastic or other materials to separate the rice from the dirt when threshing (causing contamination with sand, rocks and dirt)
- Harvesting too early or too late (causing shattering)
- Inadequate winnowing (causing contamination with sand, rocks and dirt)
- Planting multiple varieties and mixing them at harvest time (reducing marketability and making milling more difficult)
- Sample respondents were interviewed to describe their production constraints based on questionnaires and they replied that lack of knowledge and skills as well as lack of appropriate technologies are the major production problems encountered in the study area. Details are indicated in table 21.

Table 22 Production constraints in the study area

Activity listed as Weakness	**Multiple response**	
	Frequency	%
Lack of knowledge and skill on rice production	137	84.6
Lack of appropriate technology on rice production	131	80.9
Lack of information on rice production	68	42.0
Less input utilization by the respondent	70	43.2
Lack of extension services	48	29.6

4.14.2.2 Processing constraints

The major problems mentioned by rice processors were power interruption, shortage of working capital, using of outdated machines that result in breakage and lack of technical skill to operate properly processing machine in decreasing order of importance.

4.14.2.3 Marketing constraints

Marketing related constraints described by traders (wholesalers and retailers) were poor quality of local rice (due to variety mixture), impurity, high proportion of broken rice, lack of warehouse (for wholesalers) and poor perception of consumers on rice consumption (consumers believed that rice causes constipation).

Strengths, weaknesses, opportunities and threats (SWOT) analysis of rice value chaindevelopment in Libo Kemkem and Fogera district indicated in Table 22.

Table 23 SWOT analysis of rice value chain in the study area

<table>
<tr><td>Strengths
Good knowledge and skill on rice production
Exchange of knowledge and inputs like local seed, and practice farmers to farmers
Availability of inputs (Fertilizer)</td><td>Weaknesses
Poor practice of post-harvest handling
Low fertilizer rate application
Lack of skilled people for the subsector
Lack of business management skills
Lack of marketing skills
Poor warehouse handling</td></tr>
<tr><td>Opportunities
Increased awareness about and availability ofimproved rice varieties
Favorable land and climatic condition
Presence of high consumer demand
High productivity potential of rice
Increased institutional support from
governmental, nongovernmental and
community based organizations
Placement of DAs at the kebele level to providetechnical backstopping to farmers</td><td>Threats
Erratic rain fall
Change in weather condition
Flood
Lack of improved/high yield variety
Absence of supplementary irrigation
Disease, insect and pest damage
Limited access to credit and saving</td></tr>
</table>

Chapter 5:
SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Summary

This study was conducted in Fogera and Libo Kemkemdistrict, which is located in South Gondar Administrative zone of Amhara region, Ethiopia in the year 2015.The main objective of the study is to examine the contribution of the rice value chain development to the livelihood of farmers and assess the challenge/constraints faced by farmers.

Based on the results of this survey a female and male housholds were interviwed go get an overall information about the impact of rice value chain in their liverlihood. The mean age of the respondents was 42.86 years. In the study area, the average family size was 5.06. The family is main labor source for rice production. The majority of the respondents were illiterate and this may affect the overall development of rice production.

The study reveals, the majority of rice producers are in better housing condition. In addition, a household allocates 46.45% of his land to rice production from his total land holding. This implies that rice is one of the major corps that farmers cultivated in the area.

Rice production in the study area characterized by rain fed production system owned by smallholder farmers. Both up land and low land rice varieties are producing in the study area. X-*Jigna* and *Gumara*rice varieties dominantly produced in the low land. Moreover improved varieties such as Nerica-4 and recently released*Edget* rice varieties have been produced in upland area and lowland areas respectively.

The result of this study revealsthat there is shortage of improved rice seed supply in the market. Thus, the majority of farmers are forced to use their own seed and exchange seed from other farmers. Thus to improve farmers earning or livelihood, provision of quality input supply will not be optional.

Based on the study finding, the majority of farmers started to apply new techniques of farming which has a positive effect on their production. However, some technologies in relation to weeding need to be introduced and demonstrated to farmers to minimize the labour and time cost that a household and his/her family spends on rice farm. Based on cost structure assessment of rice along the value chain actors, the cost of weeding accounts 46.9 % to 51.8 % of the total rice production costs. Introduction of small and affordable technologies to farmers will have a great impact for the improvement of a household life in terms of saving time and money for laborers.

Based on the results of this survey, it is possible to see that the amount rice consumed by households decreased while the market volume increased. This trend shows that the price of rice starts to increase from year to year and this in turn encourages farmers to allocate more land and produce rice to earn a better money. In addition, rice farmers are getting better price offer in the market which have a positive impact on the improvement of a household life.

The result also revealthat the rice value chain is working in terms of market relationships. Processors/millers provided embedded services like market information, warehouse and credit services to farmers. These services improve the livelihood of farmers intermes of information empowerment, safe and secure storage availability and accessibility of money for emergency cases.

This finding also shows that almost all farmers supply their rice to the market. In addition, different value chain actors are also involved in the rice value chain maps which give different options for producers to sell their products. However, it observed that processors purchased rice products with the same price regardless of the products quality. This situation impact farmers adversely because a market should offer a better price for better products otherwise farmers will not be encouraged to produce a better quality rice production if the market has not encourage them by offering a better price from the local rice production.

Regarding labor involvement all household family including hired labor involved in almost all rice production activities. It was reported that boys and girls have significant role in rice production.

The source of income of sample respondents in the study area mainly generated from farming system.Compared to other crops, the growing of rice mainly X-Jigina, Gumara (IAC-164) and Nerica-4 resulted in better income of households.

As the result this survey, the cost benefit analysis of rice production shows that rice production is a profitable business for farmers. Sample respondents in the study area obtained net profit of Birr 11,890.40 per hectare.

The cost and market margin of rice at farmers is also calculated andthe result shows that rice was a profitable crop to critical value chain actors.

This survey also identified the principal rice value chain actors from conception to consumption. These are input suppliers (production and processing), producers, collectors, millers (processors), middlemen, wholesalers, retailers and consumers. In addition, there are value chain supports involved in rice value chain development. These include financial service providers, research center, GOs and NGOs. Value chain map for the actors was developed.

Opportunities in rice production and marketing in the study area were identified, and these are: natural resources availability, conducive weather condition, high productivity of the crop, good market of the rice product, availability of supportive institutions, increase consumers demand from time to time, government gives more emphasis to the sector and the crop less susceptible to insect and pest.

Production related constrains identified by key informants and group discussion were the dominant rice variety (X-Jigina) may be lost its viability, the mixture of rice variety (white and red rice), low rate of fertilizer application, weed manifestation, erratic rainfall, flood and rice shattering. Power interruption, shortage of working capital and using of outdated machines were listed as a problem by processors.

Moreover, marketing related constraints described by traders (wholesalers and retailers) were poor quality of local rice (due to variety mixture), impurity, high proportion of broken rice, lack of warehouse (for wholesalers) and poor perception of consumers on rice consumption.

5.2 Conclusion and Recommendations

The result of this study revealed that rice value chain in the study are contribute positively on the livelihood of farmers.Allocation of rice land for cultivation increases and the productivity of rice also increases from year to year. In addition farmers are able to get better market for rice compared to other crops. Riceis the main source of incomeand food (consumption) of households in Libo Kemkem and FogeraDistrict.

However, to enhance the livelihood of farmers, strong and competent value chain needs to be created in the study area. There is shortage of improved input supplies in the market thereforefarmers are forced to use the local varieties. In addition, the market actors are not offering better price for better product and this will distort the market and farmers will not be encouraged to produce a better product. Farmers also face problem in relation to weeding and storage, appropriate and cost effective technologies needs to be introduced to minimize the time spent on weeding and the harvest that damages due to poor storage method as well.

This study assessed different rice value chain actors, their roles and interrelationships identified, and based on that value chain map developed for the study area. Moreover, supporters that support the value chain actors also identified. Market actors involved in value addition for local rice so that different products are distributed to the major towns of the country.

Considering the potentiality of rice in terms of production and productivity rice plays significant contribution to ensure livelihoods of producers in the study area. Based on the research findings the following points are recommended.

Improving the extension services: According to the recommended extension package an extension worker should support 401 household farmers. But the results of this study indicated that an extension worker (agronomist) in the study areas serves for 868 to 1328 households. This creates inefficiency in delivery of extension service to the crop producers.Therefore, the number of extension workers should be increase in such rice potential areas.

Strengthening capacity building ofproducers: Capacity building should be given to rice producers on regular basis. Attention should be given to address the issues of using improved seeds, proper application of fertilizer rate, in addition to hand weeding use of appropriate technology to reduce the weed infestation and improve the current practices of post-harvest handling that result in quality products that can compete with imported rice both in terms of price and quality.

Upgrade the existing rice processing machine: The findings of this study indicated that rice breakage was the major problem as the result of old machine used for milling. There is a need to develop regulation mechanism for imported processing machines. In order to produce quality rice that competes the imported rice it is recommended to implement the national rice standard (ES ISO 7301:2001).

Promote local rice: Consumers are the vital end actors where finance is generated in the value chains. In this regard the perception of consumer on local rice should be improve. In this regard it is important to promote local rice from nutrition and health benefit aspects.

Strengthening value chain development: In the study area it was observed that supporters give more emphasis for inputs distribution (mainly fertilizers). Therefore, more attention should be given to the value chain developments by which agricultural products reach final consumers and to the intrinsic potential of such chains to generate value added and employment opportunities.

Table 24: Profile of processors in the study area (Yifag sub-town)

S/N	List of traders	Name of manager/owner	Mobile	Milling machine model	Available # of machines	Market destination
1	Yifag farmers' cooperative	Tsegaw Walelgn	582770209	Combined machine	1	Operation not commenced due shortage of power
2	Baye Mohamed	Baye Mohamed	918700323	Model 70 & 110	2	Mainly Addis Ababa
3	Ahimed Mohamed	Ousman Mohamed	918700390	90 & 110	2	Mainly Addis Ababa
4	Oumer Mohamed	Ebirahim Oumer	910220008	90 & 110	2	Mainly Addis Ababa and Gonder
5	Essa Mohamed	Essa Mohamed	918700391	70 & 90	2	Addis Ababa
6	Adem Mohamed	Adem Mohamed	918700376	70 & 110	2	Addis Ababa
7	Mossa Yimer	Yesuf Yimer	918700356	90, 11o, Combined machine & SB 10	4	Addis Ababa, Dessie, Chagine, Gonder, Bahir Dar
8	Mare Mohamed	Mohamed Eshetu	918700315	SB-10 and N-90	2	Addis Ababa
9	Addsie Yazew	Eyayu Alene	918064425	90	1	Addis Ababa
10	Guadie Mekit	Nigusie Teshome	941379566	110	1	Addis Ababa
11	Dawud Kassaw	Esmael Kassaw	918247504	90	1	Addis Ababa
12	Mola Zeleke	Mola Zeleke	918247384	70	1	Addis Ababa
13	Meriem Hassen	Mohamed Yenus	0913085841	110	1	Addis Ababa
14	Yesuf Yimer	Yesuf Yimer	0918700357	SB-10& 90	2	Addis Ababa, Bahir Dar, Dessie
15	Hassen Esmael	Hamid Hassen	0918317565	110	1	Addis Ababa, Gonder, Bahir Dar
16	Merdia Ebirahim	Jemal Ahimed	0918560719	110	1	Addis Ababa,

S/N	List of traders	Name of manager/owner	Mobile	Milling machine model	Available # of machines	Market destination
						Bahir Dar
17	Belay Yimer	Belay Yimer	0918700407	Combined , 70, 110 & SB-10	3	Addis Ababa, Bahir Dar, Dessie, Chagine, Gonder, Wolega.
18	Tirumar Mohamed	Seid Muhie	0918556204	70 & 110	2	Addis Ababa, Gonder, Bahir Dar
19	Takele Wassie	Mustefa Takele	0928464010	70 & 110	2	Addis Ababa, Dessie
20	Hassen Mohamed	Hassen Mohamed	0918710955	90	1	Addis Ababa
21	Gete Yalew	Gete Yelaew	918700421	70 & 110	2	Addis Ababa, Bahir Dar

REFERENCES

Achike, A. I. and Anzaku, T.A.K., 2010. Economic Analysis of the Marketing Margin of Benniseed in Nasarawa State, Nigeria; Journal of Tropical Agriculture, Food, Environment and Extension 9(1)

Altenburg and Christian von Drachenfels, 2007. Creating an Enabling Business Environment In Asia: To what Extent is Public Support Warranted?

AfDB (African Development Bank), 2010. Smallholder Agriculture in East Africa: Trends, Constraints and Opportunities, working paper series. http://www.afdb.org/fileadmin/uploads/afdb/Documents/Publications/ WORKING%20105%20%20PDF%20d.pdf

Africa Rice, 2009. Increasing investment in Africa's rice sector, annual report. http://www.dfid.gov.uk/r4d/PDF/Outputs/Warda/AfricaRice-AnnualReport-2009.pdfAGRA-JICA CARD: 2008. Initiative for doubling rice production in Africa

Agrifood Consulting International, 2005. Northeast Thailand Rice Value Chain Study, Project Brief Series. www.agrifoodconsulting.com, Accessed on: November, 2014)

Altenburg, 2007. Donor Approaches to Supporting Pro-Poor Value Chains; Report Prepared For the Donor Committee for Enterprise Development Working Group on Linkages And Value Chains, By German Development Institute

Amhara Regional Bureau of Finance and Economy Development, (2014). Forecast Report, Bahir Dar.

Anandajayasekeram P and Berhanu Gebremedhin, 2009. Integrating Innovation Systems Perspective and Value Chain Analysis in Agricultural Research for Development: Implications and Challenges. Improving Productivity and Market Success (IPMS) of

Ethiopian Farmers Project Working Paper 16. ILRI (International Livestock Research Institute), Nairobi, Kenya.

Andreas Stamm and Christian von Drachenfels, 2011. Value Chain Development Approaches and activities by seven UN agencies and opportunities for interagency cooperation; German Development Institute.

Astewel Takele, 2010. Analysis of Rice Profitability and Marketing Chain: The Case of Fogera District, South Gonder Zone, Amhara National Regional State, Ethiopia. MSc Thesis (Unpublished). Haramaya University, Ethiopia

Heiko Bammann, 2007. Participatory Value Chain Analysis for Improved Farmer Incomes; Employment Opportunities and Food Security Pacific Economic Bulletin Volume 22 Number

Bhalla and Singh, 2001.Indian Agriculture**;** Four Decades of Development

Bekur, 1997. Rice production at the Fogera plain. Magazine of the Amhara National Regional State Culture, tourism and Information Bureau (Amharic Version) No. 3

Biruhalem Kassa Gebremeskel, 2010. Rice value chain in Metema district, North Gondar, Ethiopia: Challenges and opportunities for innovation. Thesis, IRLDS, Addis Ababa University, Addis Ababa, Ethiopia.

Bosena Tegegene, F. Bekabil, G. Berhanu, and H.Dirk, 2011. Structure-Conduct-Performance of Cotton Market: The Case of Metema District, Ethiopia. Journal of Agriculture, Biotechnology & Ecology, 4(1), 1-12, 2011 ISSN: 2006-3938

Bolwig, S., Ponte, S., du Toit, A., Riisgaard, L. and Halberg, N., 2010. Integrating Poverty and Environmental Concerns into Value Chain Analysis; A Conceptual Framework Development Policy Review

Dercon and Zeitlin, 2009. Food and Agriculture in Ethiopia; Progress and Policy Challenges

Elizabeth Dunn, 2005. Tanzania Country Study Interview Guidelines and Questionnaires; Organization ACDI/VOCA

EUCORD, (The European Cooperative for Rural Development), 2012. Rice Sector Development in East Africa, EUCORD.

FAO, 2014. Rice Market Monitor, VOLUME XV1I, ISSUE No. 2

FAOSTATA, 2009: The Food and Agriculture Organization Corporate Statistical Database Website disseminates statistical data collected and maintained by the The Food and Agriculture Organization Corporate Statistical Database (FAOSTAT). http://faostat3.fao.org/home/E

Flores, S and P. Lindo, 2006. Pautas Conceptuales y Metodológicas: Análisis de Género en Cadenas de Valor. Managua, SNV/UNIFEM

Gabagambi, D. M., 2011. Basic Marketing Concepts for Agribusiness Students. Proceeding Of Study Materials for Economics Students at Sokoine University of Agriculture, Morogoro, Tanzania.

Ghimiray M., Wangdi K., Chhetri B.G., Bockel L. and Punjabi M. 2007. Rice Commodity Chain Analysis. FAO, Rome

Gereffi et al, 2005. The governance of Global Value Chains; Review of International Political Economy, Volume 12, Issue 1

Harvey, 2006; World Bank, 2008. World Development Report; Agriculture for Development

IRRI, 2013.Trends in global rice consumption, Vol. 12, No. 1

Jon Hellin and Madelon Meijer, 2006. Guidelines for value chain analysis

John Humphrey and Lizbeth Navas-Alemán, 2007. IDS Research Report Research Summary 63; Value Chains, Donor Interventions and Poverty Reduction; A Review of Donor Practice

Jonathan Mitchell, Jodie Keane and Christopher Coles, 2009. Trading Up; How a Value Chain Approach Can Benefit the Rural Poor, COPLA Global; Overseas Development Institute

Kaplinsky, 2000. Globalization and Unequalisation; What can be Learned from Value Chain Analysis? The Journal of Development Studies

Kaplinsky, R., and Morris, M., 2000. A Handbook for Value Chain Research, prepared for The Institute for International Development Research Center (IDRC)

Kebebew Assefa, Dawit Alemu, Kiyoshi Shiratori, and Abebe Kirub, 2011. Challenges and Opportunities of Rice in Ethiopian Agricultural Development. FRG II Project, Empowering Farmers' Innovation Series No. 2. Ethiopian Institute of Agricultural Research (EIAR), Addis Ababa.

Kula, O and Emmanuel Dormon, 2009. Global Food Security Response Ghana Rice Study. Micro Report#156. Prepared under USAID Accelerated Microenterprise Advancement Project

L.F. Henriksen L. Riisgaard S. Ponte F. Hartwich P. Kormawa, 2010.Agro-Food Value Chain Interventions in Asia; Working paper

Libokemkem DOA, 2013. Libokemkem District Office of Agriculture annual report, Addis Zemen.

Magingxa and Kamara, 2003. Institutional Perspectives of Enhancing Stallholder Market Access in South Africa

MEDA, (Mennonite Economic Development Associates), 2015. http://www.meda.org/about-edget

Mendoza, G. (1995). A Primer on Marketing Channels and Margins. In Price Products and People, eds. Scott, 254-275. International Potato Center, Lima, Peru.

Michael Hailu, 2005 ‘’Spore’’ No 157 Adding Value

MoA, (Ministry of Agriculture), 2011. National Rice Research and Development Strategy of Ethiopia (NRRDSE). Implementation Plan 2011 – 2015. Addis Ababa, Ethiopia.

MoARD, (Ministry of Agriculture and Rural Development), 2010. National Rice Research and Development Strategy of Ethiopia. Addis Ababa, Ethiopia.

Mohapatra, S, 2012. Rice: Ethiopia’s Millennium Crop. Rice Today January-March 2012, Vol. 11, No. 1

Niels Halberg. 2005, Global Trends in Agriculture and Food Systems, CAB International; Global Development of Organic Agriculture

Porter, M, 1985. Competitive Advantage: Creating and sustaining superior performance. www.themanager.org

Riisgaard, L; S. Ponte, 2014. Pro-Poor Value Chain Development; 25 Guiding Questions For Designing and Implementing Agroindustry Projects

Dani Rodrik, 2004. Industrial Policy for the Twenty-First Century; John F. Kennedy School Of Government, Harvard University

Rubin, D, C. Manfre and K. Nichols Barrett, 2009. Promoting Gender Equitable Opportunities in Agricultural Value Chains: A handbook; Washington, D.C.: USAID.

Sharankos, 1998. Social Research, 2nd edn, Basingstock, Masbilan

Shiratori, K, Dawit Alemu, and Friew Kelemu, 2014. Experience in Rice Mechanization. FRG II Project, Empowering Farmers' Innovation Series No. 6. Ethiopian Institute of Agricultural Research (EIAR), Addis Ababa.

Strock H, Bezabih Emmana, Birehanu Adnew, A.Borowieck and Shimels W/Hawariat.1991. Farming Systems and Farm Management Practices of smallholders in the Hararghe Highlands: Farming Systems and resources economics in the tropics. Wssenshaftsver lag vauk, kiel, Germany, 41-48 pp.

Tareke Berhe and Toshiro Mado, 2005. Promoting Rice “From Plant to Plate” for Food Security in Sub-Saharan Africa: SG2000’s Strategy. Presented at a WARDA Rice Policy and Strategy Seminar, November 7-9, 2005, Cotonou, Benin

Tilahun Gebey, Kahsay Berhe, Dirk Hoekstra and Bogale Alemu, 2012. Rice value chain development in Fogera district based on the IPMS experience. Nairobi, Kenya: ILRI.

UNIDO, (The United Nations Industrial Development Organization), 2009. Agro-Value Chain Analysis and Development. The UNIDO Approach. A staff working paper.

Webber, C. M.; P. Labaste, 2014. Building Competitiveness in Africa’s Agriculture: A Guide to Value Chain Concepts and Applications." World Bank.

Zewdie Gebretsadik, 2004. Response of Upland Rice (Oryza sativa L.) to Nitrogen and Phosphorus Fertilizer Applications in Oromia Zone of Amhara Region. MSc Thesis (Unpublished). Alemaya University, Ethiopia. 0917854678

APPENDICES

Appendix 1: Household Questionnaire

Household Questionnaire

THE CHALLENGES AND CONTIRUBTION of Rice value chain development on the livelihood of small holder rice farmers

(In the case of Ethiopia Driving Growth Entrepreneurship and Trade (EDGET) project in Fogera and Libokmkem District)

Introduction: *The purpose of this study is to learn more about the contribution and challenges of rice value chain in the livelihood of small holder rice farmers and as well as the prospective of rice value chain development in the area. Your answers will help the research to assess and analysis the rice value chain contribution on the small holder rice farmers in the district. Therefore, please speak freely and give honest answers. The data will not be shared with anybody and so be assured of the confidentiality of any information you provide.*

PART ONE:

General

Date of interview	DD/MM/YY
Name of Interviewer	
Name of supervisor	

Demographic profile

1.1 Name of HH head: ______________________________

1.2 Sex: 1. Female 2. Male

1.3 Age: _____

1.4 Marital Status: 1.Unmarried 2. Married 3. Divorced 4. Widowed

1.5 HH Size: Female__________ Male_________ Total____________

1.6 Education level of respondent

(1) Unable to read and write; (2) Able to read and write; (3) Primary first cycle 1-4 (4) Primary Secondary cycle 5-8; (5). Secondary school 9-10; (6) Preparatory 11-12 (7) above 12

Assets owned household items

Types of Assets owned	Quantity	Land	Area Covered	Livestock	Quantity
Iron Roofed House		Total land holding(ha)		Cow	
Radio		Own land(inherited/state		Oxen/Bulls	
Radio and Tape		Rented in land		Sheep	
TV		Rented out land		Goats	
Mobile phone		Cultivated land for rice		Mule	
DVD				Donkey	
Water pump				Poultry	
Other Specify				Beehive	
				Other Specify	

PART TWO: Rice Production/Cultivation

1. How do you get information about rice seed **(Multiple answer is possible)**

   1) Neighbors 2) Extension Workers 3) Cooperatives 4) Radio/public office 5) Processors/traders 6) Other Specify____________________

2. Do you buy seed?

   1) Yes 2) No

3. If yes to Q_2__, from whom do you buy seed?

   1) Local farmer / market 2) Agricultural office 3) Private seed enterprise

   4) Research institutes 5) Wholesalers/traders 6) NGOs 7) Cooperative

   8) Other Specify

4. If no to Q_3__, how did you get seed?

   1) My own seed 2) Bartered/exchanged

5. In the past year, did you experience a challenge in improved seed supply?
   1) Yes 2) No
6. If yes to Q__5__, what challenge did you have?
   1) Variety mixture
   2) Poor germination
   3) Physical impurity
   4) Diseased seeds
   5) Shortage of improved seed supply
   6) Other (specify)_________
7. Have you ever take training on seed quality?
   1) Yes 2) No
8. If yes to Q_7___, who gave you the training?
   1) Agricultural offices
   2) Universities/Agricultural research institutes
   3) Private seed enterprise 4) NGO (specify)_____
   4) Other (specify)
9. What kind of planting method are you using on the majority of your rice under cultivation? (Multiple answer is possible)
   1) Broadcasting 2) Row planting 3)Transplanting 4) Pre-germination
   4) Mixed planting (Rice with grass pea, chickpea….)
   5) Other (Specify)______________________________
10. What kind of rice weeding method are you using?
   1) Hand weeding 2) Weeding tool 3)Rotary weeder
   3) Herbicide 5) Other Specify _______________________
11. Your rice production in Quintal in paddy rice /Timad or Kada from 2003 to 2007 EC production year

Year (EC)	Area (in Timad/Kada)	Production (in Qtl)	What kind of rice do you produce? 1. Upland; 2.low land, 3. Both 4. Other Specify	Which seed variety do you use? 1. Nerica 4, 2. Superica-1, 3.X-Jigina 4. Other Specify	Consumed (in Qtl)	Marketed (in Qtl)	Others (may be if for seed)
2006/07							

2005/06							
2004/05							
2003/04							
2002/03							

12. What is the trend of your rice production?

1) Increasing 2) No change 3) Decreasing 4) Other Specify________________

13. If your answer in Q.12... in increasing, what are the reasons.

1) Using improved variety 2) Using fertilizes 3) Increase land allocation

4) Applying good agronomic practices 5) others (specify) ___________

14. If your answer in Q14 in decreasing, what are the reasons?

1) Decrease in land allocation 2) Lack of improved seed

3) Lack of fertilizer 4) Shortage of rain fall 5) Pests and diseases (specify)

6) Natural hazards (specify) ____ 7) other specify____________

15. In the last harvest (2005/06 E.C), what did you do with your rice by products?

Straw	Husks	Bran
1 Used as livestock feed % **2** Used for thatching the roof _% **3** Used as fuel wood(for cooking) __ % **4** Sold _ % **5** used for Gotera making__ % **6.** Other (specify) **___%**	**1** Used as livestock feed % **2** Used for thatching the roof % **3** Used as fuel wood(for cooking) _ % **4** Sold _ % **5** Exchanged as milling service_% **6** Other (specify)**____%**	**1.** Used as livestock feed __% **2.** Sold _ % **3.** Exchanged as milling service _% **4.** Other (specify)**_____%**

16. After harvesting your rice crop, what do you do on that land?

1) Fallow land 2) Planting crops 3) Others (specify) _________

17. If you planting crops after harvesting your rice crop, what kind of crop followed after rice?

1) Chickpea 2) Grass pea 3) Vegetables 4) Sorghum 5) Maize 6) Lentils

7) Other (specify) __________

PART THREE: Activities in Utilization, Storage and Marketing of Rice

18. What is the percentage of your rice product utilization in 2005/06 E.C?

    1) Household consumption: _____ quintals (____ %) 2) For sell: _quintals (__ %) 3) For seed: _____ quintals (____ %) 4) for gift: _____ quintals (__%) 5) Other (specify) ________________________

19. Do you store your rice?

    1) Yes 2) No

20. If your answer for Q 23 is yes, where do you store your rice before selling?

    1) Using own "Gotera" 2) Using plastic sacks 3) Processors store

    4) Cooperative store 5) other Specify_____________

21. Do you encountered any constraints in rice storage?

    1) Yes 2) No

22. Do you encountered storage pest attack?

    1) Yes 2) No

23. Do you encountered shortage of space for rice storage?

    1) Yes 2) No

24. Do you sell your rice?

    1) Yes 2) No

25. If yes, what form are you selling rice?

    1) Parboiled rice 2) Milled rice 3) Paddy rice

26. If yes, how frequent do you sell your rice per year?

    1) Once in a year 2) Twice in a year3) three times in a year

    4) Four times in a year 5) Other Specify_______

27. If yes, how do you sell your rice?

    1) Direct to a buyers, ____ % 2) Through the cooperative, ____ %

    3) Through marketing groups, ____ % 4) Other Specify ____ %

28. If you sell your rice directly to the buyers, who are your customers?

    1) Direct to consumers, ____ % 2) To cooperative, ____ % 3) To wholesalers, ____ % 4) To retailers, __ % 5) to processors, __ % 6) Collectors, __ % 7) other specify__ %

29. How do you get information about market price of rice?

    1) Processors/trader/miller 2) Market agents (Traders) 3) Cooperatives

4) Marketing group committee 5) Market information notice board

6) Extension workers 7) Other Specify: ____________________

30. How do you set the price of paddy/milled rice?

1) Based on market price 2) Based on cost of production

4) The processor set the price 5) Other Specify: ______________

31. Where do you get the processing/milling service?

1) Processors/millers 2) Cooperatives 3) Other Specify: _______

32. How long it take to have a rice processing/milling service in minutes? Minutes

33. What are the major challenges you faced related to processing/milling service?

1) Processors/millers located in far distance 2) I did not get the service properly (on time) 3) The machines are old which results high breakage 4) Service offered to members only 5) I prefer to sell as paddy 6) Othe

34. If you get milling service, what is the average share of milled rice from your total production in 2005/06 E.C? ___________%

35. What is the recovery amount of milled rice you get from processed paddy rice 2005/06 E.C? ___________%

36. How satisfied with the quality of service provided by processors/ millers?

1) Very good 2) Good 3) Neutral 4) Poor 5) Very poor

37. If your answer is Poor or Very Poor, why in Q 36?

1) Milled rice volume is lower than standard 2) Price for milling service is expensive 3) I feel I was cheated 4) Unable to get service at any time in working days/hours 5) They don't have improved technology 6) Other Specify___________

38. In addition to milling services, what types of services do you get from processors/millers?

1) Warehouse service 2) Credit services 3) Market 4) Other, specify: _____

39. Who is responsible to sell rice product in to the market? What is the share?

1) Head of household: (_______ %) 2) Wife: (______ %) 3) Elder children: %) 4) Other specify: (_______ %)

40. What is your gross income from the following major crops/livestock sources in 2005/06E.C production year?

Income source	Quantity (quintal/number)	Unit price/ quintal	Gross income
Rice			
Maize			
Teff			
Sorghum			
Grass pea			
Chickpea			
Oats			
Onion			
Garlic			
Tomato			
Safflower			
Cow			
Oxen/Bull			
Sheep			
Goats			
Mule			
Donkey			
Poultry			
Bee colony			
Other specify			

PART FOUR: The Cost-Benefit Structure of Producer

41. Do you record your income and expenses from your rice farming activities?

1. Yes 2)No

PART FIVE: Service Providers

42. Where do you get fertilizer for your rice production?

1) Private seed growers/enterprise 2) Research institutes 3) Agricultural office 4) Wholesalers/traders 5) NGOs (Specify) _____ 6) Cooperative 7) purchased from a local farmer 8) Other Specify_____

43. Where do you get Agriculture tools for your rice production?

1) Research institutes 2) Agricultural office 3) Wholesalers/traders

4) NGOs 5) Cooperative 6) purchased from a local farmer 7) other (specify)

44. Where do you get of chemicals (pest and herbicide)?

1) Private enterprise 2) Research institutes 3) Agricultural office

4) Wholesalers/traders 5) NGOs 6) cooperative 7) Purchased from a local farmer 7) other (specify) _____________

PART SIX: Opportunities and Constraints in Rice Production and Marketing

45. What are the weaknesses of in the rice production in priority?

1. Lack of knowledge and skill
2. Lack of information
3. Lack of appropriate technologies (improved seed, farm machinery…)
4. Lack extension service support
5. Less use of input (multiple answer is possible)
6. Others specify ___

46. What are the opportunities for rice production?

1) Natural resource availability (land and water 2) Conducive weather condition 3) Availability of institutions working on rice 4) Good market compared to other crops 5) increased demand of rice consumers 6) Better government emphasis 7) Less damage of rice by insect pest 8) High productivity (multiple answer is possible in priority order)

47. What are the threats to increase quality production in priority order?

1) Lack of improved/high yielding varieties 2) Fertilizer is not available 3) Limited access to credit 4) Poor physical infrastructure (Road) 5) Less training opportunity 6) Absence of supplementary irrigation 7) Change in weather condition 8) Poor market access 9) Labor shortage 10) Lack of plowing oxen 11) Damage of over flood 12) Insect pest damage (multiple answer is possible)

------THE END-----

Thank you very much for your cooperation and valuable information!!

Appendix 2: Checklists Used for Focused Group Discussion

1. When does rice production started? How?
2. How the rice production trends and average yield/ha since started and for what purposes of rice?
3. How is the consumption and marketing ratio of rice since started? What is the price trend of rice over years?
4. What are the major crops growing in the area?
5. How profitable is rice relative to other crop options?
6. What type of service you get for your rice production and by whom?and what are the quality of service you get?
7. What is the marketing style of your rice? (Paddy/Milled) ________% paddy and _____% milled rice.
8. What quality specifications do buyers prefer for milled rice? Which quality rice has good payment?
   6.1 Color
   6.2 Breakage
   6.3 Cleanness (purity)
   6.4 Shape (too long/too slender)
   6.5 Variety /color mixture
   6.6 General appearance/uniformity
   6.7 Other specify

9. What quality specification do collectors/processors for paddy rice?

   1. Cleanness
   2. Variety /color mixture
   3. Moisture content
   4. Free from mold
   5. General appearance/uniformity
   6. Other specify

10. Cost –benefit structure of producer on **one** Timad land for year of 2006/07E.C

No	Description of cost	Unit	Quantity	Unit Price	Total	Income	Profit
1	**Seed**						
1.1	Local seed	Kg					
1.2	Improved seed (eg Nerica 4)	Kg					
1.3	Labor cost for	kg					

	cleaning						
1.4	Labor cost for sawing	PD					
2	Fertilizer						
2.1	DAP	Kg					
2.2	Urea	Kg					
2.3	Interest rate of loan for fertilizer	%					
2.4	transportation of fertilizer from distribution to house/farm	Qt					
2.5	Transport of fertilizer from home to farm	Qt					
3	Herbicide use instead of hand weeding						
3.1	Herbicide (2.4 - D)	Liter	-				
3.2	Labor to spray	Labor cost	-				
3.3	Rent for sprayer	Sprayer	-				
4	Pesticide	Birr	-				
5	Fungicide	Birr	-				
6	Other inputs (Specify)	Lump					
	Total cost of inputs						
7	Land preparation						
7.1	1st round	#Days					
7.2	2nd round	**# Days**					
7.3	3rd round	# Days					
7.4	4th round	# Days					
7.5	Land rent (per one production season)	Timad					
7.7	Bund construction	Labor cost					
8	Hand weeding						
8.1	1st round	Labor cost					
8.2	2nd round	“					
8.3	3rd round	“					
8.4	4th round	“					
9	Harvesting	“					
9.1	For collection	“					
9.2	Hipping	“					
9.3	Preparation of threshing field	“					
10	Threshing						
10.1	Manual (using human labor)	“					
10.2	Using threshing machine	Qt					
10.3	Transporting of straw	Timad					

11	Hipping	PD					
12	Purchase of sac	No.					
13	Transport from farm to house	Qt					
13.1	Using donkey or human (rent)	Qt					
14	Transport from house to market	Qt					
14.1	Using donkey/human/Bajaj/ mule cartel	Qt					
15	Other cost of production (such as rent for storage)	Lump					
16	Annual tax payment for land	Timad					
17	Total cost of production including inputs cost						
18	Sale of rice (paddy) - producer to processor	Qt					
19	Cost benefit analysis (profit) paddy rice						
	Cost benefit analysis (profit) of milled rice	Qt					
	Net profit per Qt of paddy rice at producer level						
	Net profit per Qt of milled rice at producer level						

9. What are the most attractive options to increase farmer net income (e.g. through new technologies, lower costs, increased productivity)? Which options have the best opportunities for expansion/ area?
10. What are the primary rice production constraints faced? (E.g., inputs, water, labour)
11. What are the best solutions to critical pre harvest of rice constraints? (E.g., inputs, water, labor)
12. What are the primary post-harvest constraints faced by farmers? (E.g. storage, processing….)
13. What are the best solutions to critical post-harvest constraints? (E.g. storage, processing……)
14. Household members involvement in rice production and marketing:

S/	**Types of major activities**	Tick "x" based on involvement				**Remarks**
		Male	Female	Children(F/M)	Labor (hired)	
1	Land preparation(clearing)					
2	Bund construction					
3	Tillage					
4	Seed cleaning					
5	Sowing					
6	Weeding					
7	Top dressing					
8	Pest control					
9	Supplementary irrigation/ drainage					
10	Harvesting					
11	Drying					
12	Hipping					
13	Preparation of threshing field (*Awudma*)					
14	Threshing					
15	Cleaning (using wind)					
16	Transporting to home					
17	Gotera making for storage					
18	Transporting to market					
19	Processing					
20	Marketing					

Appendix 3: Checklists Used for Processors during the survey work

General

- o Date of interview____________________
- o Code: _________
- o Start time:____________ End time:______________
- o Altitude:________________
- o Name of Interviewer:__________________________
- o Name of supervisor:___________________________

Part A: Demographic profile

1. Name of the Enterprise_____________________________
2. Location: Town ________________Kebele_________________
3. Year Established _______________E.C
4. Number of years in operation ____________ years
5. Legal status of the Enterprise : a) Sole proprietorship b) Plc c) Other (specify) __________
6. Education level of the owner(s) of the Enterprise:______________
7. Owners of the enterprise : Male________ Female________Total _______
8. Current number of employees:
   a) Male________ Female _________Total ___________

b) Managerial (M/F) _____Technical (M/F) _____ Laborer (M/F)____Total (M/F) _______

Part B: Operation in Rice Processing

9. Currently available Operating equipment

S/N	Equipment	Quantity	Capacity (Qt/hr.)	Supplier (Name, Location)
1	Rubber roller			
2	Steel Engleberg De-huller			
3	Other (specify)			

10. Where did you bought your rice Processing Equipment?
    a) Local supplier b) Local agents c) Importing (specify):_________________________

11. Available warehouse of the enterprise
    a) Number of warehouses _________________
    b) Size _________________
    c) Storage capacity __________________

12. Services Provided by rice processor :

S/N	Activities performed	Response (Yes/No)	Remark
1	Paddy cleaning		
2	De-stoning		
3	Husking		
4	Aspiration		
5	Polishing		
6	Washing/drying		
7	Grading		
8	Color sorting		
9	Blending		
10	Packaging/labelling		
11	Marketing		
12	Milling service		
13	Purchasing milled rice		
14	Warehouse service to producer (paddy rice)		
15	Financial service (sac provision, cash for harvesting and weeding, for social purpose)		

13. Services Provided by rice processor to producer(specifically) :

a). De-hulling b). Polishing c) Parboiling d). Milling

14. Your current service rate of rice for :
    a) De-hulling _____________Birr/Qt
    b) Polishing ______________Birr/Qt
15. Current Average Extraction Rate(Qt)
    White rice Red rice
    a) De-hulling ______________________________
    b) Polishing _______________ ________________
    c) Parboiling _______________ _______________
16. Do you trade rice? a) yes b) No
17. If yes for above question, trading status a) Wholesale b) Retail C) Both
18. List your major market destinations (major cities) and their share?

____

19. Who are major trader in the listed market destinations (major cities) and their share?
    a) Distributor
    b) Retailers
    c) Institutional buyer (Hospital/University)
    d) Broker
    e) Other (Specify)--
20. Types of serviced crops a) Rice b) Oat c) Others (specify)
21. Do you have identified/ registered customers of rice farmers who supply paddy rice consistently? a) Yes b) No
22. If yes for above question:
    a) Do you make any discount for these customers? a) Yes b) No
    b) Is there any formally agreements? a) Yes b) No
23. Do you provide incentives/services to your client farmers? a) Yes b) No
24. If yes for above question list them?

    ____

    ____

    What is the peak processing season in your past experience?

    a) Oct.-Dec b) Jan-March c) April-June d) July-August
25. Have you ever been idle in your processing activities?
    a) Yes b) No
26. If yes for above question state the

    months____

    ____
27. Do you feel breakage of rice as a problem in your processing activities of rice?
    a) Yes b) No

28. If yes for above question what do you think is the source of the problem?

____

____

____

Marketing activities with respect to:

a) Grading rice: i) Color ii) Breakage level iii) None

b) Bagging: i) Traditional ii) Modern iii) None

29. What is the source of finance for your business?

a) Equity b) Credit c) Both

30. If credit is taken what purpose is it used for?

a) Equipment and machinery b) Store and processing shade constriction

c) Working capital d) other (specify)

31. If credit is received what was your source?

a) Banks b) MFI c) Relatives and friars d) Other (specify) ________________

32. What is the source of energy for the processing equipment?

a) Electricity b) Other (specify) -----------------------

33. By-products of the rice processing?

a) Husk b) Bran c) Other (specify) ----------------------------

34. What do you do with the By-products?

a) Husk: i) for sale ii) Own use

If for sale current selling price Birr ----------- per Qt.

b) Bran i) For sale ii) Own use

If for sale, current selling price Birr ------------ Per Qt.

35. What is the By-product commonly used for?

a) Husk __________________

b) Bran _______________

Part C: The Cost-Benefit Structure of Processor

36. Registered Capital ________________ Birr
37. Purchasing cost of milled/paddy rice? Milled rice Birr/Qt__ Paddy Rice__ Birr/Qt
38. Purchasing cost of the machines ?____________Birr
39. Depreciation cost of the processing machine? _________Birr
40. Cost of sack (baggage)? ____________Birr
41. Wear and tear (maintenance cost)? Birr
42. Labor (machine operator)?
43. Labor (support laborer/guard)? Birr
44. Cost of electricity/annul Birr?________________________
45. Other cost (water, warehouse)? Birr___________________

46. Labor cost of loading and unloading? Birr_______________
47. Tax payment? Birr _______________
48. Sales of milled rice? Birr__________

Part D: Problems Encountered

49. Problem encountered by the enterprise (list in priority):

S/N	Problems	Rank
1	Shortage of working capital	
2	Shortage of investment capital	
3	Lack of appropriate technology	
4	Lack of technical skills	
5	Lack of business management skills	
6	Lack of marketing skills	
7	Market access	
8	Power interruption	
9	Limited working space	
10	Other (specify)	

50. Major challenges and opportunities

Challenges:

Opportunities:

51. SWOT Analysis

Strength	**Weakness**
Opportunity	**Threats**

52. Any suggestion /comments/ recommendations you would like to make:

------THE END-----

Appendix 4. Questionnaire Used for Wholesaler and Retailers

General

- o Date of interview___________________
- o Name of Interviewer:__________________________
- o Name of supervisor:___________________________

Part A: Demographic profile

1. Name of the Enterprise--
2. Location: Town ------------------------------- Kebele----------------------
3. Year Established ------------------E.C
4. Number of years in operation -------------------- years
5. Legal status of the Enterprise : a) Sole proprietorship b) Plc c) Other (specify) __
6. Education level of the owner(s) of the Enterprise:______________

Owners of the enterprise: Male------------- female----------------Total -------------

Part B: Operation in Retailers

- ☐ **What are the most promising end market opportunities?**
  - o Which rice products are currently marketing?
    - ☐ Brown rice
    - ☐ Milled rice (broken)
    - ☐ Milled rice (graded)
    - ☐ Parboiled rice
  - o What is the most consumed rice?
    - ☐ Brown rice
    - ☐ Milled rice (broken)
    - ☐ Milled rice (graded)
    - ☐ Parboiled rice
  - o In what form local rice (Milled) is consumed by consumers?
    - ☐ Table food
    - ☐ Make Enjera mix with Teff and others grain
    - ☐ Soup
    - ☐ Other (Specify)
  - o What are existing and potential end markets for local rice? (they are primarily divide by their income)
    - ☐ The high income market
    - ☐ The middle-income and lower-middle income market
    - ☐ The low-income market
  - o What are existing and potential end markets for imported rice? (they are primarily divide by their income)
    - ☐ The high income market
    - ☐ The middle-income and lower-middle income market
    - ☐ The low-income market

- o What is perception of rice in Ethiopia?
  - ☐ Alternative to stable food
  - ☐ Luxury food
  - ☐ Food for poor households?
  - ☐ Other (specify)
- o Who actually consumes local rice?
  - ☐ Traders
  - ☐ Students
  - ☐ Employees
  - ☐ Driver
  - ☐ Day laborer
  - ☐ Women
  - ☐ Men
  - ☐ Others (Specify)
- o What are most institutional/plc buyers and their share?
  - ☐ Hospitals (Quintal/year)
  - ☐ University(_Quintal/year)
  - ☐ Hotels (Quintal/year)
  - ☐ Restaurants (_Quintal/year)
  - ☐ Enjera Bakers (__Quintal/year)
  - ☐ Others (Specify)___
- o What are the preferences of Ethiopians for rice?
  - ☐ Do they prefer local rice
  - ☐ Imported rice? Why?
- o What are their differences in preferences
  - a. Quality
  - b. Price
  - C. other (specify)
- o What varieties of rice are grown in Ethiopia?
  - ☐ Short size and bold shape
  - ☐ Long size and slender
- o What is the most preferred variety?
  - ☐ Short size and bold shape
  - ☐ Long size and slender
- o What is most consumed variety?
  - ☐ Short size and bold shape
  - ☐ Long size and slender
- o What are the market trends in the relevant markets?
  - ☐ Growing
  - ☐ Normal
  - ☐ Decline
  - ☐ Others specify
- o What are competing countries / regions as appropriate and available?
  - ☐ Egypt
  - ☐ Thailand
  - ☐ Pakistan
  - ☐ India
  - ☐ Others (specify)

- What are the market opportunities for value addition
  - ☐ Parboiled,
  - ☐ Branding,
  - ☐ quality milling
  - ☐ Other (Specify)
- What standards regulate the subsector?
  - ☐ Quality
  - ☐ Prices
  - ☐ others
- what is the price range of imported rice
  - ☐ 15-50 birr/kg
  - ☐ 51-100 birr/kg
  - ☐ >100 birr/kg
- What is the price range of local rice
  - ☐ 15-50 birr/kg
  - ☐ 51-100 birr/kg
  - ☐ >100 birr/kg
- Variations in price of rice during the year?
  - ☐ Jan-march
  - ☐ April-June
  - ☐ July-Sep
  - ☐ Oct-Dec
- Where did you get bagging materials?
  - ☐ Private enterprise
  - ☐ Cooperative/association
  - ☐ Others (Specify)

Part C: The Cost-Benefit Structure of Retailers

- Registered Capital Birr
- Purchasing cost of milled/paddy rice? Milled rice Birr/Qt Paddy RiceBirr/Qt
- Purchasing cost of the machines? Birr
- Depreciation cost of the processing machine? Birr
- Cost of sack (baggage)? Birr
- Wear and tear (maintenance cost)? Birr
- Labor (machine operator)? Birr
- Labor (support laborer/guard)? Birr
- Cost of electricity/annum? Birr
- Other cost (water, warehouse)?Birr
- Labor cost of loading and unloading? Tax payment? Birr
- Sales of milled rice? Birr

Part D: Problems Encountered

- Problem encountered by the enterprise (list in priority):

S/N	Problems	Rank
1	Shortage of working capital	
2	Shortage of investment capital	
3	Lack of appropriate technology	
4	Lack of technical skills	
5	Lack of business management skills	
6	Lack of marketing skills	
7	Market access	
8	Power interruption	
9	Limited working space	
10	Other (specify)	

- Major challenges and opportunities

Challenges:

Opportunities:

- SWOT Analysis

Strength	**Weakness**
Opportunity	**Threats**

- Any suggestion /comments/ recommendations you would like to make:

------THE END-----

Appendix 5. Questionnaire Used for Input Suppliers during the Survey Work

1. General Overview:
    - Name of Enterprise:______________________________
    - Date of establishment: ______________
    - Working capital: Birr______________
    - Location: District/Town___________ Kebele ________________

2. Major role in rice value chain:
3. Major costs and benefit in related to rice value chain roles:
4. Major challenges and opportunities

    Challenges:
    Opportunities:

5. SWOT Analysis

Strength	**Weakness**

Opportunity	**Threats**